II.—*Sponges from the Coasts of Northeastern Canada and Greenland.*

By Lawrence M. Lambe, F.G.S., of the Geological Survey.

(Read May 29, 1900.)

In a paper entitled "Sponges from the Atlantic Coast of Canada," published in 1896, in the Transactions of this Society, the writer gave the results of a careful study of a number of recent marine sponges from the River and Gulf of St. Lawrence, the Atlantic Coast of Nova Scotia, and the Bay of Fundy.

The present paper consists of identifications or descriptions of species found farther to the north, off the coast of Labrador, in Davis Strait and Baffin Bay, and may be considered, in a measure, as supplementary to the first paper. The specimens are from the museum of University College, Dundee, Scotland, and have been received from Professor D'Arcy W. Thompson, at whose request the examination of the collection in question was undertaken. The majority of the specimens are from Davis Strait, and were for the most part collected by Mr. A. M. Rodger, Professor Thompson's assistant, who accompanied Captain Phillips, of the SS. "Esquimaux," on a whaling voyage in 1892, and also visited East Greenland in 1894 with Captain Robertson, of the S.S. "Active." References are also made to a few species from Hudson Bay and Strait obtained, of late years, by Doctor Robert Bell and Mr. A. P. Low, of the Geological Survey.

All the specimens in the collection are preserved in alcohol.

MONAXONIDA.

Reniera mollis, Lambe.

Reniera mollis, Lambe. 1893. Sponges from the Pacific coast of Canada, Trans. Royal Soc. Canada, vol. xi., p. 26, pl. ii., figs. 3, 3*a*.
" " Lambe. 1896. Sponges from the Atlantic coast of Canada, Trans. Royal Soc. Canada, second series, vol. ii., p. 183.
" " Lambe. 1900. Notes on Hudson Bay sponges, Ottawa Naturalist, vol. xiii., p. 277.

This species, described originally from specimens from Vancouver Island, has been found in the east off the Labrador coast and near the entrance to the Baie des Chaleurs.

It is represented in the present collection by specimens from Davis Strait that serve to enlarge the known range of the species but that apparently do not present any new structural features.

Localities.—Davis Strait, Reef Coal Hill, bearing south-east, 20 miles, in 30 fathoms, rocky bottom, A. M. Rodger, 30th of May, 1892, one specimen; Davis Strait, off Cape Raper, 4 miles S., in 60 fathoms, bottom of stones and sand, A. M. Rodger, 13th of September, 1892, two specimens. The colour of this sponge may be naturally dark; two of the specimens are of a pale yellowish-brown colour, and appear to be faded, the third has been protected from the light and is of a brown shade.

In 1897 Mr. A. P. Low whilst dredging in Wakeham Bay, Hudson Strait, obtained a fragmentary specimen in 10 fathoms, mud bottom.

Gellius Laurentinus. (Sp. nov.)

(Plate I, figs. 1, 1*a*.)

A *Gellius* that at first was thought to be possibly a variety of *Gellius flagellifer*, Ridley and Dendy, is here described under a new specific name. *G. flagellifer* was referred to by the writer in 1896 (*vide* Transactions, Royal Society of Canada, second series, vol. ii.) as occurring in the Gulf of St. Lawrence; the specimens representing the new species are from St. Paul's Island at the southern entrance to the Gulf of St. Lawrence, from the Strait of Belle Isle and from Davis Strait. *G. Laurentinus* differs from *G. flagellifer* principally in the size of the microsclera which are small and of a normal shape quite different to the large sigmata characteristic of the latter species.

In *G. Laurentinus* the sponge is amorphous and forms small, rounded masses, that consist of a loose irregular reticulation of oxeote spicules without apparently any special dermal arrangement thereof. *Texture* fragile, crumbling easily. *Dermal membrane* thin, delicate, separated with difficulty from the spicules beneath. A few small openings, flush with the general surface, that are to all appearances, oscula, occur irregularly at the surface.

Spicules.—*Megasclera*; large, rather abruptly but sharply pointed, smooth oxea, varying in length from ·275 to ·373 mm., with an average diameter of ·015 mm. *Microsclera*; simple sigmata, with very little variation in size, ·032 mm. in length from curve to curve; in moderate numbers in the dermal membrane and apparently also in the body of the sponge.

Localities.—Gulf of St. Lawrence, 20 miles N. by W. of St. Paul's Island, 100 fathoms, rocky bottom, A. M. Rodger, 4th of April, 1892, a fragment; Strait of Belle Isle, off Norman's Light, 60 fathoms, rocky bottom, A. M. Rodger, 9th of April, 1892, a fragment; Davis Strait, 3 miles from the mouth of Coutts Inlet, 130 fathoms, mud bottom, A. M. Rodger, 30th of July, 1892, two specimens, the largest of which is about 3 cent. broad and 1·5 cent. thick, and part of a third that has grown round a worm tube.

Esperella Fristedtii. (Sp. nov.)

(Plate I, figs 2, 2*a-h*.)

Cladorhiza cupressiformis, Fristedt. 1887. Sponges from the Atlantic and Arctic Oceans and the Behring Sea (translation), Vega-expeditionens vetenskapliga arbeten, p. 426, pl. 24, fig. 13 and pl. 27, fig. 11.

There are in this collection three specimens from Davis Strait that agree so well in general shape and in spiculation with a sponge from the Siberian Arctic Ocean, referred to by Fristedt (op. cit.) under the name *Cladorhiza cupressiformis*, Carter, that the writer believes them to be the same specifically. The Siberian sponge is thought, however, not to be referable to Carter's species and also to more properly belong to the genus *Esperella*, in which genus likewise *Esperia cupressiformis*, Carter, should probably be placed. Under these circumstances the name *Esperella Fristedtii* is proposed for Fristedt's sponge and the Davis Strait specimens are included under the new name.

The following is descriptive of the Davis Strait specimens:—Sponge upright, slender, consisting of an upper cylindrical part supported on a short, thin stem that below has an expanded root-like surface of attachment; from the upper cylindrical part spring numerous short, approximately horizontal, thorn-like processes that are compressed laterally, their greatest diameter being in a vertical direction. The upper extremity is slightly attenuated and the lateral processes are either only indicated on the stem, or absent, leaving it quite smooth. It is moderately flexible, especially the processes which are pliant and elastic. A dermal membrane, overlying the soft parts, extends out over the processes forming a complete covering. Neither pores nor an oscular opening have been observed. Measurements taken from the largest, perfect specimen are as follows—total height 6·5 cent., length of stem a little

over 1 cent., diameter of stem nearly 2 mm., average diameter of the upper part, exclusive of the processes, about 4 mm., length of processes varying from 1 to 3 mm. This specimen is attached to a pebble; of the other two, one, with the stem missing, is 5 cent. long, the other has a total length of 23 mm. and its base firmly clasps three or four minute stones.

Skeleton.—Compound of an axis of spiculo-fibre from which minor fibres, forming the axial part of the processes, are given off at right angles.

Spicules.—(a) *Megasclera*; large, smooth, gradually and sharply pointed, smooth style, often narrowing toward the head, varying in length from ·465 to ·849 mm., with an average diameter of ·013 mm. ; occurring in the main axial part with their pointed ends directed upward, and in the processes with the pointed ends outward. (b) *Microsclera*; small palmate anisochelæ, with an average length of ·022 mm., abundant in the dermal membrane and throughout the sponge. Besides these two forms of spicules a third is present, one that is not mentioned by Fristedt in the description of his specimen and that might easily be overlooked on account of its inconspicuous size and shape. This spicule is a small, smooth, generally rather bluntly-pointed, either bent or straight, tylostylus, in length varying from ·085 to about ·124 mm. and with a maximum thickness of ·006 mm. ; it occurs in small numbers and is apparently distributed through the sponge.

In the specimen already mentioned as being without a stem, the spicules are somewhat different in size to those of the other two; it is found that the styli are larger, reaching a length of 1·50 mm. with a thickness of ·020 mm. and that the anisochelæ are smaller, having an average length of only ·015 mm., beyond which there appear to be no structural differences of importance.

Esperella Fristedtii differs from *Esperia cupressiformis*, Carter, not only in not having the "tricurvate" spicule but also in the general form of the sponge including that of the processes, in the shape of the anisochelæ and in other points of dissimilarity that are apparent.

Localities.—In Davis Strait, collected by A. M. Rodger. Cape Wild, bearing N.E. 10 miles, 200 fathoms, 4th of July, 1892; 3 miles from mouth of Coutts Inlet, 130 fathoms, 7th of July, 1892; E.S.E. of Erick Point, 20 miles, 60 to 100 fathoms, 4th of August, 1892.

ESPERELLA MINUTA. (Sp. nov.)

(Plate I, figs. 3, 3*a-c*.)

Sponge small, stipitate, consisting of a laterally compressed head borne on a slender stalk. In the single specimen representing this species, the stalk, which measures about 10 mm. in length and ·3 mm. in diameter, adheres firmly, by its slightly expanded basal extremity, to a grain of sand; the head is about 3·5 mm. high, 2·75 mm. broad and about 1 mm. thick in the direction of its compression. The head does not seem to be abnormally flattened. No osculum has been observed.

