

ART. III.—*Catalogue of Non-Calcareous Sponges collected by J. Bracebridge Wilson, Esq., M.A., in the neighbourhood of Port Phillip Heads.*

PART II.

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INTRODUCTORY REMARKS.

The present contribution deals with the important Monaxonid family of the Desmacidonidæ. These are very abundant in Victorian waters. No less than fifty-eight species are here catalogued, of which twenty-eight appear to be new. It has been necessary to institute three new genera, for which the names *Microtylotella*, *Amphiastrella* and *Fusifera* are proposed.

Family DESMACIDONIDÆ.

Skeleton usually reticulate. Megascleres monactinal or diactinal. Microscleres always present, of various forms, but, with rare exceptions, including chelæ.

Sub-family ESPERELLINÆ.

Skeleton fibre not echinated by laterally projecting spicules.

Genus *Esperella*, Vosmaer.

Megascleres always monactinal, smooth styli or tylostyli. Microscleres palmate anisochelæ, usually with other forms associated.

Esperella enigmatica, Carter, sp.

Esperia parasitica, Carter, A.M.N.H., February, 1885, p. 108.

Pseudoesperia enigmatica, Carter, A.M.N.H., December, 1886, p. 455.

This species is well characterised by its massive form, thick, loose dermal membrane, very coarse, sandy fibre, and the rosettes of peculiar quadridentate anisochelæ. As Mr. Carter himself abandoned the name *parasitica* as founded on a misconception, I have no hesitation in following his example. It appears scarcely necessary to retain the genus *Pseudoesperia*.

R.N. 335 (7 f; "dull orange-yellow"); 439 (s. 9, 13 f; "ochre-yellow"); 611 (s. 6, 8 f; "ochre-yellow"); 713 (s. 8); 853 (s. 9); 860 (s. 9).

B.M. d. 111 ("*Pseudoesperia enigmatica* olim *Esperia parasitica*." Reg. 86-12-15-467).

Esperella phillipensis, n. sp.

The single specimen forms a rather thin, spreading crust, with irregular surface and few small vents.

Skeleton. The main skelton is very lax and irregular, consisting of loose fibres and whisps of spicules running towards the surface and branching repeatedly as they approach the dermal membrane. Very numerous megascleres are also scattered in the ground substance between the fibres. The dermal skeleton is a rather close reticulation of loose spicular fibre.

Megascleres, long, straight, slender tylostyli, with well-marked ovoid heads and rather abrupt, sharp points, measuring about 0.3 by 0.005 mm.

Microscleres, (*a*) moderately stout, palmate anisochelæ, of ordinary form, occurring abundantly in rosettes and singly, and measuring about 0.037 mm. long when fully developed; (*b*) slender sigmata, simple and contort, with short, abruptly recurved, sharp points, measuring about 0.045 mm. from bend to bend by 0.0015 mm. in thickness in the middle.

R.N. 827 (s. 10).

Esperella spongiosa, n. sp.

External form variable, from massive to flabellate or digitate. Soft and spongy, with thick, easily separable, reticulate dermal membrane. Vents commonly large and on prominent parts. Pale yellow in spirit. The colours in life recorded are dirty white, brown, vinaceous (purple), ochraceous buff, etc.; nothing very distinctive. Localities recorded: s. 1, s. 5, s. 9, x.

Skeleton. The main skeleton is a very irregular network of stout fibre, usually containing many spicules bound together by much spongin, often also containing much sand or broken spicules. Numerous megascleres are scattered in the ground substance. The dermal skeleton is a rather close reticulation of spicular fibre, echinated by abundant projecting spicules.

Megascleres, slender styli or tylostyli with feebly developed heads; gradually sharp-pointed at the apex; measuring about 0.158 by 0.0027 mm.

Microscleres, (a) slender palmate anisochelæ, scattered singly, about 0.025 mm. long and with narrow palm, of ordinary form: (b) some specimens contain a few slender, contort sigmata, about 0.066 mm. long from bend to bend. In many specimens there are scattered through the ground-substance, millions of minute, ovoid, highly refractive, very definite bodies, measuring about 0.0083 mm. in length. These occur in such numbers as to impart a peculiar opaque appearance to the whole sponge and also to sections. I do not at present understand their true nature.

This is a very unsatisfactory species, owing to the absence of constant and well-defined characters.

R.N. 280; 292; 350; 363; 372; 396; 408; 472; 525; 578; 579; 581; 588; 603; 648; 749; 805; 941; 968; 990; 1152; 1190; 1194.

Esperella arenicola, Ridley and Dendy.

Esperella arenicola, Ridley and Dendy, Challenger Monaxonida, p. 72, pl. xv., figs. 4, 4a; pl. xvi., fig. 8.

This species, already obtained by the Challenger from Bass Straits, is represented in the collection by two specimens from the Queenscliff jetty, which agree very closely with the original type.

R.N. 689; 693.

Esperella toxifer, n.sp.

Sponge massive, sessile, spreading, irregular. Surface uneven but subglabrous. Vents small, scattered on upper surface. Texture extremely soft and spongy, coarsely fibrous. Colour in spirit pale yellow; in life "wax ochre."

Skeleton, the main skeleton is very lax and irregular, consisting of branching, whip-like, multispicular fibres, trending in a sinuous manner towards the surface, and branching freely, especially as they approach the surface; sometimes forming oblique anastomoses. A large quantity of very pale-coloured spongin invests these fibres. Very numerous megascleres are also scattered irregularly through the ground substance. There is no special dermal skeleton.

Megascleres, straight, slender tylostyli, gradually sharp-pointed and with fairly well developed ovoid heads; measuring about 0.2 by 0.004 mm.

Microscleres, (a) extremely minute and slender anisochelæ, only about 0.01 mm. long; (b) smooth, slender toxa, gradually sharp-pointed at the ends, measuring about 0.095 by 0.0017 mm.; (c) slender sigmata, simple and contort, measuring about 0.012 mm. from bend to bend, very rare.

R.N. 779 (Sorrento Jetty).

Esperella crassa, n. sp.

Sponge massive, irregular, lobose or ridged, with vents on prominent parts. Surface covered with delicate, minutely reticulate dermal membrane, with coarser reticulation of underlying parts showing through. Texture compact, incompressible, friable, intensely and coarsely sandy throughout. Dark brown in spirit.

Skeleton. The main skeleton is made up almost entirely of sand, not arranged in definite tracts or fibres, with the very much reduced proper spicules scattered in the soft tissues between. The dermal membrane is free from coarse sand but contains many foreign spicules arranged in a very loose and irregular network.

Megascleres, very slender styli or perhaps strongyla, commonly slightly curved, measuring about 0.16 by 0.002 mm. Most abundant just beneath the dermal membrane, pointing towards the surface.

Microscleres, minute, slender, palmate anisochelæ, of ordinary form, about 0.016 mm. long.

R.N. 521 (x, 20 f; "wood brown, the vents and inner surface sulphur yellow"); 939 (x A).

Esperella rara, n. sp.

The single specimen is massively lobose, very irregular. Surface irregularly conulose and rugose, with reticulate dermal membrane. Vents small, marginal and scattered. Texture very coarse, with much sand internally, compressible, resilient. Colour in spirit pale yellow.

Skeleton, composed largely of sand, arranged in coarse, loose, irregular fibres, with no evident cementing substance. The megascleres are very abundantly scattered in the soft tissues between, not arranged in definite fibres but in loose radiating whips towards the surface. No special dermal skeleton.

Megascleres, straight slender tylostyli, sharply pointed and with small oval heads; measuring about 0.23 by 0.004 mm.

Microscleres, (a) slender, palmate anisochelæ, about 0.02 mm. long, often smaller; perhaps sometimes isochelæ; (b) short, slender trichodragmata, about 0.016 mm. long.

R.N. 1108 (x C).

Genus *Esperiopsis*, Carter.

Megascleres always monactinal, smooth styli or tylostyli. Microscleres isochelæ, to which other forms may be added.

Esperiopsis turbo, Carter, sp.

Holopsamma turbo, Carter, A.M.N.H., March, 1885, p. 213.

Sigmatella turbo, Lendenfeld, Monograph of Horny Sponges, p. 617.

This sponge is well characterised by its stipitate, pear-like shape, reticulate dermal membrane, skeleton of sandy fibres and greatly reduced spiculation. The megascleres are represented by slender styli, and the microscleres by very minute isochelæ, difficult to detect, both of which I have found in a fragment of Mr. Carter's specimen from the British Museum.

R.N. 265 (18 f; "dark purplish-brown"); 574 (x, 19 f; "brick red"); 647 (x, 20 f; "fawn colour over ferruginous"); 1050 (x B).

B.M. d. 50 ("*Holopsamma turbo*," Reg. 86-12-15-415).

Sub-genus *Pseudohalichondria*, Carter.

Differs from *Esperiopsis* only in the remarkable spined isochelæ.

