

XV.—Atlantic Sponges collected by the Scottish National Antarctic Expedition.

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(Plates XXXVIII–XL.)

The sponges in the following report were collected in the North and South Atlantic during the *Scotia's* voyages to and from the Antarctic regions in the years 1902–1904.

All the sponges in the collection were obtained off the south-west coast of Cape Colony, with the exception of five well-known species which were taken off St Helena, the Cape Verde Islands, and the Princesse Alice Bank. Only one specimen was dredged in deep water, namely, in 350 fathoms off the Princesse Alice Bank, while the remainder were taken between tide-marks to a depth of 30 fathoms.

The collection contains thirty-five species, of which fifteen are described as new.

To complete the list of sponges obtained by the *Scotia* in Atlantic waters, mention may be made here of one species which is not contained in this report. This species, *Cladorhiza thomsoni*, dredged in deep water between Gough Island and the Cape of Good Hope, has been described by Professor TOPSENT (24 and 25). It was taken at Station 468, 39° 48' S., 2° 33' E., depth 2770 fathoms.

The five species above referred to, *Leucandra crambessa*, *Aphrocallistes beatrix*, *Tethya lyncurium*, *Chondrosia plebeja* and *Chondrosia reniformis*, call for no special remark. They have all been previously obtained in, or fairly near, the areas for which they are here recorded.

With regard to the South African specimens, the collecting was confined to a short stretch of coast-line from False Bay to Saldanha Bay. The South African collection, as a whole, is characterised by the comparatively large size of the specimens, by the scarcity of small encrusting species, by the almost complete absence of calcareous sponges, and, consequently, by the rather small variety of species for the number of specimens obtained. These are, however, features usually observed in a collection of sponges which form part of a general gathering of animals obtained in such a limited period of time as that which was at the disposal of the workers on board the *Scotia* when, on her return voyage from the Antarctic, she paid a short visit to South African waters.

Apart from the general characteristics of the collection thus touched upon, a noteworthy feature is the all but complete absence of horny sponges, a group one would have expected to find fairly well represented in a shallow-water collection from this region. The only horny sponge present is a small fragment, too incomplete to identify, consisting as it does merely of macerated fibres.

Many of the sponges living between tide-marks were quite unattached to any

support; this feature, as well as the large size of the specimens, showing the extremely sheltered nature of the bays in which they were found.

Since ESPER described some sponges from the Cape of Good Hope more than one hundred years ago, a few species have been noted from time to time from the district, chiefly by CARTER, VOSMAER, RIDLEY and DENDY, and more recently, by BAER. The following species in the collection are known only from this locality:—*Mycale simonis* (Ridley and Dendy), *Homæodictya elastica* (Vosmaer), *Myxilla simplex* (Baer), *Clathria lobata* Vosmaer, and *Siphonochalina tubulosa* (Esper).

With regard to the geographical distribution of the remaining species in the collection, two of them, *Spirastrella purpurea* and *Halichondria panicea*, have practically a world-wide distribution. *Hymedesmia baculifera* has been recorded from the coast of Algeria, off the Azores, and off the Farões and Iceland; while the remaining species, *Cliona lobata*, *Hymeniacion caruncula*, *Pocillon hyndmani*, *Reniera cinerea* and *Halisarca dujardini*, have long been known from the European coasts of the Atlantic. Some of them have a fairly wide distribution, and their known geographical range has been extended southwards in the Atlantic by their discovery off the south-west coast of Africa. The gathering at the jetty at Cape Town Docks, in particular, as far as the sponges and hydroids are concerned, might have been taken, for example, at any suitable spot along the Irish coast, consisting as it does of specimens of *Reniera cinerea* and *Halichondria panicea*, the latter being overgrown by the hydroids *Plumularia setacea*, *P. echinulata*, and *P. pinnata*. On the other hand, the sponges of the western and eastern coasts of South Africa have apparently little in common. The most complete account of South African sponges is contained in Mr KIRKPATRICK'S report on the Gilchrist Collection (10). Forty-five species are enumerated in this report. All but two, which were dredged in False Bay, were obtained off Natal and off the south-east and south coasts of Cape Colony. There is not a single species in this collection which is represented among the *Scotia* sponges, and only five genera are common to the two collections. At the same time it must be remembered that the Gilchrist sponges were taken, as a rule, in deeper water than were the *Scotia* specimens, and that among them are several species previously obtained in the Atlantic, which are not found in the present collection.

Two of the species obtained by the *Scotia*, *Spirastrella purpurea* and *Halichondria panicea*, have been recorded, the former from Port Elizabeth and Mozambique, and the latter from Zanzibar, but these two species, as already mentioned, have an almost world-wide distribution. In addition to these, a few other widely distributed species, not represented in this collection, have been recorded from both the west and east coasts of Africa. On the whole, there does not seem to be a close agreement between the sponges of the Atlantic and Indian Ocean coasts of South Africa, but too little is known as yet to allow of a detailed comparison between these two areas.

The following list gives the species in the collection in their systematic order :—

CALCAREA.

HETEROCELA.

Family GRANTIIDÆ.

- Leucandra pumila* (Bowerbank).
Leucandra crambessa Haeckel.

NON-CALCAREA.

Order *HEXACTINELLIDA.*

Sub-order HEXASTROPHORA.

Family APHROCALLISTIDÆ.

- Aphrocallistes beatrix* Gray.

Order *TETRAXONIDA*

Grade **Tetractinellida.**

Sub-order ASTROPHORA

Family GEODIIDÆ.

- Geodia littoralis* n. sp.
Geodia libera n. sp.

Grade **Monaxonellida.**

Sub-order HADROMERINA.

Family TETHYIDÆ.

- Tethya lynceurium* (Linn.).

Family CLIONIDÆ.

- Cliona lobata* Hancock.

Family SPIRASTRELLIDÆ.

- Spirastrella purpurea* (Lamarck).

Family POLYMASTIDÆ.

- Polymastia littoralis* n. sp.

Family CHONDROSIIDÆ.

Chondrosia reniformis Nardo.*Chondrosia plebeja* Schmidt.

Sub-order HALICHONDRINA.

Family AXINELLIDÆ.

Hymeniacion caruncula Bowerbank.*Leucophlæus styliferus* n. sp.

Family PÆCILOSCLERIDÆ.

Sub-family ECTYONINÆ.

Hymedesmia baculifera (Topsent).*Hymedesmia parva* n. sp.*Microciona similis* n. sp.*Microciona tenuis* n. sp.*Pocillon hyndmani* (Bowerbank).*Clathria lobata* Vosmaer.*Clathria raphidotoxa* n. sp.

Sub-family MYXILLINÆ.

Myxilla simplex (Baer).*Tedania scotiæ* n. sp.

Sub-family MYCALINÆ.

Mycale simonis (Ridley and Dendy).*Mycale* sp.*Esperiopsis informis* n. sp.*Homæodictya compressa* (Esper).*Homæodictya elastica* (Vosmaer).*Homæodictya multiformis* n. sp.*Homæodictya alata* n. sp.

Family HAPLOSCLERIDÆ.

Siphonochalina tubulosa (Esper).*Siphonochalina anonyma* n. sp.*Pachychalina hospitalis* n. sp.*Halichondria panicea* (Pallas).

Reniera cinerea (Grant).
Reniera saldanhæ n. sp.
Reniera sp.
Reniera sp.

Order MYXOSPONGIDA.

Family HALISARCIDÆ.

Halisarca dujardini Johnston.

The stations at which the sponges were obtained are as follows, together with a list of the species taken at each station :—

Station 24. Porto Grande, St Vincent, Cape Verde Islands, shore, N.E.
 1st December 1902.

Leucandra crambessa Haeckel.
Tethya lyncurium (Linn.).
Chondrosia reniformis Nardo.

Station 478. Table Bay, shore. May 1904.

Geodia libera n. sp.
Myxilla simplex (Baer).
Esperiopsis informis n. sp.
Siphonochalina tubulosa (Esper).

Station 479. False Bay, shore. 6th May 1904.

Hymeniacidon caruncula Bowerbank.

Coaling jetty at Cape Town Docks. 14th May 1904.

Halichondria panicea (Pallas).
Reniera cinerea (Grant).

Station 482. Houtjes Bay, Saldanha Bay, shore. 19th May 1904.

Geodia littoralis n. sp.
Geodia libera n. sp.
Spirastrella purpurea (Lamarck).
Polymastia littoralis n. sp.
Hymeniacidon caruncula Bowerbank.
Leucoplæus styliferus n. sp.
Hymedesmia baculifera (Topsent)
Hymedesmia parva n. sp.
Microciona similis n. sp.
Microciona tenuis n. sp.

Pachychalina hospitalis n. sp.

Reniera sp.

Station 482 (*cont.*). Saldanha Bay, 5 fathoms. 20th May 1904.

Homæodictya multiformis n. sp.

Siphonochalina tubulosa (Esper).

Station 482 (*cont.*). Reit's Bay, Saldanha Bay, shore. 21st May 1904.

Hymeniacidon caruncula Bowerbank.

Leucoplæus styliferus n. sp.

Myxilla simplex (Baer).

Homæodictya multiformis n. sp.

Homæodictya alata n. sp.

Siphonochalina tubulosa (Esper).

Halichondria panicea (Pallas).

Reniera cinerea (Grant).

Reniera saldanhæ n. sp.

Reniera sp.

Halisarca dujardini Johnston.

Station 483. Entrance to Saldanha Bay, 25 fathoms. 21st May 1904.

Leucandra pumila (Bowerbank).

Cliona lobata Hancock.

Leucoplæus styliferus n. sp.

Pocillon hyndmani (Bowerbank).

Clathria lobata Vosmaer.

Clathria raphidotoxa n. sp.

Myxilla simplex (Baer).

Tedania scotiæ n. sp.

Mycale simonis (Ridley and Dendy).

Mycale sp.

Esperiopsis informis n. sp.

Homæodictya compressa (Esper).

Homæodictya elastica (Vosmaer).

Homæodictya multiformis n. sp.

Homæodictya alata n. sp.

Siphonochalina tubulosa (Esper).

Siphonochalina anonyma n. sp.

Halichondria panicea (Pallas).

Reniera saldanhæ n. sp.

Station 499. St James's Bay, St Helena, 15° 57' S., 5° 40' W., 30 fathoms.
2nd June 1904.

Chondrosia plebeja Schmidt.

Station 542. Princesse Alice Bank, 37° 56' N., 29° 11' W., 350 fathoms.
4th July 1904.

Aphrocallistes beatrix Gray.

I have to thank Professor VOSMAER and Dr C. ZIMMER for their valuable gifts of fragments of several type-specimens, and Mr R. KIRKPATRICK, of the British Museum, for his kindness in allowing me every facility for studying specimens under his care. I wish also to acknowledge my great indebtedness to Miss EILEEN E. BARNES for the care with which she made the drawings for this paper.

CALCAREA.

HETEROCÆLA.

Family GRANTIIDÆ.

Leucandra pumila (Bowerbank).

Station 483. Entrance to Saldanha Bay, 25 fathoms. 21st May 1904. One specimen.

The only specimen of this species in the collection is growing on a hydroid colony. It is 11 mm. in height and agrees very well with HÆCKEL'S description (8), except that it possesses numerous small, bayonet-headed monaxons in the dermis, a form of spicule not mentioned in the early accounts of the species. Small monaxon spicules, which sometimes vary very much in numbers in different specimens of the same species, were often overlooked by the early workers at the Calcarea. It seems possible, therefore, that a careful examination of the type-specimen of this species would result in the discovery of their presence, although I was unable to find them in a section of the type in the British Museum. Or, as DENDY and ROW (*Proc. Zool. Soc. London*, 1913, p. 715) suggest, it may be that some individuals of a species possess them, while others do not. Otherwise the *Scotia* specimen agrees exactly with the type as regards the size and character of the spicules. The small, bayonet-headed monaxons are 0·055–0·075 mm. in length by about 0·0025 mm.

This species, which appears to have a wide geographical distribution, has been already recorded for South Africa (8).

Leucandra crambessa Haeckel.

Station 24. Porto Grande, St Vincent, Cape Verde Islands, shore, N.E. 1st December 1902.

Several specimens were obtained, growing on sea-weed, which agree exactly, both in external appearance and in the structure of the skeleton, with HÆCKEL's description (8) of this species. Although six species of *Leucandra* were found in the collection of calcareous sponges made within recent years off the Cape Verde Islands (18), *L. crambessa* was not among them. This species, though long known only from the Mediterranean, has, however, already been found outside that area, BREITFUSS having recorded it for the west coast of Portugal (*Zool. Jahrb. Syst.*, xi. 1898).

NON-CALCAREA.

Order *HEXACTINELLIDA*.

Sub-order *HEXASTROPHORA*.

Family *APHROCALLISTIDÆ*.

Aphrocallistes beatrix Gray.

Station 542. Princesse Alice Bank, 37° 56' N., 29° 11' W., 350 fathoms. 4th July 1904.

The collection contains five small pieces of this well-known species, which has frequently been dredged in the neighbourhood of the Azores and in other parts of the Atlantic. The two largest pieces are, respectively, 90 and 120 mm. in length. They are of the characteristic shape, with radial, thimble-like diverticula. The Atlantic specimens of this widely distributed species have usually been recorded under the name of *Aphrocallistes bocagei* Wright, a name now regarded by SCHULZE (17) as a synonym of *Aphrocallistes beatrix* Gray.

Distribution.—North and South Atlantic, and Indian and Pacific Oceans, from about 77 fathoms to 1075 fathoms.

With the exception of *Aphrocallistes beatrix*, no Hexactinellid sponges are in the collection, but a small, sponge-like mass, dredged in 25 fathoms at the entrance to Saldanha Bay, proved to be made up of numerous long diacts of Hexactinellida matted together. Among the diacts, in addition to a quantity of fine mud, were entangled hexacts, oxyhexasters, and other Hexactinellid spicules, as well as styli, chelæ, and sigmata of Monaxonellid sponges.

TOPSENT (23) has noted similar accumulations of Hexactinellid spicules, which were found among the sponges of the *Français* Antarctic Expedition, and which, he suggests, may be due to the action of currents. The spicules belonged to species of *Rossella*. These accumulations of *Rossella* spicules were obtained in much shallower water than were the living representatives of the *Rossellidæ* which had previously been dredged by the *Belgica* in the same region.

