already been recorded from *Oidemia nigra*, but this is, I believe, the first time that *P. brevicolle* has been met with in the scoters. The most recent note on the species is by Braun *, in the course of which he criticises Mueller's observations †. My specimens are small, 1·74–3·41 mm. long with a breadth of ·35–·54 mm. They are somewhat cylindrical anteriorly, more flattened posteriorly, agreeing in this respect with Braun's specimens. The posterior end is usually rather blunt. With regard to the length of the neck (distance between centres of suckers, as I take it) my specimens are apparently much more extended than those of Mueller or Braun, for I find the proportion to be nearly constantly $\frac{1}{3}$ of the body-length, certainly never less than $\frac{1}{4}$, and in young examples much more. The constriction behind the ventral sucker is not a mere narrowing in the breadth, but is usually accompanied by distinct transverse annulation of the cuticle. The breadth here is only about half that at the widest part of the body. The oral sucker is slightly larger than the ventral. The latter is, as Braun says, usually deeper, although in extension of the anterior part of the body the oral sucker may be quite as deep. There is practically no prepharynx. The pharynx is almost globular, measuring ·14–·21 × ·12–·22 mm.; it is thus somewhat larger than Braun has it. He is correct in saying that the œsophagus is extremely short, the bifurcation taking place almost immediately behind the pharynx.

The testes are contiguous or very nearly so, and the posterior is most often but not invariably the larger. With regard to the ova, there seem to be great variations in size, although when the large size of the ova is taken into consideration the variation is not excessive. The observations of Mueller and Braun show an apparent discrepancy; the former gives the dimensions as ·12–·13 × ·1 mm., the latter ·104 × ·08 mm. This difference must result from the fact that Mueller had only measured the larger ova and Braun the smaller. With the view to explain this difficulty I measured the ova in upwards of 30 examples, and find the limits in length to be ·100–·124 mm., and in breadth ·062–·078 mm. These limits do not represent isolated examples, for all sizes between them were observed. The average figures are ·1118 × ·0685 mm., but this does not imply that such a size is commoner than others. From this it is obvious that Mueller's figures, which are at best a rough approximation, are too high, and that Braun probably was contented with measuring a very few ova. Both find the breadth too great. These observations, I may add, were conducted almost entirely on specimens from *Hæmatopus*.

* Zool. Jahrb. Syst. xvi. pp. 12–13, pl. i. fig. 9.
† Arch. Naturg. lxiii. p. 19, pl. iii. fig. 2.

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XXXIX.—*Preliminary Report on the Monaxonellida of the National Antarctic Expedition.*

By R. KIRKPATRICK.

THE Monaxonellida brought home by the 'Discovery' include 43 species, of which 24 are new. Most of the specimens came from the neighbourhood of the Winter Quarters (lat. 77° 49′ S., long. 167° 7′ 4″ E.).

Polymastia invaginata, sp. n.

Sponge hemispherical, free or attached, covered with a thick pile of pointed spicules; with one large oscular papilla usually completely invaginated, so that the summit of the oscule is on a level with, or below, the general surface. Under surface with a fleshy basal pad.

Colour in spirit pale yellow above, and often grey and semi-transparent on the under surface in free specimens. Consistence dense and firm.

Skeleton.—Choanosomal, formed of fibres curving upwards from the base to the periphery, penetrating the cortex, and forming the thick surface pile; with stellate groups of small tyles between the fibres.

Cortical skeleton formed of a dense layer of vertical tyles of various lengths embedded in a tough fibrous layer from ·5 to 1·25 mm. thick.

Basal skeleton consisting of spicules transversely arranged, and crossing each other in an irregular manner.

Spicules.—Large, smooth, slightly curved styles, or occasionally strongyles, 2240 × 40 μ.

Cortical tyles with small spheroidal head, short neck, fusiform straight shaft, varying in length from 140 to 350 μ, and in thickness from 12 to 19 μ. A few very slender styles scattered in the choanosome, 70 × 6 μ, with head and neck making an angle with the shaft. Some medium-sized cortical tyles in the oscular papilla have long, oval heads. Tyles of the stellate clusters slender, with the head making an angle with the shaft, 200 × 15 μ.

Localities. Winter Quarters, 10–30 fath.; off Mt. Erebus, 500 fath.

Sphærotylus antarcticus, sp. n.

Sponge dome-shaped or spheroidal, attached or free. Surface beset with a dense short pile of cortical microtyles; with several usually elongated papillæ with or without a large terminal orifice. Dermal pores distributed over the cortex, each pore opening into a single tubular canal in the cortex; the mouth or pore of the pore-canal is guarded with a ring of radiating cortical tyles. Flagellated chambers diplodal.

Skeleton formed mainly of radiating fibres composed of styles, with diverging brushes of spherostyles near the surface. Cortex with a surface-layer of densely packed tufts of small vertical tyles, and a subcortical layer of tangential styles and tyles.

Spicules.—Spherostyles 8 mm. in length by 30 μ in diameter in the middle, and 14 μ in the region below the distal knob; distal knob 28 μ in diameter, hemispherical, with granular surface and with a few square teeth or serrations on the edge.

Styles straight, fusiform, blunt-pointed, 2·8 mm. in length, 41 μ in diameter in the middle, 23 μ in diameter at the rounded end.

Cortical tyles curved, 146 μ long, head 3·25 μ in diameter; neck slender, 2·75 μ thick, with broad oar-blade-like shaft, but circular in section, 7 μ thick.

Styles of lower cortical tangential layer, also in choanosome, 900×20 μ. Tyles of the same layer nearly straight, 270 μ long, with head 7 μ in diameter and relatively thick neck 6·8 μ in diameter.

Slender, curved tyles, 460×10 μ, scattered in choanosome.

Young specimens are oval, with one long closed papilla; the bundles of divergent exotyles are more or less separate and distinct, and the distal knobs retained and not broken off.

Locality. Winter Quarters, 10–30 fath.

SIGMAXINYSSA, gen. nov.

Cup-shaped Axinellidæ with longitudinal skeletal fibres joined by transverse ones on the inner aspect, and with tufts given off at right angles to these on the outer aspect. Megascleres, oxeas; microscleres, sigmata and toxa.