Pseudohalichondria clavilobata, Carter.

Pseudohalichondria clavilobata, Carter, A.M.N.H., December, 1886, p. 454; pl. x., figs. 6-9.

This remarkable sponge, so well characterised by its spined isochelæ, appears to be not uncommon in Port Phillip.

R.N. 446 (s. 9, 17 f; "ochre-yellow"); 709 (s. 8); 857 (s. 9); 966 (s. 6); 986 (s. 9).

B.M. sp. 38 ("*Pseudohalichondria clavilobata*, C. Type;" Reg. 86-12-15-81); d. 14 (wrongly labelled "*Spongelia stellidermata*;" Reg. 86-12-15-287).

Genus *Desmacidon*, Bowerbank.

Megascleres always diactinal, smooth oxea or strongyla. Microscleres isochelæ, to which others may be added.

Desmacidon australis, n. sp.

Massive, irregular; with numerous vents scattered on prominent parts. Texture very sandy, sometimes with a dermal layer almost free from sand or with a beautiful minute sandy reticulation on the surface. Internally the sand is arranged in stout radiating columns whose ends may form pock-like markings on the surface. Grey in spirit.

Skeleton. The spicular skeleton is very much reduced, consisting mainly of slender strongyla scattered through the ground substance between the sandy columns and occasionally arranged in loose whisps, especially towards the surface. There may be a well-developed dermal reticulation of broken foreign spicules.

Megascleres, slender strongyla, measuring about 0.16 by 0.0028 mm.

Microscleres, (a) very slender tridentate isochelæ, about 0.012 mm. long, with small teeth; (b) very slender simple and contort sigmata, measuring about 0.02 mm. from bend to bend.

R.N. 303 (18 f; "dirty buff yellow"); 351 (19 f; "yellowish-brown, pale"); 532 (x, 19 f; "ochraceous"); 762 (s. 1); 929 (x A); 951 (s. 8); 999 (s. 1).

Desmacidon stelliderma, Carter sp.

Halichondria stelliderma, Carter, A.M.N.H., December, 1886, p. 451.

This species is characterised by its thick, lobose and compressed, or massively lobulate external form; with small vents scattered on prominent parts; soft and spongy texture and pale yellow colour in spirit. The main skeleton is a wide, sub-rectangularly meshed network of stout spicular fibre, containing very many slender spicules. At the surface radiating whisks of the same spicules surround the ends of the primary fibres in a stellate fashion. The megascleres are very slender, straight, smooth strongyla, commonly slightly inflated at the ends, and measuring about 0.18 by 0.0028 mm. The microscleres are thickly scattered through the ground substance and have the form of small tridentate isochelæ with strongly curved shafts and very minute flukes, the whole resembling a sigma and measuring about 0.01 mm. long.

R.N. 684 (s. 9); 710 (s. 8); 947 (s. 9); 955 (s. 6); 967 (s. 6).

B.M. sp. 29 ("*Halichondria stelliderma*, C. Type;" Reg. 86-12-15-148).

Desmacidon intermedia, n.sp.

Subcylindrical or slightly compressed, irregularly branched. Main stem up to one inch in diameter, tapering gradually to apex, nearly a foot long; branches much shorter and slenderer. Surface smooth and even, minutely reticulate, with thick dermal membrane, harsh to the touch. Vents very small, slightly prominent, uniserial or scattered on both margins. Firm, resilient, very tough. Very pale yellow in spirit, stained purplish on the surface.

Skeleton, a very irregular, coarse network of stout multispicular fibre, breaking up at the surface into close-set radiating tufts of oxea, whose shortly projecting points form the dermal reticulation. Many oxea are loosely scattered between the fibres, which themselves have no obvious cement.

Megascleres, rather stout, straight, sub-fusiform oxea, rather abruptly pointed at each end; measuring about 0.25 by 0.01 mm.

Microscleres, small tridentate isochelæ, with fairly stout strongly curved shaft and small but distinct triangular flukes. Length of the whole about 0.016 mm. These spicules are thickly scattered through the soft tissues.

This very interesting species is evidently closely related to the succeeding (*D. carnosa*).

R.N. 1163 (x).

Desmacidon carnosa, Carter, sp.

Fibulia carnosa, Carter, A.M.N.H., January, 1886, p. 51.

This species closely resembles the preceding (*D. intermedia*), with its characteristic branched external form and strong spicular fibre composed of densely packed oxea, breaking up at the surface into a densely radiate dermal skeleton. The microscleres, however, are only minute C-shaped sigmata.

I have no doubt, from comparison with *D. intermedia*, that this is a *Desmacidon* with reduced or imperfectly developed chelæ. Even the sigmata appear sometimes to be absent (e.g. R.N. 354).

R.N. 354 (19 f; "bright orange-scarlet"); 402 (x, 19 f; "dull red"); 725 (s. 5; "orange-red"); 726 (s. 5; "orange-scarlet"); 852 (s. 9).

B.M. d. 112 ("*Fibulia carnosa*"; Reg. 86-12-15-372).

Desmacidon (?) *arenifibrosa*, n. sp.

Erect, short-stalked, palmo-digitate, very irregular; branches short, blunt, compressed or subcylindrical. Surface subglabrous, very minutely reticulate; in parts with much projecting fibre, in parts minutely conulose. Vents small, scattered. Compressible, resilient, tough. Greyish-yellow in spirit.

Skeleton. The main skeleton is a very definite and fairly uniformly distributed but not very regular reticulation of stoutish pale coloured horny fibre, almost filled throughout with sand and broken spicules. The primary fibres, radiating to the surface, are about 0.1 mm. thick and the connecting fibres are rather slenderer. The meshes of the network are wide but extremely variable. There is a very well-developed, close-meshed dermal reticulation, composed of sand and broken spicules and with small rounded meshes.

Megascleres. Many foreign megascleres are present but I have not found any which can be safely regarded as belonging to the sponge.

Microscleres. Immense numbers of very minute isochelæ are scattered through the soft tissues. These are very slender and have sharply recurved, very slender median palms running almost parallel with the main shaft for about a third of its length, the lateral palms being inconspicuous. Length about 0·016 mm.

R.N. 979 (s. 5).

Desmacidon (?) *chaliniformis*, Carter, sp.

Dysidea chaliniformis, Carter, A.M.N.H., March, 1885, p. 217.

In the fragment of Mr. Carter's specimen sent to me from the British Museum I find numerous minute isochelæ of peculiar shape, sparsely and irregularly scattered through the dried-up soft tissues between the sandy fibres. These spicules measure about 0·012 mm. in length. They have a very slender, very slightly curved shaft, with apparently three very short, blunt teeth widely divergent from each end, but all apparently on the same side. It is very difficult to make out the exact form of the spicule, which makes a near approach to the minute amphiastra or birotulates of *Iotrochota*. The presence of these spicules seems to necessitate the placing of this species in the *Esperellinae*. I have found no proper megascleres.

Whether all the specimens included by von Lendenfeld under the name *Phoriospongia chaliniformis** belong to the same species appears very doubtful.

B.M. d. 8 (" *Dysidea chaliniformis*." Reg. 86-12-15-341).

Genus *Iotrochota*, Ridley.

Megascleres styli, sometimes with diactinal forms also. Microscleres amphiasters (birotulates†). Colour usually dark purple.

* Monograph of Horny Sponges, p. 600.

† Usually extremely minute.

Iotrochota coccinea, Carter sp.

Halichondria birotulata, Carter, A.M.N.H., January, 1886, p. 52.

Axinella coccinea, Carter, A.M.N.H., November, 1886, p. 378.

Erect, lamellar to digitate, or thickly lobose. Surface smooth, glabrous but uneven, sometimes minutely conulose. Vents rather small, scattered. Soft and spongy, resilient, rather tender. Very dark purple throughout, colouring the spirit.

Skeleton. The main skeleton is a coarse, subrectangular but irregular wide-meshed network of fibres containing many spicules and a great deal of spongin. The diameter of the meshes varies greatly. The primary fibres are about 0.09 mm. thick, the secondaries somewhat thinner, both multispicular. There is usually no skeleton at all in the dermal membrane, only occasionally a few scattered spicules. Spicules also occur scattered between the fibres of the main skeleton.

Megascleres, slender styli, straight or slightly curved, usually well-pointed, measuring about 0.2 by 0.004 mm. Slight variations in size and proportions occur, and I have also seen a few rounded at both ends (strongyla).

Microscleres. Excessively minute amphiastra (birotulates), very hard to find, very slender and only about 0.0072 mm. long. I have not been able to resolve the terminal knobs into teeth.

Mr. Carter identified this species with Higgin's *Halichondria birotulata*, which is also an *Iotrochota*. It seems to me better to keep them distinct, although the species of this genus are extremely hard to satisfactorily distinguish, and they may all be mere local varieties of Bowerbank's *I. (Halichondria) purpurea*. As Mr. Carter has described the same species (as shown by examination of his type from the British Museum) under the name *Axinella coccinea*, the name *coccinea* may be conveniently retained.