Order *TETRAXONIDA*.Grade **Tetractinellida**.

Sub-order ASTROPHORA.

Family GEODIIDÆ.

Geodia littoralis n. sp. (Plate XXXVIII, fig. 5; Plate XL, fig. 1.)

Station 482. Houtjes Bay, Saldanha Bay, shore. 19th May 1904. Three specimens.

Sponge more or less rounded in outline, but very irregular. Two of the specimens are complete, except that in places their surface is injured. Each has a thick, finger-like projection from one end.

The specimens grew apparently quite free, as there is no sign that they were attached at any point. The largest measures 13·5 cm. by about 8·5 cm., and is about 4·5 cm. thick. Another is 10·2 cm. in length by 10 cm., and is about 5 cm. thick. The third specimen is broken. It is 6·5 cm. in its greater diameter.

The surface is strongly hispid in places.

The colour in spirit is pale yellow throughout the whole sponge.

The excurrent chones occur in groups, generally in slightly depressed areas; they are similar to the incurrent chones, except for their greater size. Both excurrent and incurrent openings are covered by a cribriporal membrane, which is echinated by tufts of cortical oxea and anatriænes. The excurrent openings are about 0·125–0·175 mm. in diameter, the incurrent being about 0·025–0·06 mm.

The main skeleton consists of radiating bundles of megascleres. The cladi of the orthotriænes are extended beneath the sterrastral layer, which is about 1·2 mm. in thickness, but many of the anatriænes and mesoprotriænes pierce the layer of sterrasters and project for some distance beyond the surface of the sponge.

Vertical bundles of small oxea occur in the cortex, and among them are minute anatriænes. These project slightly and cause the finer hispidation of the surface.

Spicules.—(1) Orthotriænes.—The shaft tapers gradually to the rounded proximal end. It is about 2·5–3 mm. in length by 0·065–0·09 mm. Cladi 0·25–0·4 mm. in length. (2) Anatriænes.—Shaft rounded at the proximal end, 4·5–5 mm. long by 0·025–0·03 mm. beneath the cladome. Cladi 0·1–0·14 mm. long. Cladome about 0·1–0·14 mm. (3) Cortical anatriænes.—Not very common. Length 0·26–0·35 mm. by 0·005 mm. Cladi to about 0·008 mm. in length. (4) Mesoprotriænes.—Shaft generally rounded at the proximal end and produced at the distal end to a length of 0·075–0·13 mm. above the origin of the cladi. Shaft up to about 4·5 mm. in length by 0·025–0·035 mm. Cladi 0·05–0·1 mm. long. (5) Somal oxea.—These taper gradually to rather blunt points. Sometimes one end is rounded off. Length 2·5–3 mm. by 0·05 mm. (6) Cortical oxea.—These taper to rather blunt points.

Sometimes one end is rounded off while the other is rather sharply pointed, so that the spicule looks like a stylus. Length 0.22–0.3 mm. by 0.005–0.007 mm. (7) Sterrasters.—Spheroidal, and slightly flattened, 0.085–0.1 mm. in diameter. (8) Somal stronglylospherasters.—These have a comparatively large centrum and numerous very short, blunt, knob-like rays. Diameter 0.005–0.007 mm. (9) Spherasters, occurring beneath the sterrastral layer, 0.013–0.02 mm. in diameter. (10) Choanosomal oxyasters, with usually two to seven rays. The rays are conical, sharply pointed, and covered with minute spines, except at the base. The rays are 0.02–0.032 mm. in length by about 0.005 mm. in thickness at their base. The diameter of the whole spicule is 0.045–0.065 mm. Very abundant.

The arrangement of the excurrent and incurrent openings, the form of the megascleres, and the presence of the cortical anatriænes in this species recall *Geodia mülleri* (Fleming). The two species differ especially as regards their microscleres. The somal asters of *Geodia littoralis*, with their comparatively large centrum and short, knob-like rays, differ in shape from the corresponding spicules of *G. mülleri*, which are typical chiasters. The spherasters lying immediately beneath the sterrastral layer differ in proportions in the two species, and are more clearly marked off from the other asters in *Geodia littoralis* than in *G. mülleri*. The choanosomal asters of the older species are very variable, passing from chiasters to oxyasters, with slender, usually fairly numerous rays. They differ altogether in appearance and size from the oxyasters of *G. littoralis* with thick rays, which are few in number. The sterrasters of the new species are slightly larger than those of *G. mülleri*.

Geodia libera n. sp. (Plate XXXVIII, fig. 6; Plate XL, fig. 2.)

Station 478. Table Bay, shore. May 1904. One specimen.

Station 482. Houtjes Bay, Saldanha Bay, shore. 19th May 1904. Four specimens.

The largest specimen, which was collected in Table Bay, is an irregular, nodular mass, 20.5 cm. long by 12 cm., with a thickness of about 9.5 cm. The remaining specimens are much smaller. They are irregularly rounded or oval, and closely resemble small, dark-skinned potatoes in appearance. They are about 65 mm., 57 mm., 31 mm., and 28 mm. in length respectively. One of the small specimens is slightly embedded in an Aleyonarian colony, but is nowhere attached to it. The other specimens, including the largest, are a little injured in places, but show no sign of having been fixed to any support.

The colour in spirit of the largest specimen is dark greyish purple externally, and is yellowish internally, while the smaller sponges are a paler purple outside, with a pale yellow interior.

The surface is even, for the most part, but harsh to the touch. In places it is strongly hispid. There are no large oscula, nor is there a specially marked oscular

area, but the whole sponge is covered by a cribriporal membrane, with pores measuring about 0.03 mm. in diameter. The main skeleton is formed in the usual way of radiating bundles of megascleres, but the dichotriænes, anatriænes, and protriænes for the most part pierce the sterrastral layer, although a few lie beneath it. The dermal membrane is supported on the cladomes of the dichotriænes, and is separated from the layer of sterrasters by a space about 0.2–0.3 mm. in width. In places the anatriænes and protriænes project some distance beyond the surface of the sponge. The cortical oxea and minute cortical anatriænes project slightly, and cause the finer hispidation of the surface.

The sterrastral layer varies in thickness in the different specimens from about 0.55 mm. to 1 mm. Large subdermal cavities occur between the dermal membrane, which is crowded with minute strongylospherasters, and the sterrastral layer.

Numerous pigment cells, brownish in colour, are found between the dermal membrane and the sterrastral layer.

Spicules.—(1) Dichotriænes.—Shaft tapering gradually to the rounded proximal end, and measuring 2.5–3 mm. in length by 0.07–0.1 mm. beneath the cladome. Protocladi 0.1 mm. by 0.05–0.06 mm. Deuterocladi 0.175–0.25 mm. in length. Cladome about 0.6 mm. (2) Anatriænes.—Shaft up to 3.5 mm. in length by 0.012–0.015 mm. under the cladome, rounded at the proximal end. Cladi 0.03–0.06 mm. Chord about 0.07 mm. (3) Cortical anatriænes.—Length 0.3–0.4 mm. by 0.0025–0.004 mm. Sometimes rounded at the proximal end. Cladi up to 0.008 mm. in length. (4) Protriænes.—Shaft 2.5–3 mm. in length by 0.012–0.019 mm., rounded at the proximal end. Cladi 0.025–0.06 mm. (5) Somal oxea.—Length 2–3 mm. by 0.045–0.06 mm., tapering at each end to a rather blunt point. Sometimes one, or, more rarely, both ends rounded off. (6) Cortical oxea.—Length 0.25–0.3 mm. by 0.005–0.008 mm., tapering at each end to a blunt point, which is sometimes rounded off. (7) Sterrasters.—Spheroidal in shape, but somewhat flattened. Diameter 0.1–0.12 mm. (8) Somal strongylospherasters.—Diameter 0.005–0.008 mm.; very short, cylindrical actines. Extremely abundant in the dermis, but common also in the interior of the sponge. (9) Choanosomal spherasters with small centrum, passing into oxyasters. Actines 0.005–0.01 mm. in length, the whole aster having a diameter of 0.013–0.024 mm.

This species differs from the majority of *Geodia* species in having the dichotriænes piercing the sterrastral layer and supporting the dermal membrane on their cladi at a certain distance above it. Among the species in which a similar arrangement of the dichotriænes occurs are *G. perarmata* Carter (2 and 5) and *G. peruncinata* Dendy (5). The *Scotia* species differs, in particular, from the former in the absence of a definite, basin-shaped, oscular area, and in the presence of minute cortical anatriænes, and from the latter in the possession of cortical oxea and of brown pigment cells in the outer layer of the cortex. There are, as well, certain differences in the character and measurements of the spicules. *G. sphæroides* (Kieschnick)

agrees with the new species in the arrangement of the dichotriænes and in the presence of brown pigment cells in the outer layer of the cortex, but differs from it in certain details in the shape and measurements of the spicules. In *G. robusta* Lendenfeld (12), taken in 84 metres off the south coast of Africa, there is a similar arrangement of the dichotriænes, but the size and character of the various kinds of spicules are quite different in the two species.

Grade **Monaxonellida.**

Sub-order HADROMERINA.

Family TETHYIDÆ.

Tethya lynceurium (Linn.).

Station 24. Porto Grande, St Vincent, Cape Verde Islands, shore, N.E. 1st December 1902. One specimen, 30 mm. in diameter.

Family CLIONIDÆ.

Cliona lobata Hancock.

Station 483. Entrance to Saldanha Bay, 25 fathoms. 21st May 1904.

The specimens obtained are boring in fragments of a balanid shell. They agree in every particular with TOPSENT's detailed description of the species (20). The tylostyli vary in length between 0.16–0.235 mm., with a maximum diameter of 0.005 mm. The spinispiræ reach a maximum length of about 0.055 mm.

The finding of *Cliona lobata* off the western coast of Cape Colony considerably extends the known geographical distribution of the species. Hitherto it has only been obtained off the western coasts of Europe, from Great Britain and Denmark to France, and off the Mediterranean coast of France.

Family SPIRASTRELLIDÆ.

Spirastrella purpurea (Lamarck).

Station 482. Houtjes Bay, Saldanha Bay, shore. 19th May 1904.

Among the Atlantic sponges collected by the *Scotia* are three small pieces of this species, as recently defined by VOSMAER (27). They grow over masses of Ascidians, Polyzoa, and fragments of shells. Their present greatest thickness is about 12 mm., but as they are all incomplete it is impossible to know their original size and shape. Here and there the surface remains uninjured. It is even, and, under the lens, is seen to be finely hispid.

The colour in spirit is pale greyish yellow.

The skeleton consists internally of a dense reticulation of closely packed tylostyli. At the surface, the tylostyli, which are here shorter, are arranged in vertical brushes, and their points project slightly beyond the dermis. The spinispiræ are not present in very great abundance, and do not form a dermal crust.

The tylostyli have slightly curved shafts and well-rounded heads. They vary in length between 0.2 mm. and 0.43 mm., and have a maximum diameter of 0.015 mm. In shape they are very similar to the stouter tylostyli of the specimen of *Hymeniacidon angulata* Bowerbank, numbered B. M. 21 by VOSMAER (27), and figured by him on pl. xiii, but they are, on the whole, fairly thick, and their diameter does not often fall below 0.01 mm. The old specimen referred to possesses a much greater proportion of more slender megascleres.

A good many abnormal tylostyli are present, similar to those described and figured by VOSMAER (27, p. 58, pl. xiv).

The spinispiræ are all slender, and are similar to those figured by VOSMAER (27, pl. xiii, fig. 1). The longest measured reached a length of 0.032 mm. As already mentioned, they do not form a superficial crust.

In attempting to assign to the *Scotia* specimens a place in one of the seven tropi or groups into which VOSMAER divides the specimens of *Spirastrrella purpurea* examined by him, only the spiculation can be taken into account, as their external form is unknown. The specimens placed in tropus *tegens* and in tropus *tuberosa* have a glabrous surface and possess robust spinispiræ, therefore the *Scotia* sponges do not belong to either of these groups. Nor do they belong to the *pyramidalis* group, the members of which also have a glabrous surface and often possess robust spinispiræ. Again, the *Scotia* specimens do not belong to the *digitata* group, as the specimens placed in it have a superficial crust of spinispiræ. They agree with the specimens placed in the remaining three tropi, *tubulifera*, *concrescens*, and *glæbosa*, in the absence of a superficial crust of microscleres, and in possessing a slightly hispid surface. As these three groups are characterised by the external appearance of the specimens placed in them, it is impossible to decide to which of them the *Scotia* specimens most strictly belong. This is, doubtless, the less to be regretted as Professor VOSMAER has shown so clearly the wonderful variations of this species and the way in which one tropus passes into another, so that, as he states, some specimens might be placed in one tropus equally as well as in another.

VOSMAER (27, p. 35) gives in full the geographical distribution of the species. As regards the distribution in the Atlantic Ocean, the sponge has been taken off the north coast of France and off Madeira. It has also been taken in the Mediterranean. The finding of specimens off the western coast of South Africa thus extends southwards the known distribution of the species in the Atlantic. Other specimens of the species have been taken off South Africa, but they were taken off the south-eastern and eastern coasts, namely, at Port Elizabeth (*S. capensis*

Carter), and at Mozambique (*S. punctulata* Ridley). The *Scotia* specimens come much nearer to the Madeira specimens in spiculation than to these, as the Port Elizabeth sponge possesses robust spinispiræ, while the sponge from Mozambique possesses a dermal crust of spinispiræ and a large proportion of slender tylostyli.

Family POLYMASTIIDÆ.

Polymastia littoralis n. sp. (Plate XXXVIII, fig. 4; Plate XL, fig. 3.)

Station 482. Houtjes Bay, Saldanha Bay, shore. 19th May 1904.