Sigmaxinyssa phakellioides, sp. n.

Sponge sessile, cornucopia- or cup-shaped. Inner surface smooth, outer surface coarsely pilose. Consistence rather hard, but flexible. Colour in spirit greyish drab. Inner surface with numerous small oscules, each about 1 mm. in diameter; outer surface pilose, with dermal membrane perforated by round pores 95 μ in diameter.

Skeleton.—On inner surface formed of close-set longitudinal lines joined by cross-bars, and giving off tufts of fibres, which proceed outwards at right angles to the outer surface, pushing up the dermal membrane, but barely projecting beyond it.

Spicules.—Oxeas, $835 \cdot 5 \times 42 \cdot 25$ μ, curved at centre, sharp-pointed. Sigmata, 81·25 μ long, 35·75 μ broad, and 3·25 μ thick, often with an angular bend at centre of shaft. Toxa, 130 μ long and 3·25 μ thick at centre, with smooth surface.

This species bears in its outward aspect a very close resemblance to cup-shaped species of *Phakellia*; also the skeletal arrangement is like that of *Phakellia*; the oxeas, sigmata, and toxa are those of a typical *Gellius*. The Axinellid genus *Sigmaxinella*, Dendy, which has microscleres in the form of sigmata, has styles for megascleres.

Locality. Coulman I., 100 fath.

Hymedesmia exigua, sp. n.

The sponge forms a thin translucent greyish-white crust, about 5 mm. in diameter, on a stone. The surface is smooth, and the substance of a fleshy consistence.

Skeleton.—The choanosome contains scattered short acanthostyles, and the dermal membrane tangential tyles isolated or in bundles of a few.

Spicules.—Megascleres: acanthostyles, 94×19 μ, short, thick, with spines pointing backwards slightly. Ectosomal tyles, $157 \times 3 \cdot 5$ μ, straight, smooth, with oval heads, 5 μ long and 4·5 μ broad.

Microscleres: pluridentate isancoræ spatuliferæ at each end, with five foliate teeth, 5 μ in length, sometimes with three or four; shaft deeply curved, 2·5 μ thick, sometimes with central alate expansions.

Sigmata, 9·6 μ long, 5·6 μ broad, ·5 μ thick, scattered separately in the choanosome.

This new species resembles in several respects *H. zetlandica*, Bowerbank, but the ancoræ of the latter have only three teeth, the sigmata are much longer (51 μ) and in sheaves; also the ectosomal tyles are much larger, viz. $328 \times 3 \cdot 25$ μ, and the spines of the acanthostyles more verticillate. *Hymedesmia irritans*, Thiele, from Juan Fernandez, has nearly the

same spicular elements, but of different dimensions, and has the labis among its microscleres.

Locality. Off Balleney I., 254 fath.

Hymerrhaphia rufa, sp. n.

The sponge forms a thin mud-coloured brown crust on a branched Polyzoon. The surface is smooth, and no pores or oscules are visible. The consistence is rather tough.

The *skeleton* of the choanosome is formed of longer and shorter acanthostyles dressed vertically, that of the ectosome being formed of tangentially arranged anisotornotes, either isolated or in bundles.

Spicules.—Megascleres: larger acanthostyles, $312 \times 25\ \mu$, swollen at the head, spined all over, with larger curved spines at the head. Smaller acanthostyles, $131 \times 18{\cdot}75\ \mu$. Anisotornotes of ectosome, $344 \times 12\ \mu$, straight, fusiform, attenuating gradually at one end but abruptly at the other.

Microscleres: isancoræ, $28{\cdot}5\ \mu$ long, with three or four teeth at each end; rarely the teeth are not developed, the ends being in the form of hemispherical cups.

Dredged near Winter Quarters, No. 10 hole, 130 fath.

Ophlitaspongia nidificata, sp. n.

Sponge massive, of an inverted pyramidal shape, sessile, narrow and contracted at the point of attachment. Surface uniformly coarsely spinous. Circular oscules (·7 mm. in diameter) on the upper surface, at the bases of the spines; (pores closed). Subdermal cavities flat and shallow. Flagellated chambers diplodal. Colour dirty grey, the tips of the spines being yellowish. Consistence hard and tough.

Skeleton consisting of dense branching axes of styles cemented with spongin and echinated by smooth styles passing at right angles from the axis to the surface. Ectosomal spicules in form of slender straight styles. Considerable tracts of dermal membrane were devoid of these spicules.

Spicules.—Megascleres: large, straight, smooth styles, on an average about $1000 \times 50\ \mu$. Also smooth curved kind, $625\ \mu$ long. Ectosomal styles straight, smooth, tapering gradually to a point, $406 \times 9\ \mu$.

Microscleres: toxa smooth, $638\ \mu$ long, $6{\cdot}25\ \mu$ thick at the centre. These spicules occur in nests or groups of five to ten.

This new species comes well within the genus *Ophlitaspongia*, Bk., as emended by Dendy. *O. seriata*, Bk., *O. subhispida*, Carter, and *O. membranacea*, Thiele, all have toxa, but the first and third species are encrusting, and the second has long slender branches.

Dredged off Coulman I., 100 fath.

Lissomyxilla, Hanitsch.

This genus was established by Hanitsch* to include Ectyonine Sponges with fibres having a core of smooth styles echinated by acanthostyles with special ectosomal megascleres, and with or without microscleres. Unfortunately the species he selected as type of the genus (*Tethea spinosa*, Bowerbank) in no way fell in with the definition, since, as Topsent† points out, this species has neither echinating spicules nor special ectosomal spicules, and Topsent refers *Lissomyxilla* to the limbo of useless names. Among the 'Discovery' sponges, however, is a specimen which fits in with Hanitsch's definition of *Lissomyxilla*, which runs:—"Skeleton fibres of the choanosome formed of smooth monactinals echinated by spined styles. Megascleres of the ectosome smooth diactinals or monactinals. Microscleres (isochelæ &c.) may be present." Accordingly I propose to revive the name.

Lissomyxilla Hanitschi, sp. n.