R.N. 332 (18 f; "black, with maroon purple tint in the juice"); 1064 (x A); 1164 (x); 1175.

B.M. sp. 37 ("[*Iotrochota*] [*Halichondria*] *birotula* Higgins;" Reg. 86-12-15-109); sp. 64 ("*Axinella coccinea* C. Type;" Reg. 86-12-15-8).

Iotrochota acerata, n.sp.

Compressed, lobose, sessile, irregular and somewhat cavernous. Vents small and scattered, some marginal. Surface glabrous but uneven; minutely reticulate in parts. Texture soft and spongy, but at the same time tough and fibrous. Colour in life and in spirit dark brown.

Skeleton, a very loose and irregular, rather small-meshed reticulation of multispicular fibre, usually with indistinct spongin. Many megascleres are loosely scattered between the fibres. There is no special dermal skeleton beyond a few sparse, radiating tufts of strongyla. The reticulate character of the dermal membrane is due to the arrangement of the underlying soft tissues.

Megascleres, (a) smooth styli, usually more or less curved; evenly rounded off at one end and sharply pointed at the other; size variable, say about 0.2 by 0.006 mm.; (b) smooth oxea, of about the same size and shape as the styli but sharply pointed at both ends; (c) smooth strongyla, straight or nearly so, and evenly rounded off at both ends, varying from a little shorter and stouter to a little longer and slenderer than the average styli. All these forms are abundantly intermingled in the deeper parts of the sponge, but the sparse dermal tufts appear to consist chiefly if not entirely of the strongylote megascleres.

Microscleres, the usual amphiastra, usually about 0.012 mm. long.

This species is distinguished by its brown colour, and by the presence of the abundant oxeote megascleres. From *I. coccinea* it is also distinguished by the much larger microscleres.

R.N. 434 (x, 19 f; "seal brown with a coating of olive yellow").

Genus *Forcepia*, Carter.

Megascleres usually diactinal, tylota or strongyla, sometimes becoming stylote. Microscleres isochelae and forcipes, possibly with other forms.

Forcepia colonensis, Carter.

Forcepia colonensis, Carter, A.M.N.H., February, 1885, p. 110.

Suberites biceps, Carter, A.M.N.H., February, 1886, p. 117.

This remarkable sponge appears to be rare. Two of the specimens which I now refer to it (R.N. 599 and 1131) have very much smaller forceps spicules than the type and may possibly be distinct. The type of *Suberites biceps* in the British Museum contains spined forceps, isochelæ and (?) sigmata and is obviously referable to *Forcepia colonensis*.

R.N. 549 (x, 19 f; "geranium red"); 599 (x, 19 f; "poppy red"); 1131 (x).

B.M. d. 106 ("Forcipia colonensis," Reg. 86-12-15-363); sp. 12 ("Suberites biceps, C. type," Reg. 86-12-15-52).

Forcepia carteri, n. sp.

Sponge massive, irregular. Surface very uneven, with scabid, subdivided sandy areas. Texture cavernous, compact between, with large sandy tracts; firm. Greyish-yellow in spirit.

Skeleton, composed chiefly of sand, not arranged in fibres but in dense irregular accumulations with comparatively clear areas of soft tissue between. There are also numerous megascleres, mostly arranged in very loose and irregular whisps.

Megascleres, straight, slender strongyla, nearly cylindrical, sometimes swollen into a slight head at one end; measuring about 0.24 by 0.004 mm.

Microscleres, (a) slender tridentate isochelæ, about 0.012 mm. long, with strongly curved shaft and short teeth; (b) forcipiform, very slender, about 0.08 mm. long, like a pair of hair-like raphides united at one end and curving somewhat apart at the other. The two limbs often appear separately, and are then indistinguishable from ordinary raphides. These spicules are very numerous.

The species makes a near approach to Carter's *Forcepia crassanchorata** from Port Elliot, S.A., but differs in details of spiculation.

R.N. 607 (x, 20 f; "ochre yellow").

Genus *Microtylotella*, nov. gen.

Megascleres diactinal (tylota). Microscleres isochelæ and microtylota, to which others may be added.

* A.M.N.H., February, 1885, p. 111, pl. iv., fig. 3, a-g.

(The term "microtylota" is here proposed for an apparently new type of microsclere consisting of a long slender shaft with a knob at each end).

Microtylotella güntheri, n. sp.

Massive, solid and heavy. Vents (in one specimen) few, large, on broad rounded margin. Very hard; composed chiefly of coarse sand arranged in dense, stout, close-packed, radiating columns, whose ends may form a meandriniform pattern on the upper surface. Colour in spirit sandy brown.

The spicular skeleton is reduced to insignificance in comparison with the coarse sand, but slender spicules are abundantly scattered through the soft tissues.

Megascleres, long, slender, nearly straight tylota, with slightly developed heads; size about 0.28 by 0.003 mm.

Microscleres, (a) very minute, slender isochelæ, about 0.012 mm. long, of ordinary form like those figured by Carter for *Forcepia colonensis*; (b) smooth, slender toxa, of extremely variable dimensions, sometimes so long and so slightly curved as to resemble raphides; (c) microtylota, with very slender, straight or nearly straight shaft, which may be very faintly microspined, terminating at each end in a small button-like knob (perhaps slightly toothed); the whole about 0.08 mm. long and 0.0015 mm. thick in the shaft.

I have much pleasure in dedicating this remarkable species to Dr. Günther, of the British Museum, as a slight recognition of his many kindnesses.

R.N. 473 (x, 20 f; "bay"); 757 (s. 5, "vermilion").

Genus *Histoderma*, Carter.

Sponge consisting of a massive body throwing off hollow processes or fistulæ; with a more or less strongly-developed cortex of horizontally-placed megascleres. Megascleres usually diactinal, but ranging from tylota to styli. Microscleres isochelæ, to which others may be added.

Sideroderma, Ridley and Dendy, may possibly have to fall under this genus.

Histoderma verrucosum, Carter.

Histoderma verrucosum, Carter, A.M.N.H., December, 1886, p. 452.

Histoderma polymasteides, Carter, A.M.N.H., December, 1886, p. 453.

The isochelæ may be extremely rare. In *R.N.* 392 and 398 I have not been able to find any, and in *B.M.* sp. 36 I could only find one.

H. polymasteides would appear from the description to be merely a more robust variety, but I have seen no specimen.

R.N. 392 ; 398 ; 627 (x, 19 f ; "buff"); 808 (s. 5); 1189.

B.M. sp. 36 (" *Histoderma verrucosum*," Reg. 86-12-15-74).

Genus *Amphiastrella*, nov. gen.

Sponge consisting of a massive body throwing off hollow fistulæ from the upper surface and (sometimes) with root-like processes below. Body with a dense cortex of horizontally-placed spicules. Megascleres diactinal, strongyla or tylota. Microscleres amphiasters (birotuliate), to which others may be added.

The erection of a new genus for Carter's *Phlæodictyon birotuliferum* seems to me necessary. The name *Phlæodictyon* was first used by Mr. Carter for entirely different forms.

Amphiastrella birotulifera, Carter, sp.

Phlæodictyon birotuliferum, Carter, A.M.N.H., December, 1886, p. 447, pl. x., figs. 1-5.

As this very remarkable species is hitherto known only from a fragment (one of the branching tubes), I propose to supplement Mr. Carter's detailed account with the description of a second specimen dredged by Mr. Wilson.

Sponge massive, depressed, sessile, irregular, thickly encrusted with shell debris and other rubbish. Lower surface sending out numerous rather slender, elongated, rootlike processes, attached to which are pebbles, &c. Upper surfaces giving off a few irregular, slender, elongated fistulæ, most of which are closed at the apex (? two open naturally). These hollow fistulæ branch irregularly, and some have distinctly reticulate walls. The body of the sponge is dense and compact, and is enclosed on all sides

by a rather thin but very dense and hard cortex. Colour in spirit, where visible, pale yellow or brown.

Skeleton, in the interior of the body are scattered many megascleres, not arranged in definite fibres. In the cortex they are very densely packed, lying in various directions, more or less parallel to the surface, and forming a thick solid crust. In the walls of the fistulæ they are arranged in loose, stout bands or fibres, which form an irregular network, with many spicules scattered in the meshes between.

Megascleres, straight or slightly-curved strongylia or tylota, with slightly-developed oval heads; size about 0.4 by 0.008 mm., but variable, sometimes much longer and slenderer.

Microscleres, (*a*) amphiasters (birotulates), varying in size up to about 0.05 mm. long, with shaft 0.0042 mm. thick. The shaft is commonly slightly constricted in the middle, and may be thickened at each side of the constriction. The umbrella-like ends may have as many as nine teeth or ribs; (*b*) slender sigmata, say 0.04 mm. from bend to bend, but variable. Neither kind of microsclere is abundant, and they might easily be overlooked.