Several pieces, which are probably parts of the same specimen, are preserved. The largest piece measures about 14 cm. by 10 cm. The sponge, which has been cut off from its support, is in the form of an encrustation, from 10 to 15 mm. in thickness. It possesses a very well-marked cortex about 3 mm. thick, which adheres closely to the choanosome. The upper surface of the sponge bears numerous papillæ, which have a maximum diameter of about 4 mm. Among these are scattered a few larger papillæ with a diameter of about 8 to 12 mm. The papillæ are very short and rigid, and are probably in a much contracted state. The surface is even and is apparently smooth, but under the lens it is seen to be very minutely hispid.

The colour in spirit is pale greyish yellow.

The skeleton of the choanosome is formed of thick fibres, consisting of closely packed styli. These fibres run vertically from the base of the sponge to the cortex. At the base they may be as much as 1 mm. in diameter, but they soon divide into finer strands which fan out beneath the cortex. The ends of the fibres penetrate into the cortex, but do not project beyond the surface of the sponge. Small subtylostyli, similar to those of the outermost layer of the cortex, occur in little bundles scattered throughout the choanosome between the main fibres, and are found in special abundance immediately below the cortex.

The cortical skeleton is made up of two layers of spicules. The outermost layer consists of closely set vertical brushes of small subtylostyli, the tips of which project slightly above the surface of the sponge. Beneath this is a thick, dense layer of large tylostyli and subtylostyli, which are placed for the most part vertically to the surface, but many of which lie quite irregularly.

The arrangement of the spicules in the papillæ is quite similar to that in the main body of the sponge. Towards the centre are strong fibres of large styli running longitudinally through the papilla, with scattered bundles of small subtylostyli lying between them. At the surface are closely set vertical brushes of small subtylostyli, and beneath them is a thick layer of densely packed tylostyli and subtylostyli.

Spicules.—(1) Large styli of the skeletal fibres.—Shaft fusiform, straight.

Length 1-1.5 mm. by 0.027-0.03 mm. (2) Tylostyli of the main mass of the cortex.—These have typically a well-marked, usually trilobed head, but sometimes the head is less well developed, so that the spicules become subtylostyli or even styli. The shaft is slightly curved and strongly fusiform. The length is 0.45-0.6 mm., with a maximum thickness of 0.027 mm. (3) Small subtylostyli of the dermal brushes and of the bundles scattered through the choanosome.—These have a slightly fusiform and slightly curved shaft. Their length is 0.14-0.24 mm. by 0.005 mm.

Polymastia littoralis resembles *Polymastia corticata* Ridley and Dendy (15) in having a thick, dense cortex, but otherwise the species differ. The arrangement of the cortical skeleton (except in the papillæ) is somewhat similar, but the choanosomal skeleton is different, strong well-defined fibres being absent from *P. corticata*. The spicules differ also in shape and measurements. *P. corticata* is, moreover, a deep-sea species, having been taken at various depths up to 1200 fathoms.

In *Polymastia meandria* Wilson (28), on the other hand, the spicules, though differing in details of measurements, are very similar in shape to those of *Polymastia littoralis*, but the structure of the cortex is different both in the papillæ and in the main body of the sponge, nor is the cortex in *P. meandria* nearly as thick as that of the new species.

Polymastia was for long considered a typical deep-sea genus, and the *Scotia* specimen is therefore interesting in having been taken between tide-marks. Only two or three other species of *Polymastia* have been so obtained. Even the widely spread *Polymastia mammillaris* has never been recorded between tide-marks, except on a few occasions for the coast of Ireland.

Family CHONDROSIIDÆ.

Chondrosia reniformis Nardo.

Station 24. Porto Grande, St Vincent, Cape Verde Islands, shore, N.E. 1st December 1902. One specimen.

Only one specimen was obtained. It is more or less pear-shaped, but rather flattened. It is 39 mm. in length.

The colour in spirit is pale greyish yellow, tinged with brown on the upper parts of the sponge.

The species has apparently a wide geographical range. It has been recorded from the Mediterranean and Cattedagat; the Gulf of Aden and off Ceylon; off Amboina, Christmas Island, Galapagos Islands, and off the coasts of Australia.

Chondrosia plebeja Schmidt.

Station 499. St James's Bay, St Helena, 15° 57' S., 5° 40' W., 30 fathoms. 2nd June 1904.

Several large sponges are in the collection, which agree exactly with this species as described by KIRKPATRICK (11) from specimens obtained in the same locality and at the same depth as those dredged by the *Scotia*. Three more or less complete specimens and numerous fragments were obtained. The more complete are in the form of cup-shaped, or irregular, nodular masses, while some of the pieces have evidently been cut from large specimens. The largest piece in the collection is a nodular mass, 15.5 cm. in length.

All the specimens are crowded throughout with substances foreign to the sponge, chiefly fragments of nullipore and shells.

The colour in spirit is black at the surface; it is paler in the interior of the sponge.

The distribution of this sponge, as given by KIRKPATRICK (11), is as follows: off Algiers; off Porto Santo Island, 60 fathoms; Grand Canary, at low tide; off Jamestown, St Helena, 30 fathoms.

Sub-order HALICHONDRINA.

Family AXINELLIDÆ.

Hymeniacion caruncula Bowerbank.

Station 479. False Bay, shore. 6th May 1904. One specimen.

Station 482. Houtjes Bay, Saldanha Bay, shore. 19th May 1904. One specimen.—Reit's Bay, Saldanha Bay, shore. 21st May 1904. Fragments.

Several specimens of this widely distributed species were obtained. They differ somewhat in external appearance, but not more so than do specimens of the species collected along our own shores, which vary from thin encrustations with even surface to large cushion-shaped masses with papillose surface and large, finger-like outgrowths.

The most complete of the South African specimens is more or less oval in outline, with a strongly convex upper surface. It is about 12 cm. in length, with a thickness of 3 cm. Numerous small oscula, about 1–1.5 mm. in diameter, are slightly raised above the general surface. A second specimen is a flat sponge, 10 mm. thick, with oscula up to 4 mm. in diameter raised a little above the surface. The specimens from Reit's Bay are fragmentary. They have a papillose surface, with large, finger-like outgrowths, on the summit of which are the large oscula. The styli vary considerably in length in each individual, but do not show much variation in size from one specimen to another. They are 0.15–0.37 mm. or 0.43 mm. in length by 0.005–0.01 mm. They are thus very slightly thicker than are the styli of European specimens of the species, which apparently seldom exceed 0.008 mm. in diameter. They are, however, almost identical in size with the styli of a specimen collected off

the west coast of Ireland, which are 0.175–0.425 in length and have a maximum diameter of 0.009.

The known distribution of *Hymeniacidon caruncula* is extended southwards in the Atlantic by the discovery of the South African specimens, the species having previously been obtained off the Azores and the Cape Verde Islands, as well as along the western coasts of Europe from the British Isles to Portugal.

Leucophlœus styliferus n. sp. (Plate XXXVIII, fig. 1; Plate XL, fig. 4.)

Station 482. Houtjes Bay, Saldanha Bay, shore. 19th May 1904. Many fragments.—Reit's Bay, Saldanha Bay, shore. 21st May 1904. One specimen.—Station 483. Entrance to Saldanha Bay, 25 fathoms. 21st May 1904. Three specimens.

Nearly all the specimens are more or less broken. They grow in flattened cake-like masses, about 10–15 mm. thick, or in irregularly rounded lumps. The largest piece measures about 60 mm. in length by 45 mm.

The texture is firm. The surface is apparently quite smooth, but under the lens it is seen to be minutely hispid.

The oscula average 1 mm. in diameter, and are usually raised a little above the general surface of the sponge on ridges or on rounded prominences.

The pores are grouped in the meshes of the dermal skeleton and usually measure between 0.01–0.03 mm. in diameter.

The specimens closely resemble *Halichondria panicea* (Pallas) in external appearance (at least when spirit specimens of the two species are compared), and also in the arrangement of the dermal skeleton and of the pores.

The colour in spirit of most of the specimens is pale yellow or pale greyish yellow, while two or three of them are pale greyish brown.

The main skeleton consists of an irregular reticulation of rather closely packed styli. More or less well-defined fibres, containing multiseriably arranged styli, run to the surface of the sponge and spread out in a slightly penicillate manner beneath the dermis. The tips of some of the spicules pierce the dermis and project a little beyond it, causing the minute hispidation of the sponge.

The dermal skeleton consists of bundles of styli, similar to those of the main skeleton, lying tangentially to the surface. These form a very regular reticulation, in the meshes of which the pores of the dermal membrane are seen. The dermal skeleton is, as already mentioned, exactly similar to that of *Halichondria panicea*, except that here styli are present instead of oxea. In places the spicules are closely packed together in sheets and the reticulation is obscured.

Spicules.—The only spicules present are styli, which sometimes show a tendency to become subtylostyli. They are fusiform and have a slightly curved shaft. The styli fall into two groups according to their size. The larger make up the chief part

of both dermal and main skeleton, and measure 0·37–0·58 mm. in length by 0·01–0·015 mm. The smaller occur in the brushes of spicules beneath the dermis, and are also found in company with the larger styli throughout the sponge. They measure 0·2–0·3 mm. in length by 0·005–0·008 mm.

The size of the spicules varies but little in the different specimens.

Leucophlæus styliferus resembles in external appearance *Leucophlæus massalis* of CARTER, who also noted the likeness of his species to *Halichondria panicea* (4, p. 323). It differs from *L. massalis* in possessing only styli, while the spicules of CARTER'S species, as seen from a preparation of the type-specimen in the British Museum, are largely oxea. The presence of oxea in CARTER'S type-specimen has already been noted (F. F. HERNANDEZ, in "Notas sobre Algunas Esponjas de Santander," p. 17, *Memoria presentada en la Universidad Central*, Madrid, 1912).

The genus *Leucophlæus* Carter (4) was not defined by its author. It is here taken in the sense in which it is understood by DENDY, who gives a definition of the genus in his important work on Ceylon sponges (5).

Family PÆCILOSCLERIDÆ.

Sub-family ECTYONINÆ.

Hymedesmia baculifera (Topsent).

Station 482. Houtjes Bay, Saldanha Bay, shore. 19th May 1904.

Specimens of a *Hymedesmia*, growing in thin patches on a small stone, agree exactly in the arrangement of the skeleton and in the size and character of the spicules with the descriptions given by TOPSENT (21 and 22) of this species. They also agree closely with LUNDBECK'S description (13) of specimens taken by the *Ingolf* Expedition.

Several patches of the sponge, the largest about 24 mm. by 15 mm. in extent, grow on a small stone, the thicker patches being pale yellowish in colour, the thinner, bluish white. The spicules differ very slightly in length in these specimens, and the dermal spicules differ as regards their shape exactly as described by TOPSENT for the type-specimens from the north coast of Africa. In the thicker patches of the sponge the spicules measure as follows:—(1) Acanthostyli, 0·09–0·225 mm. long by 0·006–0·01 mm. (2) Dermal spicules rounded at one end and sharply pointed at the other, or occasionally very slightly swollen at the ends (strongylo- to subtylotornota), 0·15–0·18 mm. by 0·003 mm. (3) Isochelæ arcuatæ, 0·02 mm. in length.

In the thinner patches the measurements of the spicules are:—(1) Acanthostyli, 0·07–0·19 mm. long by 0·005–0·009 mm. (2) Dermal spicules (strongylo- to subtylota), 0·12–0·15 mm. by 0·0025 mm. (3) Isochelæ arcuatæ, 0·02 mm. in length.

The dermal spicules are sometimes very slightly polytylote, a condition mentioned by LUNDBECK as occurring in the corresponding spicules of the northern specimens.

The species appears to have a wide geographical and bathymetrical range. It has been recorded off La Calle, Algeria (21); off the Azores, 1250 metres (22); and it was dredged by the *Ingolf* at a number of stations in Denmark Strait, off the south of Iceland and east of the Farøe Islands, at depths varying between 76 and 691 fathoms (13). HENTSCHEL (9) describes a variety of the species for Shark's Bay, South-West Australia, in 6–9 metres.

Hymedesmia parva n. sp. (Plate XL, fig. 14.)

Station 482. Houtjes Bay, Saldanha Bay, shore. 19th May 1904.

Sponge forming a very thin encrustation on both inner and outer surfaces of a large dead *Patella* shell.

The thickness of the sponge is about 0·2 mm.; the surface is finely hispid.

The main skeleton consists of acanthostyli, closely crowded together and standing vertically with their heads on the substratum. The longer project very slightly beyond the surface of the sponge. The dermal skeleton consists of tornota lying horizontally to the surface. They occur singly, or sometimes a few lie loosely together, but they do not form well-defined bundles. Some of the tornota lie horizontally to the surface at different levels through the sponge.

Spicules.—(1) Acanthostyli, which are divided into two groups.—The longer are straight or slightly curved, and taper evenly from the base to a fairly sharp point; the head is covered with numerous, fairly strong, blunt spines, and a few very small spines are scattered for some distance along the shaft, leaving the upper part smooth. These spicules are fairly uniform in size, and measure 0·15–0·2 mm. in length by 0·01 mm. The smaller acanthostyli are very similar in shape to the above, but are spined along their whole length. They measure 0·075–0·1 mm. by 0·006–0·008 mm. (2) Tornota.—Very slightly swollen at the ends, which terminate in a point; 0·1–0·15 mm. in length by 0·0025 mm. (3) Isochelæ arcuatæ.—These are abundant throughout the sponge and in the dermal membrane. They are 0·02–0·027 mm. in length, with a rather strongly curved shaft about 0·003 mm. in diameter. Very small chelæ of a similar shape, but only about 0·01–0·015 mm. in length, are present in numbers. (4) Sigmata.—These are abundant throughout the sponge and in the dermal membrane. They are 0·02–0·035 mm. in length, with a maximum thickness of 0·0025 mm.

Microcionia similis n. sp. (Plate XL, fig. 6.)

Station 482. Houtjes Bay, Saldanha Bay, shore. 19th May 1904. One specimen.

Sponge forming an encrustation, about 0·45 mm. in thickness, on a small stone.

The surface is hispid, and the colour in spirit is pale greyish yellow.

