XXIV.—PRELIMINARY ACCOUNT OF THE TETRACTINELLID SPONGES DREDGED BY H.M.S. *CHALLENGER*, 1872-76. By PROFESSOR W. J. SOLLAS, LL.D., D. Sc. Part I.—The Choristida.

[Presented, July 15, 1886.]

The following short abstract of my forthcoming Report on the *Challenger* Tetractinellid Sponges is published by kind permission of Dr. John Murray, Director of the *Challenger* Expedition Reports :—

Tribe I.—TETRACTINELLIDA, Marshall.

Skeleton characterized by quadri-radiate spicules, or "Lithistid" sclerites.

Order I. Choristida, Sollas.—Quadri-radiate spicules are present, but not "Lithistid" sclerites.

Order II. Lithistida, Zittel.—The chief skeleton consists of "Lithistid" sclerites articulated to form a consistent network. Quadri-radiate spicules may be present or not.

Order 1. Choristida.

Sub-order 1. Tetradina.—The chief spicules of the choanosome are tetrads, amphitetrads, candelabra, or modified triana.

Sub-order 2. Trianina.—The heads of the adult trianine spicules are confined to the ectosome.

Sub-order 1. Tetradina.

Family 1. **PLAKINIDÆ.**—The canal system is eurypylous. Candelabra are present.

Family 2. **PACHASTRELLIDÆ.**—The canal system is either eurypylous or aphodal. The tetrads are simple.

Family 3. **CORTICIDÆ.**—The canal system is aphodal; the characteristic tetrads are candelabra, or forks with trifurcate arms, or forks with the surface ornamented by spines, or amphitetrads.

Sub-order 2. Trianina.

Family 1. **TETILLIDÆ.**—Flesh spicules are arculi or spirulæ; the triana are characteristic; the canal system in the lowest forms is eurypylous, in the highest, aphodal; the ectosome in the lower forms is the outer epithelium and a thin layer of collenchyme; in the higher, a highly differentiated cortex; choanosome, a collenchymatous mesoderm in the lower forms, sarcenchymatous in the higher.

Family 2. **THENEIDÆ.**—The flesh spicule is a spini-spirula; stellates are absent; the canal system is eurypylous; the ectosome is not differentiated to form a cortex; the mesoderm is collenchymatous.

Family 3. **STELLETTIDÆ.**—The characteristic flesh spicule is a stellate; other forms may also be present; the canal system is aphodal, but approaches the eurypylous type in the lower forms; the ectosome may, or may not, form a cortex; the mesoderm of the choanosome a sarcenchyme.

Family 4. **GEODINIDÆ.**—The characteristic spicule is the globate; the canal system always aphodal; the cortex always well differentiated; the mesoderm of the choanosome a sarcenchyme.

Sub-order 1.

Family 1. **PLAKINIDÆ**, Schultze.

Genus 1. *Epallax*, g. n.—Plakinidæ, with large acerate spicules and small quadriradiate spicules.

Epallax callocyathus, sp. n.—Sponge, vasiform, expanding towards the upper margin, which is rounded, and gently undulating, produced into a short, strong slender stalk below, by which it is attached; walls thin; oscules small, opening into the interior of the cup in longitudinal linear series irregularly alternating; pores, in sieves on the outer surface, overlying the incurrent canals, which interdigitate with the excurrent canals, both being wide-branching sinuses produced by a folding of the choanosome. Both surfaces hispid; ectosome thin, collenchymatous; choanosome, a collenchymatous mesoderm; eurypylous flagellated chambers. Spicules—(1) acerate, 3·04 by 0·078 mm.; (2) acerate, 3·93 by

0·039 mm.; (3) calthrops, usually quadriradiate, but frequently tri- and bi-radiate, or sometimes quinqui- and sex-radiate; one ray of a tetrad, 0·0276 by 0·004 mm.; (4) stellates: these differ from the calthrops by possessing more numerous and smaller rays.

Habitat.—Station 192, lat. 5° 49′ 15″ S.; 132° 14′ 15″ E.; 140 fms.

Family 3. CORTICIDÆ.

Genus 1. **Thrombus**, g. n.—Corticidæ, containing spined forks like those of *Corticium kittoni*, Carter (*Thrombus kittoni*), see *Ann. Mag. Nat. Hist.*, ser. 4, vol. xiv., p. 24. 1874.

Thrombus challengeri, sp. n.—Mesoderm, a collenchyme which contains numerous oval granular cells, 0·016 to 0·02 mm. in diameter. Spicules like those of *Thrombus kittoni*, but larger; fork, shaft, 0·1 by 0·012 mm.; arms, 0·055 by 0·012 mm.

Habitat.—Station 177; lat. 16° 45′ S.; long. 168° 7′ W.; off Api, New Hebrides, 130 fms.

Sub-order 2.

Family 1. TETILLIDÆ.

Genus 1. **Tetilla**, O. Schmidt.—The ectosome never forms a cortex, and is not provided with special spicules; the mesoderm is a collenchyme, and the canal system eurypylous.

Tetilla sandalina, sp. n.—Sponge small; more or less ellipsoidal, or fusiform; a single lateral oscule at one end; ectosome not developed; flagellated chambers large. Spicules—(1) fusiform acerate, 2·326 by 0·0237 mm.; (2) trichite acerates, 0·395 mm. long; immeasurably thin; (3) trifid forks with filiform proximal ends; arms of unequal length; one about 0·197, the other two 0·0513 mm. long; (4) arculi and sigmellæ about 0·025 mm. long; anchors absent.

Habitat.—Azores, lat. 37° 26′ N.; long. 55° 13′ W. 1000 fms.

Tetilla leptoderma, sp. n.—Sponge small; somewhat spherical; a single oscule, lower surface produced into slender rootlets, ectosome thin; flagellated chambers large. Spicules—(1) a fusiform acerate, 4·185 by 0·0474 mm.; (2) trifid forks, filiform at one end, rays of unequal length at the other, 4·03 by 0·0118 mm.;

the longer ray is 0·197, the two shorter, 0·106 mm. long; (3) trichite forks, similar to the preceding, but smaller, and of hair-like fineness; shaft, 1·162 mm. long; (3) somal anchor, a fusiform shaft, with a filiform end, 6·0 by 0·01 mm.; arms, 0·118 by 0·012 mm; (4) radical anchors similar, but with a more massive head, and a distal mucrone; shaft, 6·8 by 0·0276 mm.; arms, 0·154 by 0·0237 mm.; (5) arculi and sigmellæ about 0·0125 to 0·019 mm. long.

Habitat.—Lat. 37° 17′ S.; long. 53° 52′ W. 600 fms.