R.N. 942 (x A).

B.M. sp. 35 (" *Phlæodictyon birotuliferum*," Reg. 87-7-11-12).

Genus *Damiria*, Keller.

Skeleton reticulate. Megascleres of two forms, both diactinal; those of the main skeleton oxea, those of the dermal skeleton tylota (? sometimes strongylote or tornote).

Microscleres isochelæ, usually accompanied by sigmata.

Not having access here to Keller's original description, I owe my information as to this genus to Topsent's useful paper, "Une Réforme dans la Classification des Halichondrina."*

Damiria australiensis, n. sp.

Form very variable, ranging from massive to digitate; with conulose or meandriform surface and delicate dermal membrane between the projecting portions. Vents variable, large or small, scattered or on mammiform or digitiform projections. Texture soft and spongy. Colour in spirit pale yellow.

* Mémoires de la Société Zoologique de France. Tome VII., p. 5, 1894

Skeleton. The main skeleton is a dense, irregularly isodictyal network of oxea. Towards the surface this is replaced by radiating, branching whisps of tylota.

Megascleres, (a) rather slender, slightly curved, smooth oxea, gradually sharp-pointed at each end, measuring about 0.2 by 0.008 mm. (very rarely a stylote spicule occurs amongst them); (b) tylota, with well-developed oval heads, smooth, straight; about 0.25 by 0.005 mm.

Microscleres, (a) tridentate isochelæ like those of *Myxilla*; fairly stout and about 0.028 mm. long, but varying in size; (b) Sigmata, small, slender, simple and contort, about 0.02 mm. from bend to bend.

R.N. 361 (s. 15, 3 f; "bright orange red"); 451 (s. 9, 17 f; "rufous"); 662; 673 (s. 10); 717 (s. 10); 718 (Sorrento Reef); 719 (Sorrento Reef); 722 (Sorrento Reef); 836 (s. 10); 837 (s. 10); 838 (s. 10); 845 (s. 10); 861 (s. 9); 903 (s. 10); 919 (s. 10); 997 (s. 14).

Sub-family ECTYONINÆ.

Skeleton fibre echinated by laterally projecting styli, usually spined.

Genus *Myxilla*, Schmidt.

Main skeleton reticulate, composed of usually spined styli, and sometimes echinated by spined styli or tylostyli of different form. Various ended diactinal megascleres are also present, chiefly at the surface. There is usually very little spongin. Microscleres tridentate isochelæ, to which sigmata may be added.

Seeing that the type of this genus, *M. rosacea*, has no special echinating spicules, I cannot agree with Topsent in separating such forms as a distinct genus under Gray's name *Dendoryx*. *Myxilla* has several years' precedence over *Dendoryx*, and at present I propose to retain the name *Myxilla* both for species with and species without special echinating spicules (*vide* Challenger Report). Similarly, Topsent's *Lissodendoryx* falls under *Myxilla*, for the degree of spination of the styli varies so much that it is impossible to draw a hard and fast line between the two.

Myxilla isodictyalis, Carter, sp.

Halichondria isodictyalis, Carter, A.M.N.H., April, 1882, p. 285, pl. xi., fig. 2.

Halichondria isodictyalis, Carter, A.M.N.H., January, 1886, p. 52.

Halichondria incrustans, Coll. Brit. Mus.

The sponge is massive, sessile, usually with more or less conulose surface and rather large scattered vents. The skeleton is an isodictyal network of smooth styli, with tylota radiating in whips towards the surface and scattered in the dermal membrane. The microscleres are small isochelæ and sigmata.

R.V. 690 (s. 7); 773 (Sorrento Jetty, "wax yellow"); 778 (Sorrento Jetty, "wax yellow"); 793 (Sorrento Jetty, "dull wax yellow"); 872 (s. 5); 886 (s. 9); 897 (s. 10); 953 (s. 6); 965 (s. 6).

B.M. d. 103 (labelled "*Halichondria incrustans*," which is explained by Mr. Carter's remarks *loc. cit.*, Reg. 86-12-15-391).

Myxilla victoriana, n. sp.

Halichondria pustulosa, Carter, A.M.N.H., December, 1886, p. 450.

Halichondria pustulata, Coll. Brit. Mus.

Not *Halichondria pustulosa*, Carter, A.M.N.H., April, 1882, p. 285, pl. xi., fig. 1.

Massive, irregular, with uneven, rugose or warty surface and scab-like pore-areas. Vents small and scattered. Texture fairly compact, but soft and spongy. Pale yellow in spirit.

Skeleton, the main skeleton is an irregular reticulation of spicular fibres, with rather strongly-developed multispicular primary lines running towards the surface. The fibres contain a considerable quantity of pale-coloured spongin, and are abundantly echinated by the spined styli. The dermal skeleton consists of the slender diactinal spicules (sometimes stylote) radiating in whips at the surface, and especially developed in a beautifully radiate manner around the scab-like pore-areas.

Megascleres, (a) Main styli, smooth, slightly curved and gradually sharp-pointed, sometimes with a faint indication of spination at the base; size about 0.2 by 0.0082 mm.; (b) Echin-

ating styli, straight, gradually sharp-pointed and spined all over, size about 0.1 by 0.0082 mm. ;* (c) Dermal spicules, straight, smooth, long and slender, varying in form from tylote to tylostylote, with feebly-developed oval heads ; size about 0.25 by 0.003 mm.

Microscleres, rather stout tridentate isochelæ, of the usual *Myxilla* pattern, about 0.025 mm. long. Very abundant.

This species is evidently distinct from Carter's original *Halichondria pustulosa*, as is clearly seen by reference to his description and figures.

R.V. 492 ("brick red"); 835 ; 844 ; 895 ; 922. All from station 10.

B.M. d. 97 ("*Halichondria pustulata*," Reg. 87-7-11-26).

Genus *Microciona*, Bowerbank (emended).

Skeleton consisting of plumose columns. Megascleres all monactinal, smooth and spined. Typical microscleres isochelæ.

Microciona scabida, Carter, sp.

Halichondria scabida, Carter, A.M.N.H., February, 1885, p. 112, pl. iv., figs. 4, 5.

Halichondria scabida, Carter, A.M.N.H., December, 1886, p. 449.

This species appears to come much nearer to Carter's original "*Halichondria pustulosa*" than does *Myxilla victoriana*, which he referred to that species.

R.V. 413 (x, 19 f ; "orpiment-orange"); 1025 (x B) ; 1038 (x B).

Genus *Clathria*, Schmidt.

Skeleton a reticulation of fibre, usually with much spongin, cored by smooth styli and echinated by spined styli. Typical microscleres small palmate isochelæ.

I propose to drop the genus *Rhaphidophlus* of Ehlers, which differs from *Clathria* only in the strongly-developed dermal crust of radiately-disposed styli. It is impossible to draw a sharp distinction between the two.

* The diameter given for spined styli is always exclusive of the spines.

Clathria typica, Carter, sp.

Echinonema typicum, Carter, A.M.N.H., May, 1881, p. 378.

Echinonema anchoratum, Carter, A.M.N.H., May, 1881, p. 379.

Echinonema flabelliformis, Carter, A.M.N.H., November, 1885, p. 352.

Echinonema pectiniformis, Carter, A.M.N.H., November, 1885, p. 353.

Phakellia ventilabrum, var. *australiensis*, Carter, A.M.N.H., November, 1886, p. 379.

This very common and variable species ranges from digitate to flabellate in shape. It is characterised by the stout, echinated, horny fibre and dermal crust of small styli. The megascleres are smooth styli, long and slender in and between the fibres, shorter at the surface, and short spined echinating styli. The microscleres are minute isochelæ, and very slender, hair-like toxa, often in bundles (toxodragmata). The latter, although not mentioned by Carter, are present in B.M. d. 96 and B.M. sp. 48. R.N. 383, 436 and 551 are distinguished from the majority of the specimens by the absence (apparently) of toxa and the more strongly-developed megascleres, but such differences are hardly of specific importance in the genus *Clathria*.

R.N. 359 (s. 15, 3 f; "dull dirty brick red"); 431 (x, 19 f; "salmon colour"); 438 (s. 14, 11 f; "vinaceous-rufous"); 677 (s. 5; "scarlet"); 797 (s. 9); 840 (s. 10); 900 (s. 10); 959 (s. 6); 1072 (x A).

Variety 383; 436 (x, 19 f; "brick red"); 551 (x, 19 f; subdued crimson).

B.M. sp. 48 ("*Echinonema pectiniformis*, C. type," Reg. 86-12-15-141); d. 85 ("*Phakellia ventilabrum*, var. *australiensis*," Reg. 86-12-15-422); d. 96 ("*Echinonema anchoratum*," Reg. 86-12-15-423).

Clathria angulifera, n.sp.

Sponge thinly lamellar, very proliferous, anastomosing, low-growing, spreading; vents small, scattered and marginal. Surface glabrous. Texture compressible, resilient, fairly tough. Colour in spirit, very pale yellow.

