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close to the end of the Liparidæ, I overlooked it when formerly working at the group, and therefore described the species as an aberrant *Pericopis*. I have to thank Mr. Stretch, of San Francisco, for directing my attention to this genus and to *Sermyla* of Walker.

The late Dr. Herrich-Schäffer, in the *Correspondenz-Blatt zoolog.-min. Ver. Regensb.* vol. xx. p. 131 (1867), described a species of *Pericopis* from Cuba, under the name of *P. cubana*; but all the diagnoses in that paper are so abbreviated as to be incomprehensible to me, so that I cannot attempt to determine its position.

The present group may be conveniently followed up by *Hypercompa* (or *Callimorpha*), the white-winged species forming a convenient transition to the typical Arctiidæ.

XXIII.—Notes Introductory to the Study and Classification of the SPONGIDA. By H. J. CARTER, F.R.S. &c.

[Continued from p. 145.]

**HOLORHAPHIDOTA.**

Family 1. RENIERIDA.

Groups 1–4. **Amorphosa, Isodictyosa, Thalyosa, and Crassa.**

Sarcode colourless, pale tawny, or dark brown. Skeleton consisting of spiculo-fibrous reticulation filled up with areolar flaky sarcode, like crumb of bread when dry. Fibre composed of spicules held together by a minimum of sarcode; areolar sarcode charged with the spicules of the species and ampullaceous sacs. Surface even, for the most part covered with a fine dermal reticulation like that of the Rhaphidonemata; sometimes without any, and then cancellous. Colour pale tawny, dark brown or white, when dry. Vents large, distinct, scattered, on a level with the surface, or more or less projecting on mammiform or mamillary prolongations of the sponge when external; or on a level with the cloacal surface in the tubular or excavated specimens—that is, when internal. Branched excretory canal-system generally well pronounced. Pores in the sarcode which tympanizes the interstices of the dermal reticulation. Spicules of one kind only, viz. the skeleton-spicule, for the most part consisting of a simple acerate, long or short, thick or thin, finely or abruptly pointed shaft varying with the species; or cylindrical, curved, round at the ends sausage-like, of various sizes in the same specimen. Forms incrusting or massive, solid or excavated, or branched; branches solid.

In the *Amorphosa* the acerates are for the most part long and fine-pointed.

In the *Isodictyosa* the acerate spicules are for the most part short and more or less attenuated towards the points; arranged "net-like," "isodictyal."

In the *Thalyosa* the spicules are much the same in size and shape as in the foregoing family, but the specimens for the most part branched and large; the branches solid and subcylindrical, also white like chalk when dry. Very subject to a parasitic polype sunk into the surface.

In the *Crassa* the spicules are robust, and the specimens chiefly large and massive. Forms often excavated cup-like or crateriform.

#### Group 5. *Fibulifera*.

Sarcodæ colourless. Skeleton composed of fine spiculo-fibre whose interstices are filled by an areolar sarcodæ like crumb of bread. Surface uniform, openly reticulate, cancellous, or covered with a fine network. Colour pale tawny, white, or brown. Vents distinct and scattered, on a level with the surface when external; and when excavated, on a level with the internal surface or that of the excavation. Pores in the sarcodæ which tympanizes the interstices of the dermal reticulation. Texture open, delicate. Spicules of two kinds, viz. skeleton- and flesh-spicules: skeleton-spicule of one form only, viz. simple acerate, more or less attenuately pointed; flesh-spicule also of one form only, viz. simple C-shaped or bihamate ("fibula," Sdt.). Forms incrusting, parasitic, or massive and lobed; or cylindrical, branched, solid; or funnel-shaped and excavated. Much subject to a parasitic polype sunk into the surface.