There are two much-worn species of this sponge of a dark, dirty-grey colour, and a third young small specimen, whitish in colour, growing on a specimen of *Hornera*. The largest specimen is 4 cm. high and 5 cm. in diameter at the base; the dermal membrane is worn away, exposing several openings of exhalant canals, 4 mm. in diameter. The dermal membrane of the smallest specimen is transparent, smooth, and raised up at one place into a small conical oscule, with radial tangential spicules in its walls.

The *skeleton* of the choanosome is formed of branching fibres on an average about $150\ \mu$ thick, echinated by spined styles in an obscurely verticillate manner, the whole skeleton, as seen in sections, having a somewhat confused appearance. The ectosomal spicules partly proceed obliquely from the main fibres to the dermal membrane, and partly lie tangentially in that membrane.

Spicules.—Megascleres: styles, $500 \times 19\ \mu$, smooth, curved near the head, sharp-pointed. Echinating acanthostyles,

* Trans. Liverpool Biol. Soc. vol. viii. p. 194 (1894).

† Archiv. Zool. Exp. et Gén. (3) tome viii. p. 265 (1900).

219 × 18·75 μ (without including spines), larger spines on the head 9 μ long. Ectosomal amphityles, 356 × 11 μ, straight, very slightly fusiform, subtylote, and with a small mucro at each end. Microscleres none.

Myxilla victoriana, Dendy (*Halichondria pustulosa*, Carter), would come under this genus, although, at the same time, it is in possession of isochelæ, and the heads of the styli of the main fibres occasionally have a slight indication of spination.

Localities. Coulman I., 100 fath.; east end of Barrier, 100 fath.

Iophon spatulatus, sp. n.

Sponge slender, cylindrical, branched. Colour pale brown in spirit. Oscules oval, about 1 × ·6 mm. in diameter, slightly raised; surrounded by a radiating zone of tyles. Pores in sieve-like areas 2–3 mm. in length and about 2 mm. in breadth, on a level with the general surface.

Flagellated chambers 26 × 23 μ.

Skeleton.—Dermal: a closely packed layer of dermal tyles.

Choanosomal: a loose network of multispicular fibres 3–6 spicules thick forms the core of the cylinder. From the central core are given off at right angles fibres one or two spicules thick which support the dermal membrane.

Spicules.—Megascleres: smooth styles, 462 × 25 μ, with a mucro at the basal end. Ectosomal subtyles 225 × 12·5 μ, fusiform, with the swelled ends smooth laterally, and with the extremities only slightly convex, in fact almost truncate, and covered with spines.

Microscleres: palmate anisochelæ 18·7 μ long, 6·2 μ broad (front view).

Bipocilla rare, 13·6 μ long, 1·15 μ thick, shaft deeply curved, slightly twisted, and with ends almost similar, spatulate, with crenulated edges; occasionally with five relatively large denticles in place of the finer crenulation. A second kind of bipocilla have a longer, less curved shaft, with scoop-like rather than spathulate ends, each scoop having four or five denticles. One example has three sharp prongs at one end and the spathulate prolongation at the other.

The species is represented by numerous small, for the most part fragmentary, slender cylindrical pieces.

Since writing the above description accounts of two new species of *Iophon* from the Antarctic have been published by Topsent, viz. *I. unicornis* and *I. pluricornis*. The two new species described in the present Report and Topsent's two species all possess the curious modified acanthostyles. *I. unicornis*, Topsent, has no bipocilla, and *I. pluricornis* has

bipocilla apparently of the typical form; the present two species both have spathulate bipocilla with crenulated ends; and, further, there are differences, viz. in the shape of the body, the arrangement of the skeleton, and the character of the ectosomal spicules, which lead me to regard the 'Discovery' specimens as belonging to distinct species.

Localities. Winter Quarters, 25–30 fath.; Coulman I., 100 fath.

Iophon flabello-digitatus, sp. n.

Sponge forming a large palmato-digitate or digitate growth in one plane; branches compressed, usually with oscules along one edge. Surface finely verruculate; with elongated pore-areas supported by fan-like wisps of ectosomal spicules.

Colour dark brown; consistence soft, the sponge being readily broken.

Skeleton typically formed of a network of spiculo-fibre, the primary lines of which proceed upwards and outwards from the inner surface of oscular tubes to the outer surface of the sponge, where their ends form the verrucæ; the secondary fibres join the primary at right angles, forming rectangular meshes about 1·25 mm. square. The thickness of the primary fibres is about ·7 mm., that of the secondary about ·5 mm.

The ectosomal skeleton consists of fan-like bundles and wisps of spicules, isolated or proceeding upwards and spreading out from the terminal main fibres.

Spicules.—Megascleres: smooth styles, 590 × 25 μ, curved, with a mucro at the head end.

Ectosomal spicules, 344 × 12·5 μ, subamphitylote, fusiform, with a marginal ring of vertical spines at both ends and a terminal central spike at one extremity.

Microscleres: palmate anisochelæ of two sizes, a large kind 35 μ long and 10·7 μ broad, with thick shaft, with triangular palmate tooth, 17·5 μ long, at the large end, not quite as long nor as broad as the alæ; lower margin of alæ convex. Lower central tooth with a curved upper edge produced into a spine.

A small kind, 17·5 μ long, 6·2 μ broad; upper palmate tooth triangular, rounded above, as broad and as long as the alæ; lower border of alæ concave; lower tooth with simple rounded upper edge.

Bipocilla varying in length from 5·5 to 11 μ, according to the convexity of the shaft, which is usually deeply curved; both ends spathulate, nearly similar, and with crenulate edges, or with 5–7 teeth.

The fine specimen (no. 184) which constitutes the type of the new species is 24 cm. wide and 25·6 cm. high.

Locality. Winter Quarters, 28–130 fath.

Myxilla decepta, sp. n.

There are two very small specimens of this species: one is in the form of an extremely thin incrustation on a piece of rock; the surface is pilose, owing to the projection of vertically dressed acanthostyles, each surrounded by tufts of ectosomal spicules. The other, which incrusts the branch of a Polyzoon, is thicker, and the surface here is partly smooth, partly provided with minute sharp-pointed conules supported by acanthostyles. The colour of both specimens is reddish brown.

The *skeleton* in the very thin incrustation at first sight resembles that of a *Hymerrhaphia*; each vertical acanthostyle is isolated and with its head on the base and its pointed end projecting. In the thicker specimen it is possible to make out primary and secondary lines of skeletal fibres.