Tetilla grandis, sp. n.—Sponge large, massive, sub-cylindrical, or sub-ellipsoidal, seated on a massive base of tangled anchoring spicules; oscules numerous, simple; surface hispid; ectosome, a fibro-vesicular collenchyme. Spicules—(1) fusiform acerate, 6·07 by 0·075 mm.; (2) trifid fork; shaft cylindrical; a filiform end; 8·57 by 0·016 mm., to 11·8 by 0·032 mm.; rays, 0·15 by 0·0118 mm.; (3) trichite fork, with one ray longer than the other two; (4) somal anchor, a fusiform shaft with filiform end, 12·14 by 0·02 mm.; rays, 0·16 by 0·012 mm.; spread, 0·16 mm.; (5) radical anchors, similar, but with a thicker head and shorter, stouter rays; shaft, 31·5 by 0·315 mm.; rays, 0·1 by 0·024 mm.; spread, 0·1 mm.; (6) arculi and sigmellæ, 0·0118 mm. long. In small specimens the spicules are smaller; thus, in one 18 by 13 mm. in diameter, the acerate is only 3·5 mm. long, in another, 32 by 26 mm., it is 4·65 mm. long.

Habitat.—Kerguelen and Christmas Island. 10–150 fms.

Tetilla pedifera, sp. n.—Sponge small, somewhat thumb-shaped; surface hispid; oscules numerous, small; ectosome thin, supported by numerous acerates lying parallel to its surface. Spicules—(1) fusiform acerate, 3·2 by 0·03 mm.; (2) forks, a slender shaft, with a filiform end; arms of unequal length, varying from 3 to 1 in number; shaft, 2·38 by 0·012 mm.; arms, long ray, 0·15 mm.; two short rays, 0·06 mm. long; (3) anchors; arms reduced to one, so that the spicule somewhat resembles a shepherd's crook; shaft, 4·46 by 0·0276 mm.; ray. 0·13 mm. long; spread, 0·055 mm.

Habitat.—Lat. 0° 48′ 30″ S.; long. 126° 58′ 30″ E. 825 fms.

Genus 2. **Chrotella**, g. n.—The ectosome is a fibro-vesicular

collenchyme, with acerate spicules strewn through it in various directions, but not at right angles to the surface; the mesoderm is a granular collenchyme; the canal system eurypylous, or aphodal.

Chrotella simplex, sp. n. Sponge somewhat spherical; surface pilose; oscules, one or more, minute. Spicules—(1) fusiform acerate, 3·0 by 0·0237 mm.; (2) trifid fork; shaft, with a filiform end, 3·4 by 0·02 mm.; rays, 0·158 by 0·016 mm.; (3) anchor; shaft, with a filiform end; axial fibre produced distally beyond the origin of the rays; shaft, 5·35 by 0·016 mm.; (4) sigmella and arculus, 0·0118 mm. long.

Habitat.—Lat. 16° 50′ N.; 25° 8′ W. 260 fms.

Chrotella macellata, sp. n.—Sponge spherical, depressed, with a flat base; oscules multiple, each leading into a large cloacal chamber; surface, hispid; flagellated chambers small. Spicules—(1) fusiform acerate, 5·7 by 0·055 mm.; trifid forks, with short prongs, highly porrectate, 0·08 by 0·02 mm.; shaft, fusiform, 7·95 by 0·0276 mm.; (3) trifid fork, with longer rays, less porrectate, 0·23 by 0·02 mm.; shaft, 2·5 by 0·24 mm.; (5) two-pronged (dicellate), and one-pronged (macellate) forks, derived from No. 4 by reduction in the number of the rays; shaft, 3·49 by 0·0316 mm.; prongs of dicellate form, 0·44 by 0·0316 mm.; of macellate, 0·58 by 0·0316 mm.; (6) anchors, shaft, 6·5 by 0·016 mm.; rays, 0·06 by 0·014 mm.; (7) arculi and sigmellæ from 0·012 to 0·016 mm. long; (8) a sigmella with two turns (= a spirula), characterizes the cortex, 0·03 to 0·04 mm. long.

Habitat.—Lat. 11° 37′ N.; long. 123° 31′ E. 18 fms.

Genus 3. Craniella, O. Schmidt.—The cortex is differentiated into an inner fibrous, and outer collenchymatous layer; the latter excavated by intercortical cavities; the former traversed at right angles by cortical acerates; the mesoderm of the choanosome is a sarcenchyme; the canal system is aphodal.

Craniella bowerbankii, sp .n.—The spicules include—(1 fusiform acerates of the body, 3·26 by 0·047 mm., and of the cortex 1·4 by 0·04 mm.; (2) forks, with a shaft, 5·12 by 0·024 mm.; rays, 0·12 mm. long.; spread, 0·06 to 0·07 mm.; (3) anchor, 5·8 by about 0·02 mm. The axial fibre of the shaft is continued into the head past the origin of the arms. Arculi and sigmellæ absent.

Habitat.—Port Jackson, var *a.*; Sydney, 35 fms., var. *b.*; Zam boanga, var. *c.*; lat. 10° 30′ S.; long. 142° 18′ E.; 8 fms. This is probably one of the two very different sponges which were named *T. similima* by Bowerbank.

Craniella pulchra, sp. n.—Spicules—(1) fusiform acerate 4·6 by 0 05 mm. Small acerate of the cortex 1·2 by 0·0395 mm.; (2) trifid fork, shaft 7·1 by 0·0225 mm.; prongs 0.125 mm. long.; (3) anchor, shaft, 8·57 by 0·0165 mm.; rays, 0·0434 by 0·012 mm.; the axial fibre of the shaft extends into the head beyond the origin of the rays.

Habitat.—Lat. 16° 50′ N.; long. 25° 8′ W. 260 fms.

Craniella carteri, sp. n.—Cortex, distinguished by curious cell-aggregates, distributed through its outer collenchymatous layer. These parenchyma-like masses of cells are sharply distinguished from the surrounding tissue, they scarcely stain with reagents, and contain ochreous-coloured spherical granules. Spicules—(1) fusiform acerate, 2·6 by 0·035 mm., and a smaller acerate of the cortex; (2) trifid forks, shaft, 3·5 by 0·014 to 0·016 mm.; rays, 0·0868 by 0·012 mm.; (4) anchors, with rays not quite terminal, the shaft being continued far enough to give a double curvature to the distal margin: shaft, 6·75 by 0·02 mm.; rays, 0·06 mm. long. Arculi and sigmellæ absent.

Habitat.—Bahia.