Skeleton, an irregular but well-defined and rather close-meshed network of rather slender fibre. The fibre is composed of very

pale spongin, cored by fairly abundant smooth styli and sparsely echinated by spined styli. The spicules occur irregularly in the fibres, not forming a compact axial core. Few spicules are scattered between the fibres. The dermal skeleton is composed of very loose radiating whisks of long slender styli.

Megascleres, (a) smooth, straight styli, in the fibres of the main skeleton, gradually sharp-pointed; size variable, say about 0.18 by 0.0042 mm.; (b) long, straight, slender styli or subtylostyli of the dermal tufts, say about 0.25 by 0.0035 mm.; (c) echinating styli; short, straight, gradually sharp-pointed, feebly spined; about 0.058 by 0.004 mm.

Microscleres, (a) extremely minute isochelae, very slender and hardly 0.006 mm. long; (b) rather short, stout toxa, very strongly angulate* in the middle, sometimes forming almost a right angle with nearly straight limbs; smooth and sharp-pointed: size variable, up to about 0.07 mm. from point to point in a straight line, by 0.004 mm. in diameter. I have also observed a few hair-like raphides, possibly young forms of megascleres, and one stoutish contort sigma.

R.N. 1160 (x).

Clathria australiensis, Carter, sp.

Wilsonella australiensis, Carter, A.M.N.H., November, 1885, p. 366.

This appears to be simply a *Clathria* with a large amount of foreign matter (sand and broken spicules) in and between the fibres and on the surface. The sand is especially abundant in the primary fibres. A considerable amount of spongin is also present. In the three specimens which I now refer to the species I find a few slender toxa, which are not mentioned in the original description.

R.N. 748 (s. 1; "cherry red"); 969 (s. 5); 1002 (s. 1).

B.M. sp. 76 (*Wilsonella australiensis*, C. type," Reg. 86-12-15-43); d. 13 (wrongly labelled "*Spongelia*," Reg. 86-12-15-288).

Clathria echinonematissima, Carter, sp.

Wilsonella echinonematissima, Carter, A.M.N.H., March, 1887, p. 210.

* Whence the specific name.

There seems to be little doubt, from Mr. Carter's description, that this species is a *Clathria*, but I have not yet had the opportunity of examining it.

Clathria piniformis, Carter, sp.

Dictyocylindrus piniformis, Carter, A.M.N.H., November, 1885, p. 354.

This is apparently an aberrant *Clathria*. The sponge is erect, lobo-digitate or flabellate, with corrugated surface. There is a well-developed horny fibre, and the spicules are all very slender. The megascleres are long slender styli which may become oxeote, and short slender echinating styli, which may also become oxeote. The latter are spined as usual, and the oxeote tendency seems to be very characteristic. No microscleres are visible.

R.N. 412 (x, 19 f; "cadmium orange"); 508 (x, 20 f; "brick red").

B.M. sp. 75 ("*Dictyocylindrus piniformis*, C. type," Reg. 86-12-15-62).

Clathria alata, n. sp.

Sponge massive, irregular, with rugose or warty surface and thick, tough, smooth dermal membrane. Vents large and small, scattered. Texture fairly firm but compressible and resilient. Pale yellow or brown in spirit.

Skeleton, the spicular skeleton is very strongly-developed, partly in stout, whip-like, multispicular fibres, enveloped in much spongin and forming a very loose, irregular network; the fibres are composed chiefly of the smooth styli. At the surface they break up into densely-packed, radiating tufts of smooth styli, forming a dermal crust. Very numerous loose megascleres are scattered between the fibres of the main skeleton.

Megascleres, (*a*) straight, smooth, rather slender styli; evenly rounded off at one end and fairly gradually sharp-pointed at the other; nearly cylindrical; size about 0.23 by 0.0042 mm.; (*b*) spined styli; straight, gradually sharp-pointed, apex free from spines; variable in size, usually rather short and stout, say about 0.1 by 0.0082 mm.

Microscleres, very numerous isochelæ. Resembling the ordinary *Clathria* type in general characters but comparatively large and

distinguished by a very thin wing-like expansion or fimbria along each side of the shaft.* Length about 0.022 mm.

R.V. 752 (s. 5; "light orange-brown"); 763 (s. 1); 792 (Sorrento Jetty; "greyish-brown"); 801 (s. 1; "orange-brown"); 842 (s. 10); 843 (s. 10).

Clathria myxilloides, n. sp.

Massive, depressed, cake-like. Surface rather uneven; villous with projecting fibres, although the dermal skeleton appears to be intact. Compact, soft, resilient. Pale greyish-yellow in spirit.

Skeleton, the main skeleton is a very loose and irregular network of stout, whip-like, multispicular fibres, mostly running towards the surface. The fibres appear very lax and with little or no obvious spongin. They are made up of the smooth styli, irregularly echinated and accompanied by the spined styli. Between the fibres loose megascleres are abundantly scattered. The dermal skeleton consists of dense, radiating tufts of smooth styli.

Megascleres, (a) long, straight, slender, smooth styli; evenly rounded at one end and sharply pointed at the other; about 0.3 by 0.0042 mm.; (b) spined styli; straight and rather slender, gradually sharp-pointed and abundantly spined all over; about 0.13 by 0.005 mm.

Microscleres, tridentate isochelæ, resembling those of *Myxilla*, with strongly-curved shaft. Length about 0.025 mm.

This species at first sight closely resembles *Clathria alata* but differs in the form of the spicules very considerably.

R.V. 729 (s. 5).

Clathria imperfecta, n. sp.

Sponge compressed, cake-like, crumbling.

Skeleton, a very irregular reticulation of loose, whip-like, multispicular fibre without obvious spongin, irregularly echinated and accompanied by spined styli, but composed principally of smooth styli. Many spicules are scattered between the fibres, especially spined styli, and at the surface there is a poorly-developed dermal skeleton of loose radially-disposed smooth styli.

* Whence the name of the species.

Megascleres, (a) smooth, straight styli, gradually sharp-pointed at the apex, and evenly rounded at the base: size about 0.2 by 0.0062 mm.; (b) spined styli; usually straight, tapering gradually to a fine point, richly spined all over; size about 0.1 by 0.005 mm.

This remarkable species, characterised by the entire absence of microscleres, should perhaps be considered as the type of a new genus. As regards external form and the general arrangement of the skeleton and the form of the megascleres it comes very near to *Clathria alata* and *C. myxilloides*.

R.N. 376 (18 f; "dull brown orange, yellower below").

Genus *Ophlitaspongia*, Bowerbank* (emend.)

Usually with strongly-developed horny fibre. Megascleres smooth styli, some of which echinate the horny fibre. Microscleres may or may not be present. External form not honeycombed.

This genus, as thus constituted, will be a very useful one differing from *Clathria* in the smoothness of the echinating styli, and from *Echinoclathria* in the external form. It has been pointed out by Topsent that the first described species of *Clathria* (*C. coralloides*) has smooth echinating spicules, but the genus was so imperfectly diagnosed by its author that we may accept the views of subsequent writers, who seem to be agreed in regarding the spined styli as characteristic. This view leaves the field open for Bowerbank's *Ophlitaspongia*, of which the type has smooth echinating styli.

Some species of the genus, in which the styli may be replaced by oxea, form an interesting link between the Ectyoninae and Chalininae, and I have little doubt that my *Siphonochalina hispiculata*, described in the first part of this catalogue, really belongs near here.

Ophlitaspongia subhispida, Carter, sp.

Echinoclathria subhispida, Carter, A.M.N.H., November, 1885, p. 356.

* Monograph of British Sponges, Vol., II., p. 14.

Echinoclathria gracilis, Carter, *op. et loc. cit.*

? *Axinella chalinoides*, Carter, A.M.N.H., November, 1885, p. 358.

? *Axinella chalinoides*, var. *cribrosa*, Carter, A.M.N.H., November, 1886, p. 377.

The sponge is branched, the branches being long and slender, subcylindrical or flattened. The skeleton is reticulate, consisting of strongly-developed horny fibre, in part cored and echinated by smooth styli. In addition to the spicules mentioned by Mr. Carter, I find in B.M. sp. 39 and in B.M. sp. 42 and in R.N. 310, slender toxa present.

R.N. 310 (20 f; "dark brownish red"); ? 628 (x, 19 f; "maroon").

B.M. sp. 39 ("*Echinoclathria gracilis*, C. type," Reg. 86-12-15-45); sp. 42 ("*Echinoclathria subhispidia*, C. type," Reg. 86-12-15-70); ? d. S1 ("*Axinella chalinoides*," Reg. 86-12-15-402).

Ophlitaspongia nodosa, Carter, sp.

Echinoclathria nodosa, Carter, A.M.N.H., November, 1885, p. 356.