The ectosomal spicules are partly arranged in paniculate tufts, partly lying tangentially in the dermal membrane.

Spicules.—Megascleres: choanosomal acanthostyles, 468 × 23·5 μ, curved, spined at the head only, with subtornote points. Ectosomal strongyles, 238 × 4·6 μ, straight, smooth, cylindrical, usually with a pointed mucro at one end.

Microscleres: arcuate isochelæ, 19·5 μ long, 5·6 μ broad, palmate tooth 8 μ long, ovoid, with rounded distal edge; with thick curved shaft; with tongue-shaped alæ about 8 μ long.

Isancoræ unguiferæ, 15·3 μ long, with slender, curved, sometimes wavy shaft, with three sharp claw-like teeth at each end.

Chelate bipocilla 8 μ long, with deeply curved shaft with spathulate ends each with three triangular denticles; these spicules are fairly common and not accidental.

There are also several isochelæ arcuatæ in which the alæ and denticle are replaced at one end by a spoon-like lamella.

The presence in *Myxilla* of chelate bipocilla similar in many respects to those found in the new species *Iophon spatulatus* and *I. flabello-digitatus* is exceptional. In other respects the spiculation is that of a typical *Myxilla*. The isochelæ arcuatæ, though only half the length, resemble in shape those of *Myxilla nobilis*, R. & D., from off the Rio de la Plata, and *M. digitata*, R. & D., from the Cape of Good Hope. The new species, again, closely resembles *Myxilla iophonoides*, Swartszewsky (Mém. Soc. Nat. Kieff, xx. p. 340, pl. xi. fig. 7, and pl. xv. fig. 27), from the White Sea; but, in addition to other differences, the latter species has no isochelæ arcuatæ.

Localities. Winter Quarters, 125 fath.; off Balleney I., 254 fath.

Tedania variolosa, sp. n.

Sponge in form of a mass of thick flabellate or digitate fronds arising from a common base; with circular sphinctrate oscules, each about 1 cm. in diameter, situated at the summits or along the upper edges of the branches, the canals into which they lead extending nearly to the base of the branches. General surface of the sponge covered with circular pore-areas each about 4 mm. in diameter, the oval or circular pores being about 90 μ in diameter, and the strands of the poral reticulum about 30 μ in breadth. Colour in spirit pale brown. Consistence soft and fleshy, being easily torn.

Flagellated chambers, 42 × 35 μ, oval, aphodal, with aphodus (in a measured example) 13 μ long.

Skeleton.—Choanosomal skeleton formed of loosely agglomerated compound, longitudinal, or main bundles about 1 mm. in diameter, curving out to the surface as they pass upwards; the separate fibres of the main bundles about 80 μ thick. The main bundles joined at right angles by secondary fibres 1–3 spicules thick. Spongin not perceptible. Ectosomal skeleton formed of circles of strongyles, the spicules isolated or in fan-like wisps, arranged partly vertically, partly tangentially, round the pore-areas; the vertical spicules usually isolated and the tangential ones in wisps. On drying the sponge the edges of the pore-areas stand up sharply, the areas themselves sinking in, giving a pock-marked aspect to the surface.

Spicules.—Megascleres: choanosomal styles, 402 × 13 μ, curved at about one fourth of the length from the round end, smooth, but occasionally with a few spines about the head. Ectosomal strongyles, 261 × 6·5 μ, smooth, occasionally slightly swollen at each end.

Microscleres none.

The single specimen is in the form of a squarish mass of thick fleshy flabello-palmate or digitate lobes; the height is 18 cm. and the breadth 13 cm.

The arrangement of the pores in circular areas each surrounded by a zone of ectosomal spicules is not common in *Tedania*; it occurs in the second new species described below, and something of the kind is found in *Tedania tenuicapitata*, Ridley, from the Straits of Magellan. In the present species

this feature is so well marked as to give the surface a pock-marked appearance.

The rhaphides, usually so characteristic of *Tedania*, have entirely disappeared.

Locality. Winter Quarters, 10 fath.

Tedania coulmani, sp. n.

The single specimen is in the form of a finger-like fragment 5·5 cm. long and 1·7 cm. in its greatest thickness. The colour is dirty grey and the consistence soft. The surface shows the same circular pore-sieve areas as in *T. variolosa*. Along one side of the sponge the surface has been torn away, exposing an exhalant canal running along the length of the specimen, but apparently the terminal oscule has been torn away.

Skeleton.—Rings of spicules, partly vertical, partly tangential, isolated or in tufts, surround the pore-areas.

The choanosomal skeleton is formed of primary longitudinal fibres about 120 μ thick, joined by secondary fibres one spicule in length and two to three in thickness, joining the former at right angles.

Spicules.—Megascleres: the choanosomal acanthostyles, 475×18 μ, curved, smooth, or with sparse spines, usually on the upper and lower thirds of the length.

Dermal ectosomal tornotes, $319 \times 12{\cdot}5$ μ, smooth, straight, fusiform, larger at one end than the other. Under a high power each end shows a rounded shoulder prolonged into a mucronate spine.

Microscleres absent.

The present species resembles *T. variolosa* in having the circular pore-areas, and in the absence of rhaphides, but differs widely in the character of the dermal tornotes. Both species differ from all other species of *Tedania* in having no microscleres. The nearest species to the present one are *Tedania tenuicapitata*, Ridley, from the Straits of Magellan, and *Trachytedania spinata*, Ridley, from the same locality; both of these have rhaphides, and neither has the circular pore-areas, though in *T. tenuicapitata* there is a tendency to a radial arrangement of bundles of dermal spicules. The spination of the acanthostyles recalls a similar character in *Trachytedania spinata*.

Locality. Coulman I., 100 fath.

Mycale acerata, sp. n.

Sponge large, massive, with numerous small rounded

mammillæ; surface finely reticulate and finely hispid. Colour creamy white in spirit. Consistence soft, the tissues being easily torn. The flesh reddish (but soon decolorized), and showing the glistening white strands of the skeleton.

Oscules in form of wide, thin-walled, cylindrical chimneys with rather jagged upper edges, about 1 cm. in height and 1–2 cm. in diameter.