Craniella schmidtii, sp. n.—Spicules—(1) fusiform acerate, 1·34 to 2·23 by 0·03 mm.; and smaller acerates of the cortex, 0·414 by 0·0276 mm. long; (2) trifid fork, two varieties which pass into each other; one with short, stout, rays, 0·127 by 0·0237 mm.; the other, with longer, slenderer, rays, 0·142 by 0·012; (3) anchors, rays, 0·075 by 0·016 mm.; spread, 0·01 mm.; the axial fibre extends into the head; (4) arculi and sigmellæ, 0·0197 mm. long.

Habitat.—Lat. 38° 30′ N.; long 31° 14′ W.; 1000 fms. This sponge is probably one of those which O. Schmidt has named *Craniella cranium*, which is a purely northern species, and it appears doubtful whether Schmidt had ever seen it.

Genus 4. **Cinochyra**, g. n.—The ectosome forms a cortex, which consists chiefly of a dense fibrous felt; cortical acerates

traverse it transversely; the innermost layer of the cortex is free from spicules; the cortex is not excavated by intercortical cavities; the oscules and pores are confined to special flasked-shaped recesses; the mouth of each flask is sphinctrate; the walls are perforated by pores which communicate with the incurrent or excurrent canals, as the case may be; the mesoderm of the choanosome is a granular collenchyme; the canal system is eurypylous.

Cinochyra barbata, sp. n.—Sponge sub-spherical or sub-cylindrical, seated on a dense mass of its own anchoring filaments. Oscules and pores as in genus. Spicules—(1) fusiform acerate, 8·03 by 0·71 mm.; and a smaller acerate of the cortex, 0·892 by 0·0355 mm.; (2) forks, a fusiform shaft, 13·21 by 0·0296 mm.; rays, 0·178 mm. long; (3) trichite forks, shaft, 0·13 by 0·004 mm.; rays variable in length, one longer, about 0·03 mm. long; two shorter, about 0·016 mm. long; (4) anchors confined to the lower part of the sponge; shaft from 20·0 to 40·0 by 0·024 to 0·03 mm.; rays, 0·103 by 0·016 mm.; spread 0·118 mm.; (5) arculi and sigmellæ, about 0·0156 mm. long.; (6) globules, 0·0535 mm. in diameter.

Habitat.—Kerguelen, 10 to 150 fms.

Family 2. THENEIDÆ.

Genus 1. Thenea.—Sponge of symmetrical form, with specialised poriferous areas. The triana are bifurcated forks, with long secondary rays; and anchors.

Thenea muricata, Bwk.—Occurs in the northern regions of the North Atlantic, not present in the *Challenger* collection.

Thenea schmidtii, sp. n.—Sponge similar to *T. muricata*, Bwk., but distinguished by the large size of its calthrops spicules, and by the comparative thinness of the collenchymatous layer about the canal walls; the rays of the calthrops from 0·175 to 0·205 mm. long.

Habitat.—Station IV., lat. 36° 25′ N.; long. 8° 12′ W.; 600 fms.; station 73, lat. 38° 30′ N.; long. 31° 14′ W.; 1000 fms.; and (O. Schmidt) Florida, 198 fms.

T. grayi, sp. n.—Sponge with a more or less flattened summit and rounded base, which in young forms is hemispherical. Oscule,

large round, laterally placed, poriferous area, also lateral on the opposite side to the oscule: both oscular and poriferous margins fringed with long spicules. Rootlets few and slender. Flagellated chambers, 0·063 mm. in diameter. Spicules—(1) fusiform acerate, 10·07 by 0·026 mm., and 7·8 by 0·08 mm.; (2) porrectate forks, shaft, 5·88 by 0·087 mm.; arms, 0·828 by 0·083 mm.; (3) bifurcated forks, shaft, 5·88 by 0·087 mm.; primary rays, 0·238 by 0·0725 mm.; secondary, 1·193 by 0·06 mm.; (4) somatic anchor, shaft, 1·07 by 0·006 mm.; rays, 0·048 mm. long; spread, 0·09 mm.; (5) radical anchor, 10·33 by 0·0175 mm.; rays, 0·09 to 0·012 mm.; spread, 0·123 mm.; (6) calthrops small, with slender rays, a single ray, 0·143 mm. long; (7) smaller calthrops of usual form; (8) spini-spirulæ, a stout spiral body, 0·0118 mm. long; spines, 0·016 mm. long. Greyish-white.

Habitat.—Station 164 c., lat. 34° 19′ S.; long. 157° 31′ E. 400 fms.

Thenea wyvillii, sp. n.—Sponge, upper surface rounded, cushion-like or flat, with a central, shallow, basin-like depression, in which the excurrent canals open by small, numerous, oscula. Equatorial margin sharp, thin, without a spicular fringe, projecting over the lower surface, which is produced into several strong rootlets, ending below in a tangled spicular base. Poriferous membrane continuous round the equatorial area. Spicules—(1) acerate, 7·85 by 0·07 to 0·084 mm.; (2) porrectate fork, shaft, 6·8 by 0·072 mm.; arms, 0·5 mm. long; (3) bifurcate forks, distinguished by the crooked form of these shafts, which measure 4·28 by 0·0968 mm.; primary arms, 0·178 by 0·08 mm.; secondary, 0·54 by 0·064 mm.; (4) somatic anchors, shaft, 0·876 by 0·008 mm.; rays, 0·95 mm. long; spread 0·1 mm.; (5) radical anchors, 18·2 by 0·011 mm.; rays, 0·1 by 0·014 mm.; (6) calthrops, very regular, triradiate and quadriradiate, as well as other forms; one ray of a quadriradiate measures from 0·08 to 0·09 by 0·0118 mm.; (7) small calthrops; rays, from 4 to 10 in number, about 0·02 mm. long; (8) spini-spirulæ, a slender spiral shaft, and numerous spines, total length, 0·02 to 0·025; length of a single spine, 0·004 mm. Yellowish-white.

Habitat.—Station 209; lat. 10° 14′ N.; long. 123° 54′ W. 95 fms.

T. fenestrata, O. Schmidt.

T. delicata, sp. n.—Sponge, small symmetrical, a conical upper half, sharply defined from a hemispherical lower half; upper surface hirsute; oscule apical; flagellated chambers, 0·087 by 0·067 mm. Spicules—(1) acerate, 6·3 by 0·044 mm.; (2) porrectate forks, shaft, 4·10 by 0·02 mm.; arms, 0·35 mm. long; (3) bifurcate forks, shaft, 4·82 by 0·065 mm.; primary rays, 0·143 by 0·06 mm.; secondary rays, 1·07 by 0·06 mm.; (4) somatic anchors, shaft, 0·954 by 0·008 mm.; rays, 0·075 mm. long; spread, 0·876 mm.; (5) anchoring spicules terminate in rounded club-like heads; shaft, 5·35 by 0·04 mm.; head, 0·0645 mm. wide; (6) calthrops few, small, tending to a spiral form; rays, 0·08 by 0·008 mm.; (7) spini-spirulæ, shaft short and straight, spined at the ends; total length, 0·04 mm. Greyish-white.