Skeleton.—Composed of upwardly directed spicules that have, in the head, a tendency to form loose strands, but that lie close to each other in the stalk in which a slight spiral twist is observable. Other spicules, in small numbers and of less size, occur at the surface, projecting beyond it, those of the head being inclined slightly upward whilst in the stalk they project at right angles to the surface.

Spicules.—(a) *Megasclera;* of two kinds. (1) Large, smooth, gradually and sharply pointed styli that occasionally show a tendency to become tylostylote; composing the principal part of the skeleton; varying from about ·327 to ·543 mm. in length and from ·006 to ·008 mm. in thickness. (2) Small, smooth, sharply pointed, tylostyli, varying in length from ·196 to ·294 mm. with a thickness of from ·005 to ·006 mm.; confined to the surface beyond which they project with their pointed ends outward; this form of spicule is not always clearly distinguishable from some of the smaller styli but its position in the skeleton is distinct and definite. (b) *Microsclera;* of one kind, viz., small, palmate anisochelæ, verying in length from ·018 to ·019 mm., abundant throughout the sponge and at the surface.

Locality.—Davis Strait, off Cape Wild, bearing N.E., 10 miles, in 200 fathoms, A. M. Rodger, 4th of July, 1892.

IOPHON CHELIFER, Ridley and Dendy.

Iophon chelifer, Ridley and Dendy. 1886. Ann. and Mag. Nat. Hist., series 5, vol. xviii., p. 349.

" " Ridley and Dendy. 1887. Rep. Monaxonida, Zool. Chall. Exp., vol. xx., p. 119, pl. xvi., fig. 3, and pl. xvii., figs. 1, 3, 8.

" " Lambe. 1893. Sponges from the Pacific coast of Canada, Trans. Royal Soc. Canada, vol. xi., p. 30, pl. ii., figs. 7, 7*a*-f.

" " Lambe. 1896. Sponges from the Atlantic coast of Canada, Trans. Royal Soc. Canada, second series, vol. ii., p. 191.

This sponge has been already recorded as occurring in Canadian waters, both in the Pacific and Atlantic oceans, so that it is only

necessary here to note the localities at which the present specimens were obtained.

Localities.—Gulf of St. Lawrence, 20 miles N. by W. of St. Paul's Island, 100 fathoms, rocky bottom, A. M. Rodger, 4th of April and 23rd of June, 1892; Englinton Fjord, Davis Strait, Captain Phillips, 1893.

Iophon chelifer may be readily recognized by its generally dark brown colour and very characteristic spicules.

Phakellia ventilabrum, Johnston. (Sp.)

Halichondria ventilabrum, Johnston. 1842. British Sponges, p. 107, pl. vii.
Phakellia ventilabrum, Bowerbank. 1864. Mon. Brit. Spong., vol. i., p. 186; vol. ii., p. 122; and vol. iii., p. 57, pl. xxii., figs. 1-7.
" " Lambe. 1894. Sponges from the western coast of North America, Trans. Royal Soc. Canada, vol. xii., p. 124.
" " Lambe. 1896. Sponges from the Atlantic coast of Canada, Trans. Royal Soc. Canada, second series, vol. ii., p. 192, pl. ii., figs. 3, 3*a*, 3*b*.
" " Lambe. 1900. Notes on Hudson Bay Sponges, Ottawa Naturalist, vol. xiii., p. 277.

Represented by a single specimen collected by Mr. Rodger in Davis Strait in 1892.

This widely distributed species has been obtained in Hudson Bay by Dr. Robert Bell and Mr. A. P. Low, and it is not uncommon in the Gulf of St. Lawrence.

Suberites montalbidus, Carter.

Suberites montalbidus, Carter. 1880. Ann. and Mag. Nat. Hist., fifth series, vol. vi., p. 256; and 1882, *ibid*, vol. ix., p. 353.
" " Lambe. 1894. Sponges from the western coast of North America, Trans. Royal Soc. Canada, vol. xii., p. 127, plate iii., figs. 6, 6*a-c*.
" " Lambe. 1900. Notes on Hudson Bay Sponges, Ottawa Naturalist, vol. xiii., p. 277.

A specimen of this sponge was dredged by Mr. Low in June, 1899, in Richmond Gulf, Hudson Bay, in from 20 to 30 fathoms, soft mud bottom. Although not represented in Professor Thompson's collection this species is mentioned here so as to make the list of sponges known to occur in eastern Canadian waters as complete as possible. *Suberites montalbidus* has a wide northern distribution and it is not surprising

to find it in Hudson Bay. Its range includes Behring Sea and Strait, Beaufort Sea, the Siberian Arctic Ocean, the Kara Sea, the European Arctic Ocean, Barent's Sea and the sea west from Greenland.

The Hudson Bay specimen is irregularly pear shaped, higher than broad, broader above than below where it has apparently been attached to some object; height 6 cent., greatest breadth a little over 4 cent., colour in alcohol a dark grayish-brown, surface rough (except on the top where it is comparatively smooth), covered with small irregular elevations separated from each other by a network of wrinkles or furrows. A single osculum, about 8 mm. in width, occupies the centre of the summit and in the sides are numerous small openings, having a maximum width of about 1 mm., which probably are the entrances to inhalent canals. The sponge is soft and yielding to the touch and probably the roughness of the surface is exaggerated by shrinkage. The spicules agree in size and shape with those of the specimen from Unalaska Island, described by the writer in volume xii. of the Royal Society's Transactions, in all particulars except that the differentiation of the megasclera into two sizes appears to be less marked.

TENTORIUM SEMISUBERITES, Schmidt. (Sp.)

Thecophora semisuberites, Schmidt. 1870. Spong. Atlant. Gebiet, p. 50, pl. vi., fig. 2.

Thecophora semisuberites, Fristedt. 1887. Sponges from the Atlantic and Arctic Oceans and the Behring Sea (translation), Vega-expeditionens vetenskapliga arbeten, p. 433.

Tentorium semisuberites, Lambe. 1896. Sponges from the Atlantic coast of Canada, Trans. Royal Soc. Canada, second series, vol. ii., p. 198, pl. iii., figs. 2, 2*a-c*.

Of this species there are two small specimens both adherent to pebbles.

The larger one is from Davis Strait, Erick Point, bearing N.W. by W., 10 miles, 150 fathoms, rocky bottom, A. M. Rodger, 24th of October, 1892: the second specimen is from East Greenland, 250 fathoms, A. M. Rodger, 1894.

The Davis Strait specimen has a height of 17 mm., whilst the other is even smaller, measuring only 7 mm. from its base to the top of the oscular tube of which in both specimens there is only one.

This sponge has been already referred to at length, in the writer's previous paper descriptive of Gulf of St. Lawrence and Atlantic sponges.

TETRACTINELLIDA.

Craniella cranium, Müller. (Sp.)

Alcyonium cranium, Müller. 1789. Zool. Dan., pl. 85, fig. 1.
Tethya cranium, Lamarck. 1815. Mem. d. Mus., vol. i., p. 71.
" " Fleming. 1828. British Animals, p. 519.
" " Fristedt. 1887. Sponges from the Atlantic and Arctic Oceans and the Behring Sea (translation), Vega-expeditionens vetenskapliga arbeten, p. 438.
Craniella cranium, Sollas. 1888. Rep. Tetractinellida, Zool. Chall. Exp., vol. xxv., p. 51.
" " Lambe. 1900. Notes on Hudson Bay Sponges, Ottawa Naturalist, vol. xiii., p. 277.

Craniella cranium is a well-known sponge found in North Atlantic waters generally. Fristedt in his admirable paper mentions three specimens from the east and west coasts of Greenland, and the writer in recognising in a sponge, dredged by Mr. Low in Hudson Bay, one that belongs to this species, extends its known range to a slight extent. As in the case of *Suberites montalbidus*, Carter, *C. cranium* is not included in the collection under examination, but its mention in this paper is thought to be desirable.

Mr. Low's specimen was obtained in June, 1899, in Richmond Gulf, Hudson Bay, at a depth of from 20 to 30 fathoms, soft mud bottom. It is somewhat ovate in shape, broadly rounded above and prolonged downward below where the basal strands have the appearance of having been attached to some foreign object; total height 10 cent., maximum breadth 4·5 cent., surface uneven, monticulose. The extreme summit is abraded. The measurements of the spicules agree with those given by Sollas in his description of the species in volume xxv of the "Challenger" reports.

Thenea muricata, Bowerbank. (Sp.)

Tethea muricata, Bowerbank. MS. 1858. Phil. Trans. Roy. Soc., p. 308, pl. xxv., fig. 18.
" " Bowerbank. MS. 1864. Mon. Brit. Spong., vol. i., pp. 25, 108, figs. 35, 304, 305.
" " Fristedt. 1887. Sponges from the Atlantic and Arctic Oceans and the Behring Sea (translation), Vega-expeditionens vetenskapliga arbeten, p. 436.
Thenea muricata, Sollas. 1888. Rep. Tetractinellida, Zool. Chall. Exp., vol. xxv., p. 95, pl. vii., fig. 3.

