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## No. IV.

## Sponges of the Coasts of Ireland.

### I.—The Triaxonida and part of the Tetraxonida.

BY

JANE STEPHENS, B.A., B.Sc.
National Museum, Dublin.

Plates I—V.

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*l, Sci. Invest.*, 1907.

phalopoda Dibranchiata of the Coasts of
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[1909].

rking Experiments on the East Coast of
906, pp. 86, charts 33. [1909].

riations in the Quantity of Glycogen present
pp. 12, diagrams 8. [1909].

HICKSON, —Alcyonarian and Madreporarian
sts, pp. 28, pl. 1. [1909].

hiate Mollusca of the Trawling Grounds of
asts of Ireland, pp. 18. [1909].

rt on the Drift of the Irish Sea, pp. 11.
[1909].

water Eel. A Review of Recent Contribu-
d its Life-History, pp. 27. [1909].

the Artificial Propagation of Salmonidae
907-1908, pp. 11, and

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# SPONGES OF THE COASTS OF IRELAND.

## I.—THE TRIAXONIDA AND PART OF THE TETRAXONIDA

BY

JANE STEPHENS, B.A., B.Sc.

National Museum, Dublin.

Plates I–V.



### i. INTRODUCTION.

Large numbers of sponges belonging to the chief subdivisions of the phylum have been obtained off the coast of Ireland, in the course of the dredging operations carried on by the Fisheries Branch of the Irish Department of Agriculture.

Of these, the Triaxonida and part of the Tetraxonida are dealt with in this paper. The term Tetraxonida is here taken in the wide sense in which it is understood by Professor Dendy (4) and includes the grades Tetractinellida, Lithistida, Monaxonellida and Pseudoceratosa. The first section of the paper contains a description of the Triaxonida and the Tetractinellida; the second deals with part of the Monaxonellida, namely, with those sponges belonging to the sub-order Astromonaxonellida. No Lithistid sponge has as yet been obtained off the coast of Ireland.

I am indebted to Miss Eileen E. Barnes for the care with which she has made the drawings for this paper.

### ii. TRIAXONIDA AND TETRACTINELLIDA.

All the sponges belonging to these two groups were obtained off the west and south-west coasts of Ireland, and, with the exception of one species, *Pachymatisma johnstonia*, they were all taken in deep water. The classification of the Tetractinellida is taken from Professor Dendy's important work on the sponges of Ceylon (4).

The following is a list of the species obtained :—

ORDER TRIAXONIDA.

*Leucopsacus scoliodocus*, Ijima.
*Mellonympha velata* (Wyville Thomson).
*Aphrocallistes beatrix*, Gray.
*Hyalonema infundibulum*, Topsent.
*Pheronema Grayi*, Kent.

ORDER TETRAXONIDA.

GRADE TETRACTINELLIDA.

*Plakortis simplex*, Schulze.
*Thrombus abyssi* (Carter).
*Thenea muricata*, Bowerbank.
*Pachastrella monilifera*, Schmidt.
*Characella pachastrelloides* (Carter).
*Poecillastra compressa* (Bowerbank).
*Sphinctrella ornata*, Sollas.
*Pachymatisma johnstonia* (Bowerbank).
*Geodia nodastrella*, Carter.
*Sidonops atlantica*, n.sp.
*Tethya cranium* (Müller).

In addition to these species, part of a Dictyonine sponge and a few fragments of one of the Geodiidae were found in the collection, but they were too incomplete to identify.

Of the sixteen species enumerated in the foregoing list, twelve are now recorded for the first time for the Irish area. Three species, *Aphrocallistes beatrix*, *Pachymatisma johnstonia* and *Tethya cranium* have previously been collected within that area, the first-mentioned being recorded under the name *Aphrocallistes Bocagei*, Wright. The remaining species is described as new.

Three of the species, *Mellonympha velata*, *Thrombus abyssi* and *Geodia nodastrella* were described in various publications dealing with the sponges collected during the cruises of the *Porcupine* in the years 1869-70, and up to this, they had not since been taken.

*Leucopsacus scoliodocus* is known only from specimens taken in the Sagami Sea, Japan, except for one specimen, described as a variety, which was dredged off the Cape Verde Islands. It is therefore interesting to find this sponge within the Irish area.

*Hyalonema infundibulum* is known only from two specimens taken in the Bay of Biscay and off the Azores.

*Plakortis simplex*, long known only from the Mediterranean, has been recorded twice off the western coasts of Europe, namely, off Spain and off Norway, so that its occurrence at an intermediate station was to be expected.

of the species obtained :—

ER TRIAXONIDA.

*ɔdocus*, Ijima.
*ita* (Wyville Thomson).
*trix*, Gray.
*libulum*, Topsent.
, Kent.

R TETRAXONIDA.

E TETRACTINELLIDA.

, Schulze.
(Carter).
Bowerbank.
*lifera*, Schmidt.
*trelloides* (Carter).
*ressa* (Bowerbank).
*a*, Sollas.
*hnstonia* (Bowerbank).
*ι*, Carter.
*ι*, n.sp.
Müller).

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ıg known only from the Mediterranean,
ce off the western coasts of Europe,
off Norway, so that its occurrence at
was to be expected.



The remaining sponges belong to well-known species, which have been fully redescribed within recent years, chiefly by Professor Topsent in his various works dealing with Atlantic sponges. Some of these species have been dredged many times in different parts of the Atlantic Ocean, while the known geographical range of others has been extended northwards by their discovery off the Irish coast.

Four other species of Tetractinellida, not represented in the present collection, are known to occur off the Irish coast, namely, *Dercitus Bucklandi* (**1** and **33**), *Stelletta Grubei* (**1**), *Pilochrota lactea* (**33**) and *Stryphnus ponderosus* (**33**). Thus the total number of Tetractinellid species taken up to the present time in Irish waters is fifteen.

Numerous slides from Canon Norman's collection, with sections and spicule-preparations of specimens dredged by the *Porcupine*, and of type and other specimens of Bowerbank, Schmidt, Topsent and others, have been of great assistance in determining some of the species. Of great assistance also was a collection of slides, now in the Irish National Museum, with sections and spicules of type-specimens of many Tetractinellida, prepared by Professor Sollas in the course of his work on the *Challenger* sponges.

## Order TRIAXONIDA.

## Sub-order HEXASTROPHORA.

## Family *LEUCOPSACIDAE*.

### **Leucopsacus scoliodocus**, Ijima.

Plate IV, fig. 2.

S.R. 506—12 IX '07. 50° 34′ N., 11° 19′ W., soundings 661–672 fms. Trawl. Temperature at 600 fms., 8.22°C.—One specimen.

With the exception of a variety, *L. scoliodocus*, Ijima, var. *retroscissus*, Topsent (**46**), described from a single specimen dredged off the Cape Verde Islands, this species is known only from the Sagami Sea, Japan (**10**). It is therefore interesting to find the species represented in the present collection.

The specimen is about 9 mm. in height by 11 mm. It is in a bad state of preservation and is broken off from its support. Two or three nodules at the base, formed of fused, thick-rayed hexactines, are the only remnants of the basidictyonal plate. The species is easily recognized by its distinctive spiculation, and the spicules of the Irish specimen agree well, both in size and character, with those of the Japanese specimens.

Topsent's variety is separated from the type solely on account of the fact that the most abundant form of microsclere is a hexactinose discohexaster, with slightly flexuous teeth,

which are a little longer than the teeth of the remaining hexactinose discohexasters. The latter kind is that described and figured by Ijima (**10**, Pl. III., fig. 29). At the same time Topsent states that the spicule shown in fig. 30 on the same plate would lead one to suppose that the first-mentioned kind of discohexaster, which is not specially described by Ijima, is occasionally present in the Japanese specimens, though probably badly developed in them.

In the Irish specimen the majority of the discohexasters (Pl. IV, fig. 2*b*) exactly correspond with the typical one figured by Ijima (**10**, Pl. III, fig. 29). They have teeth 0·01 mm., or more rarely 0·013 mm. in length. But accompanying them are discohexasters with rather longer recurved teeth (Pl. IV, fig. 2*a*), which recall those of Topsent's variety. These teeth are from 0·019 to 0·027 mm. long, not quite reaching 0·03 mm., the length given by Topsent for the teeth characteristic of the discohexasters of his specimen.

The teeth are 4–5 in number at the end of each ray in both these forms of discohexaster.

Ijima (**10**, p. 66) has shown in the case of an allied sponge, *Caunoplectella cavernosa*, possessing three different forms of large discohexasters, which probably represent developmental stages of the same kind of discohexaster, that one form is absent from young individuals, but makes its appearance later, becoming predominant in the fully developed specimens. Referring to this fact, Topsent suggests that, when more specimens are examined, the Cape Verde Islands sponge may prove to be simply a specimen of *Leucopsacus scoliodocus* with highly differentiated spiculation. In view of this statement, and of the fact that the typical short-toothed discohexaster predominates over the longer-toothed form, the Irish specimen is referred to the type rather than to the variety.

No tylfloricomes were seen in the Irish sponge. Ijima, however, states that this form of hexaster is of inconstant occurrence in the Japanese specimens.

*Distribution.*—Pacific Ocean: Sagami Sea, Japan, 313 fms. (**10**). The variety *L. scoliodocus*, var. *retroscissus*, Topsent, was dredged off the Cape Verde Islands in 633-598 metres (**46**).

### Family *ROSSELLIDAE*.

### Sub-family *LANUGINELLINAE*.

**Mellonympha velata** (Wyville Thomson).

*Rossella velata*, Wyville Thomson.

S.R. 327—8 v '06. 51° 43′ 30″–51° 38′ N., 12° 15′–12° 18′ W., soundings 550–800 fms., ooze. Sprat net on trawl. Temperature at 530 fms., 8.95°C.—One specimen.

The only specimen in the collection is in a very bad state of preservation. It is about 15 mm. in height by 7 mm. in

ıan the teeth of the remaining hexac-
ıe latter kind is that described and
l. III., fig. 29). At the same time
ıpicule shown in fig. 30 on the same
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*L. scoliodocus*, var. *retroscissus*,
ged off the Cape Verde Islands in
3).

*ROSSELLIDAE.*

*LANUGINELLINAE.*

**relata** (Wyville Thomson).

*ata*, Wyville Thomson.

13′ 30″–51° 38′ N., 12° 15′–12° 18′ W.,
) fms., ooze. Sprat net on trawl.
0 fms., 8.95°C.—One specimen.

ıe collection is in a very bad state of
ıt 15 mm. in height by 7 mm. in



breadth. The prostalia pleuralia are much broken; only two of them still show the four tangential rays. These rays, when the spicules are complete, form the beautiful veil-like covering which gives the sponge its name.

Remains of the basal tuft of spicules are present. The spicules agree exactly in character with the short descriptions given by Schulze (**27** and **28**). The oxyhexasters are very abundant. They are usually about 0·1 mm. in diameter. Each of their short principal rays bears two or three terminal rays. The two kinds of discohexasters are rather scarce; one form, similar to the oxyhexasters in shape, but with discs on the terminal rays, is about 0·1 mm. in diameter; the other form, with numerous terminal rays, is rather smaller. Plumicomes are present, but are very scarce. They are about 0·06 mm. in diameter.

In his later description of the species Schulze (**28**) assigns this sponge to a new genus, *Mellonympha*, which is characterised by the presence of plumicomes, in addition to oxyhexasters and discohexasters, and restricts the genus *Rossella* to those species which possess for hexasters, only oxyhexasters and discohexasters.

*Distribution.*—North Atlantic, off the Strait of Gibraltar, 651 fms. (**34**, p. 418). Carter (*Ann. Mag. Nat. History* (4), xv, 1875, p. 121) states that fragments of *Rossella velata* were found among sponges dredged by the *Porcupine* to the N.W. of the Shetland Islands, in 345 fms.

## Family *APHROCALLISTIDAE.*

**[1] Aphrocallistes beatrix,** Gray.

*Aphrocallistes Bocagei*, Wright.

*Aphrocallistes ramosus*, Schulze.

*Aphrocallistes azoricus*, Topsent.

*Helga* cxx—24 viii '01. 77 miles W.N.W. of Achill Head, soundings 382 fms. Trawl.—Several pieces.

S.R. 479—28 viii '07. 51° 20′ N., 11° 41′ W., soundings 468–560 fms. Trawl. Temperature at 400 fms., 9.55°C.—Numerous pieces.

S.R. 483—30 viii '07. 51° 37′ N., 11° 56′ W., soundings 610–664 fms., mud and sand. Trawl. Temperature at 550 fms., 8.34°C.—Several pieces.

S.R. 504—12 ix '07. 50° 42′ N., 11° 18′ W., soundings 627–728 fms., coral. Trawl. Temperature at 600 fms., 8.22°C.—Numerous pieces.

[1] See also Addenda, p. 38.

S.R. 505—12 IX '07. 50° 39′ N., 11° 14′ W., soundings 464–627 fms. Trawl. Temperature at 600 fms., 8.22°C.—One small fragment.

S.R. 1242—14 VIII '11. 56 miles W. ¼ S. of Great Skellig, 51° 27′ N., 11° 55′ W., soundings 550–590 fms. Trawl.—A few small fragments.

The specimens obtained are more or less broken, but several of the larger pieces are well preserved. The largest is 150 mm. in height by 105 mm.; another piece is 120 mm. high by 100 mm., with a fine sieve-plate measuring 80 mm. by about 50 mm. in diameter. Some of the specimens are growing on *Lophohelia*. The specimens are of the characteristic shape, with radial thimble-like diverticula, as shown in the figures of the species given by Schulze, Wright and others, whether under the name of *Aphrocallistes beatrix*, or under one of the names now recognized by Schulze (**29**) as its synonyms.

The soft parts of the sponge are sometimes well preserved, and preparations are easily obtainable showing the characteristic spicules of the species which have been so often described and figured.

*Aphrocallistes beatrix* was taken off the S.W. of Ireland in 500 fms. by the *Flying Fox*, and was recorded under the name of *A. Bocagei* (**14**). It was dredged twenty years previously by the *Porcupine* at Station 36, 1869, 48° 50′ N., 10° 9′ W., 725 fms., nearly 1° to the south of what is now usually taken as the southern limit of the Irish area.

*Distribution.*—North Atlantic: from the S.W. of Ireland to the Cape Verde Islands. South Atlantic: off St. Paul. Indian Ocean: Bay of Bengal, off the Andaman Islands, off the Nicobar Islands, Strait of Malacca, etc. Pacific Ocean: off Japan and the Philippines and at various stations off the East Indies.

Bathymetrical range, about 77 to 1075 fms.

## SUB-ORDER AMPHIDISCOPHORA.

### FAMILY *HYALONEMATIDAE*.

### **Hyalonema infundibulum**, Topsent.

Plate II, fig. 3.

S.R. 494—8 IX '07. 51° 59′ N., 12° 32′ W., soundings 550–570 fms. Trawl.—Two specimens.

The specimens agree exactly, both in external appearance and in spiculation, with the descriptions and figures given by Topsent (**37**, **40** and **45**) of the species.

The sponges are extremely soft to the touch and very fragile. Both are cup-shaped, with the edges of the cup very thin and

° 39′ N., 11° 14′ W., soundings 464–
Temperature at 600 fms., 8.22°C.—
t.
56 miles W. ¼ S. of Great Skellig,
W., soundings 550–590 fms. Trawl.
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PHIDISCOPHORA.

*ALONEMATIDAE.*

**nfundibulum**, Topsent.

te II, fig. 3.

59′ N., 12° 32′ W., soundings 550–
Two specimens.

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e descriptions and figures given by
f the species.
y soft to the touch and very fragile.
the edges of the cup very thin and



ragged. The more complete of the two is 75 mm. in height by 35 mm. in diameter near the base, and 55 mm. in diameter near the summit. The central cavity is about 50 mm. deep and has four large, and many small, irregular openings at the bottom. There is no trace of a central cone, nor are there any indications that a cone has been torn away. The second specimen is about 70 mm. in height by 55 mm. across. Part of the wall of the cup is missing, but the bottom of the central cavity is uninjured and here again there is no trace of a central cone.

Each sponge has, at its base, a rounded hole from which the root-spicules were evidently torn. Three tufts of basal spicules were dredged at the above station, but there is nothing to show that any of them belonged to the specimens obtained.

*Distribution.*—North Atlantic : Bay of Biscay, 1710 metres, one specimen (**40**) ; off the Azores, 1372 metres, one specimen (**37** and **45**).

In addition to the root-tufts of spicules above referred to, which were dredged at S.R. 494, tufts of rooting spicules of *Hyalonema* were obtained at the following stations :—

S.R. 501—11 IX '07. 50° 49′ N., 11° 22′ W., soundings 447–625 fms. Trawl.—One root-tuft.
S.R. 502—11 IX '07. 50° 46′ N., 11° 21′ W., soundings 447–515 fms. Trawl. Temperature at 447–515 fms., 8.8°C. —Several root-tufts.