This species is branching, with the branches nodulated and sometimes anastomosing. The skeleton is reticulate, with well-developed horny fibre. The spicules are smooth styli, in and projecting from the fibre and scattered between. Special echinating spicules can hardly be said to exist, and I have seen no microscleres.

R.N. 264 (18 f; "brick red"); 644 (s. 5, 7 f; "crimson, with a very light wash of sepia"); 899 (s. 10).

B.M. sp. 41 (*Echinoclathria nodosa*, C. type," Reg. 86-12-15-96).

Ophlitaspongia tenuis, Carter, sp.

Echinoclathria tenuis, Carter, A.M.N.H., November, 1885, p. 355.

Phakellia papyracea, Carter, A.M.N.H., November, 1886, p. 379.

(Not *Phakellia papyracea*, Ridley and Dendy, Challenger Monaxonida, p. 172).

The sponge is stipitate, thin, flabellate. The main skeleton consists of a fairly regular, rather small-meshed, sub-rectangular network of strongly-developed horny fibre, cored and echinated by smooth, short, stout styli or subtylostyli of variable size. This skeleton is condensed in the central plane. There are also present long and very slender, smooth tylostyli, with well-developed heads. These appear to be very characteristic, they occur in longitudinal whisps and scattered towards the middle of the sponge, and in loose radiating tufts at the surface. No microscleres have been detected. The species is interesting because it shows a structure intermediate between the *Ectyoninae* and *Axinellidae*, so that it might, with almost equal justice, be placed in either group. Indeed, I find from examination of the British Museum specimens that Mr. Carter's *Echinoclathria tenuis* and *Phakellia papyracea* are identical.

R.N. 287 (18 f; "bright brick red"); 353 (19 f; "venetian red with yellow spots"); 1075 (x A).

B.M. sp. 43 ("*Echinoclathria tenuis*, C. type," Reg. 86-12-15-147); d. 88 ("*Phakellia papyracea*," Reg. 86-12-15-231).

Ophlitaspongia gabrieli, n. sp.

Sessile, spreading, encrusting; rising into short mammiform projections, each bearing a smallish vent. Surface uneven, with minutely reticulate dermal membrane in the depressed portions, more or less granular elsewhere. Texture soft, resilient; colour in spirit pale yellow.

Skeleton, the main skeleton is a sub-rectangularly meshed network of strongly-developed horny fibre. The primary fibres are about 0.055 mm., thick and sparsely cored with slender styli. The secondary connecting fibres are a little slenderer and without any spicular core. The dermal skeleton consists of sparse tufts of slender styli projecting very slightly beyond the dermal membrane.

Megascleres, smooth, straight styli, of two chief sizes, (a) comparatively short; hastately and very sharply-pointed at the apex, and evenly rounded off at the base; measuring about 0.09 by 0.0042 mm. These occur pretty abundantly scattered in the soft tissues between the fibres; a very few of them echinate

the fibres; a very few oxea of about the same proportions also occur. The styli coring the main fibres are of about the same length but much slenderer; (*b*) comparatively long; gradually sharp-pointed at the apex, and evenly rounded off at the base; measuring about 0.19 by 0.003 mm.: occurring in the dermal tufts and scattered between the fibres.

Microscleres, a very few long, slender oxoote spicules, slightly angulated in the middle, may perhaps represent toxa. They measure up to about 0.25 by 0.002 mm.

I have much pleasure in dedicating this species to Mr. J. Gabriel, to whose dredging operations I am indebted for many Victorian sponges.

R.N. 915 (s. 5).

Ophlitaspongia axinelloides, n. sp.

Sponge erect, lobose, stipitate. Vents small, marginal. Surface smooth, minutely reticulate. Colour in spirit pale yellow.

Skeleton, the main skeleton is a rather close sub-rectangularly meshed network of strongly-developed horny fibre. The primary lines are about 0.07 mm. thick and pretty abundantly cored by the short, smooth styli, many of which are arranged in an Axinellid manner, with their apices projecting obliquely upwards and outwards from the fibre. The secondary, connecting fibres are a little slenderer, sparsely cored and rarely echinated by scattered styli. Numerous styli are irregularly scattered in the soft tissues between the fibres. The dermal skeleton is not very strongly developed and consists of rather sparse, radiating tufts of styli supported on an underlying reticulation of horny fibre belonging to the uppermost part of the main skeleton.

Megascleres, smooth, straight, styli; usually short and stout, evenly rounded and slightly narrowed at one end and tapering gradually to a fine point at the other; measuring about 0.1 by 0.0082 mm. Such spicules are the most abundant in all situations; they are occasionally replaced by sharp-pointed oxea of about the same dimensions, while longer and slenderer styli of variable size occur plentifully scattered amongst them. The latter are sometimes of almost hair-like proportions.

R.N. 329 (18 f; "deep blood red").

Genus *Echinoclathria*, Carter.

Sponge made up of a honeycomb-like mass of anastomosing, flattened trabeculae. Skeleton reticulate, horny, with or without spicules in the fibre. Megascleres smooth, either styli or tylota; smooth echinating styli commonly present. Palmate isochelae may be present.

Echinoclathria favus, Carter.

Echinoclathria favus, Carter, A.M.N.H., October, 1885, p. 292.

Echinoclathria favus, Ridley and Dendy, Challenger Monaxonida, p. 160, pl. xxxi., figs. 4, 5, 5a.

It is rather curious that this species, which would seem, from Mr. Carter's original description and from the "Challenger" Collection, to be not uncommon in Bass Straits, is unrepresented in Mr. Wilson's later collections.

Echinoclathria glabra, Ridley and Dendy.

Echinoclathria glabra, Ridley and Dendy, Challenger Monaxonida, p. 163, pl. xxix., figs. 11, 11a; pl. xxxi., fig. 2.

This species was described from a single specimen collected by the "Challenger" in Bass Straits. Mr. Wilson has added three more.

R.N. 691 (s. 7, Queenscliff Jetty); 696 (s. 7, Queenscliff Jetty); 707 (s. 3; "yellowish grey").

Echinoclathria arenifera, Carter.

? *Holopsamma laminaefavosa*, Carter, A.M.N.H., March, 1885, p. 212.

Echinoclathria favus, var. *arenifera*, Carter, A.M.N.H., November, 1885, p. 350.

The sponge is honeycombed as usual but intensely sandy. The spicules are difficult to make out, apparently smooth, echinating subtylostyli and slender linear spicules only. B.M. d. 54, 55 and 58 all contain proper spicules, while their presence is doubtful in d. 49 and 56.

R.N. 308 (20 f; "sandy sponge colour"); 557 (x, 19 f; ochraceous buff); 698 (s. 7, Queenscliff Jetty); 830 (s. 10); 833 (s. 10); 849 (s. 10).

B.M. ? d. 49 (“*Holopsamma laminaefavosa*,” Reg. 86-12-15-420); d. 54 (“*Holopsamma laminaefavosa*,” unregistered); d. 55 (“*Holopsamma laminaefavosa*,” Reg. 86-12-15-491); d. 56 (“*Holopsamma lamina*,” Reg. 86-12-15-490); d. 58 (*Holopsamma lamina*,” Reg. 86-12-15-312).

Genus *Plumohalichondria*, Carter.

Skeleton arranged in plumose columns. Megascleres smooth diactinal and spined monactinal. Typical microscleres isochelæ.

Plumohalichondria caespitosa, Carter, sp.

Echinonema caespitosa, Carter, A.M.N.H., November, 1885, p. 352.

The massive, proliferous, coralloid external form and columnar structure with the plumose skeleton columns are very characteristic of this species.

R.N. 485 (s. 10, 8 f; “salmon colour”); 565 (s. 10, 8 f; “orange”); 664; 901 (s. 10).

B.M. sp. 45 (“*Echinonema caespitosa*, C type,” Reg. 86-12-15-97).

Plumohalichondria uncifer, n. sp.

Sponge thin, encrusting, with minutely conulose surface and columnar structure. Colour in spirit pale yellow.

Skeleton composed of short, stout, plumose columns, running from the base to the dermal membrane and branching slightly in their course. These columns consist chiefly of spined styli, whose basal portions are connected together by much spongin; accompanied by a few slender oxea. The oxea become more abundant towards the surface, radiating off from the plumose columns in tufts to the dermal membrane.

Megascleres, (a) long, straight, slender oxea; smooth and rather abruptly pointed; measuring about 0.16 by 0.0027 mm.; (b) spined styli; rather slender, straight or slightly curved, tapering very gradually to the apex, the neighbourhood of which alone is free from spines; varying much in size, about 0.18 by 0.0083 mm. when fully grown.

Microscleres, (*a*) robust tridentate isochelæ, with strongly-curved shaft and short blunt teeth. These spicules vary up to about 0·04 mm. in length. What I take to be young forms are extremely abundant. The smallest are very slender and the developing teeth gives them a peculiar appearance; (*b*) rather slender, simple and contort sigmata; measuring when fully grown about 0·033 mm. from bend to bend. Both forms of microscleres are very abundant.