The main skeleton consists of short, unbranched, plumose fibres, about 0·1 mm.

in diameter, rising vertically from the base of the sponge to the surface. These are placed about 0·1–0·15 mm. apart, and contain a good deal of spongin. The spicules in these fibres are chiefly large styli, but towards the surface the columns end in vertical brushes of slender dermal styli. These, as well as some of the large styli, project beyond the surface of the sponge. Occasionally a large, isolated stylus, with head based on the substratum, is seen between the fibres, but usually this space is quite free from megascleres. The skeletal styli vary in size according to their position in the fibres. The largest have their heads inserted towards the centre of the fibre, while the smaller styli are placed externally to them and occur towards the base of the fibre.

The dermal skeleton consists of vertical brushes of slender styli. Similar styli also lie horizontally in the dermal membrane between the skeletal fibres, and a few are to be seen lying horizontally at the base of the sponge.

Spicules.—(1) Styli of the main fibres, 0·11–0·6 mm. in length by 0·01–0·03 mm. in thickness. These vary in size according to their position, as already described. The largest styli are slightly constricted immediately above the head; the shaft is curved and the spicule is quite smooth, or at most, is sometimes extremely minutely spined on the head. The smallest styli are of a similar shape, but have a fairly strongly spined head and a few small spines scattered along the shaft. They are not very numerous. The longest and the shortest styli are not sharply marked off from each other, but are connected by a series of styli intermediate in size and in degree of spinulation. (2) Dermal styli, slender, with usually a slightly crooked shaft; they are very minutely spined on the head, and they vary in length between 0·2–0·45 mm. by 0·003–0·005 mm. (3) Isochelæ palmatæ of the usual *Microciona* type, 0·02 mm. in length. (4) Toxa, evenly curved; arms with slightly recurved tips; very uniform in size and shape; 0·06–0·075 mm. in length by 0·002 mm. thick.

The spicules of this species are somewhat similar in shape to those of *Microciona atrasanguinea* Bowerbank, but their measurements are different. The large styli of *Microciona similis* are twice as thick as those of *M. atrasanguinea*, while the toxa are only half as long as those in the older species. The smallest styli of *M. similis* are much larger and less spiny than the corresponding spicules of *M. atrasanguinea*. In section the two species look very different, as in *M. atrasanguinea* the fibres are much larger and thicker than in *M. similis*, and contain much more numerous styli.

In spite of these differences, which lie chiefly in the proportions of the spicules, it seems possible that a series of specimens might be obtained, showing intermediate characters as regards the size of the spicules and thus bridging over the differences between the typical *M. atrasanguinea* and the South African specimen above described. On the other hand, specimens of *M. atrasanguinea* so far collected at different parts of the coasts of the British Isles show very little variation in the size of their spicules. For the present, at any rate, the South African sponge must be regarded as a distinct species.

Microciona tenuis n. sp. (Plate XL, fig. 5.)

Station 482. Houtjes Bay, Saldanha Bay, shore. 19th May 1904.

Sponge forming an encrustation about 0·3 mm. in thickness on the outer and inner surfaces of a large dead *Patella* shell.

The surface of the sponge is very finely hispid.

The colour in spirit is pale yellow.

The main skeleton consists of short, unbranched, plumose fibres, running vertically from the base of the sponge to the surface. The fibres are about 0·075 mm. in diameter and are set about 0·1 mm. apart. Between them, rather numerous small styli, spiny along their whole length, are set vertically with their heads based on the substratum. The spicules of the skeletal fibres are styli which vary greatly in length and in amount of spinulation according to their position. The largest styli, spined only on the head, are inserted towards the centre of the fibre. The shorter styli are placed externally to them. They increase in length and decrease in amount of spinulation from the base to the summit of the fibres.

The dermal skeleton consists of slender styli occurring among the terminal spicules of the fibres and also lying more or less horizontally in the dermal membrane.

Spicules.—(1) Styli of the main fibres, 0·075–0·55 mm. in length by 0·005–0·018 mm. The longest styli occur at the summit of the fibres. They pierce the dermal membrane and cause the chief hispidation of the surface of the sponge. They are smooth, except at the head, which is thickly covered with short, blunt spines. The shaft is curved and tapers evenly from the base to a sharp point. The smallest styli are spined along their whole length; the shaft is straight or very slightly curved. These styli occur in greatest numbers at the base of the fibres, and are also placed between them. They are about 0·075 mm. in length by 0·005–0·007 mm. A series of spicules can be found bridging over the differences between the longest and the shortest styli. At the one end, leading from the entirely spined spicules, are styli about 0·1–0·125 mm. long, with spines extending along the shaft for about three-fourths of its length. Rather longer spicules are spined to about half their length, while still longer styli, with only a few spines a little way along their shaft, lead on to the largest styli which are only spined on the head. (2) Dermal styli, slender, exceedingly finely spined on the head. Shaft usually slightly curved. Length 0·14–0·25 mm. by 0·003 mm. These spicules are not very numerous. (3) *Isochelæ palmatæ* scattered in abundance through the sponge. Length 0·015 mm. (4) *Toxa*.—These spicules are strongly curved in the centre. They vary from exceedingly minute to about 0·18 mm. long by 0·0025 mm. Not very numerous.

Pocillon hyndmani (Bowerbank).

Station 483. Entrance to Saldanha Bay, 25 fathoms. 21st May 1904.

Several pieces of this species were obtained, encrusting the stems of a hydroid to a height of about 45 mm. One small specimen is growing at the base of a specimen of *Siphonochalina anonyma* n. sp., and another is at the base of the young specimen of *Homæodictya compressa* (Esper).

The colour in spirit is dark purple grey.

The spicules agree exactly in character with those of the type-specimen, but the megascleres are slightly shorter than those of the type.

The measurements of the spicules are as follows:—(1) Acanthostyli belonging to two groups, 0·15–0·18 mm. in length by 0·011 mm., and 0·09–0·115 mm. in length by 0·004 mm. (3) Anisochelæ, 0·019 mm. long. (4) Bipocilli, 0·015 mm. in length.

Clathria lobata Vosmaer.

Station 483. Entrance to Saldanha Bay, 25 fathoms. 21st May 1904. One specimen.

The only specimen obtained consists of a broad, fan-like lobe, 36 mm. in height by 40 mm. in width and 9 mm. in thickness, rising directly from an approximately circular base, 15 mm. in diameter. A short, thick, finger-like lobe is given off on either side of the fan-like expansion. The surface is apparently even, but, under the lens, it is seen to be minutely hispid. The dermal membrane is thin and is firmly attached to the underlying tissues. The pores are numerous, and the oscula are not apparent. The consistence is firm, but slightly compressible.

The colour in spirit is pale greyish yellow.

The main skeleton consists of a reticulation of well-marked horny fibres, cored by large, smooth styli and echinated by short acanthostyli. The principal fibres are usually 0·07 to 0·13 mm. thick. They run upwards through the sponge, branch and curve outwards to the surface, where they pierce the dermis, and end in tufts of spicules. They contain several rows of large, smooth styli arranged in a slightly plumose manner, so that sometimes the tips of the spicules project from the sheath of spongin enveloping them, and add to the echination of the fibres. The main fibres are usually the length of the large, smooth styli apart. The transverse fibres are at right angles to the principal ones. They are about 0·025–0·05 mm. thick, and consist of one or several styli surrounded by a distinct sheath of spongin. Occasionally they are echinated by one or two acanthostyli. Large numbers of megascleres are scattered through the sponge, and in places the arrangement of the skeleton is irregular.

The dermal skeleton consists of vertical brushes of closely set slender styli, which project slightly beyond the surface of the sponge. The terminal styli of the main fibres also project and add to the hispidation of the surface.

Spicules.—(1) Large styli of the fibres.—These are smooth, fusiform, with slightly curved shaft, usually between 0·25–0·35 mm. in length, with a maximum

diameter of 0·021 mm. (2) Acanthostyli echinating the fibres.—Straight or slightly curved shaft with characteristically arranged spines as described and figured by RIDLEY and DENDY (15), for a sponge recorded as a variety of VOSMAER'S species. The head is thickly spined, with the spines on its sides directed towards the pointed end of the spicule. Then follows a space usually free from spines. The remainder of the spicule is thickly spined, with the points of the spines directed towards the head of the spicule. Length 0·13–0·16 mm. by 0·01–0·013 mm. (3) Slender styli, straight, with minutely spined head, forming the dermal brushes of spicules and scattered through the sponge. They are somewhat varying in length, being usually between 0·15–0·28 mm. by 0·005–0·008 mm. (4) Isochelæ palmatæ.—Numerous, very minute, scattered through the sponge. Length about 0·008 mm. (5) Toxa.—Numerous, scattered through the sponge. The ends are spined and there is a strong curve in the middle of the spicule. From exceedingly minute to about 0·175 mm. in length, with a thickness of 0·0025 mm.

Through the kindness of Professor VOSMAER, I have been able to compare the *Scotia* specimen with fragments of the original specimens, a preliminary description of which has alone been published (26). As far as can be seen from a study of the dried fragments the arrangement of the skeleton is identical, except that in both of VOSMAER'S specimens numerous sand grains are incorporated with the skeleton. The spicules are exactly similar as to shape, but there are slight differences as regards their measurements. The dermal spicules are alike both in size and character, but the large, smooth styli, though alike in shape, are, on the whole, a little shorter in the original specimens, in which they vary between 0·2–0·26 mm. Their maximum diameter is the same, namely, 0·021 mm. The acanthostyli are, as a rule, slightly shorter in one of the specimens, being 0·11–0·14 mm. in length. In the other specimen they are about the same as in the *Scotia* sponge. The microscleres are exactly similar in all three specimens.

Though differing in external appearance from the specimen described by RIDLEY and DENDY (15) under the name *Rhaphidophlus lobatus* (Vosmaer) var. *horrida*, the arrangement of the skeleton is similar and the spicules of both agree exactly, except that in this case, too, there are slight differences in their measurements. The smooth styli are rather longer and thicker in the *Challenger* specimen, and the characteristic acanthostyli, which are identical in shape, are very slightly longer than in the *Scotia* specimen.

With the possible exception of one of the original specimens of which the locality is not known, the specimens of this species hitherto obtained have been collected in the neighbourhood of the Cape of Good Hope.

Clathria rhaphidotoxa n. sp. (Plate XXXVIII, fig. 2; Plate XL, fig. 15.)

Station 483. Entrance to Saldanha Bay, 25 fathoms. 21st May 1904. Three specimens.

The sponge forms a thick encrustation. The upper surface rises in a number of parallel-walled meandrine ridges, about 3–6 mm. in height and 2–3 mm. apart. The summits of the ridges are slightly hispid.

The dermal membrane is thin and easily detachable. No oscula or pores could be made out. The consistence is firm, but compressible.

The colour in spirit is pale yellow.

The largest of the three pieces in the collection is 65 mm. by 55 mm., with a thickness of about 35 mm.

The main skeleton is made up of a reticulation of well-developed fibres, in which a good deal of spongin is present. The principal fibres run upwards through the sponge. They branch, and reaching the surface of the sponge their terminal spicules pierce the dermis and project slightly. They contain a core of multiseriably arranged spicules, consisting chiefly of large skeletal styli, but often containing in addition slender styli similar to those of the dermis, short acanthostyli, and bundles of long, raphide-like toxa, all being enveloped in a distinct sheath of spongin. The main fibres are echinated by numerous short acanthostyli. They are about 0·06–0·13 mm. in thickness and lie about 0·15–0·3 mm. apart.

The connecting fibres vary in diameter from 0·025–0·05 mm., and do not, as a rule, contain spicules. Sometimes one large stylus is present enclosed in spongin, or, more rarely, two styli lie side by side.

The dermal skeleton is made up of slender styli, lying tangentially in the dermal membrane. In places the styli occur singly, but they are usually crowded together into flat bundles lying tangentially, or projecting more or less obliquely beyond the surface of the sponge. There are, however, no closely set vertical bundles of dermal spicules such as are characteristic of the species separated by some authors from *Clathria* and placed under the genus *Rhaphidophlus*. The hispidation of the surface is caused chiefly by the projection through the dermis of the spicules at the ends of the main fibres.

Spicules.—(1) Large styli coring the fibres.—The shaft is a little curved and tapers evenly to a sharp point, or there is occasionally a very slight constriction above the head. The spicule is sometimes smooth, but there are usually very minute spines on the head, or there are fewer stronger spines instead of the more numerous slender ones. Length 0·23–0·45 mm., with a maximum diameter of 0·021 mm. (2) Acanthostyli echinating the fibres.—The shaft is straight and strongly spined along its whole length, the spines on the shaft being curved, with their points directed downwards. Length 0·12–0·15 mm. by 0·01–0·014 mm. (3) Dermal styli.—Straight, minutely spined on the head, usually between 0·14 and 0·3 mm. in length by 0·005–0·008 mm. (4) Isochelæ palmatæ.—Present in great numbers throughout the sponge and in the dermal membrane. Length 0·015–0·02 mm. (5) Toxa.—These occur in abundance, singly, or in raphide-like bundles, through the sponge and in the dermal member. The length is very varying, from

about 0.1 mm. to 0.6 mm., with a maximum diameter of about 0.002 mm. The smaller toxa have a well-marked bend in the centre of the spicule, with, as a rule, straight arms. In the longer toxa the bend is sometimes well defined, but is often slight, or inappreciable.

Clathria raphidotoxa somewhat resembles *Clathria meandrina* Ridley (14) in external appearance, the surface of both being raised up into similar meandrine ridges, but it differs from that species in the arrangement of the skeleton and in the size and shape of the spicules. On the other hand, the spicules of *Clathria raphidotoxa* and *Rhaphidophlus filifer* Ridley and Dendy (15) are somewhat similar, although differing in various details, but the two species are clearly marked off from each other by the different arrangement of the dermal skeleton as well as by their external appearance.

Sub-family MYXILLINÆ.

Myxilla simplex (Baer). (Plate XXXIX, figs. 1 b and 4 c.)

Station 478. Table Bay, shore. May 1904.

Station 482. Reit's Bay, Saldanha Bay, shore. 21st May 1904. Seven specimens.

Station 483. Entrance to Saldanha Bay, 25 fathoms. 21st May 1904. Sixteen specimens.