Habitat.—Station, 147., lat. 46° 16′ S.; long. 48° 27′ W. 1600 fms.

T. wrightii, sp. n.—Sponge depressed, a flat or obtusely conical upper surface, bearing the oscule; and a flat base; margin more or less lobate; equatorial recess discontinuous; forming a number of circumscribed poriferous areas. Oscular and poral areas not defended by projecting spicules; rootlets absent. The flat cake-like form of the sponge is characteristic.

Habitat.—Station 302, lat. 42° 43′ S.; long. 82° 11′ W. 1450 fms.

Genus 2. **Normania.**—Sponge without specialized porous areas, like those of Thenea; triana; simple forks, without anchors; quadriradiate spicules, as well as calthrops, occur in the choanosome; mesoderm of the choanosome a collenchyme; canal system, eurypylous.

Normania schulzii, sp. n.—A plate-like erect sponge, bearing pores on one surface, and oscules on the other; distinguished from *Normania crassa* by the size of its spicules; the acerates, 3·57 by 0·071 mm.; the forks, shaft, 0·714 by 0·071; arms, 0·357 mm. long.

Habitat.—Station 150; lat. 52° 4′ S.; long. 71° 22′ E. 150 fms.

N. crassiuscula, sp. n.—A plate-like sponge similar in character

of its spicules to *N. schulzii*, but distinguished by the course of the excurrent canals, which run obliquely and longitudinally upwards through the plate to open in patent oscules on one face of the plate.

Habitat.—Porto Praya, St. Jago. 100–128 fms.

N. goliath, sp. n.—Sponge massive, surface raised into sharp undulating ridges, with deep intervening furrows; surface hispid; oscules numerous on the sides and summits of the ridges. Spicules—(1) fusiform acerate, 2·475 by 0·08 mm.; (2) calthrops, each ray 0·684 by 0·05 mm.; (3) acerella, 0·316 by 0·008 mm.; (4) echinella, 0·16 mm. long; (5) globules, 0·16 mm. in diameter.

Habitat.—Station 122; lat. 9° 5′ S.; long. 34° 50′ W. 350 fms.

N. laminaris, sp. n.—Sponge, a thin lamellar expansion 4 to 5 mm. thick; oscules small, dispersed on the inner face. Spicules—(1) a stout fusiform acerate, 3·5 by 0·05 mm.; (2) a slender cylindrical acerate, 5·3 by 0·008 mm.; (3) fork; shaft, 0·678 by 0·06; arms, 0357 by 0·06 mm.; calthrops, acerella, echinella, and spinispirula also present.

Habitat.—Amboyna.

N. tenuilaminaris, sp. n.—This chiefly differs from the preceding species by the greater thinness of the wall, which is from 3 to 3·5 mm. thick. I now only provisionally distinguish it, reserving a final decision to the completed report.

Habitat.—Station 236, lat. 34° 58′ N.; long. 139° 29′ E.; 238–775 fms.

Genus 3. **Vulcanella**, g. n.—Spicules similar to those of Normania; sponge distinguished by the specialisation of the oscula, each the large patent opening of a shallow cloaca, which is lined by a coarsely fenestrate membrane.

Vulcanella cribrifera, sp. n.—Sponge egg-shaped, bearing one or more large oscules on the upper surface; margins of oscules strongly hispid. Spicules—(1) fusiform acerate, 3·04 by 0·067 mm.; (2) slender hispidating acerate, 7·5 by 0·032 mm.; (3) fork, shaft, 1·0 by 0·04 mm.; arms, 0·25 by 0·032 mm.; (4) calthrops

(possibly not proper to the sponge), rays from 0·28 to 0·64 mm. long; (5) acerella, 0·011 mm. long; (6) spini-spirula, 0·016 to 0·02 mm.; (7) cylindrical spicules, with rounded ends (sausage-shaped), 0·357 by 0·028 mm.; these are confined to the cloaca.

Habitat.—St. Jago, Porta Praya.

Genus 4. **Characella**, g. n.—Similar to Normania, but distinguished by the absence of forks in the choanosome; and by possessing only one form of flesh-spicule, which is an amphiaster form of spini-spirule.

Characella aspera, sp. n.—Sponge irregular in form; growing into irregular ridges, lobes, and folds; oscules numerous; pores generally dispersed or collected within circular depressed areas. Spicules—(1) acerate, 1·476 by 0·073 mm.; (2) forks, shaft from 0·2 to 0·4 by 0·04 to 0·074 mm.; arms, when simple 0·2 to 0·64 mm. long; when bifurcate, primary rays, 0·143; secondary, 0·27 mm. long; (3) acerella, 0·4 by 0·008 mm.; (4) amphiaster, 0·0276 to 0·0434 mm. long; (5) globules 0·05 mm. in diameter.

Habitat.—Station 122; lat. 2° 5′ S.; long. 34° 50′ W. 350 fms.

Family.—STELLETTIDÆ.

The genera of the family Stellettidæ may be arranged in sub-families, as follows:—

A. Stellettidæ with but one form of stellate.

1. Sub-family. HOMASTERINA.

Ectosome not a cortex—**Myriastra.**
Ectosome a cortex.—**Pilochrota. Asterella.**

B. Stellettidæ with more than one form of stellate (Heterasterina).

(*a*) Both forms are stellates.

2. Sub-family. STELLETTINA.

Stellates are the only flesh spicules.
Without a cortex—**Anthrastra.**
With a cortex—**Stelletta.**
Trichite sheaves are also present—**Dragmastra.**

(*b*) One form is a stellate, the second a sanidaster.

3. Sub-family. **SANIDASTERINA.**

No other flesh spicules are present—**Tribrachium.**
Trichite sheaves are present as well—**Tethyopsis.**

(*c*) One form is a stellate, the second an amphiastrella.

4. Sub-family. **STRYPHNINA.**

A single genus—**Stryphnus.**

(*d*) One form is a stellate, the other a spined bacillus.

5. Sub-family. **PSAMMASTERINA.**

A single genus—**Psammastra.**

Although this classification appears to be wholly based on the flesh-spicule, it is not so in fact; but it happens as a remarkable coincidence that differences in the flesh-spicule are as a rule associated with other and profounder differences in the organism: we might easily have brought the latter more prominently forward in this classification, but it would have involved more space than we can here afford.