Thenea muricata, Lambe. 1896. Sponges from the Atlantic coast of Canada, Trans. Royal Soc. Canada, second series, vol. ii., p. 202, pl. iii., fig. 4.

Two small specimens of this species are labelled East Greenland, A. M. Rodger, 1894, 250 fathoms.

We have hitherto known that this sponge occurs on the north-east coast of the United States, in the Gulf of St. Lawrence, in Davis Strait and Baffin Bay and off the east coast of Greenland as well as in more eastern waters of the North Atlantic.

CALCAREA.

LEUCOSOLENIA CANCELLATA, Verrill.

(Plate II, figs. 5, 5*a-e*.)

Leucosolenia cancellata, Verrill. 1874. Explorations of Casco Bay, Pro. Am. Ass. Adv. Sci., p. 393.

" " Lambe. 1896. Sponges from the Atlantic coast of Canada, Trans. Royal Soc. Canada, second series, vol. ii., p. 203, pl. iii., figs. 5, 5*a-d*.

A number of very perfect specimens of this species are included in the collection; one of the largest is shown on plate II. In 1873 Dr. J. F. Whiteaves dredged a single specimen on the Orphan Bank, off the entrance to the Baie des Chaleurs.

Localities.—Strait of Belle Isle, off Norman's Light, 60 fathoms, rocky bottom, A. M. Rodger, 9th of April, 1892, four specimens; Davis Strait, off Cape Raper, 4 miles S., 60 fathoms, bottom of stones and sand, A. M. Rodger, 13th of September, 1892, twelve specimens; Davis Strait, Cape Aston, 60 fathoms, Captain Phillips, 10th of August, 1893, one specimen.

SYCON PROTECTUM, Lambe.

(Plate I, figs. 4, 4*a-j*.)

Sycon Protectum, Lambe. 1896. Sponges from the Atlantic coast of Canada, Trans. Royal Soc. Canada, second series, vol. ii., p. 204, pl. iii., figs. 6, 6*a-g*.

This species was originally described (op. cit.) from a specimen dredged by Dr. Whiteaves, in 1872, eight miles south-east of Bonaven-

ture Island, Gaspé. A particularly large and well preserved specimen from Upernavik, Baffin Bay, in the present collection, extends the range of the species much farther north. The writer has also recorded the occurrence of *S. protectum* at Boat Harbour, near Nanaimo, Vancouver Island, B.C. (*vide* Ottawa Naturalist, vol. xiii., p. 262.)

The Upernavik specimen is irregularly ovate in shape, very hispid and attached by the centre of the base; its dimensions are :—height including the oscular fringe 25 mm., greatest breadth 17 mm., length of oscular fringe 10 mm., width of the same at the osculum 4 mm.

The spicules are, as already mentioned in the original description, gastral quadriradiates, tubar triradiates, triradiates, near the dermal surface, with a bent basal ray protecting the entrances to the inhalent canals, oxea at the distal ends of the chambers projecting far beyond the dermal surface, slender linear spicules associated with the oxea, and the oxea of the oscular fringe.

There are apparently triradiates occurring with the gastral quadriradiates, differing from the latter only in the absence of the apical ray. The sections obtained from the specimens in the present collection are better than those used for the original description and from them it is seen that the bent rays of the triradiates near the dermal surface converge toward and serve to protect the entrances to the inhalent canals and are directed away from the distal ends of the chambers. The oxea of the dermal surface reach a length in the Upernavik specimen of 4·07 mm.

Localities.—Strait of Belle Isle, off Norman's Light, 60 fathoms, rocky bottom, A. M. Rodger, 9th of April, 1892, one specimen; Baffin Bay, Upernavik, west coast of Greenland, 1892, one large and well-preserved specimen.

Sycon mundulum. (Sp. nov.)

(Plate III. figs. 7, 7*a-e*.)

Sponge solitary, erect, tubular, broadest at or near the base, diminishing in size gradually to the osculum above which is without a spicular fringe. Texture not very firm. Surface hispid. Length of specimen 19 mm., breadth a little above the base 3·75 mm., width of osculum 1·25 mm.

The radial tubes are arranged regularly round a rather narrow cylindrical gastral cavity. Length of radial tubes, not including the dermal tufts of oxea, ·75 mm., breadth of the same ·137 mm.

Skeleton.—The skeleton is composed of gastral quadriradiate, gastral triradiate and tubar triradiate spicules, dermal oxea projecting from the distal ends of the radial tubes and linear spicules occurring with the oxea.

1. *Gastral quadriradiates.*—Comparatively few in number with long apical rays; all rays slender, terminating in fine points; facial rays straight, not quite in the same plane but inclined a little toward the apical ray, length about ·117 mm., with a diameter at midlength of ·003 mm.; apical ray up to ·229 mm. in length and ·005 in diameter.

2. *Gastral triradiates.*—In three or four layers parallel to the gastral surface. Rays lying in the same plane, slender, sharply pointed, in size about ·124 by ·003 mm.

3. *Tubar triradiates.*—Sagittal; the three rays of the same thickness; basal ray tapering to a sharp point, straight, ·131 mm. long and ·006 mm. thick at midlength; lateral rays curved toward the basal ray, sharply pointed, ·078 mm. long; oral angle 134°.

4. *Dermal oxea.*—Occurring in tufts at the distal ends of the radial chambers in which their inner ends are embedded and beyond which they project by about two-thirds of their length. Sharply pointed, generally slightly curved, reaching a length of ·506 mm. with a midlength diameter of ·013 mm.

5. *Linear spicules.*—Scattered among and lying in the same direction as the dermal oxea, over ·262 mm. in length and about ·0016 mm. in diameter. These spicules, on account of their slenderness, are generally broken.

Localities.—Davis Strait, Exeter Harbour, 10 fathoms, stony bottom, A. M. Rodger, 9th of September, 1892, one specimen; Davis Strait, off Cape Raper, 4 miles S., 60 fathoms, bottom of stones and sand, A. M. Rodger, 13th of September, 1892, two specimens.

Sycon Eglintonensis. (Sp. nov.)

(Plate II, figs. 6, 6*a-e*.)

Sponge solitary, in the form of a long, curved subcylindrical tube narrowing slightly toward either extremity, attached by the base, with a single, terminal naked osculum. Surface hispid from the projecting oxea. Texture firm. The only specimen in the collection is 32 mm. long, 4·5 mm. broad at midheight and 1·5 mm. broad at the osculum; the gastral cavity is 2·5 mm. wide surrounded by the wall 1 mm. thick.

Skeleton.—The skeleton consists of gastral quadriradiates, gastral triradiates, tubar triradiates, large oxea and linear spicules.

1. *Gastral quadriradiates.*—With slender facial rays and a very long apical ray projecting into the gastral cavity; facial rays straight or slightly curved, sharply pointed, bent a little toward the gastral cavity, ·170 mm. long and ·0049 mm. thick at midlength; apical ray reaching a length of ·753 mm. with a thickness of ·006 mm.

2. *Gastral triradiates.*—Strongly sagittal; the three rays of the same thickness, sharply pointed and lying in the same plane; the basal ray in its greatest development twice as long as the lateral rays, straight, reaching a length of ·353 mm. with a thickness at midlength of ·006 mm.: lateral rays, including an angle of 120°, curved slightly toward the basal ray, about ·176 mm. long. In several layers parallel to the gastral surface.

3. *Tubar triradiates.*—Sagittal, with little variation in size; of very much the same shape as the gastral triradiates but smaller; basal ray averaging ·196 mm. long, lateral rays about ·117 mm. long and ·006 mm. in diameter with an included angle of 123°.

4. *Large oxea.*—Occurring in the outer ends of the radial tubes beyond which they project at right angles to the general surface; generally slightly curved, reaching a length of ·849 mm. and a thickness of ·013 mm.

5. *Linear spicules.*—Very slender, few in number, up to a length of ·196 mm. and ·0016 mm. thick; in direction parallel to the large oxea among which they are scattered.

Locality.—Davis Strait, Eglinton Harbour, 15 fathoms, mud bottom, A. M. Rodger, 17th of September, 1892, one specimen.

Grantia Phillipsii. (Sp. nov.)

(Plate IV, figs. 9, 9*a-i.*)

Sponge solitary, stipitate, consisting of a well-developed peduncle supporting an elongated, spindle-shaped head, that terminates above in a single naked osculum. In the specimen representing this species in the collection, the lower end of the stem is wanting. Height of specimen 9 mm., length of head 3·3 mm., greatest breadth of head at its midlength 1 mm., thickness of stem ·3 mm. with an increase in diameter toward the head, width of osculum about ·5 mm. Wall ·2 mm. thick, surrounding a comparatively wide gastral cavity that extends downward to the junction of the head with the stem.

Skeleton.—The skeleton consists of gastral quadriradiate, tubar triradiate and dermal triradiate spicules and very small, slender oxea echin-

ating the surface, principally that of the stem where they are abundant.

1. *Gastral quadriradiates.*—Facial rays straight, rather slender, tapering to a sharp point, not in the same plane but making an angle with the apical ray a little less than a right angle, length about ·104 mm., thickness at midlength ·003 mm.; apical ray straight, sharply pointed, averaging in length ·065 mm. and in thickness ·0049 mm.