This species, which was described from one small specimen taken off Cape Town (1), appears to be common off the west coast of Cape Colony. The numerous specimens in the collection agree very well with the description of the type. They are all more or less rounded or oval in shape. The surface is grooved and the oscula are, as a rule, numerous, the largest measuring about 6 mm. in diameter. The sponges are rather firm to the touch but easily broken, and they are only slightly compressible. In external appearance they closely resemble spirit specimens of *Myxilla incrustans* (Johnston). Many of the specimens apparently grew quite free of any support. Others are encrusting the bases of dense hydroid colonies, while the Table Bay specimens are growing among the roots of a large sea-weed in company with *Esperiopsis informis* n. sp.

The smallest specimen is a little encrusting patch, 7 mm. in diameter, growing at the base of a young *Homæodictya compressa* (Esper). The remaining specimens vary in size from 45 mm. by 30 mm. in diameter, with a height of 20 mm. to 125 mm. by 72 mm., with a height of 53 mm.

The spicules vary in size to some extent in the different specimens, but in the majority the measurements agree very well with those given for the type.

The measurements are as follows:—(1) Styli, 0.16–0.22 mm. in length, with a maximum diameter of 0.012 mm. (2) Tornota, 0.16–0.2 mm. by 0.008 mm. (3) Anchoræ spatuliferæ, maximum length about 0.024 mm. (4) Sigmata, from

very minute to usually 0.035 mm. in length, but sometimes reaching a length of 0.055 mm.

In two or three specimens the styli are slightly longer than usual. They reach a length of 0.27 mm. or 0.3 mm., with a maximum diameter of 0.013 mm. The anchoræ have a maximum length of 0.035 mm. in several of the sponges. The styli are often quite smooth, but for the most part they are very slightly spined. The spines are mostly on the head of the spicule, but sometimes a few are to be found along the shaft. In one specimen only, the smallest in the collection, are the styli, which reach a maximum length of 0.22 mm., fairly well spined. In the largest specimen the styli, here as much as 0.3 mm. in length, all seem perfectly smooth. The spiculation of these two specimens at first sight appears to be very distinct owing to the difference in size and in amount of spinulation of the styli, but these two extremes are connected by every possible variation in length and spinulation of the styli in the remaining specimens.

The styli very rarely have their points rounded off as shown in plate v, fig. 21 (1).

A specimen of *Myxilla simplex* is shown on Pl. XXXIX, fig. 1, with a specimen of *Homæodictya multiformis* n. sp. growing on it. A small specimen of the same species is indicated on Pl. XXXIX, fig. 4 c, growing on *Homæodictya compressa* (Esper).

Tedania scotiæ n. sp. (Plate XXXVIII, fig. 3; Plate XL, fig. 7.)

Station 483. Entrance to Saldanha Bay, 25 fathoms. 21st May 1904.

Five specimens are in the collection. They are, with the exception of one specimen which is rather compressed, rounded, cushion-like sponges. The largest is 75 mm. by 57 mm. in diameter and 37 mm. in thickness. It is penetrated by numerous hydroid stems. Two of the specimens are small and incomplete. They measure about 10 mm. in length and are growing at the base of hydroid colonies. The surface is rubbed in places, but where it is uninjured it is even, and under the lens it is seen to be minutely hispid. The dermis is rather thick. The oscula are scattered; they are small, scarcely reaching 1 mm. in diameter. The pores could not be made out. The consistence is firm and very slightly compressible.

The colour in spirit is pale yellowish grey.

The main skeleton is an irregular reticulation of rather closely arranged spicules. The principal fibres are broad tracts of styli running upwards through the sponge, with single styli, or bundles of two or three styli, at right angles to them, or lying quite irregularly. The skeleton is, on the whole, rather confused. A considerable amount of spongin is present. It is especially noticeable connecting the bases of the styli.

The dermal skeleton consists of closely packed tylota lying horizontally, or more or less obliquely to the surface of the sponge. Some of the obliquely lying tylota project slightly from the surface.

Spicules.—(1) Styli.—The shaft is slightly curved, the curve being most marked at a little distance below the head. Length 0·28–0·375 mm. by 0·008–0·01 mm. (2) Tylota.—There is a rather well-marked swelling at each end of the spicule passing evenly into the shaft. The ends are smooth. Length 0·22–0·3 mm., with a maximum diameter of 0·005 mm. (3) Onychata.—Scattered or in bundles, in great abundance through the sponge and in the dermal membrane. These spicules are of two kinds: (*a*) straight, abruptly pointed at one end and tapering to a long point at the other; spined; length 0·125–0·15 mm. by 0·0025 mm.; (*b*) rather longer, more slender and more finely spined than (*a*), often slightly curved; one end abruptly pointed, the other tapering to a long and very fine point; at a short distance, usually 0·02–0·03 mm., below the blunt end there is a rounded swelling; length of the spicule 0·15–0·175 mm. by about 0·001 mm.

The spicules, both megascleres and microscleres, vary but little in size in a single specimen, or from one specimen to another.

The megascleres are very similar in shape to those of *Tedania suctorica* Schmidt. They are below the average size as stated by LUNDBECK (13) for that species, though their measurements are about the same as the lowest measurements for the species given by the same author. The two species differ in external appearance, as *Tedania scotiæ* does not possess papillæ, and in the size and shape of the microscleres.

Onychata with a similar rounded swelling have been noted in three species, namely, in *Tedania pectinicola* Thiele (19), *T. charcoti* Topsent (23), and *T. murdochi* Topsent (25). In addition to other differences in spiculation, all these species possess tornota as dermal spicules and cannot be confused with the new species.

The term onychata, recently suggested by Professor TOPSENT (25) for the characteristic microscleres of the genus *Tedania*, is here adopted in preference to the older term, raphides, usually applied to them.

Sub-family MYCALINÆ.

Mycale simonis (Ridley and Dendy).

Station 483. Entrance to Saldanha Bay, 25 fathoms. 21st May 1904.

The collection contains one complete specimen and two or three fragments of this species, all growing at the base of hydroid colonies, and partly encrusting their stems.

The complete specimen is a small, oval, cushion-like mass about 25 mm. in its greater diameter. In spirit it is pale grey in colour, with an even, but minutely hispid surface.

The *Scotia* specimens agree exactly with the type (15) in the arrangement of the skeleton and in the shape of the spicules. There are a few slight differences in the measurements of the latter. The subtylostyli are 0·3–0·425 mm. by 0·01–0·013 mm.

They are slightly crooked, a character not mentioned in the original description, but which is shown in the figure given (15, pl. xv, fig. 7).

The rosette anisochelæ are a little smaller in the *Scotia* specimens than in the type, but their proportions are exactly similar. They measure 0·065 mm. in total length, while the larger alæ are 0·032 mm. in length and are the same in breadth. The medium-sized anisochelæ are 0·03 mm. long, with the larger alæ 0·02 mm. in length by 0·013 mm. in breadth. The smallest anisochelæ are 0·013 mm. in length, with the larger alæ 0·008 mm. long. The sigmata are slightly smaller than in the type, the maximum measurement being about 0·18 mm. for the length and 0·013 mm. for the thickness. Young sigmata are to be seen of about the same length, but only about 0·003 mm. thick. The toxa vary a good deal in length, being usually 0·15 mm. long, but they may be found up to 0·2 or 0·3 mm., a length which some of the toxa in the type-specimen reach, as may be seen from a preparation in the British Museum.

The species has hitherto only been obtained by the *Challenger* Expedition. It was dredged in Simon's Bay, Cape of Good Hope, in 10–20 fathoms (15).

Mycale sp.

Station 483. Entrance to Saldanha Bay, 25 fathoms. 21st May 1904.

Several pieces of a *Mycale* were found, which are too fragmentary to name, consisting as they do chiefly of macerated fibres, with most of the microscleres washed away. The following kinds of spicules were obtained from one fragment in a rather better state of preservation:—Subtylostyli, 0·25 mm. in length by 0·008 mm.; anisochelæ, 0·025 mm. and 0·05 mm. in length; sigmata, 0·08–0·1 mm. long; toxa, with well-rounded curve in the middle of the spicule, up to 0·14 mm. long.

Esperiopsis informis n. sp. (Plate XL, fig. 11.)

Station 478. Table Bay, shore. May 1904.

Station 483. Entrance to Saldanha Bay, 25 fathoms. 21st May 1904.

This species is represented by several pieces, more or less broken. They are encrusting the base of hydroid colonies, the stems of which are growing through the sponge. The Table Bay specimen is growing on a *Laminaria*-like root.

The texture of the sponge is rather firm, and the surface is slightly hispid. The oscula are on a level with the general surface of the sponge and are about 1–2 mm. in diameter. The dermal membrane is thin and is pierced by numerous pores.

The colour in spirit is pale greyish yellow.

The main skeleton is made up of a network of fibres. The principal fibres, which consist of multiserially arranged styli, run vertically through the sponge. They pierce the dermal membrane and project slightly beyond the surface of the sponge as tufts of spicules. They are about 0·15–0·2 mm. apart, and are connected by

transverse fibres consisting of a single stylus or of a bundle of a few styli. Spongin is present in rather scanty quantities, and is best seen at the points where the transverse fibres join the main ones. There is no special dermal skeleton.

Spicules.—(1) Styli, with a slightly curved shaft. They vary in length between 0.2–0.26 mm., but are usually 0.23–0.25 mm. long. Their thickness is 0.008–0.01 mm. (2) Isochelæ palmatæ are scattered throughout the sponge and in the dermal membrane. They are 0.024–0.027 mm. in length by about 0.008 mm. across the tooth. The axis is curved back from the inner side of the tooth, and its end shows as a tubercle in front view, as described by LUNDBECK (13) for a sponge recorded by him under the name *E. sp. (? alderi* Bowerbank). This structure cannot be made out in all the chelæ.

In the arrangement of the skeleton and in the size and shape of the megascleres, this species is very like *Esperiopsis fucorum* (Johnston). It differs from the older species in the larger size and, more particularly, in the structure of the isochelæ. It agrees with the *Ingolf* specimen mentioned above as regards the size and shape of the isochelæ, but differs from that sponge in possessing much shorter styli.

Homæodictya compressa (Esper). (Plate XXXIX, fig. 4; Plate XL, fig. 12.)

Station 483. Entrance to Saldanha Bay, 25 fathoms. 21st May 1904. Two specimens.

One of the specimens of *Homæodictya* in the *Scotia* collection resembled ESPER'S figure (7, pl. lv) of the sponge named by him *Spongia compressa* very closely in external appearance, and its structure agreed so well with EHLERS' (6) short description of the same specimen, that efforts were made to gain further information about the type-specimen. Finally, a fragment of the original specimen was obtained through the kindness of Dr C. ZIMMER of the Zoological Museum, Alte Akademie, Munich, in whose charge is the ESPER collection of sponges. An examination of this fragment showed that the arrangement of the skeleton and the size and character of the spicules agree exactly in both sponges.

Two specimens of this species are in the collection. The larger closely resembles in shape, and in size and arrangement of the oscula, the figure given by ESPER. The *Scotia* specimen consists of a thick stalk, 30 mm. in diameter, which spreads out into a broad compressed lobe, 105 mm. in greatest breadth and about 30 mm. thick. The sponge, which is broken off from its support, is 175 mm. high.

The whole surface, including that of the stalk, is covered with closely set tufts of spicules, about 2 mm. in length, formed by the projecting ends of the main skeletal fibres. One surface of the sponge is even, but the opposite side, towards the summit, is raised into a prominent ridge running across the broadest part of the sponge. The oscula are found along the margin of the sponge and on the summit

of the ridge. They are 2–6 mm. in diameter. The dermal membrane is very thin and transparent. The consistence is very firm but compressible, the stalk being much more rigid than the upper part of the sponge. Colour in spirit pale yellow.

The small specimen (Pl. XXXIX, fig. 4) is similar to the above in general outline, but it only reaches a height of 70 mm., with a greatest breadth of 28 mm., and a thickness of 10 mm. The stalk is 5 mm. in diameter and rises from a broad flattened base. The oscula are confined to the upper margin of the sponge. The whole surface, including that of the stalk and of the flattened base, is hispid with the projecting ends of the main skeletal fibres. The hispidity is rather less marked towards the lower part of the sponge than towards its summit. The texture, especially that of the stalk, is much less firm than in the large specimen. Growing round the base of the stalk are very small specimens of *Pocillon hyndmani* (Bowerbank), *Myxilla simplex* (Baer), and *Esperiopsis informis* n. sp.

The main skeleton is made up of a reticulation of strong fibres, as described by EHLERS (6) for the type-specimen. The principal fibres run upwards through the stalk and through the main body of the sponge. They branch, and bending towards the surface, they pierce the dermal membrane and project beyond it to a distance of about 2 mm. as strong tufts of spicules. They consist of a core of multiserially arranged oxea surrounded by a thick sheath of spongin, and are about 0·15–0·25 mm. in diameter. They are connected by a rather irregular network of more slender fibres, the thicker of which consist of multiserially arranged oxea surrounded by a strong spongin sheath. They are about 0·12–0·2 mm. in diameter. The fibres are rather more closely placed in the stalk, thus giving a greater rigidity to it. There is no special dermal skeleton.

Spicules.—(1) Oxea, curved, tapering evenly to sharply pointed ends. They do not vary much in size, being usually between 0·4–0·5 mm. in length by 0·02–0·024 mm. in thickness. (2) Isochelæ palmatæ.—These occur in great abundance through the sponge and in the dermal membrane. They are 0·027–0·032 mm. in length. In some the peculiar bending inwards of the axis from the inner side of the tooth, which is characteristic of many *Homæodictya* species, can be clearly seen, both in side view, and, showing as a tubercle, in front view. In other isochelæ the structure is not so well marked, and in many it cannot be made out at all. The spicules of the small specimen agree exactly with those of the large specimen, there being, however, a larger proportion of more slender oxea present.

As far as can be made out from the fragment of the type-specimen available, the arrangement of the skeleton agrees exactly with that of the *Scotia* specimens, and the spicules are identical in size and shape. EHLERS (6) gives 0·44 mm. for the length of the oxea in ESPEL'S specimen, and this is about the average length of the oxea in both the large specimens, but in the type, as in the recently collected specimen, they vary between 0·4–0·5 mm. in length, and between 0·02–0·024 mm. in thickness.