#### Group 6. *Halichondrina*.

Sarcodæ pale tawny or brown-purple. Skeleton composed of reticulate spiculo-fibre whose interstices are filled up by an areolar sarcodæ which, when dry, resembles crumb of bread. Surface uneven, cancellated, reticular, rough. Colour tawny, ochre-yellow, or brown-purple. Vents distinct, scattered, on a level with the surface or on the prominent parts of mammiferous lobes. Pores in the dermal sarcodæ which tympanizes the interstices of the cancellated surface. Texture crumb-of-bread-like, soft, crushable. Spicules of two kinds, viz. skeleton- and flesh-spicules. Skeleton-spicule for the most part of two forms, viz.:—1, simple acute, smooth or more or less spined; 2, acerate, curved, fusiform, smooth; or subcylindrical, substraight, or subfusiform; terminated by more or less inflated

extremities, which may be simply attenuated or conically pointed, spearhead-like, or the same truncated, or simply round, or more or less bulb-like; or the ends may be more or less microspined. Flesh-spicules for the most part of two forms, viz. equianchorate and bihamate: the former shuttle-like or naviculiform, or angulate (that is, bow-shaped) with falcated spreading arms, or elliptical with linear arms; the latter or bihamate spicule simple, smooth, C-shaped, more or less spirally contort. Sometimes the skeleton-spicule may be simply cylindrical, curved and smooth, with rounded extremities; and sometimes the flesh-spicules may be altogether absent or not discoverable. Forms for the most part incrusting or massive, lobed, sometimes lobo-branched.

#### Group 7. *Hyndmanina*.

The same as the foregoing, but with dark brown sarcode and an equianchorate like that characterizing the next group (viz. the *Esperina*), together with a short, little, grotesque form of the same kind, much curved upon itself, with the ends unequal and each three-lobed, terminating in the centre in a little point; occasionally bihamates, C-shaped and contort.

N.B. This may be viewed as a hybrid between the *Hali-chondrina* and *Esperina*—that is, possessing the two forms of skeleton-spicule of the former, together with the inequianchorate and simple bihamate of the latter; added to which is the “grotesque spicule” above described, which again looks like a hybrid between the inequianchorate and bihamate, but nevertheless is a constant attendant, so must be regarded as a distinct feature.

#### Group 8. *Esperina*.

Sarcode pale tawny, or yellow or vermilion-red when fresh. Skeleton composed of an anastomosing reticulation of thick round spiculo-fibre, of a greyish colour when fresh, opaque white when dry, part of which is frequently naked or devoid of sarcode, and the rest filled up with areolar sarcode. Fibre of two kinds, viz. vertical or large and horizontal or small. Surface even or undulating, presenting an exquisitely beautiful polygonal, lacy or star-like reticulation, which is generally characteristic of the group; sometimes villous, or villous and placoid. Vents distinct and scattered. Pores in the sarcode which tympanizes the interstices of the dermal reticulation. Texture of the skeleton coarse, fibrous; that of the areolar sarcode delicate, crumb-of-bread-like. Spicules of two kinds, viz. skeleton- and flesh-spicules. Skeleton-spicule of one form only, viz. sub-pinlike, with the inflated end for the most part

less in diameter than the shaft; the shaft fusiform, and the inflation elliptical, mostly elongate and terminal. Flesh-spicules of two or three forms, viz.:—1, inequianchorate of different shapes; 2, simple bihamate; 3, simple tricurvedate or bow-like. Forms massive, lobular, for the most part incrusting and amorphous; sessile or stipitate, and fixed by stem-like enlargement of the spiculo-fibre.

#### Group 9. Hymedesmina.

Sarcode pale yellowish. Skeleton composed of reticulate spiculo-fibre whose interstices are filled up by areolar sarcode, which when dry resembles crumb of bread. Surface substelliform, heterahedrally reticulate, like that of *Esperia*. Colour pale yellowish white. Vents and pores ———? Texture crumb-of-bread-like, delicate, crushable. Spicules of two kinds, viz. skeleton- and flesh-spicules. Skeleton-spicule simple acerate, subacuate fusiform, also like that of *Esperia*, or simple acuate, according to the species. Flesh-spicules anchorate, tricurvedate, and bihamate, according with the species; the anchorate peculiar, consisting of a straight shaft trenchant and notched circularly in the centre and at each end on the inner aspect, terminated respectively by a *single* arm recurved, also trenchant on the inner border, pointed and turned to one side at each end in opposite directions. Forms incrusting, massive, lobed, amorphous.