2. *Tubar triradiates.*—Sagittal; all rays of the same thickness and rather slender; lateral rays nearly at right angles to and curved slightly toward the basal ray, about ·078 mm. long and ·005 mm. in diameter at midlength; basal ray about ·163 mm. in average length, tapering gradually to a fine point.

3. *Dermal triradiates.*—Sagittal; varying considerably in size and in the proportionate length of the basal ray. The lateral rays are oblique to and make an angle of about 25° with the plane in which the basal ray lies. All the rays are of equal thickness, the basal ray is straight and tapers to a point, reaching a length of ·232 mm. with a diameter at midlength of ·010 mm., the lateral rays are also sharply pointed, generally straight, with a length of about ·091 mm. and an included oral angle of about 115°. The basal ray is at times equal in size to or not much longer than the lateral rays.

With the dermal triradiates may be classed the triradiates that compose the stem. These latter are very similar in shape to the dermal triradiates and both forms pass by insensible gradations the one into the other, the principal differences being that the spicules of the stem have a somewhat larger basal ray and shorter lateral rays with an oral angle of 145°; the basal ray reaches a length of ·262 mm., the lateral rays are about ·072 mm. in length with a diameter at midlength of ·010 mm. and curve a little toward the basal ray. The dermal triradiates with those of the stem have the basal ray directed downward and the lateral rays inclined inward.

4. *Slender oxea of the stem.*—Occurring abundantly in the stem, at right angles to and projecting beyond the surface; slightly curved, sharply pointed, about ·078 by ·002 mm. in size. This spicule is found only in small numbers in the head.

Locality.—Davis Strait, Cape Aston, 60 fathoms, Captain Phillips, 10th of August, 1891.

Grantia invenusta. (Sp. nov.)

(Plate VI, figs. 14, 14*a-f*.)

Sponge solitary, erect, in the form of a subcylindrical tube, attached by the base, attenuated below and broadest above midheight, with a single naked osculum at the upper end. Wall of tube ·65 mm. through, leaving a gastral cavity about as wide as the wall is thick. Surface with a regular reticulation of low ridges. Texture moderately firm. Length of the only specimen in the collection 9·5 mm., maximum breadth 2·25 mm., width of osculum ·8 mm. This sponge was growing on a *hydroid* to which also was attached a specimen of *Leucosolenia cancellata*, Verrill.

Skeleton.—Composed of gastral quadriradiate, gastral triradiate, tubar triradiate and dermal triradiate spicules.

1. *Gastral quadriradiates.*—With slender, gradually tapering and sharply pointed rays; facial rays curved very slightly toward the apical ray; ·085 mm. in length and ·003 mm. in diameter at midlength; apical ray generally slightly curved, longer and a little stouter than the facial rays and sometimes rather obtusely pointed, ·098 mm. in length and ·0049 mm. thick.

2. *Gastral triradiates.*—Differing from the quadriradiates only in the absence of an apical ray. In an average sized spicule the rays are ·104 mm. long and ·003 mm. in diameter.

3. *Tubar triradiates.*—Sagittal, graceful in shape, rather slender, with rays of the same thickness; basal ray ·150 mm. long with a diameter at midlength of ·0049 mm.; lateral rays straight or with their extremities slightly curved toward the basal ray, ·078 mm. long.

4. *Dermal triradiates.*—Sagittal, with sharply pointed rays of the same thickness, that are not in the same plane but are inclined slightly inward; basal ray straight, ·072 mm. long, lateral rays, straight, ·058 mm. long and ·0049 mm. in diameter at midlength.

Locality.—Davis Strait, off Cape Raper, 4 miles S., 60 fathoms, bottom of stones and sand, A. M. Rodger, 13th of September, 1892, one specimen.

Leucandra valida. (Sp. nov.)

(Plate IV, figs. 10, 10*a-e* and Plate V, figs. 11, 11*a-e*.)

Sponge solitary, erect, subcylindrical, broadest near the base, narrowing gradually upward, terminating above in a single osculum provided with a short fringe. Surface bristly. Wall about 1·02 mm. thick

surrounding a moderately wide gastral cavity. Of the two specimens in the collection the larger is 24 mm. high, 5 mm. broad near the base and 1·5 mm. broad at the distal end beyond which the oscular fringe extends about 2·5 mm.

Skeleton.—The skeleton consists of gastral quadriradiates, gastral triradiates, subgastral triradiates, parenchymal triradiates, dermal triradiates, large oxea and linear spicules of the dermal surface and oxea of of oscular fringe.

1. *Gastral quadriradiates.*—Stout; facial rays curved slightly inward, rather sharply pointed, averaging about ·294 mm. in length and ·018 mm. in diameter at midlength; apical ray comparatively short, about ·183 mm. long and ·013 mm. in diameter.

2. *Gastral triradiates.*—With rays somewhat shorter but of nearly the same stoutness as the facial rays of the quadriradiates; rays curved slightly inward, about ·196 by ·013 mm. in size. In fewer numbers than the quadriradiates.

3. *Subgastral triradiates.*—Sagittal; all the rays straight and of the same thickness; basal ray ·222 mm. long and ·016 mm. thick; lateral rays nearly at right angles to the basal ray and ·131 mm. in length. They vary somewhat in size and are not abundant.

4. *Triradiates of the parenchyma.*—Nearly regular or more or less sagittal, very variable in size, distributed irregularly in the thickness of the sponge; the largest form is slightly sagittal with rays of the same diameter; basal ray ·290 mm. long and ·014 mm. in diameter at midlength; lateral rays about ·275 mm. long. The smallest form has a basal ray ·072 mm. long and lateral rays ·039 mm. long. Between these extreme forms are intermediate sizes grading into each other.

5. *Dermal triradiates.*—Of large size, in three or four layers parallel to the dermal surface; rays of nearly the same length and of about the same thickness, generally straight, sharply pointed and lying in the same plane, attaining a length of ·288 mm, with a thickness at midlength of ·019 mm.

6. *Large oxea.*—At right angles to the dermal surface, deeply embedded in the wall and projecting far beyond the surface ; sharply pointed, generally rather stouter at the distal than at the proximal end, averaging in size 1·01 by ·032 mm.

7. *Linear spicules.*—Occurring singly or in bundles at the surface similarly to the large oxea; up to ·491 mm. in length and ·003 mm. thick.

8. *Oxea of the peristome.*—Slender, between 2 and 3 mm. in length with a maximum thickness of ·006 mm.

Locality.—Davis Strait, Exeter Harbour, 10 fathoms, stony bottom, A. M. Rodger, 9th of September, 1892, two specimens.

Leucandra Cumberlandensis. (Sp. nov.)

(Plate V, figs. 12, 12*a-j*.)

Sponge solitary, upright, tubular, attached by the base, narrowing slightly above where it terminates in a single osculum surrounded by a short fringe. Surface hispid. The dimensions of the largest specimen are:—length 16 mm., maximum breadth 3 mm., length of oscular fringe about 2 mm., wall ·7 mm. thick inclosing a moderately wide gastral cavity.

Skeleton.—Composed of gastral quadriradiates, subgastral triradiates, triradiates and quadriradiates of the parenchyma, dermal triradiates, oxea and linear spicules at right angles to the surface and oxea of the peristome.

1. *Gastral quadriradates.*—Facial rays longer than the apical ray, generally curved slightly inward, sharply pointed, about ·189 mm. long with a thickness at midlength of ·006 mm.; apical ray, ending in a sharp point, about ·137 mm. long.

2. *Subgastral triradiates.*—Sagittal; the three rays of the same diameter and lying in the same plane; basal ray straight, averaging ·373 mm. in length and ·01 mm. in thickness; lateral rays widely spreading with a graceful curve, ·203 mm. long.

3. *Triradiates of the parenchyma.*—Sagittal, of large size; all the rays of the same thickness and sharply pointed; basal ray straight, about ·366 mm. in length and ·013 mm. thick at midlength; lateral rays curved toward the basal ray, ·255 mm. long; oral angle 125°.

4. *Quadriradiates of the parenchyma.*—Sagittal with a long basal ray directed toward the dermal surface, with poorly developed lateral rays and a very short or scarcely developed apical ray; basal ray straight, sharply pointed, up to ·360 mm. in length and ·009 mm. in diameter.

5. *Dermal triradiates.*—Slightly sagittal or nearly regular, of large average size, in three or four layers at the surface; length of rays about ·242 mm. with a thickness at midlength of ·013 mm. A few spicules of smaller size also occur thinly scattered among the larger ones; the rays of the smaller kind average ·089 mm. in length with a thickness of ·006 mm.

6. *Large oxea.*—At right angles to the surface, with the proximal end deep in the wall; sharply pointed, nearly or quite straight, reaching a length of 1·2 mm. with a diameter of ·019 mm.

7. *Linear spicules.*—Scattered among the large oxea, at right angles to the surface, in small numbers; generally broken but over ·657 mm. in length with a thickness of ·002 mm.

8. *Oxea of the oscular fringe.*—Over 2 mm. in length and about ·006 mm. thick.