Like the oxea, the isochelæ agree exactly with those of the type in size and shape. EHLERS' measurement of 0.036 mm. for the length of the isochelæ seems to be a little above the actual length. Although the *Homæodictya* structure of the isochelæ is not mentioned by EHLERS, it can be clearly seen in some of the isochelæ. On the other hand, there are many isochelæ here, as in the *Scotia* specimens, in which this structure cannot be made out.

Unfortunately the locality of ESPER's type-specimen is not known. It seems possible that it may have been obtained in the neighbourhood of the Cape of Good Hope, where other sponges described by ESPER were collected.

CARTER (3) describes some sponges from Algoa Bay, and assigns them to ESPER's species. They appear to resemble it closely in external appearance as well as in spiculation, although he definitely states that the isochelæ do not show an inward bending of the axis.

Two species of *Homæodictya*, *H. conulosa* (Ridley and Dendy) and *H. grandis* (Ridley and Dendy), were obtained by the *Challenger* in Simon's Bay, not far from where the *Scotia* specimens were collected. *H. compressa* differs from both in external appearance. It differs also from *H. conulosa* in having oxea which are much shorter than the oxea in the newer species and less than half as thick. On the other hand, its oxea are hardly more than half as thick, and its isochelæ are half the size of the corresponding spicules in *H. grandis*.

Homæodictya elastica (Vosmaer). (Plate XL, fig. 17.)

Station 483. Entrance to Saldanha Bay, 25 fathoms. 21st May 1904. One specimen.

Only one specimen was obtained. It is an upright, branching sponge. The branches are slightly compressed and slender, or they widen out and coalesce into broad, fan-like expansions. They lie more or less in one plane. The sponge is torn from its support; its height is 85 mm. and its breadth is about 115 mm., while the thickness of the branches is about 6 mm. The texture is rather soft and compressible. The surface is minutely hispid owing to the projecting ends of the main skeletal fibres. The oscula are small, averaging about 1 mm. in diameter. They are usually on a level with the surface, but occasionally have a slightly raised rim. They occur scattered in numbers over one side of the sponge and along the margins of the branches. They are not strictly confined to one surface, as some are to be found on the opposite side. The dermal membrane is thin. The pores are numerous; those measured varied between 0.07-0.15 in diameter.

The colour in spirit is pale greyish yellow.

The main skeleton is made up of a reticulation of fibres. The principal fibres run vertically upwards from the base of the sponge. They branch, and bending outwards to the surface, they pierce the dermal membrane, and project as short,

thick tufts of spicules. These fibres contain multiserially arranged oxea united by spongin, which, as a rule, does not form a distinct sheath. They are 0.05–0.1 mm. thick, and are placed about 0.2–0.3 mm. apart in the centre of the sponge. Towards the surface they are closer together, and immediately beneath the dermis they are about the length of one oxea apart. They are connected by short, transverse fibres, at right angles to them and running only from one main fibre to the next. The transverse fibres, in which the spongin is relatively more abundant than in the main fibres, and which are about 0.02–0.05 mm. in thickness, are placed much closer together towards the surface of the sponge than towards its centre. They contain two, three, or more rows of spicules. In places considerable numbers of sand grains are present in the sponge. There is no special dermal skeleton.

Spicules.—(1) Oxea, curved, tapering evenly to sharp points. They are short and fairly thick, and do not vary much in size. They measure 0.13–0.16 mm. by 0.009–0.011 mm. (2) Isochelæ palmatæ.—These occur in the dermal membrane and are scattered through the sponge. They are 0.019–0.024 mm. in length, and they are not very abundant. The whole spicule is slightly curved, and occasionally the peculiar bending of the end of the axis from the inner side of the tooth can be seen, a character to be found in many *Homæodictya* species. Usually this structure cannot be made out.

Through the kindness of Professor VOSMAER I have been able to compare the *Scotia* specimen with fragments of two of the original specimens from the Cape of Good Hope, of which a preliminary description has been published under the name *Desmacidon elastica* (26).

The arrangement of the skeleton is the same in all the specimens, and the spicules are in close agreement. The oxea are similar in shape and size. In VOSMAER'S specimens they are 0.13–0.16 mm., with a maximum diameter of 0.013 mm., being, on the whole, very slightly thicker than in the *Scotia* specimen. The palmate isochelæ are similar in shape, but are slightly longer than in the *Scotia* specimen, being 0.024–0.03 mm. in length. Sand grains and broken shafts of spicules foreign to the sponge are sometimes incorporated with the skeleton. In external appearance, too, the specimens are probably alike, as Professor VOSMAER states that the form of his specimens resembles that of *Homæodictya palmata* (Johnston), a species which the *Scotia* specimen also resembles externally.

Homæodictya elastica differs from *H. palmata* in the shape of the isochelæ, and in the somewhat smaller size of the oxea.

Homæodictya multiformis n. sp. (Plate XXXIX, figs. 1 a, 2, 3; Plate XL, fig. 16.)

Station 482. Saldanha Bay, 5 fathoms. 20th May 1904. Three specimens.—
Reit's Bay, Saldanha Bay, shore. 21st May 1904. Five specimens

Station 483. Entrance to Saldanha Bay, 25 fathoms. 21st May 1904. Thirty-one large and twenty-five small specimens, and fragments

A large series of specimens of this species was obtained, about twenty-five small specimens from 2–24 mm. in height, and about thirty-nine larger specimens, some of which are over 100 mm. in height. The latter vary a good deal in external appearance. Some of them are quite *Siphonochalina*-like, consisting as they do of upright, rounded tubes, free except at the base, or more or less coalescent throughout their length, with a large osculum at the summit of each tube. Others consist of upright, flattened branches bearing a row of small oscula round the margins, and closely resembling *Homæodictya palmata* (Johnston) in external appearance. Others, again, have more or less coalescent flattened branches, with numerous small oscula scattered chiefly over one surface, as well as along the edges of the branches, or they possess fewer, but larger oscula. Some of the specimens consist of fan-like lobes with numerous oscula along the margins, while two form thick encrustations on sea-weed, and possess numerous oscula. In a few specimens, part of the sponge consists of *Siphonochalina*-like tubes, while the remaining part consists of branches bearing small oscula. The specimen figured (Pl. XXXIX, fig. 1) has somewhat this shape. It is growing on a large specimen of *Myxilla simplex* (Baer), to which it is attached in two places. It rises to a height of 112 mm., and possesses several tubes about 13–16 mm. in diameter, which are more or less coalescent. A branch is given off nearly half-way up these tubes, which is attached to another part of the supporting sponge, over which it spreads as a thin encrustation bearing numerous oscula. From this part arise two branches, the more complete of which has small oscula along the margin, and which consists apparently of small coalescent tubes. The oscula are about 7 mm. in diameter on the more *Siphonochalina*-like part of the sponge; on the other part they vary from 1–4 mm. in diameter.

The young specimens are growing on colonies of a *Sertularella*. They vary in size from 2 mm. in height by 1 mm. to 24 mm. in height by 8 mm. The smaller of these are somewhat oval, and are compressed from side to side, with a single osculum at the summit, or with several oscula. The larger are finger-like, sometimes with a well-marked stalk, occasionally cylindrical, but usually more or less compressed. There is a fairly large osculum at the summit, or a row of smaller oscula along the margin. They are, for the most part, unbranched, but one of the largest of these young specimens gives off a branch bearing a terminal osculum. Some of these young sponges are extremely like small specimens of *Siphonochalina* in external appearance. Next in size to these small specimens is one 45 mm. long with a greatest breadth of 10 mm. It is much compressed, and bears several oscula along its edge. The largest specimen in the collection is about 100 mm. in height, with a breadth of 125 mm. It consists of a number of flat, more or less coalescent, fan-like lobes, with numerous oscula along their margins. It contains many embryos, the older of which are crowded with short, slender oxea.

The surface of all these specimens is even, but it is minutely hispid from the projecting ends of the main skeletal fibres. The oscula are on a level with the

surface or may be slightly raised above it. The dermis is thin and is pierced by numerous pores; those measured varied between 0.025–0.1 mm. in diameter. The consistence is rather soft and compressible.

The colour in spirit is pale greyish yellow, the younger sponges being lighter in colour than the large ones.

The main skeleton consists of a regular reticulation of fibres. The principal fibres run upwards to the surface; they pierce the dermis and project as long tufts of spicules. They are about 0.03–0.075 mm. in thickness, and are distant from each other about the length of one skeletal spicule, or, in other words, they are placed on an average 0.2 mm. apart. They consist of oxea, multiseriably arranged and cemented together by spongin which does not form a distinct sheath. They are connected by transverse fibres perpendicular to them, which run from one main fibre to the next, but which do not themselves form continuous fibres. The transverse fibres consist of single oxea, or of a bundle of several oxea more or less enclosed in spongin. They are about 0.025–0.05 mm. thick, and towards the surface of the sponge they lie nearer together than at the centre. Spongin is much more abundant in some specimens than in others. There is no special dermal skeleton.

Spicules.—(1) Oxea.—These are slightly curved, tapering evenly to sharp points. They vary between 0.175–0.255 mm. in length, and have a maximum diameter of 0.013 mm. In the majority of the large specimens they are between 0.2–0.25 mm. long, but in a few sponges they are only 0.175–0.225 mm. in length. In the youngest specimens the oxea are shorter, but they increase in length, on the whole, with the size of the specimen, until the maximum length is reached. The greatest thickness of the oxea is not much less than that of the oxea in the adult specimens, being about 0.01 mm., but many very slender oxea are to be seen. The shorter oxea are rather sharply bent in the middle. The curve becomes less abrupt, as a rule, the longer the spicule. In the embryos the oxea vary from 0.075 mm. in length to 0.2 mm., and from exceedingly slender to about 0.006 mm. in thickness. (2) Isochelæ palmatae.—These are scattered through the sponge. In some specimens they are fairly numerous, in others a few only can be found after prolonged searching. Typically they have the end of the axis bent out from the inner side of the tooth, but often this structure cannot be made out. The isochelæ are about 0.032–0.04 mm. in length, and about 0.01 mm. across the tooth. In the young specimens the isochelæ are usually 0.032–0.035 mm. long, and they appear to be relatively more abundant than in the older specimens. The bending of the axis from the inner side of the tooth is usually clearly seen in them. No isochelæ were found in any of the embryos.

Some of the specimens, as already mentioned, are very like *Homæodictya palmata* (Johnston) in external appearance, and the arrangement of the skeleton is very similar in the two species. On the other hand, *Homæodictya multiformis* possesses rather longer and more slender oxea. The isochelæ, too, are larger, and

although showing the characteristic bending of the axis, they are quite different in shape from those of *Homæodictya palmata*.

Homæodictya alata n. sp. (Plate XXXIX, fig. 5; Plate XL, fig. 13.)

Station 482. Reit's Bay, Saldanha Bay, shore. 21st May 1904. One small specimen.

Station 483. Entrance to Saldanha Bay, 25 fathoms. 21st May 1904. Two specimens.

Three specimens are in the collection. The largest is an irregularly oval mass about 42 mm. thick, with broad, wing-like expansions on either side formed by flattened anastomosing branches. The whole sponge measures about 160 mm. in diameter by 95 mm. There is no sign of its having been attached to any support. The remaining specimens are very much smaller and are incomplete, but they have a similar external appearance. The surface is slightly papillose, and, under the lens, it is seen to be finely hispid. The oscula are not numerous. They are small, round and scattered, and are about 1-1.5 mm. in diameter. The pores are scattered; the largest measured reached a diameter of 0.15 mm. The consistence is firm, but slightly compressible.

The colour in spirit is pale greyish yellow.

The main skeleton is an irregular reticulation of fibres. The principal fibres are strong bands of multiseriably arranged oxea. They run upwards through the sponge and branch. At the surface they end in densely set vertical brushes of spicules, which pierce the dermis. The transverse fibres connecting the principal ones are ill-defined, and consist of single spicules, or of a few spicules lying loosely together. Numerous scattered oxea occur through the sponge. There is no special dermal skeleton.

Spicules.—(1) Oxea, rather abruptly pointed and usually slightly crooked. They measure 0.3-0.425 mm. in length by 0.01-0.015 mm. (2) Isochelæ arcuatæ.—These microscleres occur in abundance through the sponge and in the dermal membrane. They have a slender, slightly curved shaft and short teeth, and they are very similar in appearance to the chelæ of *Homæodictya ramosa* (15, pl. xxiii, fig. 4 *a* and *b*). Length 0.016 mm.

This species approaches *Homæodictya ramosa* (Ridley and Dendy) of the *Challenger* Expedition (15) in its spiculation, but differs from it in external appearance and in the arrangement of the skeleton. The oxea, too, are much longer in the *Challenger* species and are, on the whole, about twice as thick as in the new species.

Family HAPLOSCLERIDÆ.

Siphonochalina tubulosa (Esper). (Plate XL, fig. 10.)

Station 478. Table Bay, shore. May 1904. Three large specimens.

Station 482. Saldanha Bay, 5 fathoms. 20th May 1904. One small specimen.—
Reit's Bay, Saldanha Bay, shore. 21st May 1904. Fragments.

Station 483. Entrance to Saldanha Bay, 25 fathoms. 21st May 1904. Six small specimens.

The external appearance of several specimens of *Siphonochalina* obtained in Table Bay resembles very closely ESPER's figure of *Spongia tubulosa* (7, pl. liv), while the structure of the skeleton and the size of the spicules agree so well with EHLERS' description (6) of the same specimen that there seems no reason to doubt the identity of the *Scotia* specimens with ESPER's species. The locality, too, is practically the same, as the specimen described by ESPER was found at the Cape of Good Hope. Through the kindness of Professor ZIMMER a search for the type-specimen was made among the ESPER collection of sponges, now in Munich, but without success.

The largest specimen is about 18 cm. by 13 cm. in diameter, with a height of 7 cm. It consists of a number of rather short, wide tubes 15–20 mm. in diameter, united at the base. These usually coalesce for a greater or less distance, and sometimes to such an extent that they are united for their whole length, so that ridges are formed pierced at intervals by oscula. In one specimen, 15 cm. by 13 cm., the tubes are so united that their limits cannot be made out, and in one part only of the sponge are the characteristic tubes seen. The summits of the tubes are rounded so that the edges of the oscula do not project above the tops of the tubes. The oscula are often about 5 mm. in diameter, but they vary from 2 to 7 mm. The tubes of the type-specimen seem to be rather worn and frayed out at their summits.