Skeleton.—Ectosomal: a network of triangular meshes formed by bundles of oxeas, the strands being about ·35 mm. thick and the meshes about ·5 mm. across. Main skeleton formed of long thick anastomosing fibres, which attenuate gradually from 1·5 mm. in thickness and break up a little below the surface into panicles of much finer fibres, which support the dermal membrane and penetrate the strands and nodes of the dermal reticulum, giving rise to a finely hispid condition of the surface. Parallel groups of oxeas scattered in the choanosome.

Spicules.—Megascleres: oxeas, $850 \times 16\ 25$ μ, slightly curved, rather abruptly pointed at one end and more tapering at the other. These oxeas form the fibres and also are gathered into bundles, one spicule in length, of parallel oxeas, scattered in the choanosome.

Microscleres: large anisochelæ palmatæ, 105×50 μ, separate or in rosettes, usually with an angular bend in the shaft; with a triangular upper tooth 60 μ long, about the same length as the upper alæ, which latter are very wide. With the lower tooth oblong, 12·8 μ high, with a slightly convex edge; in one of the specimens this edge is produced into a denticle.

A smaller kind of anisochelæ palmatæ, 47 μ long and 17 μ broad, at the upper end, with a long oval tooth 20 μ long extending below the alæ.

Trichodragmata, 62×12 μ, the trichites being very fine, sharply pointed oxeas.

There are three fine specimens of this species, the largest forming a thick flabellate body 17 cm. high, 11 cm. broad, and 7 cm. thick.

The mammillæ are on an average about ·75 cm. in height, and 1 cm. in diameter at the base. The new species bears a very close resemblance to *Mycale magellanica*, Ridley, which likewise has a mammillated, finely reticulate surface and glistening skeletal fibres, but here the surface is smooth and not hispid, and the megascleres are styles, or subtyles, such as are normally found in the genus *Mycale*. The microscleres also are different in the two species.

A second species of *Mycale* with oxeate megascleres is

Mycale intermedia (O. Sch.), from East Greenland, noticed by Thiele. The Arctic specimen consisted only of a fragment; but the spicules, which are all considerably smaller than in the Antarctic species, have the following dimensions:—Oxeas 450 μ long, 10–12 μ thick; large anisocheles 50–60 μ long; small anisocheles 18 μ long.

Locality. Winter Quarters, 25–178 fath.

Desmacidon mæandrina, sp. n.

The material consists of three subcylindrical fragments tapering at the distal end.

The consistence is hard and dense. The colour in spirit is dirty brownish grey.

The surface is fairly uniformly level, and presents flattened papillæ or meandrine ridges, slightly roughened at the top by projecting oxeas (best seen on side view with a lens).

The dermal membrane roofs over the grooves and spaces between the papillæ and ridges. The pores are mostly circular and about 95 μ in diameter.

The small circular oscules, numerous and scattered, are about 1 mm. in diameter. The skeleton is formed of a thick, main axis, consisting of rather loose longitudinal strands; from this are given off at right angles cylindrical or lamellar bundles of loose strands, which proceed to the surface and form the papillæ and ridges.

Spicules.—Megascleres: oxeas, 579 × 39 μ, curved (usually) or bent at the centre, with sharp, pointed ends. Microscleres: isancoræ unguiferæ, 26 μ long and 15·8 μ broad; shaft strongly curved and 3·52 μ thick; with usually five teeth or claws, about 5·28 μ long, at each end, viz. a central, single, and two lateral bifurcated teeth.

The largest of the three pieces of this sponge is 6·2 cm. long and 16 mm. in diameter. The fragments appear to be broken off from some branched specimen, and I shall refer to them as branches. They are subcylindrical, being slightly compressed in one plane. The chamber system is aphodal, the flagellated chambers (44 × 29 μ) being pyriform. There is a considerable amount of variation in the teeth of the isancoræ, the number varying from three to six, the most usual number being five.

In some respects the new species resembles *Desmacidon* (?) *ramosa* (R. & D.), obtained by the 'Challenger' from the Cape of Good Hope and Marion Island. In both species there is a central axis of longitudinal fibres, whence fibres proceed to the surface at right angles. In the 'Challenger'

species the radiate bundles branch in a fan-like manner, finally forming an almost uniform surface layer of vertical oxeas. The microscleres in *D.* (?) *ramosa* are isochelæ arcuatæ.

Locality. Coulman I., 100 fath.

Desmacidon spinigera, sp. n.

Sponge digitiform or knob-like; surface coarsely spinous. Consistence rather hard. Colour pale red. Several small oscules about 2 mm. in diameter.

Dermal membrane spread like a delicate net between the spines, and at some distance from the floors of the subdermal spaces. Flagellated chambers oval, 46 × 32 μ.

Skeleton formed of coarse, longitudinal main strands, about 180 μ thick, radiating out to the surface, with loose scattered spicules between, united in horizontal bundles only beneath the surface.

Spicules.—Megascleres: oxeas, 731 × 26 μ, curved at centre, mostly subtornote, though some attenuate gradually, with sharp pointed ends.

Microscleres of one kind, viz. isochelæ palmatæ, 24·64 μ long and 5·28 μ broad, on side view; pointed at each end, with straight axis; with palmate teeth 8·8 μ long, and with narrow alæ 8·8 μ long.

Four specimens were obtained. The type specimen from No. 10 hole, 130 fath., is digitate, 7·5 cm. in length and 2 cm. in diameter. The spines are ·2–·5 cm. long, those at the lower end pointing obliquely upwards, but above becoming vertical to the long axis.

This species bears much resemblance to *Desmacidon setifer*, Topsent, obtained by the 'Belgica' from the Atlantic. The isochelæ are of much the same character, but those of *D. setifer* are very much larger, viz. 75–100 μ by 18–20 μ. Further, the consistence of the latter is soft, the colour yellowish in spirit, and the surface hispidation much finer.

Localities. Winter Quarters, 20–130 fath.; Coulman I., 100 fath.

Joyeuxia Belli *, sp. n.

Sponge attached, ovoid, with a thick rind enclosing a soft pulp; with short conical osular, and long trumpet-shaped poral papillæ. Surface finely pilose. Colour of surface yellow, of the rind whitish, and of the pith deep yellow.