### **Pheronema Grayi**, Kent.

Plate I, and Plate II, fig. 2.

S.R. 327—8 V '06. 51° 41′ N., 12° 16′ 30″ W., soundings 550–800 fms., ooze. Trawl.—One specimen.
S.R. 331—9 V '06. 51° 12′ N., 11° 55′ W., soundings 610–680 fms., ooze. Trawl.—Ca. two hundred and thirty specimens.
S.R. 332—10 V '06. 51° 12′ N., 12° 2′ 30″ W., soundings 680–735 fms., ooze. Trawl.—Seven specimens.
S.R. 333—10 V '06. 51° 37′ N., 12° 9′ W., soundings 557–579 fms., ooze. Trawl. Temperature at 500 fms., 9.2°C.—Two specimens.
S.R. 334—10 V '06. 51° 35′ 30″ N., 12° 26′ W., soundings 500–520 fms. Trawl.—Fifty-two specimens.
S.R. 364—10 VIII '06. 51° 23′ 30″ N., 11° 47′ W., soundings 620–695 fms., ooze. Trawl. Temperature at 600 fms., 7.92°C.—Two small specimens.
S.R. 387—7 XI '06. 51° 47′ N., 12° 12′ W., soundings 530–535 fms., ooze. Trawl. Temperature at 500 fms., 9.13°C.—One specimen and fragment.

S.R. 400—5 II '07. 51° 18′ N., 11° 50′ W., soundings 525–600 fms., mud and ooze. Trawl. Temperature at 580 fms., 8.35°C.—Three small specimens.

S.R. 477—28 VIII '07. 51° 15′ N., 11° 47′ W., soundings 707–710 fms., ooze. Trawl. Temperature at 707–710 fms., 7.19°C.—Ca. one hundred specimens.

S.R. 479—28 VIII '07. 51° 20′ N., 11° 41′ W., soundings 468–560 fms. Trawl. Temperature at 400 fms., 9.55°C.—One specimen.

S.R. 497—10 IX '07. 51° 2′ N., 11° 36′ W., soundings 775–795 fms., ooze. Trawl.—One specimen.

S.R. 500—11 IX '07. 50° 52′ N., 11° 26′ W., soundings 625–666 fms. Trawl. Temperature at 600 fms., 8.22°C.—One specimen.

S.R. 506—12 IX '07.—50° 34′ N., 11° 19′ W., soundings 661–672 fms. Trawl. Temperature at 600 fms., 8.22°C.—Eighteen small specimens.

S.R. 593—6 VIII '08.—50° 31′ N., 11° 31′ W., soundings 670–770 fms., ooze. Trawl. Temperature at 650 fms., 7.75°C.—Three specimens.

S.R. 753—17 V '09. 65 miles W. by S. ½ S. of Tearaght Light, 51° 24′ N., 11° 59′ 30″ W., soundings 561–572 fms. ooze. Trawl. Temperature at 550 fms. 8.79°C.—Three small specimens.

From a study of the foregoing list of stations it will be seen that *Pheronema Grayi* has been taken in great numbers over an area off the S.W. coast of Ireland extending from 53° 31′ N., to 51° 37′ N., and from 11° 19′ W. to 12° 26′ W. The depths at which the species was dredged are from 468 to 800 fms. At one station about two hundred and thirty specimens were taken in a single haul.

The specimens in the collection are of very different sizes. The smallest is 8 mm. in height by 6 mm. in diameter, exclusive of the prostalia, which project singly from all over the body, except from a narrow region round the osculum, a region which is not so well marked in the young sponge as it is in the older specimens.

A large number of specimens vary between 12 mm. and 35 mm. in height, while many more are from 75 mm. to 110 mm. high. The largest measures 145 mm. in height by 135 mm. The large sponges are about the size of specimens of *Pheronema Grayi* obtained farther south in the Atlantic. Saville Kent (**12**) gives four to four and one half inches for the height and breadth of the first-found specimens, and Topsent (**45**) states that 80 mm. to 100 mm. is an average size for specimens dredged off the Azores. The largest noted by the latter writer is a specimen from the Bay of Biscay, which is 180 mm. in diameter (**40**).

The oscular cavities of some of the sponges from S.R. 477 and S.R. 500 were half filled with the large eggs of a species of

° 18′ N., 11° 50′ W., soundings 525–
d ooze. Trawl. Temperature at 580
ree small specimens.
51° 15′ N., 11° 47′ W., soundings 707–
Trawl. Temperature at 707–710 fms.,
hundred specimens.
51° 20′ N., 11° 41′ W., soundings 468–
Temperature at 400 fms., 9.55°C.—

1° 2′ N., 11° 36′ W., soundings 775–
Trawl.—One specimen.
)° 52′ N., 11° 26′ W., soundings 625–
Temperature at 600 fms., 8.22°C.—

° 34′ N., 11° 19′ W., soundings 661–
Temperature at 600 fms., 8.22°C.—
ecimens.
° 31′ N., 11° 31′ W., soundings 670–
Trawl. Temperature at 650 fms.,
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5 miles W. by S. ½ S. of Tearaght
11° 59′ 30″ W., soundings 561–572
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ed with the large eggs of a species of



Cephalopod, *Rossia* sp. (see Anne L. Massy, The Cephalopoda Dibranchiata of the Coasts of Ireland, *Fisheries, Ireland, Sci. Invest.*, 1907, I, [1909]).

*Distribution.*—North Atlantic; off Setubal, Portugal, 400–600 fms. (**12** and **13**); Bay of Biscay, 650–1410 metres (**40**); off the Azores, dredged in great abundance at a number of stations at depths of 793–1557 metres (**37** and **45**).

A fragment of a Dictyonine sponge was dredged at S.R. 480, 28 VIII '07. 51° 23′ N., 11° 38′ W., soundings 468 fms., stones. Trawl. It is growing on a piece of dead coral, and is about 14 mm. in diameter by 6 mm. in height. It is so much injured that its original shape cannot be made out. Numerous free spicules are present, which I have not been able to identify with those of any known species, and the specimen is unfortunately in too fragmentary a state to describe at length.

The beams of the dictyonal framework are spined; they are usually between 0·025–0·05 mm. in thickness. The following kinds of spicules are present:—

(1) Large sword-like dermal hexactines, which vary a good deal in size. The distal ray is up to 0·1 mm. in length by 0·012 mm., the tangential rays are about 0·25 mm. long, and the proximal is nearly 1 mm. long. All the rays are spined.
(2) Scopulae, about 0·8 mm. long by 0·005 mm. with slightly spined arms.
(3) Numerous slender diacts, up to about 0·6 mm. in length. No uncinates were seen.
(4) Oxyhexasters, about 0·085–0·1 mm. in diameter. The principal rays are 0·024–0·027 mm. long; each bears two or three terminal rays of about the same length as the principal ray.
(5) Discohexasters, the principal ray bears usually three terminal rays. The diameter of the whole is rather less than that of the oxyhexaster.

Both forms of hexasters are present in numbers, the oxyhexasters being more abundant than the discohexasters.

About half a dozen small, rounded sponge-like masses were dredged at S.R. 506—12 IX '07. 50° 34′ N., 11° 19′ W., soundings 661–672 fms. Trawl. These, at first sight, looked like Hexactinellid sponges, but, on examination, they proved to be merely accumulations of Hexactinellid spicules.

The large spicules form a felted mass, holding together small or broken spicules and ooze. Similar accumulations of Hexactinellid spicules have been described from time to time. They are sometimes found in much shallower water than are the living sponges to which they belong. It has been suggested by Professor Topsent (Spongiaires, *Expédition antarctique française*, 1903–1905, Paris, 1908) that these accumulations of Hexactinellid spicules may be due to the action of currents.

## Order TETRAXONIDA.

### Grade TETRACTINELLIDA.

### Sub-order HOMOSCLEROPHORA.

### Family *PLAKINIDAE*.

**Plakortis simplex**, Schulze.

S.R. 151—27 VIII '04. 50 miles W.N.W. of Eagle Island, 54° 17′ N., 11° 33′ W., soundings 388 fms., stones and rock. Dredge. Temperature at 388 fms., 9.15°C.—One specimen.

The sponge is about 40 mm. by 18 mm. in diameter, with a thickness of 10 mm.

The spicules agree exactly with the descriptions of the species given by Schulze (**26**) and Topsent (**39**), and they have been compared with preparations made from one of the specimens from Banyuls named by the latter author.

*Distribution.*—North Atlantic: Trondhjem Fjord (Norman Coll., see **45**, p. 103); off the Cantabrian coast of Spain (**44**). Mediterranean: Naples (**26**); Banyuls, between tide-marks (**39**); La Calle (**44**): Red Sea (**22**).

The specimen from Amboina recorded as *P. simplex* (**41**) proves to be *Placinastrella clathrata*, Kirkpatrick (**44**, p. 344, and **45**, p. 103). Hentschel (**9**) has recently recorded a sponge from the Aru Islands under the name of *Plakortis simplex*.

### Sub-order ASTROPHORA.

### Family *THROMBIDAE*.

**Thrombus abyssi** (Carter).

S.R. 353—6 VIII '06. 50° 37–50° 40′ N., 11° 32′ W., soundings 250–542 fms., mud and sand. Trawl. Temperature at 500 fms., 8.58°C.—Two specimens.

The smaller specimen obtained is a fragment 6 mm. in length by little more than 1 mm. in breadth; the larger is a thin encrustation about 25 mm. long by 10 mm. broad. Both are growing on dead *Lophohelia*. The oscula are small and scattered. The colour in spirit is pale greyish-yellow.

The spiculation is exactly as described for the original specimens (**2** and **39**). It is made up of trichotriaenes and amphiasters. The former are very regular in shape, nor do they vary much in size. The shaft projects above the cladome and is 0·055–0·06 mm. in length by 0·007 mm. The protocladi are 0.01 mm. long; the deuterocladi are as much as 0.016 mm. in length. The cladome is 0·055–0·06 mm. across.

[1] See also Addenda, p. 38.

TETRAXONIDA.

TETRACTINELLIDA.

HOMOSCLEROPHORA.

*PLAKINIDAE.*

**is simplex,** Schulze.

50 miles W.N.W. of Eagle Island, ′ W., soundings 388 fms., stones and Temperature at 388 fms., 9.15°C.—

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ER ASTROPHORA.

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The amphiasters are 0·005 mm. long.

With the exception of a variety, *Thrombus abyssi* (Carter) var. *niger,* Topsent (**45**), obtained off the Azores in 1360 metres, the species has only been taken by the *Porcupine* Expedition. It was dredged at Station 3, 1870, at the western entrance of the English Channel, 48° 31′ N., 10° 3′ W., in 500 fms. (**2**).

FAMILY *THENEIDAE.*

[1] **Thenea muricata,** Bowerbank.

S.R. 336—12 v '06. 51° 19′ N., 12° 20′ W., soundings 673–720 fms. Trawl. Temperature at 700 fms., 6.84°C.—Two specimens.

S.R. 497—10 IX '07. 51° 2′ N., 11° 36′ W., soundings 775–795 fms., ooze. Trawl.—Four specimens.

S.R. 499—11 IX '07. 50° 55′ N., 11° 29′ W., soundings 666–778 fms. Trawl. Temperature at 600 fms., 8.22°C.—One small specimen.

S.R. 500—11 IX '07. 50° 52 ′ N., 11° 26′ W., soundings 625–666 fms. Trawl.—One specimen.

S.R. 506—12 IX '07. 50° 34′ N., 11° 19′ W., soundings 661–672 fms. Trawl. Temperature at 600 fms., 8.22°C.—Two specimens.

S.R. 593—6 VIII '08. 50° 31′ N., 11° 31′ W., soundings 670–770 fms., ooze. Trawl. Temperature at 650 fms., 7.75°C.—Five specimens.

S.R. 944—17 v '10. 86 miles W. ¼ N. of Great Skellig, 51° 22′ N., 12° 41′ W., soundings 982 fms., ooze. Trawl. Twenty-two small specimens.

The specimens obtained vary in size from 6 mm. in diameter and 7 mm. in height to about 105 mm. in diameter by 40 mm. in height. Apart from their differences in size, they vary a good deal in external appearance, as regards shape, number of oscula present, and degree of hispidation due to long projecting spicules.

The small specimens from S.R. 944 are from 10 to 25 mm. in diameter, and are very similar to the figures of *Thenea muricata* given by Vosmaer (**48** and **49**). Each has one small osculum, or, occasionally, two small oscula. Except for the few long tufts of spicules, these specimens are fairly smooth in appearance, though harsh to the touch from slightly projecting spicules. Buds are present on many of the specimens.

One specimen, about 67 mm. by 55 mm. in diameter and 32 mm. in height, has one irregularly shaped osculum, 25 mm. in length.

The remaining specimens vary from 70 mm. to 105 mm. in diameter, and have a height of 30 mm. to 40 mm. Several of them possess one long narrow osculum, and are very similar in appearance to some of Lendenfeld's figures of *Thenea*

[1] See also Addenda, p. 38.

*Valdiviae* (**19**, Pl. XVIII). Others have a number of small oscula, up to about 8 mm. in diameter. The oscula vary in number from 7 to 17 to each sponge. Some of the sponges are fairly smooth, others are very shaggy, with a dense thatch of long, projecting spicules.

With regard to the spiculation, emphasis has been laid on the length of the shaft of the dichotriaenes and on the size and relative abundance of the plesiasters in differentiating the North Atlantic species of *Thenea*.

In the small Irish specimens the shaft of the dichotriaenes is about 4·5 mm. long; in the larger specimens it is often between 6 and 9 mm. in length. Sollas' measurement, 5 mm. (**30**) is usually quoted for the length of the dichotriaenes in *T. muricata*. In medium-sized specimens of *T. muricata* from the Shetlands, with which the Irish specimens were compared, the shaft of the dichotriaenes varies from 5 to 8 mm. in length. In a specimen of the same species from Davis Strait only three or four dichotriaenes were measured, and these were from 8·5–10·5 mm. in length.

As to the plesiasters, in two or three Irish specimens of very different sizes, they are rather scarce, and their rays reach a maximum length of about 0·085 mm. In the majority of the specimens the rays of the plesiasters reach a maximum length of 0·125 mm., or more rarely, 0·135 mm.

Sollas (**30**) states that the rays of the largest plesiasters in *T. muricata* may reach a length of 0·005 inches (0·127 mm.) or more. One of his preparations from a specimen from Kors Fjord, shows rather numerous plesiasters with rays up to 0·125 mm. in length. The two specimens from the Shetlands, above referred to, have plesiasters with rays up to 0·15 mm. in length. The plesiasters are rare in one specimen, abundant in the other. The Davis Strait sponge, which has such large dichotriaenes, possesses plesiasters with rays not more than 0·075 mm. in length. The plesiasters, too, are very scarce.

In spite of these differences in the size and relative abundance of the plesiasters, and in the length of the dichotriaenes, as well as the difference in the external appearance of the sponges, the Irish specimens cannot be regarded as belonging to more than one species, and they are assigned to *Thenea muricata*, because they agree so well with descriptions given of the species, and with the specimens from Norway, the Shetlands and Davis Strait, with which they have been compared. Moreover, it seems doubtful if specific differences can really be maintained between the North Atlantic specimens of *Thenea* now assigned to several species.

The specimens of *Thenea Schmidti*, Sollas, from the Mediterranean and the Azores, with which the Irish specimens have been compared, have much larger plesiasters than have any of the Irish specimens, though it is impossible to decide whether these spicules are in greater abundance in *Thenea Schmidti*, or in some, at least, of the Irish specimens. The rays of the

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plesiasters in the specimens of *Thenea Schmidti* that were examined had a maximum length of about 0·25 mm.

Lendenfeld (**19**) states that the chief differences between his species, *Thenea Valdiviae*, obtained off the Färöes, and *Thenea muricata*, lie in the possession by the former of one large irregularly-shaped osculum and 9–12 mm. long dichotriaenes, while the latter possesses one small round osculum and 5 mm. long dichotriaenes.

Small specimens of *Thenea muricata* certainly possess one small round osculum, but the larger specimens possess either one large osculum, or several small round oscula (Sollas mentions one Norwegian specimen which possessed six oscula), or sometimes several small oscula and one larger, slit-like osculum may be present in the same specimen.

From the measurements given above of the length of the dichotriaenes, it will be seen that the shaft varies from 4·5 mm. to at least 10·5 mm. in length in different specimens of *Thenea muricata*, so that no value can be laid on the length of the dichotriaenes in separating *Thenea Valdiviae* from *Thenea muricata*.

The plesiasters in *Thenea Valdiviae* seem to be intermediate in size between those of *Thenea muricata* and *Thenea Schmidti*, as their longest rays reach a length of 0·17 mm., or, more rarely, 0·2 mm.