This species appears to be nearly related to *P. cæspitosa*, but is distinguished by the thin habit, the more robust chelæ and the presence of abundant sigmata.

R.N. 1047 (x B).

Plumohalichondria gravida, n. sp.

Massive, compact, solid. Intensely and coarsely sandy. Sand arranged in stout vertical columns ending in slight conuli on the surface. Surface subglabrous between the sandy points. Vents rather large, scattered, with wide, vertical oscular tubes. Texture hard, friable. Colour in spirit sandy brown, with grey flesh.

Skeleton, composed chiefly of sand, with numerous spined styli echinating the sand grains, and other spicules scattered between. At the surface the oxea form radiating tufts.

Megascleres, (*a*) straight, smooth, slender oxea, rather abruptly pointed; about 0·14 by 0·0027 mm.; (*b*) short, slender, straight, finely pointed and entirely spined styli; about 0·06 by 0·004 mm.

Microscleres, (*a*) tridentate isochelæ, up to about 0·023 mm. long, but commonly much smaller; (*b*) rather slender, simple and contort sigmata, about 0·03 mm. from bend to bend.

R.N. 716 (s. 8); 881 (s. 9).

Plumohalichondria incrustans, Carter, sp.

Echinonema incrustans, Carter, A.M.N.H., November, 1885, p. 353.

Plumohalichondria mammillata, Carter, A.M.N.H., November, 1885, p. 355.

Plumohalichondria mammillata, Ridley and Dendy, Challenger Monaxonida, p. 156, pl. xxx., figs. 4, 4a; pl. xlvii., figs. 4, 4a.

The British Museum specimens show conclusively that *Plumohalichondria mammillata* is a mere synonym of *Echinonema incrustans*.

R.N. 496 (s. 10, 8 f; "scarlet vermilion").

B.M. sp. 46 ("Echinonema incrustans, type," Reg. 86-12-15-123); d. 98 ("Plumohalichondria mammillata, unregistered"); d. 107 ("Plumohalichondria mammillata," Reg. 86-12-15-249).

Plumohalichondria arenacea, Carter.

Plumohalichondria arenacea, Carter, A.M.N.H., November, 1885, p. 367.

This is probably merely a variety of *P. incrustans*, of very robust habit, with sandy fibre and dermal crust of spined styli. There is no tangible difference in the spiculation of the two. The external form varies from massive to flabellate.

R.N. 323 (18 f; "pale grey buff with a red tint on the projecting parts"); 528 (s. 1, 14 f; "between vermilion and ochraceous-rufous"); 675 (s. 5); 682 (s. 5); 708 (s. 5¹; "flesh to brick red"); 924 (s. 1); 974 (s. 5); 1084 (x A).

B.M. sp. 67 (*Plumohalichondria arenacea*, C. type," Reg. 86-12-15-80).

Plumohalichondria purpurea, Carter,

Plumohalichondria plumosa, var. *purpurea*, Carter, A.M.N.H., November, 1886, p. 376.

This is a remarkable species intermediate in characters between *Plumohalichondria* and *Echinodictyum*; it differs from the typical *Plumohalichondria* in that the microscleres are entirely wanting. The name was unfortunately chosen because the purple colour is not characteristic and was probably adventitious in the type. There is only one specimen in the collection and that is extremely irregular, massive, proliferous; with conulose and rugose but subglabrous surface, and firm, compact texture. The colour in spirit is pale yellowish-grey; in life it was buff.

R.N. 759 (s. 1; "buff.")

B.M. sp. 47 ("Plumohalichondria plumosa, var. purpurea. Carter. Type of var.," Reg. 86-12-15-127).

Plumohalichondria tenuispiculata, n. sp.

Sponge forming a thin crust, rising up into small, irregular, branched, coralloid processes. Surface very uneven. Consistence pretty firm and compact. Nearly white in spirit.

Skeleton, very confused, consisting of very abundant slender spicules, in great part scattered quite irregularly but often collected into loose, whip-like, irregularly-branching fibres, with no obvious spongin. The axial portions of the fibres consist of the slender oxea and they are irregularly echinated by the spined styli.

Megascleres, (a) very slender, long, straight oxea, measuring about 0.2 by 0.002 mm.; (b) comparatively short, straight, spined styli; gradually and finely pointed, spined all over but most abundantly at the base; size about 0.08 by 0.004 mm.; (c) very long and slender spined styli, gently curved and drawn out gradually into long fine points, the spines dying away towards the apex; measuring up to about 0.25 by 0.0027 mm. Intermediate forms of spined styli are also met with.

The species is nearly related to *P. purpurea*, but differs in the much more slender spicules and perhaps also in the external form. There are no microscleres.

R.V. 1024 (x B).

Genus *Echinodictyum*, Ridley.

Skeleton usually reticulate. *Megascleres* smooth diactinal in the fibre and spined monactinal echinating the fibre. Smooth styli may also be present. No microscleres.

Echinodictyum ridleyi, n. sp.

Sponge lamellar to flattened digitate; may be stipitate, proliferous and bushy. Lamellæ usually thin. Vents small and marginal. Surfaces usually smooth and glabrous. Texture compressible, resilient, tough. Colour in spirit pale greyish yellow.

Skeleton, the main skeleton is an irregular network of well-developed horny fibre of pale colour, cored by numerous smooth oxea in the main fibres. These spicules are commonly arranged in a very loose, wispy manner; they may be absent from some

of the short connecting fibres. The spined echinating styli are but sparingly developed. The smooth styli are very irregular in their distribution; they may be abundant towards the dermal surface, projecting obliquely from the horny fibre in a plumose fashion. There is usually no special dermal skeleton, but in one specimen there are loose dermal tufts of the slender oxea which give the surface a hispid character.

Megascleres, (a) long, smooth, straight, slender oxea; rather abruptly pointed; size about 0.27 by 0.0042 mm.; (b) very slightly curved, smooth, gradually and usually finely-pointed styli or subtylostyli; size about 0.19 by 0.0072 mm.; (c) spined styli; short, straight, gradually sharp-pointed, sparingly spined; size about 0.1 by 0.006 mm.

R.V. 269 (20 f; "dull brownish red"); 633 (x, 19 f; "ochraceous-rufous"); 928 (x A); 1033 (x B).

Echinodictyum spongiosum, n. sp.

Encrusting, irregular; may be massive, proliferous, lobulated. Vents minute or of fair size, scattered. Texture soft and spongy. Colour in spirit pale greyish-yellow.

Skeleton a very loose network of multispicular, wispy fibres, mostly branching off from one another at acute angles and running towards the surface. The tylote spicules, of which the fibre is chiefly composed, are invested and held together by a considerable amount of very pale-coloured spongin, and are here and there echinated by spined styli. The fibres divide up into almost single spicules as they approach the surface, but there is no properly developed dermal skeleton. The whole skeleton is very lax, and a good many loose spicules are scattered between the fibres.

Megascleres, (a) straight or nearly straight, slender tylota; with cylindrical shaft and small ovoid head at each end; size about 0.19 by 0.0028 mm.; (b) spined styli or subtylostyli; straight, sharply pointed, with small sharp spines irregularly distributed but most abundant at the base; size about 0.087 by 0.0042 mm. As compared with the tylota these spicules are very scarce, and their presence might easily be overlooked.

R.V. 790 (Sorrento Jetty; "sponge grey"); 946 (s. 9).

Echinodictyum arenosum, n. sp.

Massive, depressed, spreading. Upper surface even, almost flat, with meandriniform sandy pattern and minutely-reticulate dermal membrane between. Vents minute, scattered. Incompressible, intensely sandy and friable, with radiately columnar structure, due to the arrangement of the sandy tracts. Colour in spirit pale grey and sandy.

Skeleton, composed chiefly of sand arranged in dense tracts as above described. Between these sandy tracts are scattered numerous slender tylostrongyla or tylosta, without definite arrangement except towards the surface, where very loose, whip-like fibres terminate in a dense layer of short, radiating tufts which support a small-meshed reticulate dermal skeleton of abundant tangentially-placed tylostrongyla or tylosta. The sand grains in the interior of the sponge are sparsely echinated by spined styli.

Megascleres, (a) tylostrongyla; straight or slightly curved, slender, with very slightly-developed head at one end and bluntly rounded off at the other, or with a small head at each end (tylosta); measuring about 0.19 by 0.003 mm.; (b) spined styli or tylostyli; straight, slender, minutely spined all over, gradually and finely pointed; size about 0.083 by 0.003 mm.; scarce.

R.V. 925 (s. 1).

Genus *Raspailia*, Nardo.

Sponge usually consisting of long slender branches; with a dense central axis of spiculo-fibre containing much spongin, from which loose tufts of spicules radiate to the surface. Smooth monactinal (sometimes diactinal) megascleres are present, and also spined echinating styli*. No microscleres.