* Named in honour of Emeritus Professor F. J. Bell, of the Zoological Department of the Natural History Museum, and editor of the "Reports on the Natural History Collections" brought home by the 'Discovery' from the Antarctic.

Flagellated chambers $23 \times 20\,\mu$; diplodal.

Skeleton.—Cortical skeleton formed of layers of strongyles crossing each other at right angles. The walls of the oscular and poral papillæ supported by a layer of longitudinal strongyles. The surface of the sponge hirsute, with a fine pile of strongyles standing out at right angles or obliquely. Choanosome without spicules.

Spicules.—Slightly flexuous smooth strongyles $850\,\mu$ long, $10\,\mu$ in diameter at the ends, and $13\,\mu$ in diameter at the centre.

There is one adult specimen 5 cm. long, 3·5 cm. broad, and 3 cm. thick, with a deep groove on the under aspect, by which it was probably attached to a worm-tube or stem of a hydroid. There is also a small conical specimen, 6 mm. high, attached to a piece of rock.

I was at first disposed to regard this remarkable species as a member of a new genus, partly on account of its very thick rind, which is in places over a millimetre in thickness, and partly because of the highly specialized poral papillæ; but apart from these characters, the new form evidently shows the closest affinities to *Joyeuxia*. The three hitherto described species all have a rind enclosing a soft pulp, the latter being without or almost without a skeleton; then, too, the pulp is highly coloured. *Joyeuxia tubulosa*, Topsent, and *J. ascidoides* (Fristedt) have fistulæ, which, however, appear to be oscular. Two of the species, *J. viridis* and *J. tubulosa*, have strongyles; *J. ascidioides* has tyles and also chelæ. Accordingly Topsent places the genus near *Desmacidon*.

The poral papillæ attain a height of 1 to 1·2 cm.; they are expanded at the end.

The inconspicuous oscular papillæ are only about 4 mm. high and are tightly contracted.

Locality. Winter Quarters, 10–20 fath.

Cercidochela *, gen. nov.

Mycalinæ with peculiar shuttle-shaped chelæ or canonochelæ †, with the single tooth from each end fused, and with a semicircular vertical lamella extending inwards from the shaft and from the dental bridge, so as to nearly meet.

Cercidochela Lankesteri ‡, sp. n.

Sponge elongated, slender, fusiform. Colour white; consistence soft. Surface smooth to the naked eye, but finely

* κερκίς, ίδος, a shuttle. † κανών, όνος, a shuttle.

‡ Named in honour of Professor Sir E. Ray Lankester, K.C.B., F.R.S.

hispid under a lens. With several small scattered oscules, about 1 mm. in diameter, level with the surface. Flagellated chambers aphodal, oval, $31 \times 21\,\mu$.

Skeleton formed of long longitudinal lines of spicule-fibres about $100\,\mu$ thick, not forming a definite central axis, radiating out in plumose manner to the surface; with a few isolated spicules arranged in a scalariform manner at right angles to main fibres. Spongin not perceptible.

Spicules.—Megascleres: oxeas, $452 \times 19{\cdot}5\,\mu$, curved at centre, attenuating gradually to sharp points slightly planed away on inner aspect. Microscleres: canonochelæ, somewhat shuttle-shaped, $45{\cdot}5\,\mu$ long by $22{\cdot}75\,\mu$ broad, with the two teeth fused to form a bridge, and with a semicircular lamella passing upwards from the shaft and downwards from the dental bridge, both lamellæ being nearly on the same plane and nearly meeting, the lamellæ sometimes with basal tubercles. Developmental forms in shape of thin, oval, linear bodies, the oval at first not being complete.

The unique specimen representing the new genus and species is 12·5 cm. long and 1 cm. in breadth at the centre. The body attenuates to fine ends, and apparently has not been attached to anything.

The remarkable canonochelæ recall to mind the sphæranchoræ of *Melonanchora*, but the latter spicules have three pairs of fused teeth.

The canonochelæ are scattered about in the choanosome in considerable numbers. The shape may be compared with an oval basin with the bottom cut out, and with two semicircular lids or lamellæ passing horizontally from the upper edge of the basin, so as to nearly meet; further, it is necessary to imagine such a basin turned up on its side.

The earliest developmental forms have an elongated C-shape; then the open C becomes a closed oval; by this time the falx at each end is perceptible, and the beginnings of the lamellæ appear. A further change leads to a marked asymmetry, the thin oval ring becoming a broad band by widening in a direction away from the edges whence the lamellæ arise.

Locality. Winter Quarters, 130 fath.

Hoplakithara *, gen. nov.

Mycalinæ possessing exotyles with large spherical spined heads and with fimbriated placochelæ.

* ὅπλα (pl. of ὅπλος), armour; κιθάρα, a guitar.

Hoplakithara Dendyi *.

Sponge in form of a small cushion, attached by a narrow base. Surface smooth to the naked eye. Colour pale brown in spirit. Consistence, hard externally, soft within. Flagellated chambers 32·5 μ in diameter, spheroidal, eurypylous.

Skeleton with protective armour formed by gigantic spheroidal heads of exotyles, the exotyles being arranged as radiating bundles in form of inverted cones, with the apices a little below the cortex; with scattered strongyles.

Spicules.—Megascleres: exotyles, with the heads a little inclined to the long axis of the spicule, the proximal end (in the interior of the sponge) rounded, the distal end swollen into large spherical heads, with short cylindrical spines covering the distal three-fourths of the head. Total length 358 μ, the shaft enlarging in diameter from 6·5 μ at the proximal end to 16 μ just below the head. Head 55 μ in diameter; cylindrical denticles 1·76 to 3·52 μ in height, with finely denticulate edge, and with cup-like depression at the summit.

Strongyles straight, fusiform, smooth, 467·5 μ long, 9·75 μ in diameter at centre, 6·5 μ in diameter at ends.

Microscleres: placocheles, fimbriated, 84·5 μ long, 29·25 μ broad; length of tooth 37·75 μ.

Sigmata very small, slender, C-shaped, 8·8 μ long, 5·28 μ broad, ·9 μ thick.