It seems possible that a series of specimens might be obtained (as was suggested from the first with regard to the two older species) which would fill in all the gaps between these three species.

*Distribution.*—Arctic and North Atlantic Oceans, at many localities and at depths between 78 and 1913 fms.

### Family *PACHASTRELLIDAE*.

**Pachastrella monilifera**, Schmidt.

*Pachastrella abyssi*, Schmidt.

S.R. 151—27 VIII '04. 50 miles W.N.W. of Eagle Island, 54° 17′ N., 11° 33′ W., soundings 388 fms., stones and rock. Dredge. Temperature at 388 fms., 9.15°C.—Three specimens.

The sponges are growing over dead coral and small pebbles. The largest is 64 mm. by 40 mm. in extent.

Colour, in spirit, pale yellow, with a pinkish tinge.

*Distribution.*—North Atlantic: off Cape St. Vincent, 292 fms. *Porcupine* Expedition (**3**); off Spain, 135 metres, and off the Azores, 318–1557 metres (**38** and **45**); Florida and the Gulf of Mexico (**24** and **25**). Mediterranean: off Banyuls and off Algeria (**38** and **44**). South Atlantic; off Tristan da Cunha, 110 fms. (**31**); off Gough Island, 100 fms. (**47**).

S.R. 151—27 VIII '04. 50 miles W.N.W. of Eagle Island, 54° 17′ N., 11° 33′ W., soundings 388 fms., stones and rock. Dredge. Temperature at 388 fms., 9.15°C.—One minute fragment.

S.R. 504—12 IX '07. 50° 42′ N., 11° 18′ W., soundings 627–728 fms., coral. Trawl. Temperature at 600 fms., 8.22°C.—Two specimens and several fragments.

The sponges are growing on dead *Lophohelia*. The two unbroken specimens are more or less rounded in shape, and are very harsh to the touch. They are about 40 and 60 mm. across, respectively.

The colour, in spirit, is pale yellow, with a pinkish tinge. The minute fragment from S.R. 151 is black in colour.

*Distribution.*—North Atlantic: off Cape St. Vincent, 374 fms, *Porcupine* Expedition (**3**); off Spain and the Azores, 300 and 736 metres, recorded as *C. Sollasi* (**37**); off the Azores, 523–845 metres (**45**).

### [1] **Poecillastra compressa** (Bowerbank).

S.R. 479—28 VIII '07. 51° 20′ N., 11° 41′ W., soundings 468–560 fms. Trawl. Temperature at 400 fms., 9.55°C.—Numerous large pieces.

S.R. 483—30 VIII '07. 51° 37′ N., 11° 56′ W., soundings 610–664 fms., mud and sand. Trawl. Temperature at 550 fms., 8.34°C.—Numerous large pieces.

S.R. 504—12 IX '07. 50° 42′ N., 11° 18′ W., soundings 627–728 fms., coral. Trawl. Temperature at 600 fms., 8.22°C.—One small piece.

S.R. 1004—12 VIII '10. 51 miles W. ½ S. of Great Skellig, 51° 22′ 30″ N., 11° 44′ 30″ W., soundings 641–636 fms., fine sand. Trawl. Temperature at 630 fms., 7.12°C.—Numerous small pieces.

Nearly all the specimens are flat and plate-like in shape and are very similar in appearance to the figures of the species given by Topsent (**45**, Pl. IV, Figs. 1 and 3). Only two or three show any tendency to become cup-shaped. One specimen, growing on dead coral, seems to be practically complete. It is oval in outline, and is about 80 mm. long by 63 mm. in breadth with a thickness of about 9 mm. The remaining specimens are all broken; the largest pieces measure about 100 mm. across and are about 12 mm. thick.

One of the specimens is growing over a number of pebbles, another, as just mentioned, on a piece of dead coral; while several others are spreading over *Aphrocallistes beatrix*. The remaining pieces are all broken off from their support.

[1] See also Addenda, p. 38.

**pachastrelloides** (Carter).

50 miles W.N.W. of Eagle Island, 3′ W., soundings 388 fms., stones and Temperature at 388 fms., 9.15°C.—One

0° 42′ N., 11° 18′ W., soundings 627– Trawl. Temperature at 600 fms., cimens and several fragments.

ing on dead *Lophohelia*. The two un- ore or less rounded in shape, and are h. They are about 40 and 60 mm.

pale yellow, with a pinkish tinge. The .R. 151 is black in colour.

antic: off Cape St. Vincent, 374 fms, ition (**3**); off Spain and the Azores, es, recorded as *C. Sollasi* (**37**); off the netres (**45**).

**compressa** (Bowerbank).

51° 20′ N., 11° 41′ W., soundings 468– Temperature at 400 fms., 9.55°C.— pieces.

51° 37′ N., 11° 56′ W., soundings 610– and sand. Trawl. Temperature at —Numerous large pieces.

0° 42′ N., 11° 18′ W., soundings 627– Trawl. Temperature at 600 fms., ll piece.

51 miles W. ½ S. of Great Skellig, ° 44′ 30″ W., soundings 641–636 fms., . Temperature at 630 fms., 7.12°C.— pieces.

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is growing over a number of pebbles, ned, on a piece of dead coral; while ding over *Aphrocallistes beatrix*. The broken off from their support.

also Addenda, p. 38.



The species is here taken, not in the restricted sense maintained by Lendenfeld (**18** and **19**), but in the wider sense in which it is understood by Topsent (**45**), *Hymeniacidon placentula*, Bowerbank and *Pachastrella stylifera*, Lendenfeld, being included among its synonyms.

With regard to the spiculation of the Irish specimens, the large oxea normally occur with both ends sharply pointed, but usually some of them can be found with one or both ends rounded off. These abnormal spicules are often thicker than the typical oxea. In some specimens they are present in great abundance and are much more numerous than are similar spicules in one of the Rockall specimens of *P. stylifera*, now in the National Museum, Dublin.

Rather short, slender oxea can always be found among the fully developed ones, but no special dermal oxea are present, such as are described for *Pachastrella tenuipilosa*, Lendenfeld (**19**), and the surface of the sponge is smooth.

The tetractines, in some individuals, are usually malformed, having their rays shortened or sharply bent in various directions, or forked. In other specimens they are more frequently normal, but malformed ones can always be found on searching for them.

The spined microxea and the metasters are of the usual type.

Lendenfeld (**19**) suggests a separation of *P. compressa* from *P. stylifera* on the grounds that amphiasters and malformed tetractines are present in, and styli absent from, the former, while amphiasters and malformed tetractines are absent from, and styli present in, the latter.

In the Irish specimens, styli and malformed tetractines occur in one and the same specimen, as they do also in the Rockall sponge above referred to. Nor is there any appreciable difference in the asters of the Rockall and the Irish specimens. Among the asters are found, often in great numbers, very slender, small asters, some of which assume more or less the form of amphiasters. All varieties in shape occur, as described by Topsent (**47**, p. 613), but the different forms cannot be sharply divided from each other.

*Distribution.*—North Atlantic: off the Shetlands, 110 fms., and Hebrides (**1**); off Rockall, 60 and 120 fms., recorded as *P. stylifera* (**17**); off the coast of France, 50 metres (**38**); off the Azores, 200–1384 metres (**45**). Mediterranean: in 126 metres (**38**). South Atlantic: Gough Island, 100 fms., a variety (**47**). Pacific: Queen Charlotte Islands (**31**).

**Sphinctrella ornata**, Sollas.

S.R. 353—6 VIII '06. 50° 37′–50° 40′ N., 11° 32′ W., soundings 250–542 fms., mud and sand. Trawl. Temperature at 500 fms., 8.58°C.—Several specimens.

S.R. 504—12 IX '07. 50° 42′ N., 11° 18′ W., soundings 627-728 fms., coral. Trawl. Temperature at 600 fms., 8.22°C.—Several specimens.

This species is growing in cavities in dead *Lophohelia prolifera*. Only the long, silvery oscular fringe can be seen externally, the rest of the sponge being quite hidden in the coral. Topsent (**45**) has described specimens of this species from the Azores, which grow in an exactly similar way in holes in coral.

*Distribution.*—North Atlantic: off the Cape Verde Islands, 100–128 fms. (**31**); off the Azores, 523–1600 metres (**45**). Pacific: off Amboina (**41**).

### Family *GEODIIDAE*.

### **Pachymatisma johnstonia** (Bowerbank).

W. 141—13 VIII '10. Off Reenacry Head, Co. Kerry, soundings 37 fms., gravel. Dredge.—One specimen.

The only specimen obtained is very small. It spreads in a thin encrustation over a stone, and is about 15 mm. by 10 mm. in extent.

This well-known species has previously been obtained off several parts of the Irish coast, usually between tide-marks at extreme low water.

*Distribution.*—North Atlantic: off the north-western coasts of Europe, from Norway to France. Bathymetrical range from between tide-marks to 180 fathoms.

### [1] **Geodia nodastrella,** Carter.

Plate IV, fig. 1.

S.R. 480—28 VIII '07. 51° 23′ N., 11° 38′ W., soundings 468 fms., stones. Oyster dredge.—One specimen.

The sponge is a good deal injured and is broken into two pieces. It shows no signs of having been attached to any support. It is 30 mm. by about 22 mm. in diameter. A cribriform membrane covers the sponge. No oscular areas could be made out. The surface is smooth and the colour, in spirit, is a pale yellowish white. The spiculation agrees exactly with that of a fragment of one of the specimens dredged by the *Porcupine* at Station 65, 1869, with which the Irish specimen was compared.

The spicules in the Irish specimen measure as follows:—

(1) Somal oxea, curved, sharply pointed and rather slender for their length, which varies between 2 and 4·5 mm. Thickness, 0·03–0·04 mm.

[1] See also Addenda, p. 38.

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Trawl. Temperature at 600 fms.,
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**ıodastrella,** Carter.

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51° 23′ N., 11° 38′ W., soundings
Oyster dredge.—One specimen.
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ıarply pointed and rather slender for
h varies between 2 and 4·5 mm.
4 mm.

ɔo Addenda, p. 38.



(2) Cortical oxea, 0·35 mm. in length by 0·007 mm.

(3) Dichotriaenes. Shaft straight, tapering to a long slender point, or with the point rounded off ; 2–4 mm. in length by 0·08–0·1 mm. beneath the cladome. Protocladi 0·15–0·2 mm. in length. Deuterocladi about 0·2–0·25 mm. in length.

(4) Anatriaenes. Shaft up to 5·5 mm. in length by 0·02–0·025 mm. beneath the cladome. Cladi, 0·1 mm. long. Chord, 0·15 mm.

(5) Promesotriaenes. Only broken ones were seen. The cladi are about 0·175 mm. long.

(6) Sterrasters, oval, rather uniform in size, averaging 0·11 mm. by 0·09 mm.

(7) Somal spherasters, with fairly well-marked centrum and blunt rays. Diameter 0·005–0·008 mm.

(8) Spherasters occurring in numbers beneath the sterrasteral layer. Centrum large, with numerous rays. These rays vary very much in shape. In some of the spherasters they are fairly long and sharply pointed ; in others they are short and blunt ; in others, again, they are reduced to rounded tubercles. These spherasters are from 0·014 mm. to 0·024 mm. in diameter.

(9) Choanosomal oxyasters, with slender rays 0·01–0·012 mm. in length. The rays are usually 8–9 in number. Diameter of the whole aster, 0·02–0·024 mm.

These spicules agree exactly in shape with those of the fragment of the *Porcupine* specimen, and their measurements also agree closely with those of the earlier specimen, as far as the latter could be ascertained, the megascleres being rather broken in the only fragment available.

The following are some of the measurements of the spicules of the *Porcupine* specimen :—Somal oxea, 2–3 mm. long by 0·03 mm. in thickness ; cortical oxea, 0·25 mm. long by 0·007 mm. ; dichotriaenes, shaft 0·075–0·09 mm. in thickness beneath the cladome. A few broken promesotriaenes were seen. Sterrasters, 0·1 mm. by 0·08 mm. ; somal spherasters, 0·005 mm. in diameter ; subcortical spherasters, with large centrum and with sharp or blunt rays, or with rounded tubercles, 0·014–0·02 mm. ; choanosomal oxyasters with rays 0·008–0·01 mm. long.

*Distribution.*—North Atlantic : "in deep water between the north of Scotland, the north-west of Shetland, and the Färöe Islands, at Stations 51, 57, 61–63 and 65, respectively ; also near Cape St. Vincent." *Porcupine* Expedition, 1869 (**3**, p. 399).

The specimen at first named *Geodia nodastrella* by Topsent (**37**) has since been assigned by him to *Geodia eosaster*, Sollas (**45**).

## Sidonops atlantica, n. sp.

Plate II, fig. 1, and Plate IV, fig. 3.

S.R. 151—27 VIII '04. 50 miles W.N.W. of Eagle Island, 54° 17′ N., 11° 33′ W., soundings 388 fms, stones and rock. Dredge, 388 fms. Temperature at 388 fms., 9.15°C.—One specimen.

The sponge is growing on a piece of *Retepora*. It is more or less rounded in shape, and measures 27 mm. in length by 20 mm. in height. It is a good deal broken at one end.

The surface is perfectly smooth for the most part, but here and there a few megascleres project beyond it.

The oscula are confined to the upper surface of the sponge. They are small, simple openings, averaging about 0·5 mm. in diameter. Some of them have a very slightly raised margin.

The pores are restricted to the free part of the under surface of the sponge. They are from 0·075 to 0·3 mm. in diameter, and they occur in sieve-like areas which are about 0·3–0·5 mm. across. Each pore-sieve contains usually from two to four pores.

The colour, in spirit, is pale buff-yellow.

The skeleton consists, as is usual in the genus, of radiating bundles of megascleres. The cladi of the orthotriaenes are extended beneath the sterrasteral layer, which is about 0·35 to 0·5 mm. in thickness.

Neither cortical oxea nor promesotriaenes could be found in situ. A few small oxea were scattered through several of the spicule-preparations, but it was impossible to decide whether they belonged to the sponge or not. Two or three broken promesotriaenes were also seen.

*Spicules*:—

(1) Somal oxea, curved, tapering to fairly sharp points. Length 2·4–3·4 mm. by 0·045–0·06 mm.

(2) Orthotriaenes. Shaft 2–3 mm. long by 0·07–0·09 mm. beneath the cladome, tapering to a blunt point. Cladi 0·4–0·55 mm. long by about 0·05 mm. at the base. Occasionally the cladi divide so that a few dichotriaenes are to be seen.

(3) Anatriaenes. Shaft 2–3 mm. in length by 0·01–0·02 mm. beneath the cladome, tapering to a long slender point. Cladi 0·09–0·16 mm. long. Chord 0·125–0·2 mm.

(4) Promesotriaenes. One broken spicule measured as follows: shaft, 3 mm. long by 0·015 mm., cladi about 0·13 mm. long.

(5) Sterrasters, oval, 0·1 mm. by 0·08 mm. in diameter.

(6) Somal spherasters, with comparatively large centrum and numerous slender, sharply-pointed, or occasionally blunt rays, 0·005–0·01 mm. in diameter. Towards the interior of the sponge the spherasters are slightly larger, being about 0·015–0·02 mm. in diameter.

**ps atlantica,** n. sp.

. 1, and Plate IV, fig. 3.

50 miles W.N.W. of Eagle Island,
3′ W., soundings 388 fms, stones and
88 fms. Temperature at 388 fms.,
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One broken spicule measured as follows:
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, with comparatively large centrum and
ler, sharply-pointed, or occasionally blunt
1 mm. in diameter. Towards the interior
the spherasters are slightly larger, being
·02 mm. in diameter.



(7) Choanosomal oxyasters, with minutely spined rays which are conical, and which taper to a sharp point. The rays are usually 3–9 in number and are 0·04–0·055 mm. in length by about 0·006 mm. at the base. Diameter of the whole aster 0·075–0·11 mm. The oxyasters are very abundant.

A few small fragments of a Geodine sponge are in the collection. These fragments are, for the most part, from the interior of the sponge, and are too incomplete to identify. They were dredged at S.R. 151–27 VIII '04. 50 miles W.N.W. of Eagle Island, 54° 17′ N., 11° 33′ W., soundings 388 fms., stones and rock. Dredge. Temperature at 388 fms., 9.15°C.

## SUB-ORDER SIGMATOPHORA.

### FAMILY *TETILLIDAE*.

**Tethya cranium** (Müller).

S.R. 151—27 VIII '04. 50 miles W.N.W. of Eagle Island, 54° 17′ N., 11° 33′ W., soundings 388 fms., stones and rock. Dredge. Temperature at 388 fms., 9.15°C.—Two specimens.

S.R. 196—11 II '05. 54° 42′ N., 10° 34′ W., soundings 242 fms., stones and coral. Oyster dredge. Temperature at 235 fms., 9.8°C.—One specimen.