Localities.—Cumberland Sound, Kingawa Fjord, 20 fathoms, sandy bottom, A. M. Rodger, 20th of August, 1892, three specimens; Davis Strait, off Cape Raper, 4 miles S., 60 fathoms, bottom of stones and sand, A. M. Rodger, 13th of September, 1892, four specimens.

Heteropia Rodgeri. (Sp. nov.)

(Plate VI, figs. 13, 13*a-g*.)

Sponge erect, solitary, nearly cylindrical, increasing slightly in diameter from the base to near the oscular opening which is devoid of a fringe. Surface even. Texture firm. Wall about ·3 mm. through. Gastral cavity large, terminating above in a wide osculum. Attaining a length of about 1 cent. with a diameter near the upper end of from 1·5 to 2 mm.

Skeleton.—Composed of the following spicules,—gastral quadriradiates, gastral triradiates, subgastral triradiates, tubar triradiates, subdermal triradiates, dermal oxea longitudinally disposed, and linear spicules at right angles to the dermal surface.

1. *Gastral quadriradiates.*—With sharply pointed rays, the apical ray being much stouter than the others; length of rays, parallel to the gastral surface, ·104 mm. with a thickness of ·006 mm., size of apical ray ·229 by ·013 mm. These spicules are not numerous.

2. *Gastral triradiates.*—Occurring longitudinally, more or less in fascicles, parallel to the gastral surface. Sagittal, with rays lying in the same plane and tapering to a sharp point; basal ray very long measuring about ·425 by ·006 mm., lateral rays curved toward the basal ray, about ·104 mm. long and ·006 mm. in diameter.

3. *Subgastral triradiates.*—Sagittal; all rays of the same thickness, lateral rays lying slightly out of the plane of the basal ray, almost straight or curving a little toward the basal ray; lateral rays measuring about ·111 by ·006 mm., basal ray ·189 mm. long. These spicules have their basal rays reaching across the wall to the lateral rays of the subdermal triradiates.

4. *Tubar triradiates.*—Similar in shape to the subgastral triradiates but generally rather smaller with a proportionately shorter basal ray. Occurring in small numbers at different levels farther removed from the gastral surface than the subgastral triradiates.

5. *Subdermal triradiates.*—Sagittal; somewhat similar in shape to the subgastral triradiates but with shorter lateral rays and a slightly shorter basal ray. The lateral rays are inclined out of the plane of the basal ray and viewing the spicule from the front their extremities curve slightly away from the basal ray. Lateral rays about ·078 by ·006 mm. in size, basal ray averaging ·170 mm. long and ·006 mm. thick at midlength. The spicule, as regards its position in the wall, is opposite to the subgastral triradiates, its lateral rays lying parallel to the dermal surface whilst the basal ray reaches some distance toward the gastral surface.

6. *Dermal oxea.*—Occurring in layers in the dermal cortex nearly parallel with the long axis of the sponge but with a slight obliquity outward and upward. Tapering gradually to a sharp point at each end, straight or very slightly curved, averaging ·822 mm. in length with a thickness at midlength of ·013 mm.

7. *Linear spicules.*—Very slender, scattered among the cortical oxea at right angles to and projecting beyond the dermal surface; about ·098 mm. long and ·002 mm. thick.

Locality.—Strait of Belle Isle, off Norman's Light, 60 fathoms, rocky bottom, A. M. Rodger, 9th of April, 1892, two specimens and the upper end of a third.

This species is named after Mr. A. M. Rodger, through whose efforts this interesting and valuable collection of sponges have, in a great measure, been secured.

Amphoriscus Thompsoni. (Sp. nov.)

(Plate III, figs. 8, 8*a-j*.)

Sponge solitary, erect, nearly cylindrical, broadest at midheight, without an oscular fringe. Wall thin, about ·15 mm. through, inclosing a comparatively wide gastral cavity. Surface even, echinated by stout, projecting oxea. Texture firm. The larger of two specimens is slightly over 1 cent. long and at midlength is about 1·5 mm. broad, tapering a little toward each extremity.

Skeleton.—The skeleton consists of gastral quadriradiate and triradiate, of subgastral triradiate, of subdermal triradiate and of dermal triradiate spicules with large oxea and small linear spicules projecting beyond the dermal surface.

1. *Gastral quadriradiates.*—Stout, with sharply pointed rays. The apical ray, straight, about ·085 mm. long and ·006 mm. thick at mid-

length. The other rays, lying parallel to the gastral surface, of the same thickness as the apical ray but longer, curved slightly toward the gastral cavity, about ·111 mm. in length.

2. *Gastral triradiates.*—With sharply pointed, straight rays, of about the same thickness as those of the quadriradiates and about ·124 mm. long.

3. *Subgastral triradiates.*—Sagittal, with rays coming to a sharp point and lying in the same plane. Basal ray straight, about ·137 mm. long with a thickness of ·006 mm., or a little more, at midlength, reaching well across the wall to the lateral rays of the subdermal triradiates. Lateral rays usually about ·104 mm. long, curved slightly toward the basal ray, of the same thickness as the basal ray.

4. *Subdermal triradiates.*—Sagittal, with sharply pointed rays that do not lie in the same plane; basal ray straight, about ·091 mm. long and ·006 mm. thick at midlength; lateral rays curved slightly toward the basal ray, about ·072 mm. in length. Viewing the spicule from the side, the lateral rays make an angle of about 132° with the basal ray. In the skeleton this spicule has its basal ray parallel with the basal ray of the subgastral triradiates.

5. *Dermal triradiates.*—Stout with tapering rays, about ·085 mm. long, curved slightly inward.

6. *Stout oxea.*—Straight and tapering to a sharp point proximally, curved in the outer half of their length and terminating abruptly in a minutely spined, more or less blunted, bent distal extremity. Deeply embedded in the wall at right angles to the dermal surface beyond which one-half or less of their length projects. Length averaging about ·262 mm. with a thickness at midlength of ·014 mm.

7. *Linear spicules.*—Very slender, hair-like, straight, about ·098 mm. long, at right angles to and projecting beyond the dermal surface.

Locality.—Strait of Belle Isle, off Norman's Light, 60 fathoms, rocky bottom, A. M. Rodger, 9th of April, 1892, two specimens.

The writer has much pleasure in naming this interesting species after Professor Thompson.

Plate I.

Fig. 1.—*Gellius Laurentinus* (page 20). Oxeote spicule ; × 272.
Fig. 1*a*. Simple sigma ; × 272.
Fig. 2.—*Esperella Fristedtii* (page 21). Natural size.
Fig. 2*a*. Stylus ; × 136.
Fig. 2*b*. Anisochela, front view ; × 272.
Fig. 2*c*. Anisochela, side view ; × 272.
Figs. 2*d*, 2*e*. Tylostyli ; × 272.
Fig. 2*f*. Stylus, from another specimen ; × 136.
Fig. 2*g*. Anisochela, front view ; × 272.
Fig. 2*h*. Anisochela, side view ; × 272.
Fig. 3.—*Esperella minuta* (page 23). Twice the natural size.
Fig. 3*a*. Large stylus ; × 272.
Fig. 3*b*. Small tylostylus ; × 272.
Fig. 3*c*. Anisochela, front view ; × 272.
Fig. 4.—*Sycon protectum* (page 27). Natural size.
Fig. 4*a*. Part of a horizontal section ; × 60.
Figs. 4*b*, 4*c*. Gastral quadriradiate spicules ; × 272.
Fig. 4*d*. Tubar triradiate spicule ; × 272.
Figs. 4*e-h*. Triradiates from near the dermal surface with bent basal rays ; × 272.
Fig. 4*i*. Large oxeote spicule from the distal end of a chamber; ×60.
Fig. 4*j*. Linear spicule ; × 136.