The minute spheroidal or cushion-shaped specimen was 2·2 mm. in height and 3 mm. in horizontal diameter; it was growing on the side of an Alcyonarian creeping over a branched *Cellepora*. No pores or oscules were discernible. The under surface, which was narrowed to the point of attachment, was paler in colour than the upper.

The new genus is closely related to the Mycaline genera *Rhaphidotheca* and *Guitarra*, to the former by its exotyles, and to the latter by its fimbriated placocheles.

The distal knobs of the exotyles of *R. Marshall-Hallii*, Kent, 49 μ in diameter, are smooth and spherical, and those of *R. rhopalophora*, Schmidt (*R. offinis*, Carter), are 104 μ long and 30 μ broad, and club-shaped. Lundbeck regards these two species as probably identical, and certainly the differences are slight.

Locality. Winter Quarters, 130 fath.

Gellius fimbriatus, sp. n.

Sponge in form of a thick triangular cake, or conico-cylindrical. Texture soft, easily broken. Colour in spirit pale buff.

* Named in honour of Professor Dr. A. Dendy.

Surface level, or almost imperceptibly hispid; showing through the dermal membrane a somewhat areolated pattern, each areola being formed by the end of a main fibre giving off fimbriated twigs which roof over the subdermal spaces between the main fibres. A few circular oscules about 5 mm. in diameter, and with slightly raised rims, occur.

Skeleton formed of longitudinal lines of flat, loose, band-like main fibres, with an irregular and obscure reticulation of single spicules between. The main fibres spread out in a paniculate manner a little below the dermal membrane.

Spicules.—Megascleres: oxeas 537 × 16·25 μ, slightly bent or curved at centre, attenuating gradually to sharp points.

Sigmata varying in size, the largest being 40 μ long, 17·6 μ broad, and 1·76 μ thick, with one or more angular bends in the curve, usually one end of the shaft with an angular bend, the other end curved.

The specimen selected as the type of this species has a flattened angular pad-like body, 10 cm. long, 4·5 cm. broad, and 2·5 cm. thick; it apparently lay free on the bottom.

An "areola" with its central node (the end of the main fibre) and lateral branchlets occupies on an average an area of 6 × 4 mm.

The upper surface alone shows the areolated appearance below the dermal membrane, the under surface being nearly opaque.

The triangular cushion-like shape of the type calls to mind *Gellius flagellifer* (R. & D.), but there are no flagellate sigmata in the new species. *G. rudis* (Topsent) has a much firmer and denser structure, the oxeas are shorter, thicker, and with tornote ends, and the sigmata are more slender and with uniform curve.

The ends of the main fibres are arranged in linear series.

The dermal membrane is separated about 3 mm. from the floors of the large subdermal spaces, and the band-like supporting pillars are about 2 mm. broad. A vertical section gives the appearance of a miniature "hall of a thousand columns." The dermal membrane on the under surface of the sponge contains scattered oxeas arranged tangentially.

Localities. Winter Quarters, 12–20 fath.; Coulman I., 100 fath.

Gellius pilosus, sp. n.

Sponge in form of an erect flattened triangular or elongate lamella divided or digitate at the upper edge. Consistence soft, fleshy, compressible.

Colour in spirit dirty white or very pale yellow.

Surface finely conulose and pilose, owing to the projection of the ends of the main skeleton-fibres about 1 mm., the conules being about ·6 mm. apart from each other.

A few oscules, about 1 mm. in diameter, on a level with the surface.

Skeleton formed of slender main axial fibres on an average about 2–5 spicules thick, curving out to the surface, where they form the pile, and of secondary fibres, usually one, but sometimes two or three spicules thick, at right angles to the main ones, with which they form oblong scalariform meshes. Spongin well developed at the nodes of the network.

Spicules.—Megascleres: oxeas, 537 × 22·75 μ, sharp-pointed, subtornote, a few being distinctly tornote.

Microscleres: sigmata, very abundant both in choanosome and ectosome, C-shaped, 39 × 16·25 μ in length and breadth and 1·5 μ thick.

There are two specimens. One of them is in the form of a triangular lamella dividing into two subterete branches, the total length being 10·5 cm., the breadth 3·5 cm., and the thickness 1 cm. The second specimen is 11 cm. long and 3 cm. broad, with little more than a notch at the upper edge, indicating a division into branches.

The new species bears some resemblance to *Gellius flagellifer*, R. & D., but differs from it in the absence of the peculiar flagellate sigmata. Further, *G. flagellifer* has an even surface, and a dermal skeleton network of spiculo-fibre; but in the new species the secondary fibres, usually not more than one spicule thick, are often not present at or just below the surface.

Locality. Winter Quarters, 25–30 fath.

Gellius cucurbitiformis, sp. n. Gellius

Sponge small, free, bulbous, with fistular prolongations. Surface smooth, showing under a lens a fine white reticulum. Colour in spirit pale brown. Consistence rather soft.

Skeleton.—With a distinct dermal layer of irregularly arranged tangential oxeas. Choanosomal skeleton a reticulum (with square or triangular meshes) of spiculo-fibre, the strands 2–3 spicules thick, with a faint indication of main fibres radiating to the surface.

Spicules.—Megascleres: oxeas, 342 × 9·75 μ, slightly curved, subtornote.

Microscleres: sigmata, varying in size, the smallest being about 20 μ long, C-shaped, and with uniform curve, and the largest 39 μ long, 19·8 μ broad, and 1·2 μ thick.

There are two small specimens, both of which were found in a tangled mass of débris surrounding a worm-tube. The

larger, the type specimen, consists of a basal bulbous portion, 13 mm. long, 7 mm. broad, and 8 mm. high, from one side of which arises a rather thick-walled fistula 13 mm. high and 5·5 mm. in diameter; at the opposite side is a broken circular area, from which, in all probability, a second fistula arose; lastly, between these two is a small raised knob with a rounded orifice on one side of it. The narrow oscular canal is not central, but along one side of the thick-walled complete fistula.

The second specimen is tubular, with a slightly enlarged solid base, whence arises a fistula; the total length is 2 cm., and diameter ·5 cm. No pores are discernible; the subdermal spaces are about ·2 mm. in depth.

The eurypylous flagellated chambers are 23 μ in diameter. Cellules sphéruleuses, 8–9 μ in diameter, are common.