S.R. 277—15 XI '05. 50 miles W.N.W. of Eagle Island, 54° 17′ 30″ N., 11° 34′ W., soundings 550 fms., gravel and shells. Oyster dredge.—Two specimens.

The specimens obtained are all small, being only from 4 to 6 mm. in diameter. They are growing on specimens of *Mycale* sp. and *Stylostichon* sp.

The species has been previously recorded for the Irish area, namely, in Dingle Bay and off the Aran Islands, Co. Galway (**50**).

*Distribution.*—Arctic and North Atlantic Oceans from many localities at depths of 15 to 550 fms.

### iii. MONAXONELLIDA (SUB-ORDER ASTROMONAXONELLIDA).

Of the Monaxonellid sponges obtained by the Fisheries Branch, only those belonging to the sub-order Astromonaxonellida, Dendy, are described in this paper.

The Astromonaxonellida which were obtained during the cruises of the *Helga* off the Mayo coast in the years 1909-1911, and which, therefore, belong to the collections of the Fisheries Branch, are included in this report. They have previously been recorded in the report on the sponges of the Clare Island Survey (**33**), and in a paper on the Results of a Biological Survey of Blacksod Bay (**5**), but details of the Stations were not given in the first-mentioned report.

Twenty-seven species of Astromonaxonellida are in the collection. The classification is taken from Professor Dendy's work on Ceylon sponges (**4**).

The following is a list of the species :—

ORDER TETRAXONIDA.

GRADE **MONAXONELLIDA.**

SUB-ORDER ASTROMONAXONELLIDA.

*Topsentia glabra* (Topsent).
*Donatia lyncurium* (Linn.).
*Timea Hallezi* (Topsent) var. *crassa*, Topsent.
*Latrunculia Normani*, n. sp.
*Cliona celata*, Grant.
*Cliona vastifica*, Hancock.
*Cliona lobata*, Hancock.
*Cliona levispira*, Topsent.
*Cliona Pruvoti*, Topsent.
*Cliona labyrinthica*, Hancock.
*Cliona coralliophaga*, n. sp.
*Alectona Millari*, Carter.
*Vibulinus stuposus* (Montagu).
*Vibulinus rigidus* (Montagu).
*Polymastia mammillaris* (Müller).
*Polymastia robusta*, Bowerbank.
*Tentorium semisuberites* (Schmidt).
*Quasillina brevis* (Bowerbank).
*Spinularia spinularia* (Bowerbank).
*Atergia corticata*, gen. et sp. n.
*Suberites caminatus*, Ridley and Dendy.
*Suberites gibbosiceps*, Topsent.
*Suberites carnosus* (Johnston).
*Ficulina ficus* (Linn.).
*Laxosuberites incrustans*, n. sp.
*Laxosuberites durus*, n. sp.
*Terpios fugax*, Duchassaing and Michelotti.

Of the foregoing, one genus and five species are described as new, while the following fourteen species are now obtained for the first time within the Irish area.

*Topsentia glabra.*
*Timea Hallezi*, var. *crassa* (**33**)
*Cliona vastifica.*
*Cliona lobata.*
*Cliona levispira.*
*Cliona Pruvoti.*
*Cliona labyrinthica.*
*Alectona Millari.*
*Vibulinus rigidus* (**33**).
*Tentorium semisuberites.*
*Quasillina brevis.*
*Spinularia spinularia.*
*Suberites caminatus.*
*Suberites gibbosiceps.*

: Astromonaxonellida are in the col-
ı is taken from Professor Dendy's
4).

f the species :—

TETRAXONIDA.

MONAXONELLIDA.

TROMONAXONELLIDA.

'opsent).
(Linn.).
ɔsent) var. *crassa*, Topsent.
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ancock.
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opsent.
psent.
, Hancock.
*a*, n. sp.
'arter.
(Montagu).
Montagu).
*llaris* (Müller).
, Bowerbank.
*erites* (Schmidt).
Bowerbank).
*ria* (Bowerbank).
en. et sp. n.
, Ridley and Dendy.
*is*, Topsent.
(Johnston).
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*s*, n. sp.
hassaing and Michelotti.

genus and five species are described
ng fourteen species are now obtained
the Irish area.

*Alectona Millari.*
ı (33) *Vibulinus rigidus* (33).
*Tentorium semisuberites.*
*Quasillina brevis.*
*Spinularia spinularia.*
*Suberites caminatus.*
*Suberites gibbosiceps.*



With the exception of the following six species, *Cliona vastifica, C. lobata, Alectona Millari, Vibulinus rigidus, Quasillina brevis* and *Spinularia spinularia*, these sponges are also new to the British area.

Three of the species, *Cliona levispira, C. Pruvoti* and *Suberites gibbosiceps* have been recorded only once previously.

With regard to the Clionidae, only one species, *Cliona celata*, was, up to the present, known to occur off the Irish coast. Eight species of boring sponges are included in this collection. Three of these, *Cliona celata, C. vastifica* and *C. lobata*, have been found boring in oyster shells taken from oyster beds at different parts of the coast. So far, the first named only has been found in abundance, but *C. vastifica* will probably prove to be fairly common when specially looked for. The third species, *C. lobata*, bores very small galleries in shells and is, therefore, easily overlooked, but it is apparently not as common as *C. vastifica*. The remaining species of boring sponges in the collection have all been dredged in deep water. They are boring in masses of coral (*Lophohelia* and *Amphihelia*). *C. vastifica* is the only species so far found off the Irish coast boring in both coral and oyster shells.

Professor Topsent (**43**) in his detailed account of the Clionidae of France gives nine species and one variety as occurring off the French coast.

With the exception of two of these species and the variety, namely, *Cliona Schmidti, C. viridis* and *C. viridis* var. *Carteri*, all the species enumerated by Professor Topsent in his monograph have now been found within the Irish area.

## Order TETRAXONIDA.

## Grade MONAXONELLIDA.

## Sub-order ASTROMONAXONELLIDA.

## Family *EPIPOLASIDAE*.

### **Topsentia glabra** (Topsent).

S.R. 353—6 VIII '06. 50° 37′–50° 40′ N., 11° 32′ W., soundings 250–542 fms., mud and sand. Trawl. Temperature at 500 fms., 8.58°C.—Three specimens.

The sponges are growing on coral (*Lophohelia prolifera*), and one of them spreads over an *Arca* shell which is attached to the coral.

The largest specimen is a thin encrustation about 20 mm. by 15 mm. in extent. In spite of its small size it is noticeable on account of its smooth, shining surface.

The large oxea have a maximum size of about 1 mm. by 0·02 mm. They are thus rather more slender than the oxea

of the type which reach a maximum diameter of 0·03 mm. In the remaining specimens the large spicules are modified into strongyloxea, a modification noted by Topsent in two of his specimens. Here again the large spicules are rather slender; a few only among them reach a diameter of 0·015 mm., while the corresponding spicules of the first-found specimens have a maximum diameter of 0·02 mm.

*Distribution.*—Off the Azores in 200–1360 metres (**45**), and in the Mediterranean, off La Calle, Algeria (**44**).

### Family *DONATIIDAE.*

### **Donatia lyncurium** (Linn).

L. 37—11 II '02. Black Rocks, Ballynakill Harbour. Shore collecting.—Two specimens.

S. 568–570—24–25 I '08. Ballyvaldon, soundings 10½–7 fms. Oyster dredge.—Three specimens.

W. 141—13 VIII '10. Off Reenacry Head, Co. Kerry, soundings 37 fms., gravel. Dredge.—One specimen.

S. 597—6 II '11. Ballyvaldon oyster beds, Norris Castle Coastguard Station, Co. Wexford, soundings 7–8 fms. Naturalist's dredge.—One specimen.

This well-known species is fairly common off the Irish coast between tide-marks, at extreme low tide, and in deeper water. The largest specimen in the present collection is 40 mm. in diameter.

*Distribution.*—Arctic and North Atlantic Oceans; Mediterranean; Gulf of Manaar. Bathymetrical range between tide-marks, at extreme low water, to 216 fathoms.

### Family *SPIRASTRELLIDAE.*

### **Timea Hallezi** (Topsent), var **crassa**, Topsent.

W. 83—25 V '09. 2·3 miles S.E. ½ S. of Inishturk Tower, soundings 13 fms., coral. Naturalist's dredge.—One specimen.

The single specimen obtained by the *Helga* has already been recorded in the report on the sponges taken during the Clare Island Survey (**33**).

### **Latrunculia Normani,** n. sp.

Plate V, fig. 2.

S.R. 151—27 VIII '04. 50 miles W.N.W. of Eagle Island, 54° 17′ N., 11° 33′ W., soundings 388 fms., stones and rock. Dredge. Temperature at 388 fms., 9.15°C.—One specimen.

S.R. 480—28 VIII '07. 51° 23′ N., 13° 38 W., soundings 468 fms., stones. Oyster dredge.—One specimen.

a maximum diameter of 0·03 mm.
ns the large spicules are modified
ication noted by Topsent in two of
the large spicules are rather slender;
ach a diameter of 0·015 mm., while
of the first-found specimens have a
2 mm.

es in 200–1360 metres (**45**), and in
off La Calle, Algeria (**44**).

*DONATIIDAE.*

**lyncurium** (Linn).

Rocks, Ballynakill Harbour. Shore
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Ballyvaldon, soundings 10½–7 fms.
ee specimens.
eenacry Head, Co. Kerry, soundings
edge.—One specimen.
aldon oyster beds, Norris Castle
Co. Wexford, soundings 7–8 fms.
—One specimen.

s fairly common off the Irish coast
eme low tide, and in deeper water.
e present collection is 40 mm. in

North Atlantic Oceans; Mediter-
aar. Bathymetrical range between
ne low water, to 216 fathoms.

*RASTRELLIDAE.*

sent), var **crassa**, Topsent.

es S.E. ½ S. of Inishturk Tower,
coral. Naturalist's dredge.—One

ained by the *Helga* has already
on the sponges taken during the

**Normani**, n. sp.

V, fig. 2.

miles W.N.W. of Eagle Island,
., soundings 388 fms., stones and
perature at 388 fms., 9.15°C.—One

23′ N., 13° 38 W., soundings 468
dredge.—One specimen.



The specimen from S.R. 151 is a mere fragment growing on a block of sandstone. The second specimen spreads in a very thin encrustation, of considerable extent, over the branches of a piece of coral (*Lophohelia prolifera*).

The surface of the sponge is smooth, but is here and there raised up into minute hillocky elevations.

The colour, in spirit, is cream white.

The pores are arranged in areas; the oscula are not apparent.

The main skeleton consists of strong fibres, made up of closely-packed, multiserially arranged styli, which run upwards through the sponge, and which are continued in a horizontal direction beneath the dermal layer of discasters.

The dermal skeleton consists of a single layer of vertically placed discasters, which are set closely together. Discasters also occur scattered through the choanosome.

*Spicules.*

(1) Styli, with a straight, polytylote shaft, having a length of 0·5–0·65 mm. by 0·008 mm.

(2) Discasters of two kinds—(*a*) Somal discasters, which possess a basal verticil of, usually, 4 to 6 downwardly directed simple spines. At the middle of the spicule is another verticil, which is cut into four broad lobes by four deep indentations reaching nearly to the shaft. Each of these lobes has a denticulated outer margin. At the upper end of the spicule is a verticil of 4 strong, upwardly directed spines, with slightly serrated outer margins. Above this verticil is the short, serrated cone-shaped apex of the spicule. Somal discasters, 0·06–0·075 mm. in length, with a diameter of 0·05 mm. across the middle verticil. (*b*) Choanosomal discasters. The shaft of this kind of spicule is continued to a strong point at either end. There are two verticils of spines, one at the middle of the spicule, and the other, which consists of 4 simple, upwardly directed spines, about 0·04 mm. long, towards one end of the spicule. The point at the other end of the spicule is sometimes bifurcated. Length of the spicule, 0·1–0·13 mm.

The somal discasters of the new species are very similar in shape to those of *Latrunculia natalensis*, Kirkpatrick (**15**), but they are about twice their size. The African species differs also in the shape of its choanosomal discasters and megascleres, as well as in its external appearance.

A spicule-preparation, labelled "*Latrunculia cratera* Bocage, variety, Lervig, Norway, 1879," in a collection of Canon Norman's slides proved to belong to the same species as the Irish specimen, which is therefore named after Canon Norman, the first collector of the species.

FAMILY *CLIONIDAE.*

**Cliona celata**, Grant.

M.L. CXVId.—17 XII '01. 1 mile S.E. of Lyon Head, Ballynakill Harbour, soundings 14 fms.

Helga 119—21 I '03. Off Arklow, soundings 10 fms.
L. 257—20 X '03. Channel off Coastguard Bay, Ballynakill Harbour, soundings 4–8 fms.
A. 5—1 VI '04. ½ mile S. by E. of Mutton Island, Galway Bay, soundings 6 fms.
A. 32—26 VII '04. Between Renville Point and Hare Island, Galway Bay, soundings 4 fms.
S.R. 147—24 VIII '04. 120 miles W.N.W. of Slyne Head, Porcupine Bank, 53° 27′ N., 13° 37′ W., soundings 91½ fms., gravel, sand and shells.
Ardfry, Co. Galway.—Oyster beds, October and December, 1906, and December, 1909.
W. 74—24 V '09. 3·3 miles N. ½ W. of Clare Island Light, soundings 25 fms., rock. Oyster dredge.
W. 106—23 VIII '09. 0·7 miles S. of Mallaranny Pier, Clew Bay, soundings 5½–11 fms.
Blacksod Bay, between tide-marks to 8 fms., at the following stations:—

| | |
|---|---|
| W. 125—18 IX '09. | W. 183—16 III '11. |
| W. 131—11 III '10. | W. 185—17 III '11. |
| W. 137—14 III '10. | W. 233—21 IX '11. |
| W. 163—18 IX '10. | W. 234—23 IX '11. |
| W. 178—13 III '11. | W. 235—24 IX '11. |
| W. 180—15 III '11. | W. 237—26 IX '11. |

W. 204—20 VIII '11. 0·9 miles S.S.E. ¼ S. of Caher Point, Caher Island, soundings 11 fms., stones. Naturalist's dredge.
W. 206—21 VIII '11. 3·8 miles N.W. ¼ N. of Clare Island Lighthouse, soundings 25 fms., stones. Naturalist's dredge.
W. 222—22 VIII '11. 2 miles S.W. by S. ½ S. of Clare Island Look-out Tower, soundings 25½ fms., stones. Canvas dredge.
Mizzen Head, Co. Wicklow, public oyster beds.

*Cliona celata* is common off the Irish coasts, especially in shallow water. It is frequently found boring in oyster shells and in limestone, and it often occurs massive.
The specimen dredged at S.R. 147 is boring in a shell of *Liomesus Dalei*.

*Distribution.*—Eastern and western shores of the North Atlantic; Mediterranean; off the south and south-west coasts of Australia, and off New Guinea. Bathymetrical range from between tide-marks to 110 fathoms.

### **Cliona vastifica**, Hancock.

Off Cleggan Head.—September, 1901.
Mizzen Head, Co. Wicklow; public oyster beds.
S.R. 1177—22 V '11. 53 miles W. ½ N. of Blackball Head, 51° 21′ N., 11° 24′ W., soundings 152½ fms., sand. Naturalist's dredge.

: Arklow, soundings 10 fms.
nel off Coastguard Bay, Ballynakill
4–8 fms.
ɔ. by E. of Mutton Island, Galway
ms.
:en Renville Point and Hare Island,
ings 4 fms.
20 miles W.N.W. of Slyne Head,
° 27′ N., 13° 37′ W., soundings 91½
ıd shells.
ster beds, October and December,
r, 1909.
es N. ½ W. of Clare Island Light,
rock. Oyster dredge.
miles S. of Mallaranny Pier, Clew
1 fms.
e-marks to 8 fms., at the following

W. 183—16 III '11.
W. 185—17 III '11.
W. 233—21 IX '11.
W. 234—23 IX '11.
W. 235—24 IX '11.
W. 237—26 IX '11.

miles S.S.E. ¼ S. of Caher Point,
lings 11 fms., stones. Naturalist's

miles N.W. ¼ N. of Clare Island
ıgs 25 fms., stones. Naturalist's

iles S.W. by S. ½ S. of Clare Island
undings 25½ fms., stones. Canvas

, public oyster beds.

off the Irish coasts, especially in
ently found boring in oyster shells
ften occurs massive.
t S.R. 147 is boring in a shell of

vestern shores of the North Atlantic ;
he south and south-west coasts of
Jew Guinea. Bathymetrical range
arks to 110 fathoms.

**stifica,** Hancock.
ıber, 1901.
; public oyster beds.
niles W. ½ N. of Blackball Head,
W., soundings 152½ fms., sand.



This widely-spread species, although previously unrecorded for Ireland, will probably prove to be fairly abundant in our waters, when it is specially looked for, as it is common off the coasts of France, from between tide-marks to deep water (**43**).