The colour in spirit is dark yellowish brown. The consistence is firm, but compressible. The surface is minutely hispid, and the dermal membrane is thin and transparent. The pores are closely set. Those measured varied between 0.025–0.175 mm.

In addition to the large specimens collected in Table Bay, some small specimens were obtained in Saldanha Bay. Allowing for the difference in size, the smaller specimens agree very closely in general appearance with the large ones. They are not so dark, being of a pale yellowish colour. Some have tubes coalescent to their summits, others have tubes which are more or less free except at the base. Thus one small specimen agrees in appearance with a certain part of one of the large specimens where the tubes are coalescent, and another young sponge agrees with a different part of the same specimen where the tubes are free. One specimen is growing over a *Laminaria*-like root, but two or three of the remaining specimens show no sign of having been attached to any support. The smallest specimen is 67 mm. high by 38 mm. in width.

The main skeleton consists of a reticulation of fibres. The principal fibres curve upwards and outwards from the irregular network of fibres immediately beneath the membrane of the oscular canal to the surface of the sponge, where they pierce the dermis and project as short, compact tufts of spicules. They consist of a core of multiseriably arranged oxea covered with a distinct sheath of spongin. They

are 0.06–0.1 mm. in diameter, and are placed about 0.2–0.4 mm. apart. The main fibres are connected by transverse fibres perpendicular to them, which join one main fibre to the next, but which do not themselves form continuous fibres. Thus a more or less rectangular network is formed. The transverse fibres are usually between 0.05 and 0.07 mm. thick. In them the oxea are arranged in two, three, or more rows, and are surrounded by a thick spongin sheath. There is no special dermal skeleton.

Spicules.—Oxea, 0.11–0.14 mm. in length by 0.013 mm. The most usual length is 0.125–0.13 mm. They thus agree with EHLERS' measurements of the oxea of the type-specimen. Some of the small specimens have, on the whole, very slightly longer oxea reaching up to 0.15 mm. in length.

Siphonochalina anonyma n. sp. (Plate XXXIX, fig. 6; Plate XL, fig. 9.)

Station 483. Entrance to Saldanha Bay, 25 fathoms. 21st May 1904. Four specimens.

The largest specimen consists of a stem, 10 mm. in diameter, rising into a long tube, 22 mm. in width. About half-way up this tube two others are given off, one of which is coalescent with the main tube for nearly the whole of its length. At the base of the main tube, at the opposite side, a branch is given off nearly at right angles, which bears three oscular tubes. The height of the specimen is 120 mm. A second specimen is 85 mm. in height, and consists of a short stem, 8 mm. in diameter, from which rises several tubes coalescing for nearly the whole of their length. The whole sponge is 56 mm. in width. A third specimen is an unbranched tube, 140 mm. in height by 19 mm. in diameter. It shows some slightly marked swellings along its length. Near the base is a small rounded knob which seems to be the beginning of a branch. The remaining specimen is very small, being only 23 mm. in height by 6.5 mm. It consists of a single tube with an osculum 1 mm. in diameter at its summit. It is growing on a Polyzoan in company with many young specimens of *Homæodictya multiformis* n. sp., some of which it resembles closely in external appearance, but it is softer and more compressible in texture than these, and the surface is more strongly hispid.

The colour in spirit of all the specimens is pale greyish yellow. The sponge is rather soft to the touch and compressible. The surface is even, but is finely hispid from the projecting ends of the main skeletal fibres. The oscula in the large specimens vary between 4 and 8 mm. The dermal membrane is thin, and the pores are scattered and about 0.03–0.075 mm. in diameter.

Numerous embryos in different stages of development occur in two of the specimens. They are about 0.2–0.3 mm. in diameter. The older embryos are crowded with slender oxea.

The main skeleton consists of fibres which run upwards and outwards from the

wall of the oscular canal to the outer surface of the sponge, where they pierce the dermis and project as tufts of spicules. These are connected by short, transverse fibres which run only from one principal fibre to the next, and do not themselves form continuous fibres. The two sets of fibres are at right angles to each other, so that a fairly regular rectangular network is formed. The main fibres contain two or three, or, for the most part, more numerous rows of spicules. The spicules are enclosed in a thin, but usually distinct sheath of spongin, and the whole fibre is from 0.04–0.07 mm. in thickness. The main fibres are often only the length of one spicule apart, but they may be two or three, or more rarely, four spicule lengths apart, or, in other words, the distance between them varies from about 0.15 mm. to 0.4 mm., or more rarely to 0.5 mm. The transverse fibres contain a single spicule, or a single row of spicules covered by a distinct sheath of spongin. They average about 0.03 mm. in thickness. There is no special dermal skeleton.

Spicules.—Oxea, curved, tapering evenly to rather short points. They do not vary much in length or thickness, being 0.14–0.17 mm. by 0.013 mm. In the youngest specimen the largest oxea present measured 0.16 mm. by 0.013 mm., but, for the most part, the oxea are shorter and much more slender than in the adult specimens. The oxea of the embryos are about 0.065–0.11 mm. in length. They vary in thickness from exceedingly slender to about 0.006 mm. in diameter.

Pachychalina hospitalis n. sp. (Plate XXXIX, fig. 7; Plate XL, fig. 8.)

Station 482. Houtjes Bay, Saldanha Bay, shore. 19th May 1904.

This species is represented by a number of specimens, most of them a good deal broken, and by many smaller fragments. The shape of the specimens is rather varying. Usually the surface rises up into numerous, short, finger-like branches which anastomose, the whole forming a compact growth of interlacing branches about 40 mm. in thickness. One specimen forms an encrustation on the inner side of a large dead *Patella* shell, on which grow specimens of *Microciona tenuis* n. sp. and *Hymedesmia parva* n. sp. Oscular tubes, up to about 7 mm. in height, rise from the otherwise even surface. A similar encrusting specimen, about 9 cm. in diameter, grows on a stone and spreads out over a *Laminaria*-like root. Other specimens form flat anastomosing branches about 5 or 6 mm. in thickness, with numerous oscular tubes rising from them. The oscula are sometimes on a level with the general surface of the sponge, but are usually raised above it. They are about 1–3 mm. in diameter. The dermal membrane is thin. The pores are scattered and are rather uniform in size. They average about 0.03 mm. Consistence rather firm, but easily compressible. The surface is even, but under the lens it is seen to be finely hispid, owing to the projecting ends of the main skeletal fibres. The colour in spirit is pale yellow. In spite of their differences in shape, all the specimens bear a general resemblance to each other.

The main skeleton is made up of a regular reticulation of fibres. The principal fibres run upwards through the sponge. They pierce the dermal membrane and project slightly above the surface. They are connected by short fibres running only from one principal fibre to the next. The transverse fibres are at right angles to the main ones, so that fairly regular rectangular meshes are formed. The main fibres consist of closely packed oxea, multiserially arranged, and covered by a distinct layer of spongin. They are usually from 0·04–0·08 mm. in diameter, but sometimes rather thicker ones are to be seen. They vary in distance from each other from about 0·1–0·35 mm., but for the most part they are about 0·2 mm. apart.

The transverse fibres average 0·03 mm. in diameter. They consist of a distinct sheath of spongin enclosing uni- to multiserially arranged oxea. There is no special dermal skeleton.

Spicules.—Oxea.—These are short, thick, slightly curved, and tapering to rather short points. They are 0·115–0·13 mm. in length, and have a maximum diameter of 0·014 mm. Many slender, young oxea are to be seen in the fibres with the fully developed spicules.

One of the specimens, which is about 75 mm. by 30 mm. in diameter, and one small fragment are interesting on account of the spicules, foreign to the species, which are incorporated in a beautifully regular manner in the skeleton. Large spicules were noticed projecting from parts of the free under surface of the sponge over an area of several square centimetres, while the broken edge of the specimen showed layers of different thicknesses parallel to the surface, which gave a stratified effect to that part of the sponge. An examination of vertical sections showed that the multiserially arranged oxea of the main fibres have in many parts been replaced by the large styli of *Polymastia littoralis* n. sp., a sponge taken at the same locality. The main fibres are connected by single oxea, sheathed in spongin, so that a beautiful ladder-like structure is formed, the oxea proper to the sponge being the rungs and the large styli the sides of the ladder. Sometimes the main fibres contain, instead, bundles of the small dermal subtylostyli or single large cortical tylostyli of *Polymastia*. Occasionally the large styli are reinforced by a few oxea, or by small subtylostyli, lying parallel to them. In places the arrangement is very irregular. Sometimes a distinct sheath of spongin is seen covering a considerable part of the large styli, which, however, do not seem ever to be completely enveloped in it. Directly beneath the surface of the sponge numerous vertical bundles of the dermal subtylostyli and numbers of large styli of *Polymastia* occur in the reticulation of oxea proper to the sponge. The whole forms rather a dense layer of spicules. Similar layers parallel to the surface are found at intervals through the sponge, as if they marked stages in growth. They give a stratified appearance to the structure of the sponge. The transverse fibres seem always to contain oxea. The apices of the *Polymastia* spicules are directed towards the surface of the sponge. The spicules are, as a rule, quite uninjured, and their axial canals are not wider than

those of the spicules taken directly from the specimen of *Polymastia*, as would be the case if they had long been separated from the parent sponge. In those parts of the sponge where the *Polymastia* spicules make up a large proportion of the skeleton, the transverse fibres usually contain only one row of oxea, and the main fibres often contain only two or three rows. With the exception of a large dichotriæne and one or two anatriænes, the only foreign spicules seen in this part of the sponge were those belonging to *Polymastia*. In the upper parts of the sponge the *Polymastia* spicules do not appear, but a few anatriænes and long shafts of probably other Tetractinellid spicules penetrate the sponge in various directions or lie horizontally on the dermis.

Halichondria panicea (Pallas).

Coaling jetty at Cape Town Docks. 14th May 1904.

Station 482. Reit's Bay, Saldanha Bay, shore. 21st May 1904.

Station 483. Entrance to Saldanha Bay, 25 fathoms. 21st May 1904.

The specimens of this almost world-wide species, collected off the coaling jetty at Cape Town Docks, are growing on the living shells of mussels, and spreading over sea-weed and over a large compound Ascidian. In places they are overgrown by *Plumularia echinulata*, *Plumularia setacea*, and *Plumularia pinnata*. On the shells they are growing in company with *Reniera cinerea*.

The specimens dredged at the entrance to Saldanha Bay are spreading over *Myxilla simplex* (Baer), or are penetrated by densely growing hydroid colonies. The best preserved specimen is about 9 cm. across. The maximum size of the oxea is about 0.5 mm. by 0.013 mm.

Reniera cinerea (Grant).

Coaling jetty at Cape Town Docks. 14th May 1904.

Station 482. Reit's Bay, Saldanha Bay, shore. 21st May 1904.

The specimens of this widely spread species, collected off the coaling jetty at Cape Town Docks, are growing in soft, cushion-like masses on living shells of mussels in company with *Halichondria panicea*. The largest is about 35 mm. in length. One of the specimens is closely crowded with embryos containing numerous very small and slender oxea. The specimens collected between tide-marks in Reit's Bay are growing in small, rounded masses on *Laminaria*-like roots, together with *Halisarca dujardini*. The oxea, which are arranged in a unispicular network, are 0.135–0.15 mm. by 0.005–0.008 mm.

This species, which has been recorded from the shores of the Arctic, North Atlantic and North Pacific Oceans, is now recorded, apparently for the first time, from the South Atlantic.

Reniera saldanhæ n. sp. (Plate XXXIX, fig. 8; Plate XL, fig. 18.)

Station 482. Reit's Bay, Saldanha Bay, shore. 21st May 1904. Four specimens.

Station 483. Entrance to Saldanha Bay, 25 fathoms. 21st May 1904. Five specimens.

Although differing somewhat in shape the specimens bear a general resemblance to each other externally. They consist for the most part of coalescent, rather thick walled tubes, rounded off at the base in the complete specimens and not tapering into a stalk. The largest specimen is 65 mm. high by 80 mm. in breadth. It is broken in two and is otherwise rather injured, but like most of the smaller, perfect specimens, it shows no sign of having been attached to any support. It consists of about eight tubes, closely united. Another specimen, nearly as large, consists of a fewer number of wider tubes. A third specimen, 90 mm. by 40 mm., is an oval cushion-like mass, rather unlike the other specimens in shape. Several smaller specimens, which were collected between tide-marks, consist of three or more coalescent tubes. They are unbroken and have an irregularly rounded outline, but are compressed from side to side. They were not fixed to any support. A small specimen, 20 mm. by 8 mm., growing on a hydroid colony, apparently belongs to this species.

The surface of the specimens is even, but seen under the lens it is very finely hispid. The dermal membrane is thin and is pierced by numerous pores. Those measured were from 0·02–0·06 mm. in diameter. The oscula vary in diameter from 3–12 mm. Each leads into a wide oscular canal, which, in most of the specimens, runs to the base of the sponge. The canal is at first the same width as the osculum, but narrows as it reaches the base of the sponge. The consistence is firm, but is compressible, as there is rather a large amount of spongin present cementing the ends of the spicules.

The colour in spirit is pale greyish yellow.

The largest specimen contains numerous embryos, which are about 0·15 mm. in diameter. Numerous small oxea are present in the older embryos.

The main skeleton consists of a unispicular network with usually quadratic meshes. The ends of the spicules are embedded in spongin, of which there is a considerable quantity present. Here and there rather ill-defined fibres, containing two, three, or more rows of spicules, run more or less vertically through the sponge. At the surface the ends of the spicules pierce the dermal membrane and project very slightly beyond it. There is no special dermal skeleton.

Spicules.—Oxea, curved, evenly pointed, 0·15–0·185 mm. long, with a maximum diameter of 0·013 mm. The oxea in the embryos are, on the whole, 0·06–0·08 mm. long, with a maximum diameter of 0·0025 mm.

Reniera sp.

Station 482. Houtjes Bay, Saldanha Bay, shore. 19th May 1904.