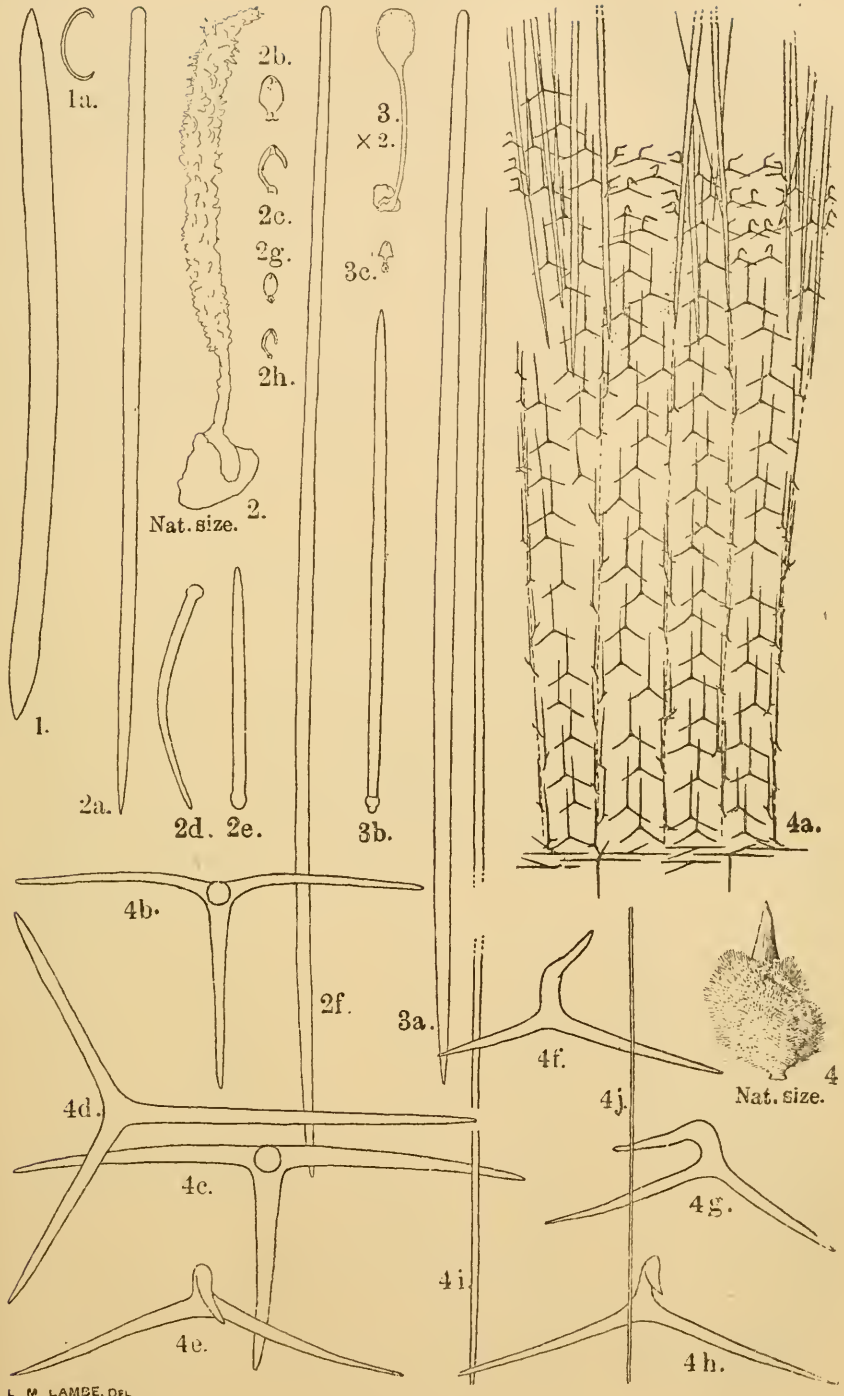

1a.
1.
2b.
2c.
2g.
2h.
2.
Nat. size.
2a.
2d.
2e.
3.
× 2.
3c.
3b.
4a.
4b.
2f.
3a.
4f.
4j.
4
Nat. size.
4d.
4c.
4g.
4i.
4e.
4h.
L. M. LAMBE, DEL.

PLATE II.

Fig. 5.—*Leucosolenia cancellata* (page 27). Twice the natural size.
Fig. 5*a*. Vertical section through the specimen figured ; × 6.
Fig. 5*b*. Part of the same section ; × 42.
Figs. 5*c*, 5*d*. Gastral quadriradiate spicules ; × 272.
Fig. 5*e*. Triradiate spicule ; × 272.

Fig. 6.—*Syeon Eglintonensis* (page 29). Twice the natural size.
Fig. 6*a*. Part of a horizontal section ; × 60.
Fig. 6*b*. Gastral quadriradiate spicule ; × 272.
Fig. 6*c*. Gastral triradiate spicule ; × 272.
Fig. 6*d*. Tubar triradiate spicule ; × 272.
Fig. 6*e*. Large oxeote spicule ; × 136.

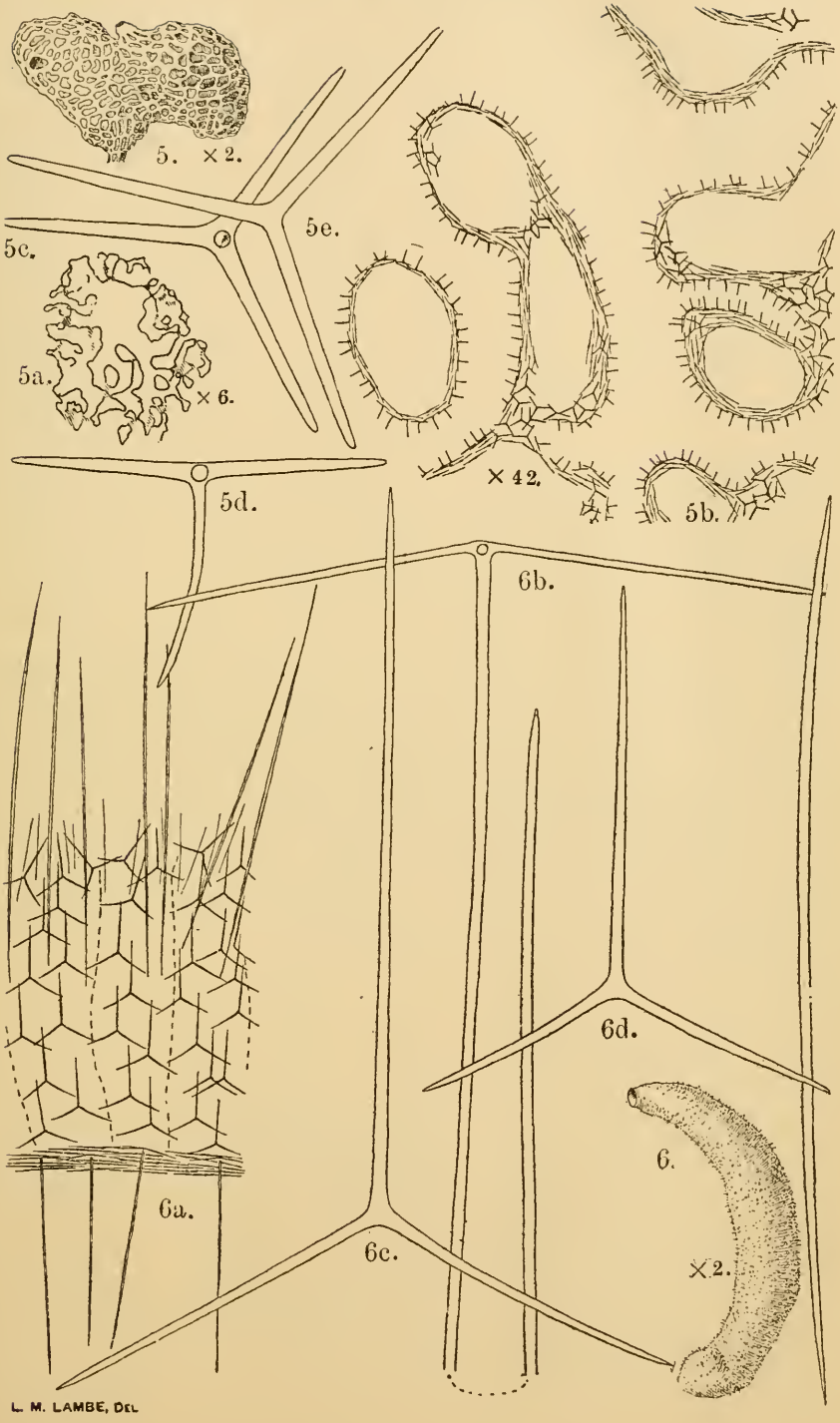
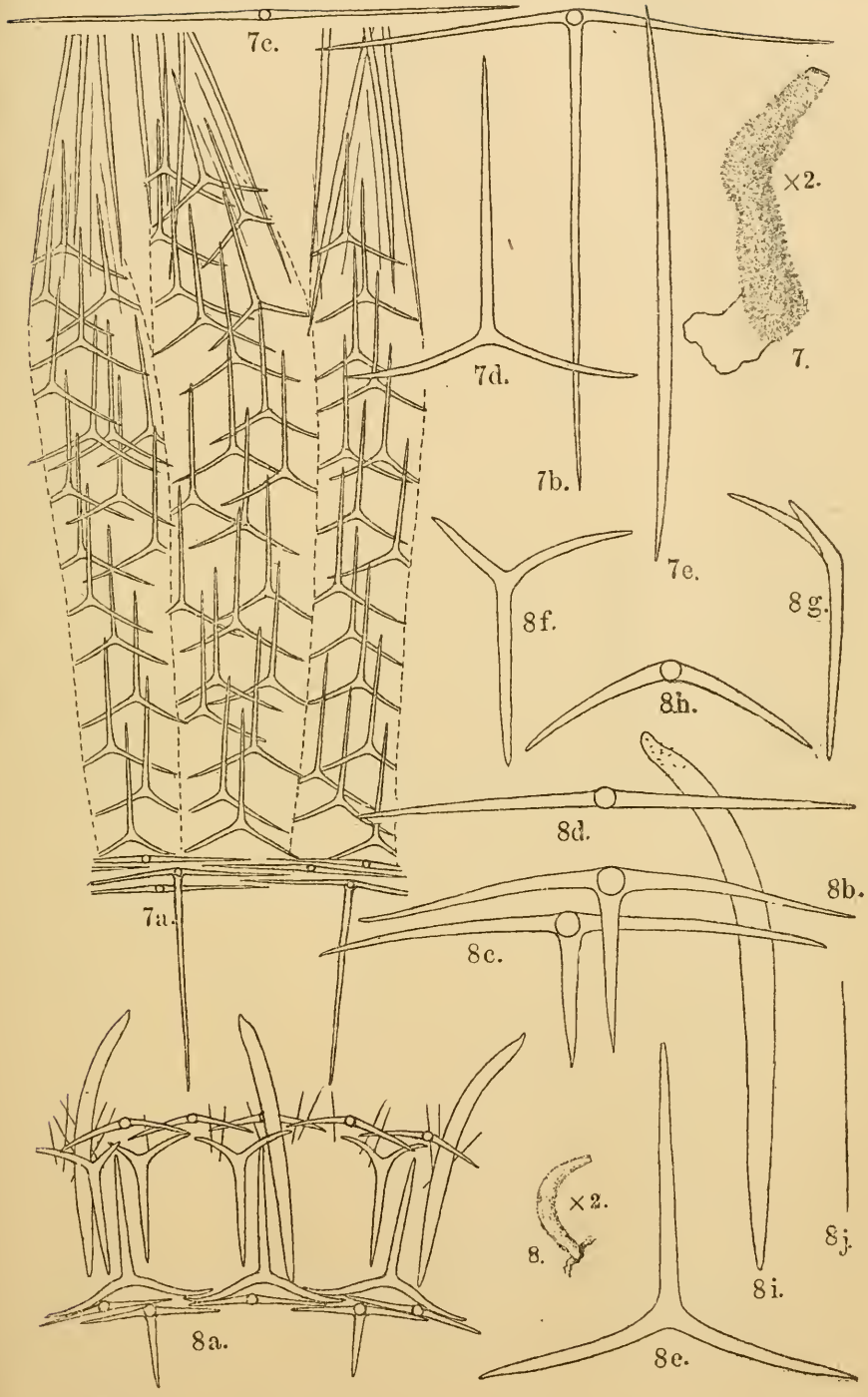