The specimen dredged off Cleggan Head is boring in a shell of *Fusus propinquus*, while those from S.R. 1177 are in coral (*Lophohelia prolifera*). The Mizzen Head specimens are boring in oyster shells.

*Distribution.*—European coasts of the North Atlantic ; Mediterranean ; Black Sea ; Gulf of Mexico ; Red Sea, Indian Ocean ; off Japan, New Zealand and South-west Australia. Bathymetrical range from between tide-marks to 328 fathoms.

### **Cliona lobata,** Hancock.

Mizzen Head, Co. Wicklow ; public oyster beds.

Ardfry, Co. Galway, October, 1906 ; "Main Pond" oyster beds.

This species is probably not very common off our coasts, but it is liable to be overlooked, owing to the small size of its papillae.

Only two specimens are in the present collection. Each is boring in an oyster shell.

*Distribution.*—Western coasts of Europe, from Great Britain and Denmark to France ; Mediterranean, off the south coast of France ; off the west coast of Cape Colony (25 fathoms).

### [1] **Cliona levispira,** Topsent.

S.R. 353—6 VIII '06. 50° 37′–50° 40′ N., 11° 32′ W., soundings 250–542 fms., mud and sand. Trawl. Temperature at 500 fms., 8.58°C.

S.R. 504—12 IX '07. 50° 42′ N., 11° 18′ W., soundings 627–728 fms., coral. Trawl.

S.R. 1004—12 VIII '10. 51 miles W. ½ S. of Great Skellig, 51° 22′ 30″ N., 11° 44′ 30″ W., soundings 641–636 fms., fine sand. Trawl.

This well-characterised species has, up to the present, only been obtained off the Azores (**45**), where it appears to be common, boring in coral, taken at depths of 1165–1360 metres.

The Irish specimens agree in every particular with the description of the first-found specimens. The species is not abundant in the present collection, and occurs boring in coral (*Lophohelia prolifera*).

[1] See also Addenda, p. 38.

**Cliona Pruvoti,** Topsent.

S.R. 151—27 VIII '04. 50 miles W.N.W. of Eagle Island, 54° 17′ N., 11° 33′ W., soundings 388 fms., stones and rock. Dredge.

S.R. 480—28 VIII '07. 51° 23′ N., 11° 38′ W., soundings 468 fms., stones. Oyster dredge.

This species has been taken only off the Mediterranean coast of France at depths of 500–600 metres, nor does it appear to be common off the Irish coast.

The specimens dredged by the *Helga* are boring in coral (*Amphihelia oculata*). They agree exactly with the description given by Topsent (**43**) of the first-found specimens. The small oxea are 0·1–0·15 mm. in length by 0·002 mm ; the large oxea have a maximum size of 0·3 mm. by 0·009 mm. The spinispirae are 0·005 mm. in length.

**Cliona labyrinthica,** Hancock.

S.R. 277—15 XI '05. 50 miles W.N.W. of Eagle Island, 54° 17′ 30″ N., 11° 34′ W., soundings 550 fms., gravel and sand. Oyster dredge.

S.R. 353—6 VIII '06. 50° 37′–50° 40′ N., 11° 32′ W., soundings 250–542 fms., mud and sand. Trawl. Temperature at 500 fms., 8.58°C.

S.R. 480—28 VIII '07. 51° 23′ N., 11° 38′ W., soundings 468 fms., stones. Oyster dredge.

S.R. 504—12 IX '07. 50° 42′ N., 11° 18′ W., soundings 627–728 fms., coral. Trawl.

S.R. 1004—12 VIII '10. 51 miles W. ½ S. of Great Skellig, 51° 22′ 30″ N., 11° 44′ 30″ W., soundings 641–636 fms., fine sand. Trawl. Temperature at 630 fms., 7.12°C.

This species is fairly abundant in the collection. It occurs boring in coral (*Lophohelia prolifera*). The spicules agree exactly in size and shape with the spicules of specimens of *C. labyrinthica* found boring in coral.

The oxea are from 0·125–0·15 mm. in length by 0·009 mm. They are thus both longer and thicker than the spicules of specimens found boring in shells (**43**).

*Distribution.*—Off the Azores, 793–1424 metres (**45**); off the Mediterranean coast of France, 500–600 metres (**43**). The locality from which the first-found specimen was obtained is unknown (**8**).

**Cliona coralliophaga,** n. sp.

Plate V, fig. 1.

S.R. 504—12 IX '07. 50° 42′ N., 11° 18′ W., soundings 627–728 fms., coral. Trawl. Temperature at 600 fms., 8.22°C.

**ruvoti,** Topsent.

) miles W.N.W. of Eagle Island, V., soundings 388 fms., stones and

[° 23′ N., 11° 38′ W., soundings yster dredge.

:aken only off the Mediterranean ! 500–600 metres, nor does it appear coast.

by the *Helga* are boring in coral ' agree exactly with the description e first-found specimens. The small :ngth by 0·002 mm; the large oxea )·3 mm. by 0·009 mm. The spini- ngth.

**yrinthica,** Hancock.

) miles W.N.W. of Eagle Island, 34′ W., soundings 550 fms., gravel dredge.

37′–50° 40′ N., 11° 32′ W., soundings and sand. Trawl. Temperature at

° 23′ N., 11° 38′ W., soundings 468 r dredge.

42′ N., 11° 18′ W., soundings 627– awl.

51 miles W. ½ S. of Great Skellig, 44′ 30″ W., soundings 641–636 fms., Temperature at 630 fms., 7.12°C.

undant in the collection. It occurs a *prolifera*). The spicules agree ex- ith the spicules of specimens of *C.* n coral.

5–0·15 mm. in length by 0·009 mm. er and thicker than the spicules of shells (**43**).

Azores, 793–1424 metres (**45**); off of France, 500–600 metres (**43**). the first-found specimen was obtained

**oralliophaga,** n. sp.

ate V, fig. 1.

° 42′ N., 11° 18′ W., soundings 627– Trawl. Temperature at 600 fms.,



The sponge forms extensive cavities in coral (*Lophohelia prolifera*). It has the lobed form typical of boring sponges. The lobes are usually elongated and are somewhat quadrangular in outline; they are up to 7 mm. in length by 5 mm. in width, but they vary considerably in size and shape; they are joined to each other by very slender connections.

The papillae are small and are few in number. They are about 0·4–0·5 mm. in diameter.

The colour in spirit is a pale pinkish purple where the sponge is exposed at the broken ends of the coral to the direct action of the spirit. The colour is deeper in those parts of the sponge which are protected by the unbroken coral.

"Cellules sphéruleuses" are extremely abundant through the sponge, and are 0·008–0·01 mm. in diameter.

The skeleton consists of an irregular reticulation of rather closely packed oxea. At the surface of the sponge the spicules lie, for the most part, tangentially, but the ends of a few of them project very slightly from the sponge. The skeleton is as irregular in the papillae as in the lobes.

*Spicules:—*

The only kind of spicules present are oxea. Spinispirae were looked for carefully, but without success. The oxea are of very different sizes, but all are of the same type. They vary from 0·08 mm. to 0·55 mm. in length by 0·0025 mm. to 0·011 mm. in thickness. The oxea taper gradually to long points; they are biangulated, that is to say, they are bent twice in the same direction, the bends being rather far from each other. Sometimes there is a slight swelling in the middle of the spicule. The oxea are very similar in shape to those of *Spongosorites placenta*, Topsent (**43**).

Two species of Cliona, namely, *C. labyrinthica*, Hancock, and *C. nodosa*, Hancock, are known, which possess oxea as the sole form of spicule. The new species differs from both these in the size and shape of the oxea.

Three species, dredged off Madeira, have been described by J. Y. Johnson (**11**) as boring sponges possessing oxea only. It is possible, as Topsent (**45**) suggests, that these sponges are not all Clionids. In any case, their oxea differ altogether in size and shape from those of the new species.

### [1] Alectona Millari, Carter.

S.R. 151—27 VIII '04. 50 miles W.N.W. of Eagle Island, 54° 17′ N., 11° 33′ W., soundings 388 fms., stones and rock. Dredge. Temperature at 388 fms., 9.15°C.

S.R. 277—15 XI '05. 50 miles W.N.W. of Eagle Island, 54° 17′ 30″ N., 11° 34′ W., soundings 550 fms., gravel and sand. Oyster dredge.

[1] See also Addenda, p. 38.

S.R. 353—6 VIII '06. 50° 37′–50° 40′ N., 11° 32′ W., soundings 250–542 fms., mud and sand. Temperature at 500 fms., 8.58°C.
S.R. 479—28 VIII '07. 51° 20′ N., 11° 41′ W., soundings 468–560 fms. Trawl. Temperature at 400 fms., 9.55°C.
S.R. 480—28 VIII '07. 51° 23′ N., 11° 38′ W., soundings 468 fms., stones. Oyster dredge.
S.R. 487—3 IX '07. 51° 36′ N., 11° 57′ W., soundings 540–660 fms. Temperature at 500 fms., 8.65°C.
S.R. 1004—12 VIII 10. 51 miles W. ½ S. of Great Skellig, 51° 22′ 30″ N., 11° 44′ 30″ W., soundings 641–636 fms., fine sand. Trawl. Temperature at 630 fms., 7.12°C.

The Irish specimens of this well-known sponge are boring in coral (*Lophohelia prolifera* and *Amphihelia oculata*). The species occurs in far greater abundance, and forms more extensive cavities, than any other of the sponges in the collection which are boring in coral.

*Distribution.*—Off the eastern shores of the North Atlantic, from the Färöes to the Azores, and in the Mediterranean. Bathymetrical range from 250 to 660 fathoms.

## Family *ASTRAXINELLIDAE.*

### **Vibulinus stuposus** (Montagu).

Plate III, fig. 7.

L. 322—23 III '04. Coastguard Deep, Ballynakill Harbour, soundings 6–8 fms. Naturalist's dredge.—One specimen.
W. 96—26 V '09. 6·2 miles E. by S. ¾ S. of Clare Island Light, soundings 16 fms. Naturalist's dredge.—One specimen.
W. 141—13 VIII '10. Off Reenacry Head, Co. Kerry, soundings 37 fms., gravel. Dredge.—One specimen.

The largest specimen is 65 mm. in height and 99 mm. in width. It is fan-shaped and bears numerous branches.

*Distribution.*—Off the western coast of Europe, from the Orkneys to Spain. From shallow water to a depth of 74 fms.

### **Vibulinus rigidus** (Montagu).

W. 106—23 VIII '09. 0·7 miles S. of Mallaranny Pier, Clew Bay, soundings 5½–11 fms. Dredge. One specimen.

The single specimen obtained by the *Helga* has already been recorded in the report on the sponges of the Clare Island Survey (**33**).

*Distribution.*—Off the coasts of England and France.

0° 37′–50° 40′ N., 11° 32′ W., sound-
., mud and sand. Temperature at

1° 20′ N., 11° 41′ W., soundings 468–
Temperature at 400 fms., 9.55°C.
1° 23′ N., 11° 38′ W., soundings 468
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e from 250 to 660 fathoms.

*TRAXINELLIDAE.*

**stuposus** (Montagu).

te III, fig. 7.

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Naturalist's dredge.—One specimen.
es E. by S. ¾ S. of Clare Island Light,
Naturalist's dredge.—One specimen.
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l. Dredge.—One specimen.
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.1 fms. Dredge. One specimen.

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on the sponges of the Clare Island

ts of England and France.



## Family *POLYMASTIIDAE.*

### Polymastia mammillaris (Müller).

Helga LXXXVa.—5 VII '01. 40 miles N. of Cleggan Head, soundings 87 fms., sand and stones. Naturalist's dredge. Temperature at 80 fms., 9.5°C.—Two small specimens.

L. 36—10 II '02. Roeillaun Rocks, Ballynakill Harbour, shore collecting.—One specimen.

S.R. 178—16 XI '04. 40 miles N.W. by W. ¾ W. of Cleggan Head, 53° 36′ 30″ N., 11° 15′ 30″ W., soundings 74½ fms., coarse gravel and stones. Oyster dredge. Temperature at 74½ fms., 10.8°C.—Five small specimens.

W. 83—25 V '09. 2·3 miles S.E. ½ S. of Inishturk Tower, soundings 13 fms., coral. Naturalist's dredge.—Three small specimens.

The smallest specimens, which are growing on stones, vary from 3 to 8 mm. in diameter and each bears one papilla. The specimens obtained off Inishturk Island, at Station W. 83, are about 15 mm. in diameter and possess from one to four papillae each; they have already been recorded in the report on the Sponges of the Clare Island Survey (**33**), and they are interesting on account of the fact that several of the papillae bear buds at their summit.

*Distribution.*—Arctic Ocean; eastern and western shores of the North Atlantic; Mediterranean; Pacific Ocean. Bathymetrical range from between tide-marks at extreme low water to 630 fms.

### Polymastia robusta (Bowerbank).

S. 568–570—24–25 I '08. Ballyvaldon, Co. Wexford, soundings 10½–7 fms. Oyster dredge.—Two specimens.

S. 597—6 II '11. Ballyvaldon oyster beds, Norris Castle Coastguard Station, Co. Wexford, soundings 7½–8 fms. Naturalist's dredge.—Two specimens.

The largest specimen is oval in shape and measures 75 mm. by 47 mm., with a height of 45 mm.

This well-known species was only once previously noted for Ireland, namely, for Birterbuy Bay (**1**).

*Distribution.*—European and North American shores of the North Atlantic. Bathymetrical range from 7 to 693 fathoms.

### Tentorium semisuberites (Schmidt).

S.R. 151—27 VIII '04. 50 miles W.N.W. of Eagle Island, 54° 17′ N., 11° 33′ W., soundings 388 fms., stones and rock. Dredge. Temperature at 388 fms., 9.15°C.—Two specimens and a fragment.

S.R. 277—15 XI '05. 50 miles W.N.W. of Eagle Island, 54° 17′ 30″ N., 11° 34′ W., soundings 550 fms., gravel and shells. Oyster dredge.—Two specimens.

S.R. 353—6 VIII '06. 50° 37′–50° 40′ N., 11° 32′ W., soundings 250–542 fms., mud and sand. Trawl. Temperature at 500 fms., 8.58°C.—A fragment.

The specimens are growing on sandstone, on pebbles, and on a piece of dead coral. The largest is 20 mm. in height by 8 mm., and the smallest is 5 mm. in height by 1·5 mm.

*Distribution.*—Arctic Ocean; off the eastern and western shores of the North Atlantic; South Atlantic, off Tristan da Cunha. Bathymetrical range 60 to 1650 fathoms.

### **Quasillina brevis** (Bowerbank).

S.R. 151—27 VIII '04—50 miles W.N.W. of Eagle Island, 54° 17′ N., 11° 33′ W., soundings 388 fms., stones and rock. Dredge. Temperature at 388 fms., 9.15°C.—One specimen.

The sponge is 15 mm. in height by 3 mm. at its greatest breadth. It is oval in shape and has a well-marked stalk. There is a single osculum at its summit.

The large spicules are from 0·6–1 mm. in length, with a maximum thickness of 0·014 mm. The longer of these are often styli or subtylostyli, but the shorter ones have a well-defined head.

The small subtylostyli, situated in vertical bundles at the surface of the sponge, average about 0·2 mm. in length.

*Distribution.*—Arctic Ocean; eastern and western shores of the North Atlantic Ocean; Mediterranean. Bathymetrical range from 85 to 388 fathoms.

### **Spinularia** Gray.

In 1867 Gray (**7**) erected the genus *Spinularia* for the reception of *Tethea spinularia*, Bowerbank (**1**), altering, at the same time, the specific name of Bowerbank's sponge to *tetheoides*. Gray's definition of his new genus is as follows:—"Sponge, massive, depressed, minutely hispid. Oscules terminal, slightly raised. Spicules of two kinds:—1. Fusiform, sometimes curved. 2. Pin-shaped, head ovate."

Through the kindness of Mr. R. Kirkpatrick, I have been able to examine some of Bowerbank's sections, and a spicule-preparation of the type specimen of *Tethea spinularia*, Bowerbank. An examination of the slides shows that the spicules called "fusiformi-acerate" by Bowerbank, and "fusiform" by Gray are not oxea as one might conclude from the figure given by the first-named author (**1**, Plate XV, fig. 28), but rhaphides, collected into trichodragmata. The structure of the skeleton

50 miles W.N.W. of Eagle Island,
° 34′ W., soundings 550 fms., gravel
r dredge.—Two specimens.
° 37′–50° 40′ N., 11° 32′ W., sound-
mud and sand. Trawl. Temperature
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The largest is 20 mm. in height by
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is that of a Polymastid sponge ; the trichodragmata occur in the choanosome. An emended definition of the genus *Spinularia*, Gray, would therefore be as follows—Polymastidae possessing two kinds of spicules, tylostyli and rhaphides collected into trichodragmata, the latter occurring in the choanosome.