Genus 1. **Myriaster.**—Sponge small; oscules distinguishable from pores; ectosome thin, mainly collenchymatous, excavated by widely extending sub-dermal cavities, which are never restricted to form chones. Flesh spicules, chiasters only. (The chiaster is a small stellate, with an excessively minute centrum, hair-like rays either abruptly truncated at the ends, or capitate; usually few in number. The typical forms, with few rays and capitate ends, may be fancifully supposed to represent the Greek letter χ, hence the name chiaster). The mesoderm is a sarcenchyme, the flagellated chambers small, usually about 0·02 mm. in diameter; they open by short abiti into the excurrent tubes. Distribution chiefly in Australian seas.

Myriaster subtilis, sp. n.—Sponge small, lobate; a few small oscules. Spicules—(1) acerate, 1·35 to 1·5, by 0·032 mm.; (2) fork; shaft, 1·2 by 0·04 mm.; rays bifurcate; primary rays, 0·042; secondary, 0·16 mm. long; (3) anchor, shaft, 1·16 by 0·012 mm.;

rays, 0·04 mm. long; (4) chiaster; rays capitate, 0·008 to 0·016 mm. in diameter.

Habitat.—Kobei, Japan. 8 to 50 fms.

Myriaster simplicifurca, sp. n.—Sponge small; a single oscule on upper surface. Spicules—(1) acerate, 2·0 by 0·0316 mm.; (2) fork, shaft, 2·325 by 0·055 mm.; arms, simple, 0·37 by 0·054 mm.; (3) anchor, shaft, 1·86 by 0·03 mm.; rays, 0·12 mm. long; (4) chiaster, 0·012 mm. in diameter.

Habitat.—Station 186, lat. 10° 30′ S.; long. 142° 18′ E. 8 fms.

Myriaster toxodonta, sp. n.—Sponge small; a few small oscules. Spicules—(1) acerate, 3·42 by 0·032 mm.; (2) fork, shaft, 3·5 by 0·05 mm; arms, bifurcate; primary rays, 0·095 to 0·127 mm. long; secondary, 0·29 to 0·32 mm. long; (3) anchor, shaft, 3·6 by 0·024 mm.; rays, 0·1114 mm. long; (4) chiaster, 0·01 to 0·016 mm. in diameter.

Habitat.—Station 203, lat. 11° 6′ N.; long. 123° 9′ E. 20 fms.

Myriaster clavosa, Ridley.

Habitat.—Stations 186 and 208.

Myriaster quadrata, sp. n.—Sponge small, a single small oscule. Spicules—(1) acerate, 2·56 by 0·016 mm.; (2) fork, shaft, 3·2 by 0·028 mm.; arms, bifurcate; primary rays, 0·11 mm., secondary rays, 0·27 mm. long; (3) anchor, shaft, 3·14 by 0·02 mm.; rays, 0·1 mm. long; (4) chiaster, 0·008 mm. in diameter.

Habitat.—Station 212, lat. 6° 54′ N.; long. 122° 18′ E. 10 fms.

Genus 2. **Pilochrota**, g. n.—Oscules distinct, pores in sieves overlying incurrent chones; ectosome, thick fibrous cortex; flesh spicules, chiasters; choanosome, as in Myriaster. Distribution: Australian seas, Tahiti, West Indies, S. Atlantic.

Pilochrota haeckeli, sp. n.—Sponge sub-globular; oscule single. Spicules—(1) acerate, 2·07 by 0·046 mm.; (2) fork, shaft, 2·18 by 0·055 mm.; arms, simple, 0·24 to 0·32 mm.; (3) anchor, shaft, 3·03 by 0·035 mm.; rays, 0·16 mm. long; (4) small acerate of the cloaca; (5) chiaster, 0·016 mm. in diameter.

Habitat.—Zamboanga. 10 fms.

P. anancora, sp. n.—Sponge small, spherical, depressed, oscule single. Spicules—(1) acerate, 1·68 by 0·023 mm., to 3·18 by 0·023 mm.; (2) fork, shaft, 1·63 by 0·0276 mm.; arms, simple, 0·127 mm. long; (3) chiaster as usual.

Habitat.—Bahia. 7–20 fms.

P. gigas, sp. n.—Sponge massive; several large oscules on the upper surface. Spicules—(1) and (2), 3·18 by 0·024 mm.; acerate, 1·7 by 0·039 mm.; (3) fork, shaft, 1·96 by 0·039 mm.; arms, 0·223 mm. long; (4) chiaster, capitate rays, 0·013 mm. in diameter.

Habitat.—St. Paul's Rocks.

P. tenuispicula.—Sponge small, oscule single. Spicules—(1) acerate, 1·35 to 2·3, by 0·016 mm.; (2) fork, shaft, 1·6 by 0·016 mm.; arms, 0·12 mm. long; (3) chiaster; rays not capitate, 0·012 mm. in diameter.

Habitat.—Bermuda, W. Indies.

P. pachyderma, sp. n.—Sponge massive, lobate, free, two or more oscules on the upper surface; cortex very thick. Spicules—(1) acerate, 1·193 by 0·0178 mm.; (2) fork, shaft, 1·114 by 0·022 mm.; arms, simple, 0·12 mm. long; (3) anchor, shaft, 1·35 by 0·0158 mm.; rays, 0·067 mm. long; (4) chiaster, rays abruptly truncate, but not capiate, 0·006 to 0·011 mm. in diameter; colour, purplish.

Habitat.—Tahiti. 30–70 fms.

P. crassispicula, sp. n.—Sponge irregularly spherical; free; oscule single. Spicules—(1) acerate, 3·5 by 0·024 mm., and 2·3 by 0·052 mm.; (2) fork, shaft, 2·36 by 0·08 mm.; arms, 0·254 mm. long; (3) chiaster, rays capitate; from 0·012 to 0·02 mm. in diameter.

Habitat.—Bahia. 7 to 20 fms.

P. purpurea, Ridley.

P. longancora, sp. n.—Sponge small; a single circular oscule, having the margin fringed by minute acerates projecting radiately in the plane of the apertures. Spicules—(1) acerate, 1·63 by

0·035 mm.; (2) fork, shaft, 2·1 by 0·047 mm.; arms, simple, 0·35 mm. long; (3) anchor, shaft, 3·5 by 0·024 mm.; rays, 0·075 mm. long; (4) minute acerate of oscular margin; (5) chiaster, 0·009 mm. in diameter in the ectosome, 0·012 mm. in choanosome.