5. ×2.
5c.
5a. ×6.
5e.
×42.
5b.
5d.
6b.
6d.
6.
×2.
6a.
6c.
L. M. LAMBE, DEL

PLATE III.

Fig. 7.—*Sycon mundulum* (page 28). Twice the natural size.
Fig. 7*a*. Part of a horizontal section ; × 136.
Fig. 7*b*. Gastral quadriradiate spicule ; × 272.
Fig. 7*c*. Gastral triradiate spicule ; × 272.
Fig. 7*d*. Tubar triradiate spicule ; × 272.
Fig. 7*e*. Oxeote spicule ; × 136.
Fig. 8.—*Amphoriscus Thompsoni* (page 36). Twice the natural size.
Fig. 8*a*. Part of a horizontal section ; × 136.
Figs. 8*b*, 8*c*. Gastral quadriradiate spicules ; × 272.
Fig. 8*d*. Gastral triradiate spicule ; × 272.
Fig. 8*e*. Subgastral triradiate spicule ; × 272.
Figs. 8*f*, 8*g*. Subdermal triradiate spicules ; × 272.
Fig. 8*h*. Dermal triradiate spicule ; × 272.
Fig. 8*i*. Stout oxeote spicule ; × 272.
Fig. 8*j*. Linear spicule ; × 272.



L. M. LAMBE, DEL.

PLATE IV.

Fig. 9.—*Grantia Phillipsii* (page 30). Twice the natural size.
Fig. 9*a*. Part of a horizontal section ; × 136.
Fig. 9*b*. Gastral quadriradiate spicule ; × 272.
Fig. 9*c*. Tubar triradiate spicule ; × 272.
Figs. 9*d-g*. Dermal triradiate spicules ; × 272.
Fig. 9*h*. Triradiate spicule of the stem ; × 272.
Fig. 9*i*. Oxeote spicule ; × 272.
Fig. 10.—*Leucandra valida* (page 32). Twice the natural size.
Fig. 10*a*. Part of a horizontal section ; × 60.
Figs. 10*b-c*. Triradiate spicules of the parenchyma ; × 136.

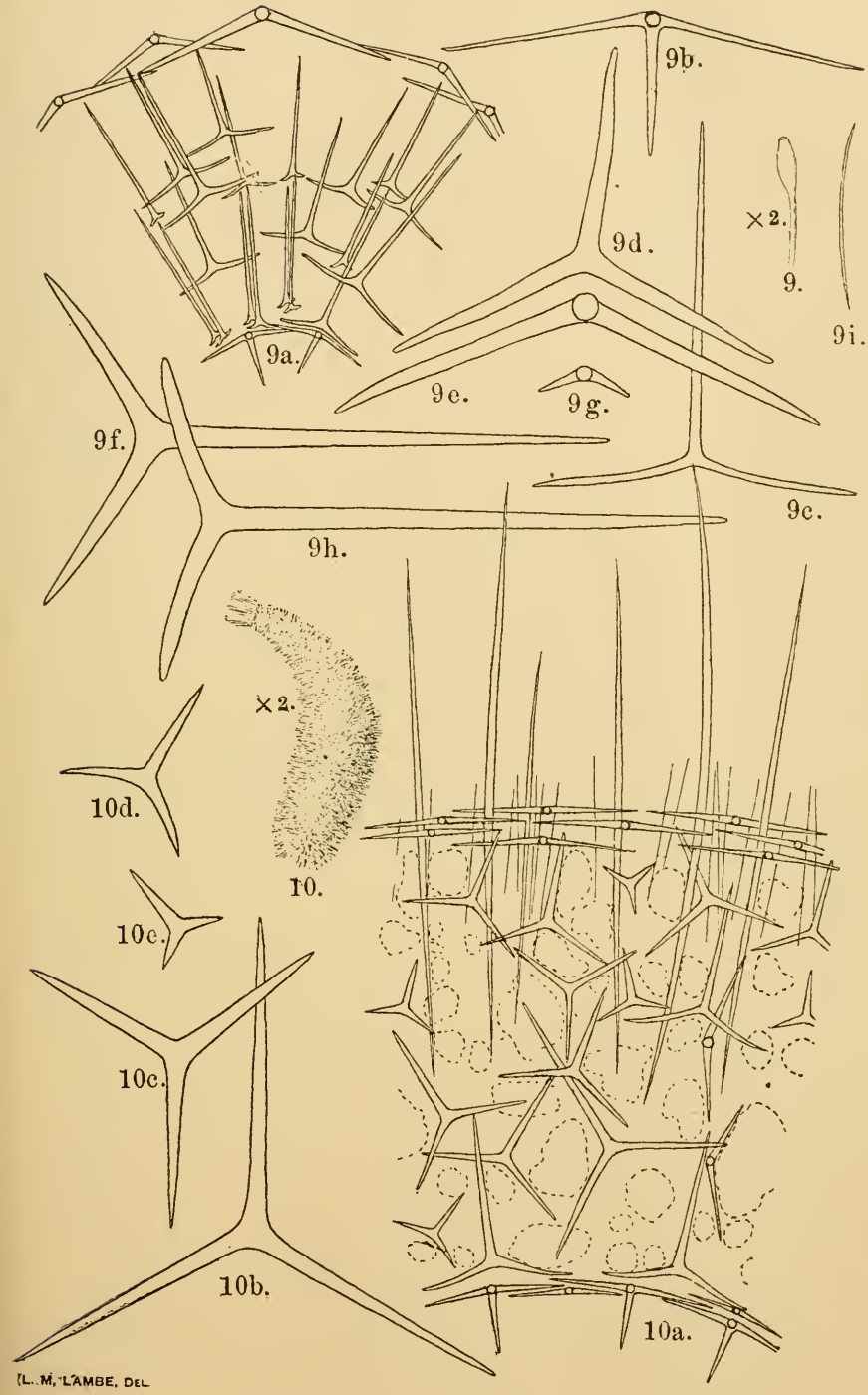

9b.
×2.
9d.
9.
9i.
9a.
9e.
9g.
9f.
9c.
9h.
×2.
10d.
10.
10c.
10c.
10b.
10a.
L. M. LAMBE, DEL.

Plate V.

Fig. 11.—*Leucandra valida* ; gastral quadriradiate spicule ; × 136.
Fig. 11*a*, Gastral triradiate spicule ; × 136.
Fig. 11*b*. Subgastral triradiate spicule ; × 136.
Figs. 11*c*, 11*d*. Dermal triradiate spicules ; × 136.
Fig. 11*e*. Dermal oxeote spicule ; × 136.
Fig. 12.—*Leucandra Cumberlandensis* (page 34). Twice the natural size.
Fig. 12*a*. Part of a horizontal section ; × 60.
Fig. 12*b*. Gastral quadriradiate spicule ; × 136.
Fig. 12*c*, Subgastral triradiate spicule ; × 136.
Fig. 12*d*. Triradiate spicule of the parenchyma ; 136.
Figs. 12*e*, 12*f*. Quadriradiate spicules of the parenchyma ; × 136.
Fig. 12*g*. Large dermal triradiate spicule ; × 136.
Fig. 12*h*. Small dermal triradiate spicule ; × 136.
Fig. 12*i*. Dermal oxeote spicule ; × 136.
Fig. 12*j*. Linear spicule ; × 136.