This definition at once recalls Topsent's genus *Rhaphidorus* (**42** and **45**), which possesses a similar spiculation and which, therefore, must now be regarded as a synonym of *Spinularia*, Gray.

A comparison of the type slides of *Tethea spinularia*, Bowerbank, with Topsent's descriptions and figures of *Rhaphidorus setosus*, the only species assigned to the newer genus, shows that these two species are identical.

*Spinularia spinularia* (Bowerbank) is represented in the present collection by one specimen.

### **Spinularia spinularia** (Bowerbank).

1866. *Tethea spinularia*, Bowerbank (**1**).
1867. *Spinularia tetheoides*, Gray (**7**).
1870. *Radiella spinularia*, Schmidt (**24**).
1898. *Rhaphidorus setosus*, Topsent (**42**).

Plate III, fig. 5. Plate V, fig. 3.

S.R. 277—15 XI '05. 50 miles W.N.W. of Eagle Island, 54° 17′ 30″ N., 11° 34′ W., soundings 550 fms., gravel and shells. Oyster dredge.—One specimen.

The sponge is 12 mm. in diameter, with a thickness of about 2 to 3 mm. It is nearly square in outline owing to the shape of the small pebble on which it is growing, and one side of which it completely covers. Near the summit of the sponge there is a single osculum, which is a little raised above the general surface.

The surface is hispid, especially towards the edge of the sponge, where the spicules project to a considerable distance. The drawings of the first-found specimens (**1**, Plate XV, figs. 23–26) do not show these long, projecting spicules, but Bowerbank states that none of these specimens possessed its natural base, so that the part containing these very long spicules may have been cut away ; or, as the sponges were dried, the long spicules may have been rubbed off.

The arrangement of the skeleton and the spiculation have been described by Topsent from the sponges dredged off the Azores and recorded by him, under the name of *Rhaphidorus setosus* (**42** and **45**). The tylostyli do not vary much from one specimen to another. They are rather thicker in the Azores sponges than in the more northern specimens, in which their maximum thickness is about 0·02 mm. The trichodragmata vary a good deal in length in the different specimens. In the

type they are 0·12 mm. in length ; in the Irish specimen they are 0·25 mm. long and in the Azores specimens from three different stations they are respectively 0·07 mm., 0·1 mm. and 0·26 mm. long. Fristedt (**6**) gives 0·3 mm. as the length of the corresponding spicules in the specimen from Swedish waters recorded by him under the name of *Radiella spinularia.*

*Distribution.*—Shetland (**1**); off the coast of Sweden (**6**); off Norway, 80–150 metres, as *R. spinularia* (W. Arndt, Jahresb. Schles. Gesell. vaterl. Cultur, 1913); off the Azores, at depths of 1360–4020 metres (**45**).

### **Atergia,** n.g.

Polymastidae massive, sessile, without papillae; possessing two kinds of spicules, tylostyli and oxea, the latter occurring scattered irregularly in the choanosome.

### **Atergia corticata,** n. sp.

Plate III, figs. 2, 3. Plate V, fig. 4.

S.R. 151—27 VIII '04. 50 miles W.N.W. of Eagle Island, 54° 17′ N., 11° 33′ W., soundings 388 fms., stones and rock. Dredge. Temperature at 388 fms., 9.15°C.—About ten specimens and fragments.

One small specimen is growing on a piece of *Retepora* ; another, the base of which only remains, is growing on a block of sandstone in company with several other species of sponges. The remaining specimens, which are larger and which are a good deal broken, have evidently been cut off similar pieces of sandstone.

The smaller and more complete specimens are nearly circular in outline and are thicker towards the centre than at the sides. The smallest is 5 mm. in diameter and bears one osculum, which is slightly raised above the general surface. Most of the specimens are more or less broken. Their greatest thickness is about 6 mm. Each possesses one to several oscula slightly raised above the surface. The largest piece is 18 mm. in diameter. The sponges are very similar in external appearance to the preceding species and to *Tylexocladus Joubini* Topsent (**45**, Plate I, fig. 9). The surface is slightly hispid over the greater part of the sponge, but where the long, projecting spicules are unbroken, the hispidation is very marked.

There is a very firm cortex about 0·35 mm. in thickness.

The colour in spirit is pale grey with a pink tinge.

The main skeleton consists of strong fibres running radially through the sponge from the base to the surface. These fibres are about 0·2 mm. in thickness near the base of the sponge; they divide into finer strands in their course to the periphery and fan out very slightly beneath the cortex, which they pierce. They are made up of multiserially arranged tylo-

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**rticata,** n. sp.

, 3. Plate V, fig. 4.

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styli, the points of which are directed upwards. The terminal tylostyli pierce the dermis and project for about half their length above the surface. These projecting tylostyli are usually broken off short on the more exposed parts of the sponge.

Isolated bundles of smaller tylostyli, one spicule in length, lie transversely to the main fibres.

Small oxea occur in immense numbers scattered irregularly through the choanosome.

The cortical skeleton consists of small tylostyli, extremely densely packed together and placed vertically to the surface of the sponge, from which their points project very slightly.

*Spicules*:—

(1) Tylostyli. These can be divided into two groups according to their position in the sponge. The tylostyli of the main fibres have a straight, slightly fusiform shaft, tapering to a very long, slender point at one end, and to a well-marked, rather elongated head at the other end. The maximum size of these spicules is about 1·5 mm. long by 0·018 mm. thick. The tylostyli of the cortex and of the transverse bundles have a slightly curved, fusiform shaft tapering to a short point. The shaft is rather broad and the neck more slender, recalling the shape of the corresponding spicules in *Sphaerotylus capitatus* (Vosmaer). The head is well defined and rounded, with sometimes a slight mucron. Length 0·15–0·4 mm. with a maximum diameter of 0·012 mm.

(2) Oxea, small, slightly curved, tapering evenly to sharp points. Occasionally with a slight swelling at the centre of the spicule. Length 0·07–0·1 mm. by 0·0025 mm.

Small oxea are known to occur in one genus belonging to the Polymastidae, namely, in *Tylexocladus*, Topsent (**45**), which resembles *Atergia* n.g. closely in spiculation, but which is clearly marked off by the possession of the peculiar form of exotylus, called by Topsent cladotylostylus, which is characteristic of the genus.

## Family *SUBERITIDAE*.

### **Suberites caminatus**, Ridley and Dendy.

Plate III, fig. 4.

S.R. 277—15 XI '05. 50 miles W.N.W. of Eagle Island, 54° 17′ 30″ N., 11° 34′ W., soundings 550 fms., gravel and shells. Oyster dredge.—One specimen.

The sponge, which is hemispherical in shape, is 9 mm. in diameter and 5 mm. in height. It agrees in every particular, both in external appearance and in spiculation, with Ridley and Dendy's description of the *Challenger* specimens.

*Distribution*.—Off Marion Island, 50–75 fms. (**21**); South Atlantic, off the Rio de la Plata, 600 fms (**21**). North

Atlantic, off Newfoundland, 1267 metres, and off Fayal, Azores, at 130 and 1900 metres (**37** and **45**). A variety of this species was taken by the National Antarctic Expedition off Balleney Island in 254 fms.

### **Suberites gibbosiceps** (Topsent).

Plate III, fig. 1.

S.R. 944—17 v '10. 86 miles W. $\frac{1}{4}$ N. of Great Skellig, 51° 22′ N., 12° 41′ W., soundings 982 fms., ooze. Shrimp trawl, 30′.—One specimen.

The sponge is growing on a piece of broken glass. It is about 61 mm. by 53 mm. in extent, with a greatest thickness of 16 mm., and it spreads over both sides of the glass. It agrees exactly in external appearance, as well as in spiculation, with Topsent's description (**45**) of the species. The large tylostyli have the same characteristically-shaped heads as described and figured by Topsent.

Up to this only five specimens of the sponge have been obtained. They were dredged at two stations off the Azores in 2252 and 1846 metres (**45**).

### **Suberites carnosus** (Johnston).

Ballynakill, LXIII.—20 III '00. Channel off Ross Point, Ballynakill Harbour, soundings 2–4 fms. Rake dredge.—Two specimens.

L. 257—20 X $\frac{1}{4}$'03.—Channel off Coastguard Bay, Ballynakill Harbour, soundings 4–8 fms. Naturalist's dredge.—One specimen.

W. 96—25 V '09. 6·2 miles E. by S. $\frac{3}{4}$ S. of Clare Island Light, soundings 16 fms. Naturalist's dredge.—Four specimens.

W. 108—25 VIII '09. Inishgowla Harbour, Clew Bay, soundings 1–4 fms. Naturalist's dredge.—One specimen.

W. 124—18 IX '09. North of Ardelly Point, Blacksod Bay, soundings 4$\frac{3}{4}$ fms. Naturalist's dredge.—Two specimens.

W. 183—16 III '11. Elly Bay, South, Blacksod Bay. Shore collecting.—One specimen.

*Suberites carnosus* is not very abundant off the Irish coast; it is occasionally found between tide-marks, but is more usually taken in a few fathoms of water.

The largest specimen in the collection is growing on a *Turritella* shell. It is 68 mm. in height by 45 mm. at its greatest width. It is penetrated in every direction by worm borings.

The small, encrusting specimen obtained off Clare Island in 25$\frac{1}{2}$ fathoms, which is referred to this species in the report on the Clare Island sponges (**33**), proved on re-examination to be a fragment of a *Laxosuberites*.

lland, 1267 metres, and off Fayal, )0 metres (**37** and **45**). A variety en by the National Antarctic Ex- Island in 254 fms.

**)osiceps** (Topsent).

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*Distribution.*—Off East Greenland; off the western shores of Europe; off the Azores; Mediterranean; Red Sea and Indian Ocean; off Australia. Bathymetrical range from between tide-marks, at extreme low water, to 450 fathoms.

### Ficulina ficus (Linn.).

Ballynakill Harbour, March, 1899.

Ballynakill LXIII—20 III '00. Channel off Ross Point, Ballynakill Harbour, soundings 2–4 fms.

Helga LIV—10 V '01. 2·9 miles N.E. by E. ¾ E. of Greenore Point, Co. Wexford, soundings 16 fms., stones, mud and sand. Oyster dredge.

Helga CXXIXd—11 IX '01. 40 miles W.N.W. of Cleggan Head, soundings 76½ fms., stones. Naturalist's dredge.

L. 264—9 XI '03. North Entrance, Ballynakill Harbour, soundings 6–8 fms. Otter trawl.

L. 287—2 II '04. "Unicorn," Fahy Bay, Ballynakill Harbour. Specimens scraped off bottom of ship.

L. 296—1 III '04. Roeillaun Rocks, Ballynakill Harbour. Shore collecting.

Galway Bay at depths of 1 to 10 fms. at the following stations—

| | |
|---|---|
| A. 5—1 VI '04. | A. 27—18 VII '04. |
| A. 16—27 VI '04. | A. 35—1 VIII '04. |
| A. 17—28 VI '04. | A. 124—9 VI '05. |

S.R. 145—23 VIII '04. 50 miles W.N.W. of Slyne Head, 53° 24 30′ N., 11° 38′ W., soundings 112 fms., fine sand.

S.R. 185—30 I '05. 70 miles S.W. of Fastnet, 50° 20′ N., 10° 20′ W., soundings 82½ fms., fine sand and shells.

S.R. 226—13 V '05. 53° 12′ N., 13° 57′ W., soundings 93 fms., gravel and shells.

W. 78—24 V '09. Inishlyre Harbour, Clew Bay, soundings 5 fms. Naturalist's dredge.

Blacksod Bay, between tide-marks to 8 fms., at the following stations:—

| | |
|---|---|
| W. 115—16 IX '09. | W. 183—16 III '11. |
| W. 124—18 IX '09. | W. 186—18 III '11. |
| W. 134—13 III '10. | W. 187—18 III '11. |
| W. 167—21 IX '10. | W. 188—18 III '11. |
| W. 171—23 IX '10. | W. 237—26 IX '11. |

W. 216—21 VIII '11. Clew Bay, 3·8 miles N.E. ½ N. of Carrowmore, soundings 18 fms., rock and sand.

S.R. 1446—20 VIII '12. 8½ miles S. by W. ½ S. of Tearaght Light, 51° 56′ 30″ N., 10° 39′ W., soundings 54 fms., sand.

River Lee, off Passage, Co. Cork.

In addition to the above stations, Miss A. L. Massy (**20**) gives a list of ninety-eight stations off the east coast of Ireland, at which the species was dredged by the *Helga*.

As may be judged from these long lists of stations, *Ficulina ficus* is very common and is widely distributed, especially in shallow water, round the Irish coast.

It is usually found in its massive form between tide-marks, at very low water, but it sometimes grows as a thin encrustation, usually on shells of *Pecten*. It most commonly occurs in shallow water, in its "*suberea*" form, on shells inhabited by hermit crabs (*Eupagurus cuanensis* and *E. bernhardus*). The elongated or "*ficus*" form is also found, sometimes in considerable numbers, growing on *Dentalium* shells.

*Distribution.*—Arctic Ocean; Behring Sea; eastern and western shores of the North Atlantic; Mediterranean; off Senegal; off Japan. Bathymetrical range from between tide-marks, at extreme low water, to 220 fathoms.

### **Laxosuberites incrustans**, n. sp.

Plate V, fig. 5.

W. 141—13 VIII '10. Off Reenacry Head, Co. Kerry, soundings 37 fms., gravel. Dredge.—Three specimens.

S.R. 1176—22 V '11. 39 miles W. ½ N. of Blackball Head, 51 26′ 30″ N., 11° 2′ W., soundings 100 fms., sand. Naturalist's dredge.—Sixteen specimens.

W. 222—22 VIII '11. 2 miles S.W. by ½ S. of Clare Island Look-out Tower, soundings 25½ fms., stones. Canvas dredge.—One fragment.

One specimen coats the upper surface of a small stone, another is cut off from its support, while the remaining form thin encrustations on eighteen specimens of coral (*Caryophyllia clavus*). The thickness varies in the different specimens from about 0·7 mm. to nearly 2 mm.

The surface is even, but under the lens it is seen to be minutely hispid.

The skeleton consists of fibres, made up of multiserially arranged tylostyli, running perpendicularly from the base to the surface of the sponge. At the surface the fibres end in closely set vertical brushes of spicules; the tips of the spicules project very slightly beyond the dermis. All the tylostyli in the sponge are placed with their points directed upwards.

*Spicules:*—

The spicules are tylostyli which vary in length according to their position in the sponge. The longest occur in the main skeletal fibres, while the shortest form the superficial brushes of spicules. The length of the tylostyli varies from 0·15 mm. to 0·65 mm. by 0·005 mm. to 0·012 mm.

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The long spicules have a well-defined, globular head. Occasionally there is a ring-like thickening beneath the head. The shaft is slightly fusiform, and slightly bent at a little distance below the head; at the other end the shaft tapers to a rather short point.

The spicules of the superficial brushes differ only in size from the large tylostyli. Two or three of the specimens differ from the others in having rather slender spicules, the maximum diameter of which is about 0·008 mm. or 0·01 mm.

The small fragment from W. 222 was erroneously recorded (**33**) as an encrusting specimen of *Suberites carnosus*. Its spicules are rather more slender than usual, a few only reaching a diameter of 0·01 mm.

**Laxosuberites durus,** n. sp.

Plate III, fig. 6. Plate V, fig. 6.

Helga XXXVIII—2 v '01. ½ mile off Ballyvaldon, Co. Wexford, 7 fms.

The sponge, which is a good deal broken, is growing over pebbles and fragments of shells. It is in the form of a lobed mass, and is hard to the touch, but is easily broken. The lobes are closely pressed together and at the summit of each are one or more small oscula, about 0·5 mm. in diameter, which are level with the general surface of the sponge.

The surface is even, but under the lens it is seen to be minutely hispid.

The colour, in spirit, is a pinkish purple.

The skeleton consists of closely set strands of tylostyli running upwards through the sponge. The tylostyli are densely crowded together and all have their points directed upwards. The fibres end at the surface in vertical brushes of closely packed spicules, the tips of which project very slightly beyond the dermis.

*Spicules:—*

The spicules are all tylostyli, which vary considerably in size according to their position in the sponge. They measure 0·17–0·75 mm. in length by 0·005–0·014 mm. The largest make up the main mass of the skeleton, while the smallest form the superficial brushes of spicules. The tylostyli do not vary much in shape. They have a straight, or sometimes slightly curved shaft, which is very slightly fusiform, and which tapers to a rather short point. The head is well developed and is ovoid in shape, being usually surmounted by a short, cylindrical mucron.

This species is perhaps nearly allied to the Adriatic sponge, named by Schmidt (**23**) *Suberites lobatus*, Nardo. It is impossible to identify this species from Schmidt's brief description. Lendenfeld (**16**) unites it with *Suberites massa*, Nardo.