There is no bast-like subdermal layer as in *Oceanapia mollis*, Dendy, and the spicules of the latter are smaller, the oxeas being 200 × 8 μ, and the sigmata only 16 μ. Lundbeck describes two species of *Gellius* with fistulæ, and with a well-developed dermal bark, viz. *G. luridus* and *G. microtoxa*, but both these species have toxa in addition to sigmata.

Locality. Winter Quarters, 25–30 fath.

Oceanapia tantula, sp. n.

The sponge consists of five small fragments of tubes, the longest of which is 8 mm. in length, by 4 mm. in diameter: three of the pieces are hollow, thin-walled, and tubular; the other two are solid. One of the solid pieces seems to belong to the top of a fistula.

The colour is transparent white.

Skeleton.—The dermal layer is composed of a chitinous-looking membrane with strongyles lying tangentially, usually in one layer and densely packed, but sometimes more or less scattered.

The white strands of the loose subdermal reticulum are visible through the surface. They are longitudinal, and only anastomose occasionally. The strands are less than ·1 mm. in diameter. They vary in composition; in some parts being composed of strongyles smaller than those of the dermal layer, in other parts of smooth trichodragmata, or again of strongyles, amphityles, and trichodragmata. The pale transparent choanosomal tissues are crowded with small spined rhaphides.

Spicules.—Megascleres: strongyles, 437 × 19 μ, slightly fusiform, curved once or sometimes twice. Occasionally one end is pointed, the spicule becoming a style.

Amphityles, 395 × 7·25 μ, slightly fusiform; heads 13 μ long, 9·75 μ broad.

Microscleres: long, smooth rhaphides, separate or in bundles, forming part of the subdermal reticulum, 650 × 2·5 μ.

Short, scattered, spined rhaphides, usually stylote, 162 μ long and about 2·5 μ broad.

H. V. Wilson describes a species of *Oceanapia*, viz. *O. bacillifera*, with strongyles, but it has sigmata.

Oceanapia (*Phlœodictyon*) *singaporensis* (Carter) has strongyles in the dermal layer, but oxeas as well as strongyles in the skeleton-fibres, and there are no microscleres.

The species of the Gelliine genus *Rhaphisia* have oxeas, trichodragmata, and, in one species, toxa; but there are no fistulæ, and there is no subdermal reticulum of spicular fibres.

Locality. Winter Quarters, 130 fath.

Petrosia fistulata, sp. n. qen Petrosia

Sponge tubular. Surface smooth, showing the round openings of the inhalant canals about ·4 mm. in diameter and close together.

Inner surface of the tube of the sponge finely or rarely coarsely pilose, and showing the round openings of the exhalant canals about 1 mm. in diameter. Colour in spirit pale yellow. Texture firm, but slightly compressible. Eurypylous flagellated chambers spheroidal, 24·5 μ in diameter.

Skeleton formed of main fibres proceeding from the inner to the outer surface, joined by secondary fibres one spicule thick, so as to form obscurely quadrangular or hexagonal tubes about ·5 mm. in diameter; ends of spicules cemented with spongin.

Spicules.—Oxeas, 492 × 24·4 μ, bent usually, or curved at centre, subtornote.

There are four specimens, the two larger being uniformly cylindrical and the smaller ventricose. The largest is 6 cm. long, the diameter being 2·1 cm. and the thickness of the wall 5 mm.

The dermal membrane roofing over the inhalant orifices is usually supported there by two or three single spicules radiating to the centre. The pores are ·95 μ in diameter.

Small embryos about ·76 mm. in diameter occur. The new species comes nearest to the species from Kerguelen, which Carter identified as *Thalysias sub-triangularis*, Duch. & Mich., but which Ridley and Dendy regarded as synonymous with *Petrosia similis* (Ridley & Dendy).

The spicules of the Antarctic species are very much larger than those of Carter's, and partly in consequence of this the skeletal network of the latter is much denser from a closer approximation of the fibres.

Localities. Winter Quarters, 25–30 fath.; McMurdo Bay, 96–120 fath.

Reniera Scotti, sp. n.*

Sponge consisting of one or more fistulæ. Texture very soft and easily lacerated. Colour in spirit varying from yellow to pale reddish. Outer surface varying from being finely hispid to having large conules and meandrine ridges. Inner surface of fistulæ very finely hispid in the spaces between the numerous orifices of exhalant canals. Flagellated chambers large, hemispherical, 60 × 40 μ.

Skeleton formed of parallel longitudinal lines of main fibres, about 2–6 spicules thick, curving outwards from the inner to the outer surface, where they pass into the conules and ridges; secondary fibres at right angles to the main ones, one or two spicules thick. The spicules are not closely united, and spongin is only present in very small amounts.

Spicules.—Oxeas, 343 × 14·6 μ, curved or bent at centre, subtornote.

There are six specimens and fragments. The outward appearance varies greatly according to age and size. In one small specimen the surface is finely hispid, in larger ones conulose, and in very large ones conulated and with high meandrine ridges. The largest specimen (No. 118) is in form of a wide thick-walled tube, 12 cm. high and 6 cm. in diameter, and with walls 1·5 cm. thick, but attenuating towards the rim of the tube. This specimen is incomplete below. The orifice is circular, and within the rim is a diaphragm contracted to a white line.

The surface is covered with large conules and meandrine ridges rising to a height of nearly 1 cm.

The dermal membrane, in the spaces between the conules and ridge, shows as a fine lace-like reticulum, with circular pores 133 μ in diameter, and beneath it the orifices (1–1·5 mm. in diameter) of the inhalant canals are visible. The exhalant orifices on the inner wall of the tube are much larger than the inhalant; they vary from 1 to 6 or 7 mm., their edges are smooth and rounded.

The species closely resembles *R. spinosella*, Thiele, from Punta Arenas. In Thiele's species the body is tubular, with conulated surface, and the texture is very soft; but the skeletal framework is irregular, and the oxeas, though similar in form, are much shorter, smaller, and more slender, being only 150–170 μ long and 7–8 μ thick.

Localities. Winter Quarters, 5–100 fath.; off E. end of Ice Barrier, 100 fath.

* This fine species is named after Captain Scott, R.N., the leader of the Expedition.