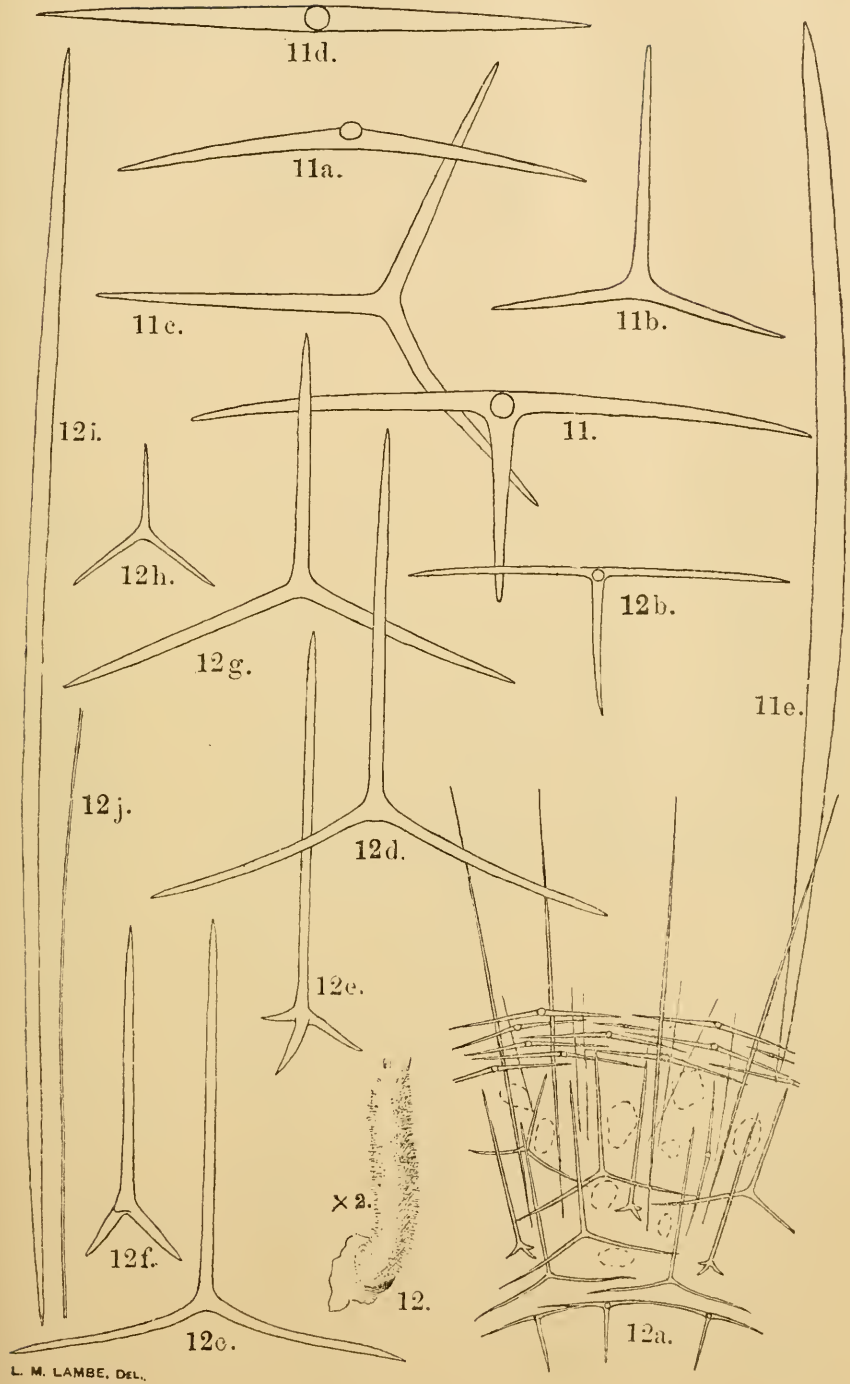

11d.
11a.
11c.
11b.
12i.
11.
12h.
12b.
12g.
11e.
12j.
12d.
12e.
× 2.
12f.
12.
12c.
12a.
L. M. LAMBE, DEL.

Plate VI.

Fig. 13.—*Heteropia Rodgeri* (page 35). Twice the natural size.

Fig. 13*a*. Part of a horizontal section ; × 136. The dermal oxea parallel to the long axis of the sponge are shewn in transverse section.

Fig. 13*b*. Gastral quadriradiate spicule ; × 272.

Figs. 13*c*, 13*d*. Gastral triradiate spicules ; × 272.

Fig. 13*e*. Subgastral triradiate spicule ; × 272.

Fig. 13*f*. Subdermal triradiate spicule ; × 272.

Fig. 13*g*. Dermal oxeote spicule ; × 136.

Fig. 14.—*Grantia invenusta* (page 32). Twice the natural size.

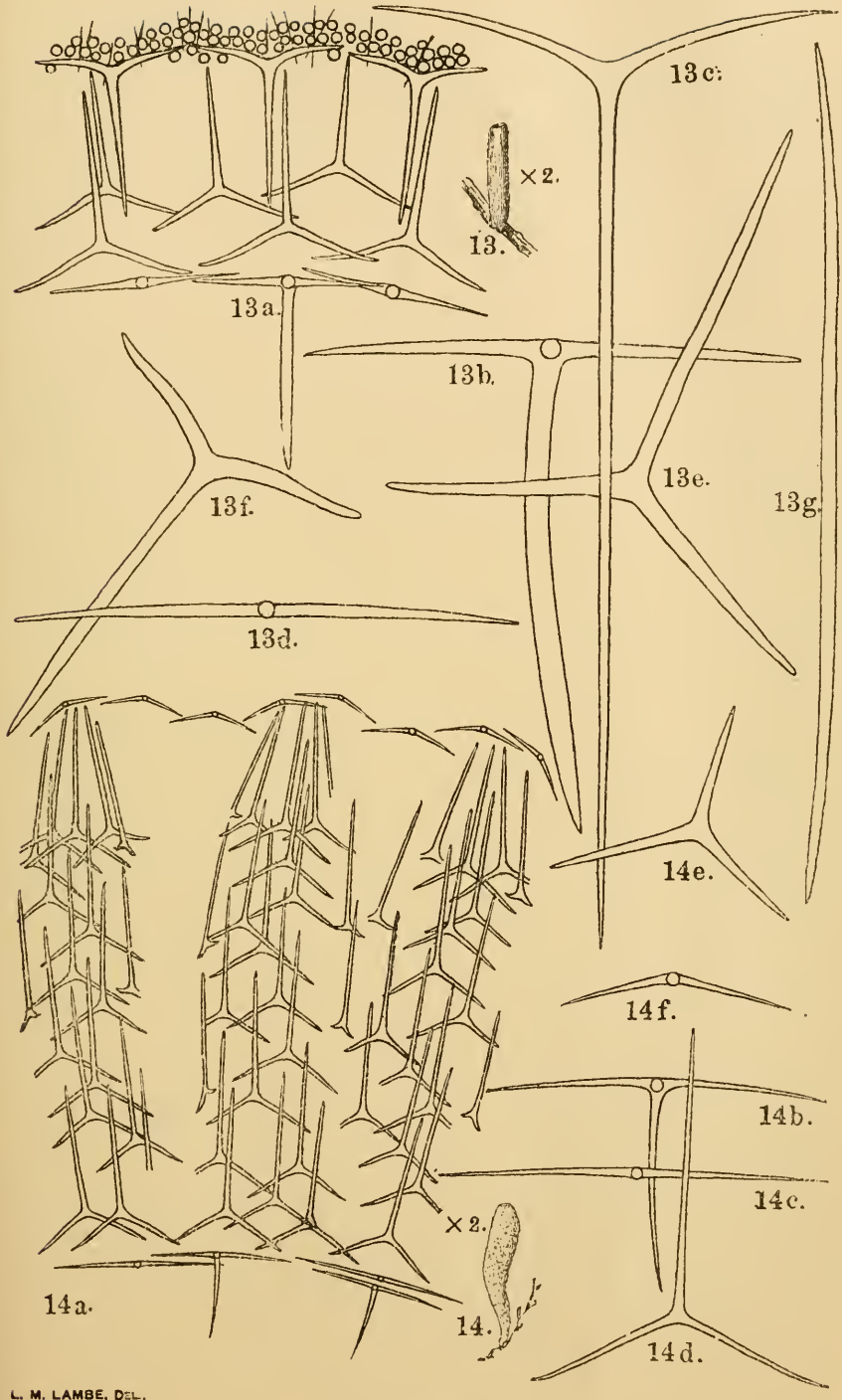
Fig. 14*a*. Part of a horizontal section ; × 136.

Fig. 14*b*. Gastral quadriradiate spicule ; × 272.

Fig. 14*c*. Gastral triradiate spicule ; × 272.

Fig. 14*d*. Tubar triradiate spicule ; × 272.

Figs. 14*e*, 14*f*. Dermal triradiate spicules ; × 272.



L. M. LAMBE, DEL.