**Terpios fugax**, Duchassaing and Michelotti.

Ardfry, Co. Galway, October, 1906.
Blacksod Bay, between tide-marks, at the following stations:—

W. 116—15 IX '09. W. 234—23 IX '10.
W. 168—21 IX '10. W. 238—27 IX '10.
W. 233—21 IX '11.

The specimens from Ardfry are growing on oyster shells taken from the "Main Pond" oyster beds. They are of a pale yellowish colour in spirit. The specimens from Blacksod Bay were found between tide-marks, along the shore from Barranagh to Carrigeenmore. They grew, at extreme low water, on the under-surface of large, flat stones, in patches of a deep blue colour (**33** and **5**).

*Distribution.*—Off the coasts of England and France; Mediterranean; off the Azores, West Indies and East Indies and off the Malay Peninsula.

## ADDENDA.

Several sponges belonging to species dealt with in the foregoing paper were received too late for insertion in their proper place.

The following five species were dredged at S.R. 1846—22 V '14. 50 miles W. ¼ S. of Great Skellig, 51° 26′ N., 11° 45′ 30″ W., soundings 550 fms., sand, mud and stones.—*Aphrocallistes beatrix*, Gray, several fragments; *Thrombus abyssi* (Carter), one specimen growing on *A. beatrix*; *Poecillastra compressa* (Bowerbank), several fragments; *Geodia nodastrella*, Carter, one small specimen, 13 mm. in diameter and nearly spherical in shape, not attached to any support; *Alectona Millari*, Carter, boring in coral (*Lophohelia prolifera*).

In company with these were dredged two small sponges belonging to a new Stellettid species which it is hoped to describe later.

One specimen of *Thenea muricata*, Bowerbank, only 4 mm. in height, was dredged at S.R. 851—9 XI '09. 50° 48′ N., 11° 41′ W., soundings 900 fms.

*Cliona levispira*, Topsent and *Alectona Millari*, Carter, boring in specimens of a simple coral (*Desmophyllum cristagalli*) were obtained at S.R. 1004—12 VIII '10, 51 miles W. ½ S. of Great Skellig, 51° 22′ 30″ N., 11° 44′ 30″ W., soundings 641-636 fms.

iassaing and Michelotti.

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W. 234—23 IX '10.
W. 238—27 IX '10.

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S.R. 851—9 XI '09. 50° 48′ N.,
fms.
it and *Alectona Millari*, Carter,
simple coral (*Desmophyllum cris-*
S.R. 1004—12 VIII '10, 51 miles
51° 22′ 30″ N., 11° 44′ 30″ W.,



## LIST OF REFERENCES.


1. **Bowerbank, J. S.**—"A Monograph of the British Spongiadae. Vols. 1–3, Vol. 4, edited, with additions, by the Rev. A. M. Norman." Ray Society, London, 1864, 1866, 1874, 1882.
2. **Carter, J. H.**—"On two new species of Gummineae, with special and general Observations."—Ann. Mag. Nat. History, (4), XII, 1873.
3. **Carter, J. H.**—"Descriptions and Figures of Deep-Sea Sponges and their Spicules, from the Atlantic Ocean, dredged up on board H.M.S. *Porcupine*, chiefly in 1869."—Ann. Mag. Nat. History, (4), XVIII, 1876.
4. **Dendy, A.**—"On the Sponges. Report on the Pearl Oyster Fisheries of the Gulf of Manaar." Suppl. Report, XVIII, London, 1905.
5. **Farran, G. P.**—"Results of a Biological Survey of Blacksod Bay, Co. Mayo."—Fisheries, Ireland, Sci. Invest., 1914, III, [1915].
6. **Fristedt, K.**—"Bidrag till kännedomen omde vid Sveriges vestra Kust lefvande Spongiae."—Kongl. Svenska Vetenskaps-Akad. Handl. 21, 1885.
7. **Gray, J. E.**—"Notes on the Arrangement of Sponges, with the Descriptions of some New Genera."—Proc. Zool. Soc., London, 1867.
8. **Hancock, A.**—"On the Excavating Powers of certain Sponges belonging to the genus Cliona, with Descriptions of several new Species, and an allied generic form."—Ann. Mag. Nat. History, (2), III. 1849.
9. **Hentschel, E.**—"Kiesel-und Hornschwämme der Aru-und Kei-Inseln."—Abh. Senckenb. Naturf. Gesellschaft. Frankfurt a. M. Bd. 34. 1912.
10. **Ijima, I.**—"Studies on the Hexactinellida. III."—Journ. Coll. Science Tokyo. Vol. XVIII, 1903.
11. **Johnson, J. Y.**—"Notes on some Sponges belonging to the Clionidae obtained at Madeira."—Journ. Roy. Micr. Soc., 1899.
12. **Kent, W. S.**—"Notice of a new Vitreous Sponge, Pheronema (Holtenia) Grayi."—Ann. Mag. Nat. History, (4), VI, 1870.
13. **Kent, W. S.**—"On the 'Hexactinellida' taken in the *Norna* Expedition off the coast of Spain and Portugal."—Monthly Microscop. Journ., 1870.
14. **Kirkpatrick, R.**—"Sponges, in Report of a Deep-sea Trawling Cruise off the South-west Coast of Ireland."—Ann. Mag. Nat. History, (6), VI, 1889.
15. **Kirkpatrick, R.**—"Descriptions of South African Sponges," in Marine Investigations of South Africa, Vol. II, 1902–03. Cape Town.
16. **Lendenfeld, R. von.**—"Die Clavulina der Adria."—Abh. der Kaiserl. Leop. Carol. Deutsch. Akad. der Naturf., LXIX, 1896 (1897).

17. **Lendenfeld, R. von.**—"Notes on Rockall Island and Bank—Reports."—Trans. Royal Irish Acad., XXXI, 1900.

18. **Lendenfeld, R. von.**—"Tetraxonia."—Das Tierreich. Berlin, 1903.

19. **Lendenfeld, R. von.**—"Die Tetraxonia."—Wiss. Ergebn. der Deutschen Tiefsee-Expedition, *Valdivia*, 1898–1899. Jena, 1907.

20. **Massy, Anne L.**—"Report of a Survey of Trawling Grounds on the Coasts of Counties Down, Louth, Meath and Dublin. Part III. Invertebrate Fauna."—Fisheries, Ireland, Sci. Invest., 1911, I. [1912].

21. **Ridley, S. O.** and **A. Dendy.**—"Report on the Monaxonida of the Challenger Expedition." Edinburgh, 1887.

22. **Row, R. W. H.**—"Reports on the Marine Biology of the Sudanese Red Sea, from Collections made by Cyril Crossland. The Sponges. Part II, Non-Calcarea."—Journ. Linn. Soc. (Zool.), XXXI, 1911.

23. **Schmidt, O.**—"Die Spongien des adriatischen Meeres." Leipzig, 1862.

24. **Schmidt, O.**—"Grundzüge einer Spongien-Fauna des atlantischen Gebietes." Leipzig, 1870.

25. **Schmidt, O.**—"Die Spongien des Meerbusen von Mexico und des caraïbischen Meeres." Jena, 1880.

26. **Schulze, F. E.**—"Untersuchen über den Bau und die Entwicklung der Spongien, IX. Die Plakiniden."—Zeitschr. f. wiss. Zool., XXXIV, 1880.

27. **Schulze, F. E.**—"Report on the Hexactinellida of the *Challenger* Expedition." Edinburgh, 1887.

28. **Schulze, F. E.**—"Revision des Systemes der Asconematiden und Rosselliden."—Köngl. Preuss. Akad. der Wissenschaften, Berlin. Math-und Naturwiss. Mitth., 1897.

29. **Schulze, F. E.**—"Hexactinellida."—Wiss. Ergebn. der Deutschen Tiefsee-Expedition, *Valdivia*, 1898–1899. Jena, 1904.

30. **Sollas, W. J.**—"The Sponge-fauna of Norway; a Report on the Rev. A. M. Norman's Collection of Sponges from the Norwegian Coast."—Ann. Mag. Nat. History, (5), IX, 1882.

31. **Sollas, W. J.**—"Report on the Tetractinellida of the *Challenger* Expedition."—Edinburgh, 1888.

32. **Sollas, W. J.**—"On the Geodine Genera, Synops, Vosm. and Sidonops.—A Correction."—Proc. Royal Dublin Soc. (N.S.), VI, 1889.

33. **Stephens, Jane.**—"Marine Porifera of the Clare Island Survey."—Proc. Royal Irish Acad., XXXI, Pt. 59, 1912.

34. **Thomson, C. Wyville.**—"The Depths of the Sea." London, 1873.

35. **Topsent, E.**—"Contribution à l'étude des Clionides."—Arch. Zool. exp. et gén. (2), v bis, 1887.

36. **Topsent, E.**—"Deuxième contribution à l'étude des Clionides."—Arch. Zool. exp. et gén. (2), IX, 1891.

fotes on Rockall Island and Bank—
ral Irish Acad., XXXI, 1900.
'etraxonia."—Das Tierreich. Berlin,

ie Tetraxonia."—Wiss. Ergebn. der
pedition, *Valdivia*, 1898–1899. Jena,

t of a Survey of Trawling Grounds on
es Down, Louth, Meath and Dublin.
te Fauna."—Fisheries, Ireland, Sci.
].

idy.—"Report on the Monaxonida of
tion." Edinburgh, 1887.

s on the Marine Biology of the Sudanese
tions made by Cyril Crossland. The
-Calcarea."—Journ. Linn. Soc. (Zool.),

gien des adriatischen Meeres." Leipzig,

ge einer Spongien-Fauna des atlan-
ipzig, 1870.
igien des Meerbusen von Mexico und
es." Jena, 1880.
uchen über den Bau und die Entwick-
. Die Plakiniden."—Zeitschr. f. wiss.

on the Hexactinellida of the *Challenger*
irgh, 1887.
ion des Systemes der Asconematiden
öngl. Preuss. Akad. der Wissenschaften,
urwiss. Mitth., 1897.
ctinellida."—Wiss. Ergebn. der Deut-
ion, *Valdivia*, 1898–1899. Jena, 1904.
nge-fauna of Norway; a Report on the
Collection of Sponges from the Norwe-
ag. Nat. History, (5), IX, 1882.
on the Tetractinellida of the *Challenger*
irgh, 1888.
Geodine Genera, Synops, Vosm. and
ion."—Proc. Royal Dublin Soc. (N.S.),

ie Porifera of the Clare Island Survey."
Acad., XXXI, Pt. 59, 1912.
"The Depths of the Sea." London,

ition à l'étude des Clionides."—Arch.
, v bis, 1887.
e contribution à l'étude des Clionides."—
én. (2), IX, 1891.




37. **Topsent, E.**—"Spongiaires de l'Atlantique Nord."—Résultats des campagnes scientifiques du Prince de Monaco. Monaco, 1892.

38. **Topsent, E.**—"Étude monographique des Spongiaires de France. I. Tetractinellida."—Arch. Zool. exp. et gén. (3), II, 1894.

39. **Topsent, E.**—"Étude monographique des Spongiaires de France. II. Carnosa."—Arch. Zool. exp. et gén. (3), III, 1895.

40. **Topsent, E.**—"Éponges. Résultats scientifiques de la campagne du *Caudan* dans le golfe de Gascogne."—Fasc. II. Ann. de l'Univ. de Lyon, 1896.

41. **Topsent, E.**—"Spongiaires de la baie d'Amboine."—Revue suisse de Zoologie, IV, 1897.

42. **Topsent, E.**—"Éponges nouvelles des Açores."—Mém. Soc. Zool. de France, XI, 1898.

43. **Topsent, E.**—"Étude monographique des Spongiaires de France. III. Monaxonida (Hadromerina)."—Arch. Zool. exp. et gén. (3), VIII, 1900.

44. **Topsent, E.**—"Considérations sur la Faune des Spongiaires des côtes d'Algerie. Éponges de la Calle."—Arch. Zool. exp. et gén. (3), IX, 1901.

45. **Topsent, E.**—"Spongiaires des Açores."—Résultats des campagnes scientifiques du Prince de Monaco. Monaco, 1904.

46. **Topsent, E.**—"Notes sur les éponges du *Travailleur* et du *Talisman*."—Bull. Muséum, Paris, X, 1904.

47. **Topsent, E.**—"Spongiaires de l'expedition antarctique nationale écossaise."—Trans. Royal Soc., Edinburgh, XLIX, Pt. III, 1913.

48. **Vosmaer, G. C. J.**—"Report on the Sponges dredged up in the Arctic Sea by the *Willem Barents* in 1878–79."—Niederl. Arch. für Zool., Supplement-band I. Leyden, 1882.

49. **Vosmaer, G. C. J.**—"The Sponges of the *Willem Barents* Expedition, 1880–1881."—Bijdragen tot Dierk. Nat. Art. Mag., 12. Amsterdam, 1885.

50. **Wright, E. P.**—"Notes on Irish Sponges. Part I. A List of the Species."—Proc. Royal Irish Acad., X., 1868.

51. **Wright, E. P.**—"Notes on Sponges."—Quart. Journ. Micr. Science for 1870.

## EXPLANATION OF PLATES I-V.

### Plate I.

*Pheronema Grayi*, Kent. Natural size.

### Plate II.

Fig. 1. *Sidonops atlantica*, n. sp. Natural Size.

Fig. 2. *Pheronema Grayi*, Kent. Young specimen. Natural size.

Fig. 3. *Hyalonema infundibulum*, Topsent. Natural size.

### Plate III.

Fig. 1. *Suberites gibbosiceps*, Topsent. Natural size.

Fig. 2. *Atergia corticata*, gen. et sp. n. Small, nearly complete specimen, ×2.

Fig. 3. *Atergia corticata*, gen. et sp. n. Part of larger specimen, ×2.

Fig. 4. *Suberites caminatus*, Ridley and Dendy, ×2.

Fig. 5. *Spinularia spinularia* (Bowerbank), ×2.

Fig. 6. *Laxosuberites durus*, n. sp. Part of specimen. Natural size.

Fig. 7. *Vibulinus stuposus* (Montagu). Specimen dredged off Clare Island. Natural size.

### Plate IV.

Fig. 1. *Geodia nodastrella*, Carter.

*a*, somal oxea, ×48; *b*, cortical oxea, ×112; *c*, dichotriaene, ×48; *d*, promesotriaene, ×112; *e*, anatriaene, ×112; *f* somal spheraster, ×480; *g*, outline of sterraster, ×112; *h*, *i*, sub-cortical spherasters, ×480; *j*, choanosomal oxyaster, ×480.

Fig. 2. *Leucopsacus scoliodocus*, Ijima.

*a*, *b*, hexactinose discohexasters, with longer and shorter teeth, ×264.

Fig. 3. *Sidonops atlantica*, n. sp.

*a*, somal oxea, ×48; *b*, orthotriaene, ×48; *c*, *d*, anatriaene, ×48 and ×112; *e*, promesotriaene, ×112; *f*, somal spherasters, ×480; *g*, outline of sterraster, ×112; *h*, *i*, *j*, choanosomal oxyasters, ×264; *k*, pore-sieves, surface view, ×24.

### Plate V.

Fig. 1. *Cliona coralliophaga*, n. sp. Oxea, ×297.

Fig. 2. *Latrunculia Normani*, n. sp.

*a*, choanosomal discaster, ×297; *b*, *c*, somal discaster, side and end views, ×297; *d*, stylus, ×297.

Fig. 3. *Spinularia spinularia* (Bowerbank).
*a*, tylostylus of the skeletal fibres, ×122; *b*, cortical tylostylus, ×297; *c*, head of tylostylus figured in *a*, ×297.