Habitat.—Torres Straits. 3–11 fms.

Genus 3. **Anthastra**, g. n.—Sponge usually more or less spherical; oscules distinguishable from the pores or not; ectosome thin, chiefly collenchymatous, excavated by extensive sub-dermal cavities which never form chones; choanosome as in Myriaster. Flesh spicules an anthaster and usually a chiaster. (The anthaster is a stellate with conical or bacillar microspined rays, which may be numerous but are usually few in number, and may be reduced to two, when a spined bacillus is the result.) Distribution: Australian seas, and Japan.

Anthastra communis, sp. n.—Sponge more or less spherical, free or attached; oscules not distinguishable from the pores. Spicules—(1) acerates 4·2 to 5·6 by 0·06 to 0·09 mm. (2) fork with bifurcated arms, primary rays projecting forwards and outwards, sometimes more outwards than forwards, sometimes the reverse, then giving the head a cyathi-form appearance, secondary rays horizontal, shaft, 4·4 to 5·7 by 0·09 to 0·11 mm.; primary rays, 0·14 to 0·16; secondary, from 0·52 to 1·114 mm. long; (3) anchor, shaft, 3·0 to 4·3 by 0·32 to 0·39 mm.; rays, 0·127 to 0·16 mm. long.; (4) anthaster, rays few, 0·02 to 0·03 mm. long; (5) chiaster, spines numerous, 0·006 to 0·008 mm. long; colour, greyish-white, sometimes russet-red (owing to presence of algal cells?).

Habitat.—Station 162, lat. 39° 10′ 30″ S.; long. 146° 37′ E.; 38 fms. Station 162a; lat. 36° 59′ S.; long. 150° 20′ E.; 150 fms. Port Jackson, 6 to 15 fms.

Anthastra pulchra, sp. n.—Sponge small, globular, free, a single oscule. Spicules—(1) acerate, 2·4 to 3·1 by 0·0315 mm.; (2) fork with simple arms, shaft, 2·6 to 2·9 by 0·0474 mm.; arms, 0·26 mm. long; (3) anchor, shaft, 2·6 to 2·9 by 0·0315 mm.; rays, 0·125 mm. long; (4) anthaster, rays few, 0·016 mm. long; (5) chiaster, variable in character, rays seldom capitate.

Habitat.—Station 163a.; lat. 36° 59′ S.; long. 150° 20′ E. 150 fms.

Anthastra parvispicula, sp. n.—Sponge small, spherical, free, a single small oscule. Spicules—(1) acerate 1·3 by 0·02 mm.; (2) fork with simple arms, shaft, 1·75 by 0·02 mm.; arms, 0·21 mm. long; (3) anchor, shaft, 1·3 by 0·016 mm.; rays, 0·045 mm. long; (4) anthaster as in *A. pulchra;* (5) chiaster, rays not capitate, 0·0118 mm. long.

Habitat.—Station 161; lat 38° 21′ 30″ S.; long. 144° 36′ 30″ E. 33 fms.

Genus 4. **Ecionema**, Bwk.—Similar to Anthastra, but with the oscules confined to the summit, the excurrent tubes running longitudinally and vertically through the sponge.

Ecionema ridleyi, sp. n.—Sponge ovate, several small oscules on the summit. Spicules—(1) acerate, 4·07 by 0·118 mm.; (2) fork, with simple arms, 4·3 by 0·118 mm.; arms, 0·27 to 0·32 mm. long; (3) anchor, shaft, 3·6 by 0·03 mm.; rays, 0·103 mm. long; (4) anthaster, small; rays few or numerous; a single ray of a tetrad form, 0·01 by 0·004 mm.; (5) chiaster, rays slender, hair-like, capitate, 0·016 mm. in diameter.

Habitat.—Port Jackson. 30–35 fms.

Ecionema pyriformis, sp. n.—Sponge obconic, attached by flat base, summit bearing numerous small oscules; pores in sieves, generally distributed over the sides; chief excurrent canals vertical. Spicules—(1) acerate, 3·14 by 0·095, to 4 by 0·104 mm.; (2) fork, shaft, 3·02 by 0·095, to 3·72 by 0·163; arms bifurcate; primary rays, 0·1114, secondary rays, 0·1114 to 0·175 mm. in length; (3) anchor, shaft, 2·1 by 0·023 mm.; rays, 0·016 mm. long; (4) anthaster, bacillary rays with rounded ends, microspined, usually 4 to 7 in number; a single ray of a tetrad form, 0·013 by 0·004 mm.; (5) chiaster rays capitate, 0·008 mm. long.

Habitat.—Port Jackson. 30 to 35 fms.

Genus 4. **Stelletta**, Schmidt.—Ectosome a thick cortex, traversed by chones. Spicules, two kinds of stellates, one with conical pointed rays.

Stelletta phrissens, sp. n.—Sponge, globular or cylindrical, attached; surface hispid, with spicules which project 6 to 7 mm. beyond it; oscules small, congregated; pores in sieves; cortex thick,

the outer collenchymatous layer without spicules. Spicules—(1) acerate, 4·75 by 0·07 mm.; (2) fork, shaft, 3·5 to 4·2, by 0·12 mm.; rays bifurcate; primary rays about half the length of secondary, which are 0·3 mm. long; (3) anchor, shaft, 8·72 by 0·06 mm.; (4) stellate sharp conical rays, small centrum; rays from 0·02 to 0·027 mm.; (5) pycnaster, a comparatively large centrum, provided with numerous short spines, with truncated ends, 0·01 mm. in diameter.

Habitat.—Station 308, lat. 50° 8′ 30″ S.; long. 74° 41′ W. 175 fms.

Genus 5. **Astrella**, g. n.—Like Stelletta, but with only one form of stellate, a pycnaster, i. e. with a small centrum, and short blunt, numerous, rays.

Astrella vosmaeri, sp. n.—Sponge, beehive-shaped, oscules not distinguishable from the pores. Spicules—(1) acerate, 3·14 by 0·06 mm.; (2) fork, shaft, 3·02 by 0·08 mm.; arms bifurcate; primary rays, 0·088, secondary, 0·24 mm. long; (3) anchor, shaft, 3·61 by 0·028 mm; arms, 0·04 mm. long; (4) pycnaster, a comparatively large centrum and short, thick, truncated rays, 0·012 to 0·016 mm. in diameter.

Genus 6. **Dragmastra.**—Like Stelletta, but with a layer of trichite sheaves in the cortex. Type, *Dragmaster* (Stelletta) *normani* (Sollas), Norway.