The sponge is growing in a brownish encrustation over fragments of *Pachychalina hospitalis* n. sp. The skeleton is rather irregular. It consists of fibres containing multiserially arranged oxea which are connected by single oxea, or by bundles of several oxea.

Spicules.—Oxea, 0·15–0·17 mm. in length by 0·008 mm.

Reniera sp.

Station 482. Reit's Bay, Saldanha Bay, shore. 21st May 1904.

Sponge spreading in a thin encrustation over a stone. The surface is slightly hispid. The colour in spirit is yellowish white. The skeleton is rather confused; it is partly unispicular and partly composed of ill-defined fibres containing multiserially arranged oxea.

Spicules.—Oxea, 0·12–0·13 mm. in length by 0·006 mm.

Order *MYXOSPONGIDA*.

Family HALISARCIDÆ.

Halisarca dujardini Johnston.

Station 482. Reit's Bay, Saldanha Bay, shore. 21st May 1904.

The sponge is growing in the form of a thin encrustation over two large pieces of *Laminaria*-like roots, in company with small cushion-like specimens of *Reniera cinerea*.

The geographical distribution of the species is wide. It has been recorded for the northern, western, and Mediterranean coasts of Europe; for East Greenland and, doubtfully, for the Red Sea. A variety has been recorded for the Straits of Magellan.

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DESCRIPTION OF PLATES.

PLATE XXXVIII.

- Fig. 1. *Leucophlæus styliferus* n. sp. Nat. size.
 Fig. 2. *Clathria raphidotoxa* n. sp. Nat. size.
 Fig. 3. *Tedania scotiæ* n. sp. Nat. size.
 Fig. 4. *Polymastia littoralis* n. sp. $\times \frac{3}{4}$.
 Fig. 5. *Geodia littoralis* n. sp. $\times \frac{3}{4}$.
 Fig. 6. *Geodia libera* n. sp. $\times \frac{3}{4}$.

PLATE XXXIX.

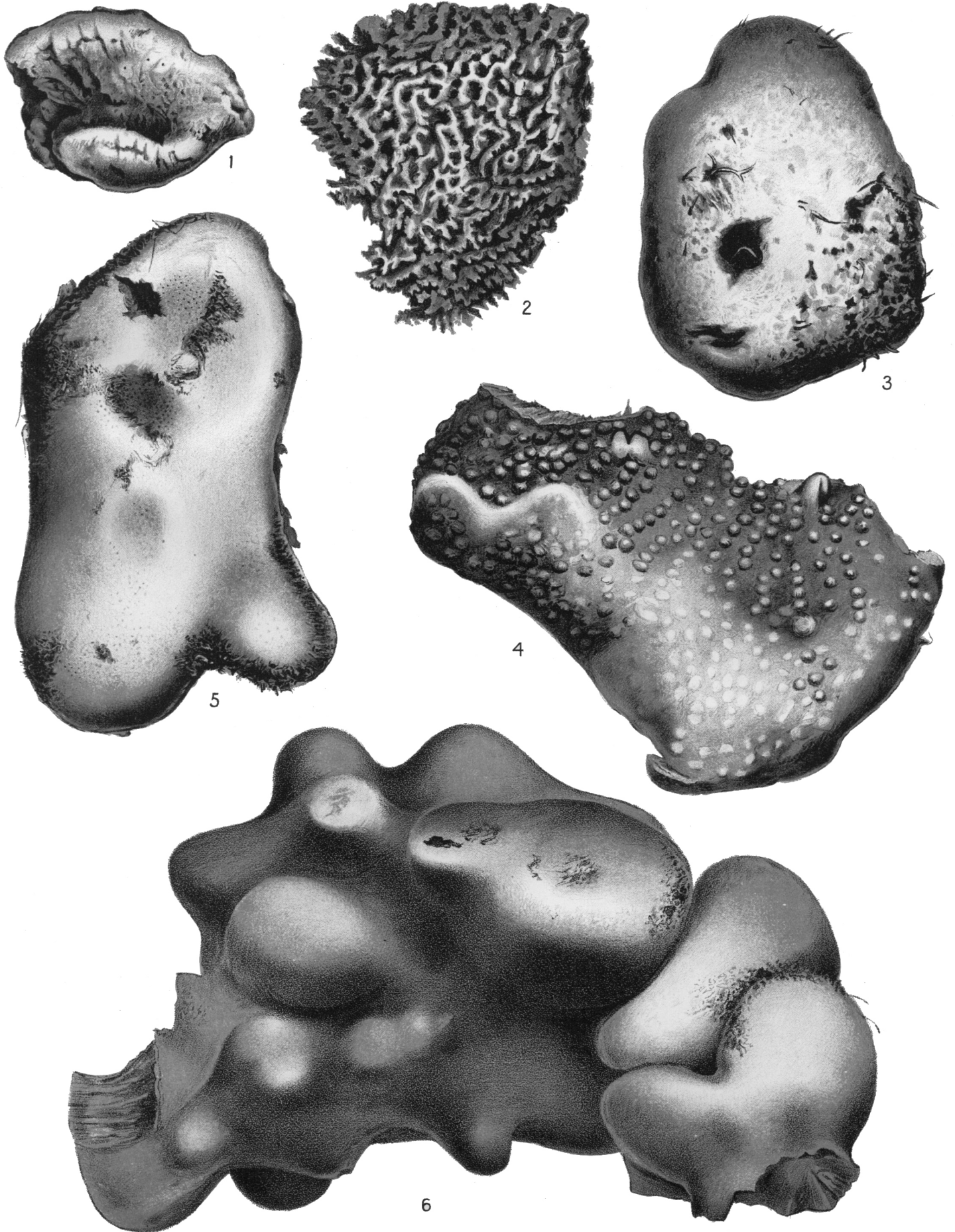
- Fig. 1. (a) *Homæodictya multiformis* n. sp., growing on a specimen of (b) *Myxilla simplex* (Baer). Nat. size.
 Figs. 2 and 3. *Homæodictya multiformis* n. sp. Young specimens. Nat. size.
 Fig. 4. *Homæodictya compressa* (Esper). Young specimen, nat. size; with small specimens of (a) *Esperiopsis informis* n. sp., (b) *Pocillon hyndmani* (Bk.), and (c) *Myxilla simplex* (Baer), growing on its base.
 Fig. 5. *Homæodictya alata* n. sp. $\times \frac{3}{4}$.
 Fig. 6. *Siphonochalina anonyma* n. sp. Nat. size.
 Fig. 7. *Pachychalina hospitalis* n. sp. Nat. size.
 Fig. 8. *Reniera saldanhæ* n. sp. Nat. size.

PLATE XL.

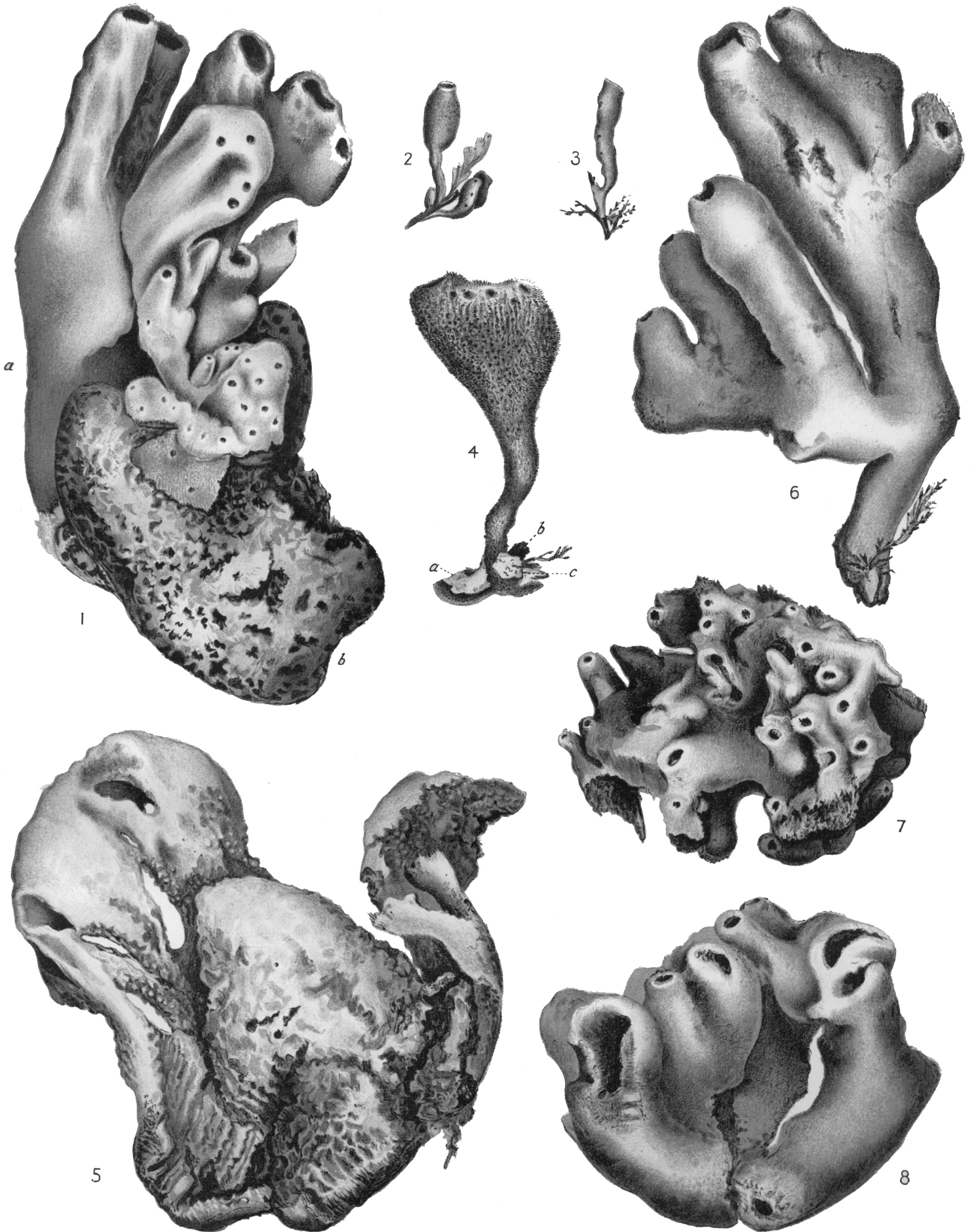
- Fig. 1. *Geodia littoralis* n. sp.
 a, somal oxea, $\times 54$; b, cortical anatriæne, $\times 297$; c, cortical oxea, $\times 122$; d, mesoprotriæne, $\times 297$; e, orthotriæne, $\times 54$; f, anatriæne, $\times 122$; g, h, i, choanosomal oxyasters, $\times 540$; j, strongylospheraster, $\times 540$; k, outline of sterraster, $\times 122$.
 Fig. 2. *Geodia libera* n. sp.
 a, somal oxea, $\times 54$; b, cortical anatriæne, $\times 297$; c, cortical oxea, $\times 122$; d, anatriæne, $\times 122$; e, dichotriæne, $\times 54$; f, protriæne, $\times 122$; g, strongylospheraster, $\times 540$; h, oxyaster, $\times 540$; i, outline of sterraster, $\times 122$.
 Fig. 3. *Polymastia littoralis* n. sp.
 a, choanosomal stylus, $\times 122$; b, c, cortical stylus and tylostylus, $\times 122$; d, dermal subtylostylus, $\times 297$.
 Fig. 4. *Leucophlæus styliferus* n. sp.
 a, large stylus, $\times 297$; b, small subtylostylus, $\times 297$.
 Fig. 5. *Microcionia tenuis* n. sp.
 a, b, c, styli of different sizes, $\times 297$; d, dermal stylus, $\times 297$; e, toxa, $\times 297$.
 Fig. 6. *Microcionia similis* n. sp.
 a, b, c, styli of different sizes, $\times 297$; d, dermal stylus, $\times 297$; e, toxa, $\times 540$; f, isochela palmata, $\times 540$.
 Fig. 7. *Tedania scotiæ* n. sp.
 a, dermal tylotum, $\times 297$; b, stylus, $\times 297$; c, d, onychata of two kinds, $\times 540$.
 Fig. 8. *Pachychalina hospitalis* n. sp. Oxea, $\times 297$.
 Fig. 9. *Siphonochalina anonyma* n. sp.
 a, oxea, $\times 297$; b, oxea of embryo, $\times 297$.
 Fig. 10. *Siphonochalina tubulosa* (Esper). Oxea, $\times 297$.
 Fig. 11. *Esperiopsis informis* n. sp.
 a, stylus, $\times 297$; b, isochela palmata, $\times 540$.
 Fig. 12. *Homæodictya compressa* (Esper).
 a, oxea, $\times 297$; b, isochela palmata, $\times 540$.

- Fig. 13. *Homæodictya alata* n. sp. Oxea, × 297.
- Fig. 14. *Hymedesmia parva* n. sp.
a, b, large and small acanthostyli, × 297; *c*, tornotum, × 297; *d*, isochela arcuata, × 540;
e, sigma, × 540.
- Fig. 15. *Clathria raphidotoxa* n. sp.
a, stylus, × 297; *b*, echinating acanthostylus, × 297; *c*, dermal stylus, × 297; *d*, toxa of
medium length, × 297; *e*, isochela palmata, × 540.
- Fig. 16. *Homæodictya multiformis* n. sp.
a, oxea of large specimen, × 297; *b*, oxea of specimen 8 mm. high, × 297; *c*, oxea of specimen
2 mm. high, × 297; *d*, oxea of embryo, × 297; *e*, isochela palmata, × 540.
- Fig. 17. *Homæodictya elastica* (Vosmaer). Oxea, × 297.
- Fig. 18. *Reniera saldanhæ* n. sp.
a, oxea, × 297; *b*, oxea of embryo, × 297.

JANE STEPHENS: "SCOTIA" ATLANTIC SPONGES—PLATE XXXVIII.



JANE STEPHENS: "SCOTIA" ATLANTIC SPONGES—PLATE XXXIX.



JANE STEPHENS: "SCOTIA" ATLANTIC SPONGES—PLATE XL.