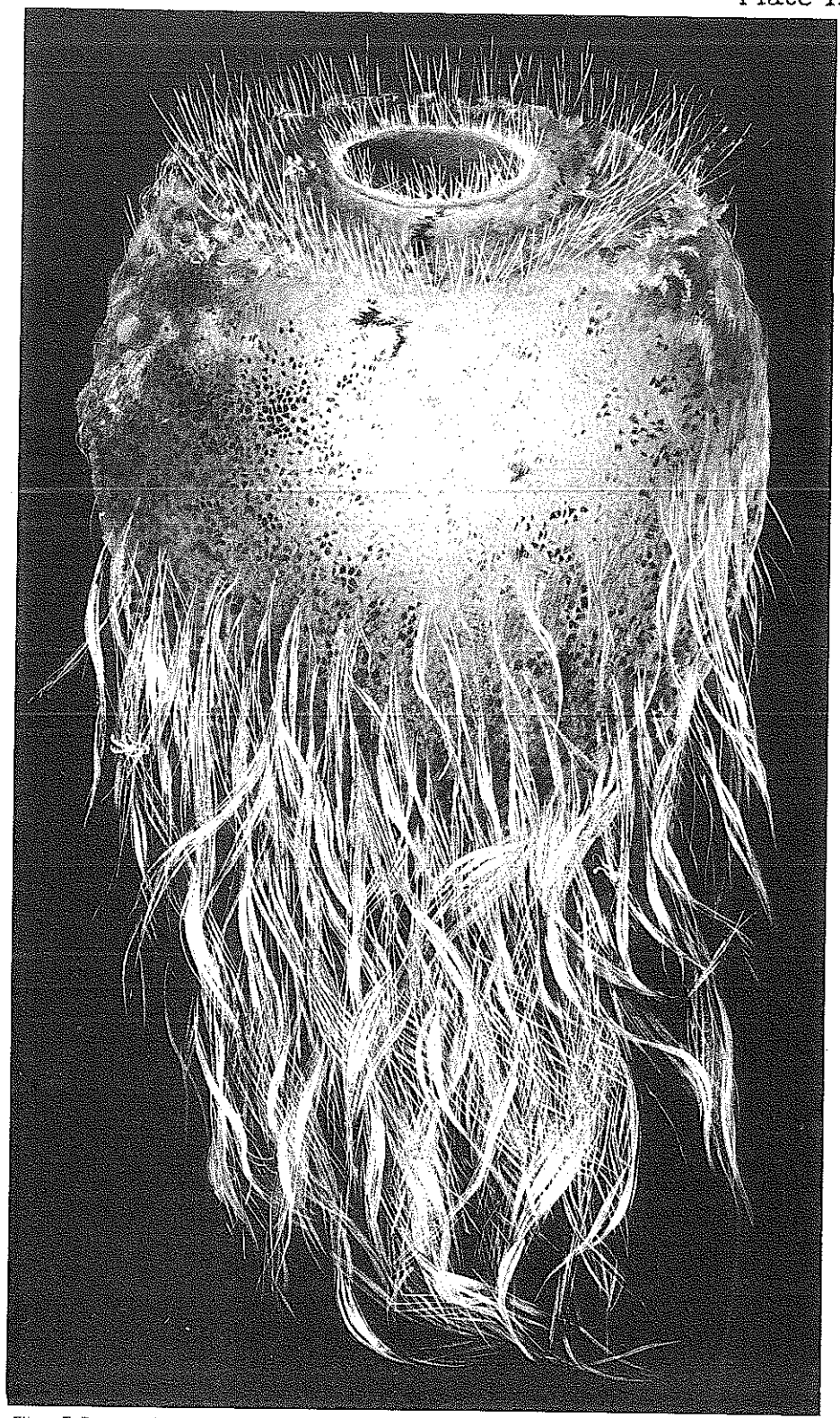
Fig. 4. *Atergia corticata*, gen. et sp. n.
*a*, tylostylus of skeletal fibres, ×122; *b–e*, cortical tylostyli, ×297; *f*, head of tylostylus figured in *a*, ×297; *g*, *h*, oxea, ×540.

Fig. 5. *Laxosuberites incrustans*, n. sp.
*a*, *b*, *c*, tylostyli, ×297.

Fig. 6. *Laxosuberites durus*, n. sp.
*a*, *b*, *c*, tylostyli, ×122; *d*, small tylostylus, ×297; *e*, *f*, heads of larger tylostyli, ×297.

Wt. P.521.—S. 276. 750. 1/15. B. and N., Ltd.

IV.'14. Plate I.



Eileen E. Barnes, del. Bemrose, Collo., Derby.

Pheronema Grayi.

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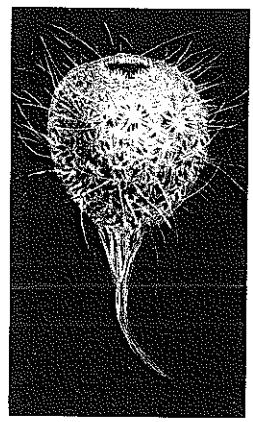

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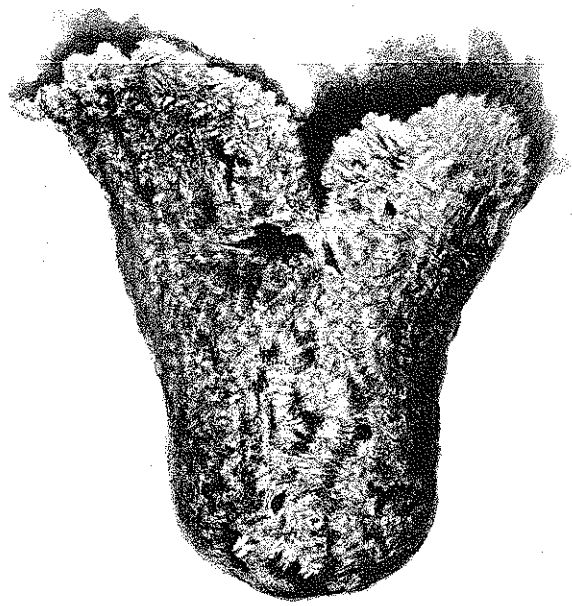
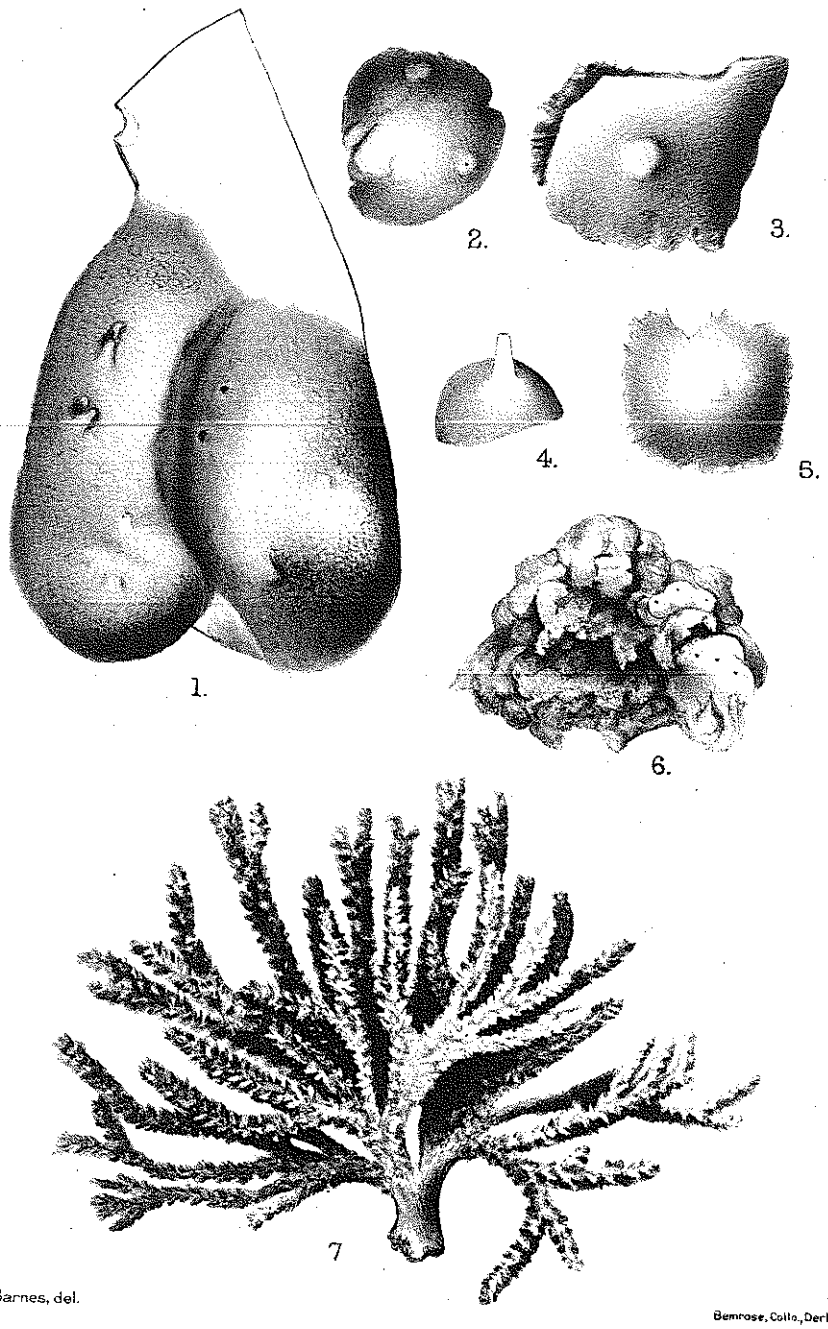


3.

Eileen E. Barnes, del.

Bemrose, Collo., Derby.

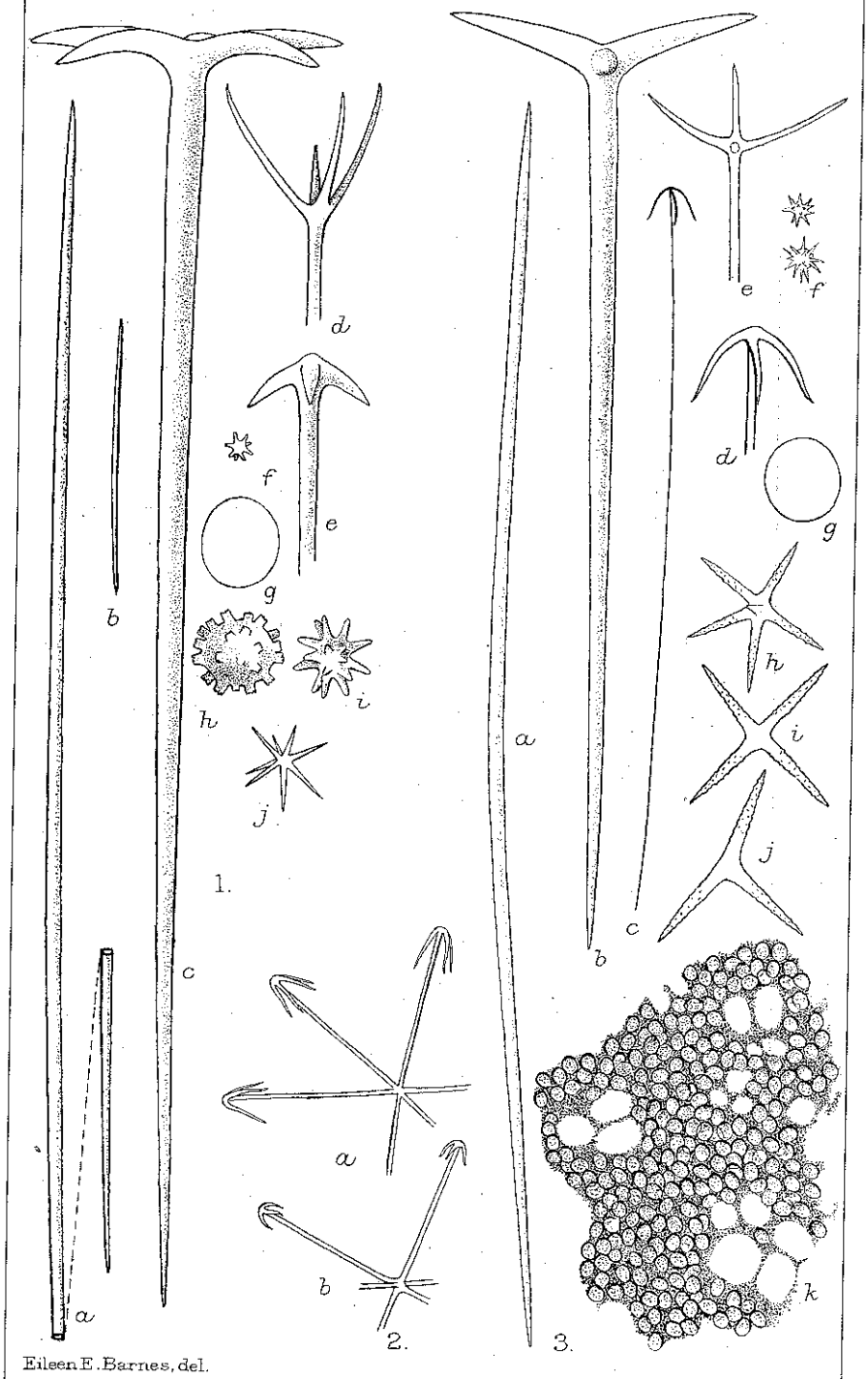
1. Sidonops atlantica.
2. Pheronema Grayi.
3. Hyalonema infundibulum.




Eileen E. Barnes, del.

Bemrose, Colls., Derby.

1. Suberites gibbosiceps.
2. 3. Atergia corticata.
4. Suberites caminatus.
5. Spinularia spinularia.
6. Laxosuberites durus.
7. Vibulinus stuposus.

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1. Geodia nodastrella.
2. Leucopsacus scoliodocus
3. Sidonops atlantica.

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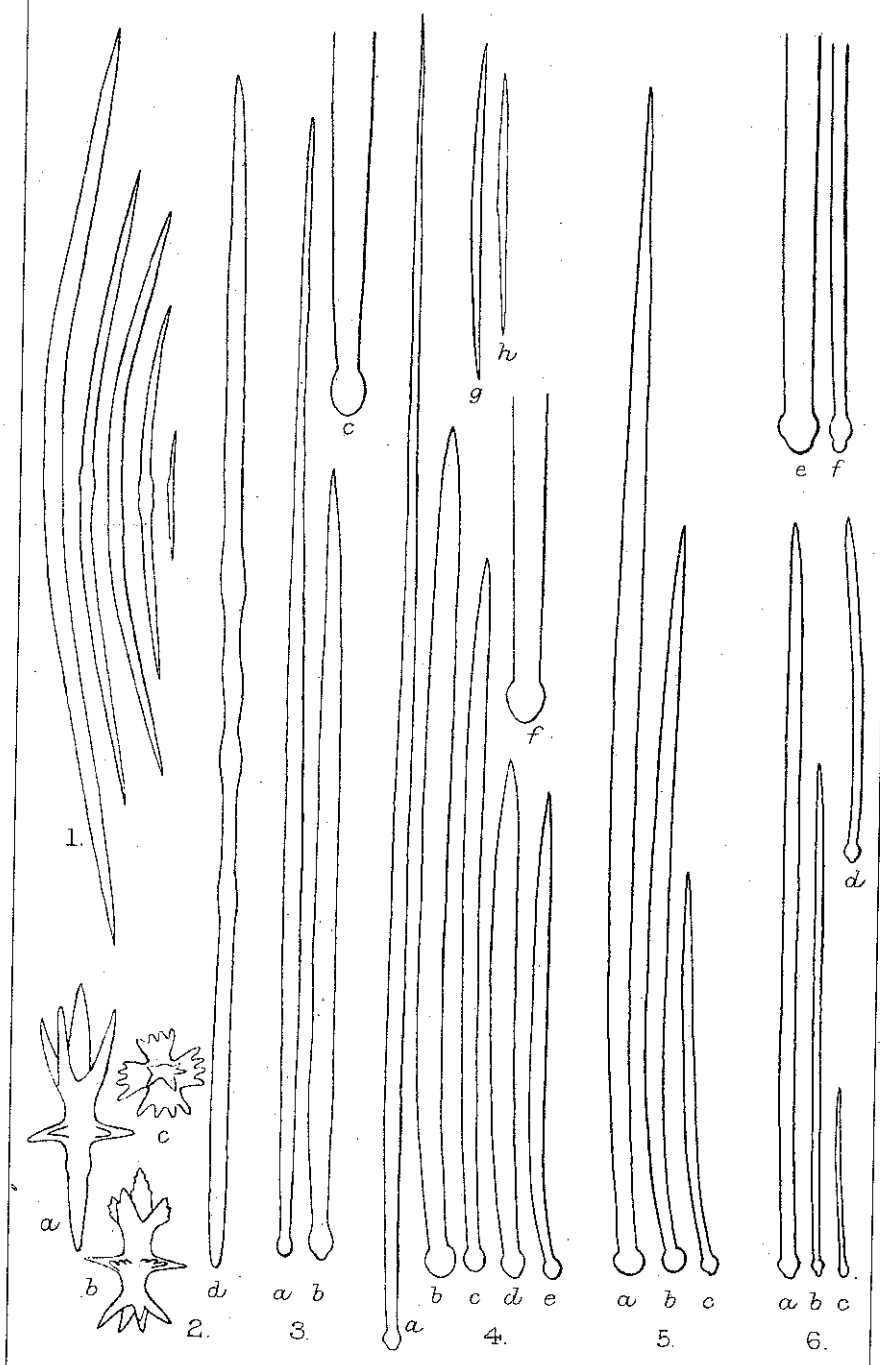


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1. Cliona coralliophaga.
2. Latrunculia Normani.
3. Spinularia spinularia.
4. Atergia corticata.
5. Laxosuberites incrustans.
6. Laxosuberites durus.

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