Genus 7. **Stryphnus**, g. n.—Stellettidæ distinguished by the absence of a radiate arrangement of the spicules of the choanosome, only those which immediately approach the surface of the sponge being arranged at right angles to it; by the comparatively small size and rarity of the fork spicules as compared with the acerates, and chiefly by the presence of a curious irregular flesh-spicule—the amphiastrella. The cortex is a vesicular collenchyme containing pigment cells.

Stryphnus niger, sp. n.—Sponge, compound, massive, oscules large, collected in groups. Spicules—(1) acerate, 2·4 by 0·61mm.; (2) fork, shaft, 0·446 by 0·0356 mm.; arms bifurcate; primary rays, 0·055, secondary, 0·079 mm. long; (3) anchors; (4) stellate, a small centrum and numerous slender conical-shaped pointed rays, 0·014 mm. long; amphiastrella, various, typically a short cylin-

drical shaft with a whirl of spines at each end; the spines may be sharp, but are more usually stunted and rounded off, or the spines may be given off quite irregularly from all parts of the shaft; 0·016 by 0·012. Colour, deep puce black.

Habitat.—Port Jackson. 30–35 fms.

Stryhnus unguicula, sp. n.—Sponge similar to *S. niger*. Distinguished by the forks, the arms of which are bifurcate, with the primary rays extending only slightly forward, and the secondary rays diverted backward; each pair of the latter, also, after diverging from each other in the usual way, are approximated so as to run parallel to each other for the last half of their course; shaft, 0·508 by 0·032 mm.; primary rays, 0·0276, secondary rays, 0·04 mm. long.

Habitat.—Port Elizabeth, S. Africa (not in *Challenger* Collection).

Genus 8. **Tribrachium**, Weltner.—Sponge, a spherical body, produced into an excurrent tube, but not into a special incurrent tube. Spicules—forks, with only two arms in the excurrent tube, with three arms in the cortex of the body; acerates, anchors, rarely stellates, and numerous sanidastra.

Genus 9. **Tethyopsis**, Stewart.—Sponge, a special poral tube at one pole of the spherical body and a special oscular tube at the other; canal system arranged on a radiate plan, primitively four excurrent canals, alternating with four incurrent canals. Spicules—reduced forks in the excurrent tube; forks with three arms, or only two or one in the cortex of the body, acerates, but no anchors; in the poral tube acerates, no forks or anchors; flesh-spicules are stellates, sanidastra, and trichite sheaves.

Genus 10. **Psammastra**, g. n.—Sponge, with a thick fibrous cortex incorporating grains of sand; oscules, two or more; surface raised into conuli; spicules—a stellate with short rays and large centrum, and another form with smaller centrum and larger rays, also, and most numerous spined bacilli; forks of very peculiar character, rays very short, appearing merely as spines of an acerate spicule with a rounded distal end.

Psammastra murrayi, sp. n.—Sponge spherical, with two or three oscules; surface raised generally into conuli, and produced here and there into strong fibrous bands for attachment; cortex thick, containing imbedded grains of sand. Spicules—(1) acerate, 4·65, and over, by 0·065 mm.; (2) fork, 3·9 by 0·071 mm.; arms simple, regularly curved outward and forward, 0·097 to 0·116 mm. long; spread, 0·161 to 0·175 mm.; (3) modified fork; a conical spicule, with rounded distal base, and three short spines given off near the distal end; the axial ray of the spines descends outwards and downwards through the spicular shaft, but bends into horizontal position as it enters the rays or spines, which may be simple or bifurcate, the bifurcation taking place in a horizontal or vertical plane; (4) stellates, a variety with large centrum and short rays, 0·012 to 0.016 mm. in diameter, passing into a second variety with small centrum and longer rays, 0·016 to 0·024 mm. in diameter; (5) bacillus, a cylindrical rod with rounded ends, microspined irregularly over the whole surface; sometimes constricted in the middle, 0·018 to 0·016 by 0·004 mm. Colour, russet brown on upper surface where exposed to the light; pale grey below.

Habitat.—Station 162, lat. 39° 10′ 30″ S.; long. 146° 37′ E. 38 fms.

Family. GEODINIDÆ.

Genus	1.	**Erylus**, Gray.	Genus	4.	**Synops**, Vosmaer.
,,	2.	**Caminus**, Schmidt.	,,	5.	**Isops**, Sollas.
,,	3.	**Cydonium**, Müller.	,,	6.	**Geodia**, Lamk.

Of the genus Geodia no examples occur in the *Challenger* Collection.

Synops is an exceedingly natural genus, characterized, not only by the restriction of the oscules to one surface, but also by the general characters of its spicules; anchors rarely occur, and the arms of the forks are usually simple.

Description of Species.

Erylus formosus, sp. n.—Sponge massive, growing into ridges and lobes, attached; oscules round, few; pores large, each the simple opening of an incurrent chone. Spicules—(1) acerate, 0·9 by 0·024 mm.; (2) fork, shaft, 0·4 by 0·024 mm.; arms simple;

(3) globate, shaped like a finger biscuit, or shuttle-shaped, or lozenge-like, surface granulated, 0·14 by 0·032, to 0·175 by 0·026 mm., or narrower and longer, 0·2 by 0·024, or shorter and wider, 0·122 by 0·048 mm.; thickness, from 0·008 to 0·01 mm.; (4) fusite, 0·07 by 0·006 mm.; (5) large stellate, with few rays, 0·063 mm. in diameter, a single ray, 0·032 mm. long; (6) small stellate, a small centrum, and numerous short rays, truncated, or capitate at the ends, 0·016 mm. in diameter.

Habitat.—Bahia. 7–20 fms.

Caminus sphæroconia, sp. n.—Sponge massive, with massive vertical lobes, attached; oscules on summits of lobes, large, leading into large cloacas; pores in sieves, roofing incurrent chones. Spicules—(1) acerate, 0·5 by 0·016 mm.; (2) fork, shaft, 0·32 by 0·016 mm.; arms simple, 0·2 mm. long; (3) globate, 0·0553 mm. in diameter; (4) globule, a minute, smooth sphere, 0·004 mm. in diameter; this serves both as ectaster and endaster; colour, purplish when exposed to the light; yellowish below.

Habitat.—Bahia, shallow water.

This sponge is very similar to *Caminus vulcani*, O. S., which also contains true forks and globules; it differs by the absence of stellates, which are present in *C. vulcani*, and by the less length of its acerate spicules (0·08 by 0·016 mm. in *C. vulcani*), and by the smaller size of the globule (0.1 mm. in diameter in *C. vulcani*). The cortex is about 0·8 mm. thick, and consists of an ecto-cortex formed of vesicular tissue, 0·05 to 0·24 mm. thick, of a globate layer, 0·65 mm. thick, and an inner fibrous layer, 0·05 to 0·08 mm. thick.