I agree with Topsent in removing this genus from the *Axinellidae* to the *Ectyoninae*, although it is certainly intermediate in structure between these two groups.

Raspailia pinnatifida, Carter, sp.

Dictyocylindrus pinnatifidus, Carter, A.M.N.H., November, 1885, p. 353.

* Often extremely rare and hard to detect, perhaps sometimes absent.

? *Axinella chalinoides*, var. *glutinosa*, Carter, A.M.N.H., November, 1885, p. 359.

Axinella setacea, Carter, A.M.N.H., November 1885, p. 359.

? *Axinella cladoflagellata*, Carter, A.M.N.H., December, 1886, p. 464.

The sponge has the typical external form of the genus, consisting of long, slender "rat's-tail" branches. The spined echinating styli are very scarce, but I have found them also in the type of *Axinella setacea* from the British Museum.

R.V. 385; 443 (s. 9, 16 f; "seal brown"); 851 (s. 9); 888 (s. 9).

B.M. sp. 74 (" *Dictyocylindrus pinnatifidus*, C. type," Reg. 86-12-15-50); sp. 66 (" *Axinella setacea*, C. type," Reg. 86-12-15-61); ? d. 82 (" *Axinella cladoflagellata*, seu *A. chalinoides*, var. *glutinosa*," Reg. 86-12-15-407).

Raspailia atropurpurea, Carter, sp.

Axinella atropurpurea, Carter, A.M.N.H., November, 1885, p. 359.

The sponge consists of a stipitate bunch of short branches of a dark purple colour, retained for a long time in spirit. The arrangement of the skeleton is that usually found in the genus, with larger stylote or tylostylote megascleres embedded in much spongin in the interior, and much smaller styli in radiating tufts at the surface. The original description makes no mention of the spined echinating styli, which are fairly numerous and which I have found also in the type specimen from the British Museum. These are short, straight, usually bluntly-pointed, and covered with small spines all over; they measure about 0.083 by 0.006 mm.

R.V. 638 (x, 19 f; "seal brown, very dark").*

B.M. sp. 63 (" *Axinella atropurpurea*, C. chief type," Reg. 86-12-15-1).

Raspailia vestigiifera, n. sp.

The sponge consists of a stipitate bunch of few, slender, rather short, stiff, erect, subcylindrical branches. The surface is

* In spirit the colour is dark purple, fading to brown on the outside.

strongly hispid. The texture is firm and very tough, and the colour in spirit is rather dark brown.

Skeleton, the skeleton consists of a very dense central axis of laminated brown spongin, apparently originally made up of a close irregular network of stout horny fibres. This central axis is very thick and is continued in short, stout, radiating fibres towards the surface. Imbedded in this abundant horny matrix are very numerous large oxete spicules, mostly lying more or less parallel to the long axis of the sponge, but many curving outwards towards the surface in the radiating fibres. At the surface are arranged, at fairly regular intervals, beautiful radiate tufts of small slender megascleres. From the centre of each of these tufts a very large oxete spicule projects outwards, approximately at right angles to the surface of the sponge and imbedded in the sponge for only about a quarter of its length.

Megascleres, (a) long and rather slender, gently-curved oxea, sharply and gradually pointed at each end and resembling those of *Halichondria*; size about 0.9 by 0.013 mm.; found in the horny fibre in the interior of the sponge with many smaller ones; (b) the very large oxea of the surface, in shape like those of the interior, but measuring about 1.47 by 0.055 mm.; (c) the spicules of the surface tufts; sub-oxete or stylote, gradually sharp-pointed at the outer end, but more or less rounded off at the inner; long, slender, gently curved; size about 0.35 by 0.004 mm.; (d) small spined styli; short, straight, gradually and finely pointed and minutely spined all over; size about 0.066 by 0.004 mm.; very rare, echinating the horny fibre in the interior of the sponge; probably to be regarded as merely vestigial structures.

R.N. 655 (x, 20 f; "bottle green with a wash of sepia").

Rospailia cacticutis, Carter, sp.

Dictyocylindrus cacticutis, Carter, A.M.N.H., November, 1885, p. 354.

This is a very remarkable species, easily recognisable by its cactiform external appearance and nearly black colour. The skeleton is composed chiefly of an irregular network of very stout horny fibre, sometimes with and sometimes without axial

spicules, and more or less abundantly echinated by short spined styli. The large, smooth styli or tylostyli occur most abundantly in the strongly-developed surface projections, accompanied by much spongin. There are no surface tufts of spicules, but the dermal membrane is glabrous and has a beautiful reticulate appearance between the projections.

R.N. 346 (20 f; "dark grey-brown"); 399; 425 (x, 19 f; "clove brown, with a slight green tinge"); 1157 (x); 1174.

B.M. sp. 70 ("*Dictyocylindrus cacticutis*, C. type," Reg. 86-12-15-120).

Genus *Fusififer*, n. gen.

Sponge massive, with fistular projections. The only known species has an intensely sandy body, covered by a thin dermal membrane. Megascleres monactinal, smooth and spined styli or tylostyli. Characteristic microscleres microxea, to which others may be added.

This is a very remarkable genus indeed, strongly characterised by its external form and by the beautiful spindle-shaped microscleres (microxea). The external form and the character of the dermal membrane approach those of *Histoderma*, but the well-developed and abundant spined echinating styli show it to be an undoubted Ectyonine.

Fusififer fistulatus, n. sp.

Sponge consisting of a massive, irregular, intensely and coarsely sandy body; invested in a thin, delicate membrane rising up above into rather short, hollow, thin-walled processes, some widely open and some closed. Body sand-coloured, projections pale yellow in spirit.

Skeleton, the main skeleton of the body is a dense agglomeration of sand grains with spicules in the interstices. The sand may be arranged in stout, flattened columns, running vertically upwards and appearing on the surface in the form of meandering sandy tracts. Many of the sand grains are abundantly echinated by spined styli. The other spicules are scattered irregularly between them, but the tylostyles may be partly collected into stout fibres running towards the surface. The dermal skeleton is a very irregular reticulation, either of single spicules (tylostyli)

placed tangentially and crossing one another in every direction, or of similar spicules more or less collected into loose fibres.

Megascleres, (*a*) long smooth tylostyli, with a slightly-developed oval head at one end and gradually sharply pointed at the other; commonly more or less curved; size variable, say about 0.54 by 0.007 mm. when fully developed; (*b*) spined styli; straight or slightly curved, slender, gradually and finely pointed, covered pretty evenly all over with small spines; commonly about 0.07 by 0.003 mm. but sometimes nearly twice as long.

Microscleres, (*a*) smooth, straight, spindle-shaped microxea, tapering equally from the middle to a fine point at each end; size about 0.046 by 0.002 mm.; pretty abundantly scattered between the sand grains and in the dermal membrane; (*b*) very slender smooth toxa varying immensely in length (measured up to about 0.3 mm., but many only about 0.013 mm. long); abundant.

R.N. 6; 501 (x, 20 f; "drab, the projections ochre-yellow"); 683 (s. 9); 1045 (x B).

Genus *Acarinus*, Gray.

Megascleres styli and *cladotylota* ("grapnel-spicules"), to which *tylota* may be added. *Microscleres* may be present in the form of palmate *isochelæ* and *toxa*.

Acarinus tenuis, n. sp.

This species occurs in the form of small thin crusts on the surface of other sponges. On one specimen of *Clathria typica* (R.N. 1072), for example, there are dozens of such crusts. They are subcircular or irregular in outline, and the largest are only about a quarter of an inch in diameter. They are thin and flat and have no visible vents. In spirit they are of a pale yellow colour. I have also found them on *Plumohalichondria arenacea* (R.N. 974) and on *Tedania digitata* (R.N. 991).

Skeleton, composed of a very loose network of irregularly-interlacing spicules, with no visible spongin.

Megascleres, (*a*) stylote or strongylote (perhaps sometimes subtylostylote); straight, smooth, long and very slender, measuring about 0.18 by 0.002 mm.; comparatively scarce; (*b*) cladotylote, straight (or nearly so), long and very slender; with a

well-developed ovoid head at one end and several well-developed, recurved, sharp teeth at the other. The usual number of teeth appears to be five, but I should doubt if this is constant. The spicule is about 0.16 mm. long, and the shaft is scarcely 0.002 mm. thick for the greater part of its length, but increases in diameter at each end; the teeth are about 0.004 mm. long. These "grapnel-spicules" are not echinating; indeed, there is no fibre for them to echinate, but they are extremely numerous. They occur scattered irregularly and also in loose bundles, in which they lie parallel to one another, with some of the grapnels at one end of the bundle and some at the other, each spicule extending the whole length of the bundle, or very nearly so.

As might naturally be expected, a few spicules of the sponge on which the specimen has grown may occur as foreign bodies. I have found no microscleres. The soft tissues are densely charged with spherical cells about 0.006 mm. in diameter.

This is one of the most remarkable sponges in the entire collection.