Cydonium glariosus, sp. n.—Sponge, more or less spherical, attached; the collenchymatous ecto-cortex is crowded with coarse grains of sand, and traversed by pencils of short acerates, which are entirely confined to it. Spicules—(1) acerate, 1·86 by 0·026 mm.; (2) small acerates of the cortex, 0·35 to 0·4, by 0·016 mm.; (3) fork, shaft, 2·86 by 0·052 mm.; arms simple; (4) second form of fork, shaft, 5·36 by 0·03 mm.; arms simple, 0·08 to 0·11 mm. long; (5) anchor, shaft, 4·65 by 0·012 mm.; rays, 0·08 mm. long; (6) globate, spherical, 0·05 to 0·058 mm. in diameter; (7) ectaster, small centrum, short rod-like rays, 0·01 mm. diameter; (8) en-

daster, centrum small, rays conical pointed, or rod-like truncated, 0·016 to 0·0193 mm. in diameter. Colour, purplish white.

Habitat.—Bahia. 7 to 20 fms.

Cydonium magellani, sp. n.—Sponge large, attached; surface hispid. Spicules—(1) acerate, 3·93 by 0·052 mm., to 2·71 by 0·058 mm.; (2) fork, shaft, 3·93 by 0·064, to 4·82 by 0·09 mm.; arms bifurcate; primary rays, 0·13, secondary, 0·275 mm. long; (3) anchor, shaft, 7·4 by 0·02 mm.; rays, 0·15 mm. long; (4) globate, spherical, depressed, 0·123 by 0·103 mm.; (5) ectaster; a fairly large centrum, numerous rod-like rays, 0·0118 mm. in diameter; (6) endaster, a globo-stellate, 0·217 mm. in diameter.

Habitat.—Stations 308 and 311. 175 and 245 fms.

Cydonium hirsutus, sp. n.—Sponge irregular lobate; surface hispid, spicules projecting 8 or 9 mm. beyond it, cortex thick. Spicules—(1) acerate, 4·5 by 0·06 mm. to over 9·0 by 0·032 mm.; (2) fork, shaft over 4·46 mm. long by 0·084 to 0·05 wide; arms bifurcate, primary arms, 0·13; secondary, 0·35 mm. long; (3) second form of fork, shaft long, diameter, 0·2 mm., arms simple 0·13 mm. long; (4) anchor, shaft, long, 0·018 mm. in diameter; rays, 0·036 mm. long; (5) globate, a flattened prolate ellipsoid: 0·306 by 0·245 by 0·161 mm.; (6) ectaster, a small centrum, and blunt conical rays, 0·012 mm. in diameter; (7) endaster, a small centrum, and a few slender conical rays, 0·02 mm. in diameter: a small globo-stellate is present, but does not belong to the sponge.

Habitat.—Station 192; lat. 5° 49′ 15″ S.; long. 132° 14′ 15″ W.; 140 fms.

Synops vosmaeri, sp. n.—Sponge cylindrical, a cup-shaped depression at the summit, erect, attached, oscules confined to the summit; pores in sieves on the sides, roofing incurrent chones. The ecto-cortex contains ectasters scattered throughout it; the globate layer is thin, and the fibrous layer remarkably thick. Spicules—(1) acerate, from 1·3 by 0·016 to 1·7 by 0·008 mm.; (2) acerate of the cortex, 0·3 by 0·004 mm.; (3) fork, shaft, 1·1 by 0·039 mm.; arms, simple, 0·29 mm. long; (4) globate, small, spherical, 0·04 mm. in diameter; (5) ectaster, a small centrum, short spines, with rounded ends, 0·004 mm. in diameter; (6) en-

daster, long hair-like rays, not numerous, 0·026 mm. in diameter.

Habitat.—Station 122; off Barre Grande. 350 fms.

Synops nitidus, sp. n.—Sponge plate-like, horizontal, oscules numerous, small, restricted to the upper surface over which they are dispersed; pores in sieves on the opposite surface; cortex—beneath the epithelium is a layer of small globo-stellates, this is succeeeded immediately by the globate layer, which constitutes almost the whole of the cortex. Spicules—(1) acerate 1·25 by 0·026 mm.; (2) fork, shaft, 1·07 by 0·039 mm., arms simple, 0·183 mm. long; (3) ectaster, a globo-stellate, 0·0135 mm. in diameter; (4) endaster, a small centrum, and long conical microspined rays, usually few in number, 0·044 in diameter.

Habitat.—Port Jackson, Sydney. The smooth, shining, upper surface is very characteristic, and no other species of Synops presents the same horizontally spreading form.

Synops neptuni, sp. n.—This is the largest tetractinellid sponge known. It has the form of a somewhat conical cup with a large central cavity, rising from a base of 12 cm. diameter to a height of 40 cm.; where broadest its diameters are 22 cm. and 31 cm. Its wall is intricately folded. The oscules are confined to the inner surface of this cup.

Habitat.—Station 122; off Brazil. 32 fms.

Isops pachydermata, sp. n.—Sponge, irregular, massive; surface smooth; oscules and pores singly perforating small rounded bosses; cortex thick, constituted almost entirely of the globate layer; beneath the epithelium a layer of globo-stellates. Spicules—(1) acerate, 1·96 by 0·052 mm.; (2) fork, shaft, 1·07 by 0·039 mm.; arms simple, 0·27 mm. long; (3) globate, a compressed ellipsoid, 0·24 by 0·19 mm. in diameter; (4) ectaster, a globo-stellate, 0·016 in diameter; (5) endaster, centrum small, spines conical, sharply-pointed, few; single ray of a triad form, 0·064 mm. long; (6) a stellate intermediate between (4) and (5).

Habitat—Station 56; lat. 32° 8′ 45″ N.; long. 64° 59′ 35″ W. 1075 fms

Definition of Terms.

Ectosome.—The outer layer of the sponge, not containing flagellated chambers.

Choanosome.—The "mark" or "parenchyma," distinguished by the presence of flagellated chambers.

Eurypylous.—When the flagellated chambers communicate by wide mouths directly with the excurrent canals.

Aphodal.—When they do so by narrow canaliculi.

Collenchyme.—Gelatinous connective tissue.

Sarcenchyme.—A collenchyme in which the *collenchytes* or branching stellate cells are replaced by granular polygonal contiguous cells.

Triana.—Tetrad spicules with a differentiated shaft—forks, and anchors.