### Family 2. SUBERITIDA.

#### Group 10. Cavernosa.

Pale tawny yellow or purple. Skeleton cavernous, multi-ocular; walls of the cavities consisting of a felt-like accumulation of the spicule of the species; cavities filled with the same kind of material, but loose, open, areolar, and more sarcode than spiculous. Surface even, undulating, or nodular. Dermal layer compact. Vents and pores situated in areolated papillæ, which are single and separate, or arranged in patches or groups united hexagonally; or with the vents simply grouped together over the nodular eminences, and the pores generally diffused throughout the intervals in the interstices of the dermal reticulation. Texture essentially cork-like. Spicule of one kind only, viz. that of the skeleton, and of one form only, viz. pin-like; shaft smooth, curved, fusiform, more or less taperingly pointed; head as large or larger in diameter than the thickest part of the shaft, subterminal and elliptical, or terminal and bulb-like, subspherical and subterminal, or almost spherical and terminal. Free or floating forms massive, waterworn, more or less rounded: fixed forms spreading hori-

zontally, clathrously, and dendritically in the substance of shells, especially those of the oyster, here and there provided with papillary heads which project through the surface of the shell; or fixed and unconnected with shells, massive, hemispherical, nodular; or crest-like, compressed, with parallel sides, thick and semicircular; or vase-like, poculous, stipitate, ribbed nodosely (Neptune's cup).

#### Group 11. **Compacta.**

Sarcode colourless, pale yellow, ochraceous. Skeleton compact, and so minutely cancellated as to form with its sarcodal contents a homogeneous soft, dense, fine, felt-like structure, interrupted only by the branching canal-systems, which are correspondingly reduced in calibre, and thus rendered more or less indistinct. Surface smooth, compact, often villous or asbestiform, from the projection of the ends of the dermal spicules. Vents not prominently marked. Pores in the interstices of the dermal reticulation. Texture compact, cork-like. Spicules of two kinds, viz. skeleton- and flesh-spicules. Skeleton-spicule of one form only, viz. pin-like; shaft smooth, curved, fusiform, more or less taperingly pointed; head elliptical and subterminal; with every variety between this and the simple acute, in which there is no inflation at all. Flesh-spicule minute, smooth, curved, cylindrical, centrally or subcentrally inflated. Or the skeleton-spicule may be smooth, acerate, fusiform, more or less sinuous, especially towards the centre, from which in the larger kinds a third sinuous arm may be developed at right angles to the other two. Forms massive, sessile, compressed pedicelled, bacillary or fig-shaped; or free and waterworn, more or less rounded, when growing over and absorbing deciduous univalve shells; or branching coalescently, branches solid, terminating in rounded extremities singly, or united laterally so as to present short digitated (toe-like) extremities; separated or united into a general mass which is sessile; sometimes parasitic on Fuci.

#### Group 12. **Laxa.**

Sarcode colourless, pale tawny, red, bright carmine, and purple. Structure crumb-of-bread-like, more or less open and cancellated. Surface uniformly granular or corrugated, villous, or smooth and pustular. Vents scattered over the surface generally, or distinct, on mammiform projections; excretory canal-systems largely developed, sometimes cavernous. Pores dispersed throughout the interstices of the dermal reticulation generally, or congregated into pustular heads. Texture light,

cellular, cork-like, or like crumb of bread. Spicules of two kinds, viz. skeleton- and flesh-spicules. Skeleton-spicule pin-like, with smooth, fusiform, curved shaft and subterminal elliptical inflation; or simple acuate; or pin-like, with conical shaft (that is, not fusiform) and terminal inflation, which is subspherical or bulb-like. Flesh-spicule of various forms, sometimes two or more forms in the same species: it may be acerate curved, simple or spined; straight, sinuous, subspiral, cylindrical, smooth or spined, long or short, depending upon the size and number of bends; or openly spiral and spined; or stelliform. Forms massive, lobed.

### Group 13. Donatina.

Sarcode of the cortex orange-red and of the body pale yellow or colourless in *Donatia lyncurium* when fresh, ? pale yellow in the rest. Surface hirsute, villous, asbestos-like; even or uniformly nodose; pavement-like, with hexahedral or polyhedral divisions; sometimes (as in *Polymastia*) furnished with tubular appendages open or closed at the extremities; or hard, stony, and placoid. Structure essentially radiate, consisting of thick bundles of stout spicules extending from the centre or base to the circumference, where they are joined by a corticular layer of much smaller spicules of a similar form, or by globular stellates, or simple globular bodies, or simple stellates like those of *Geodia* and *Stelletta* respectively. Intervals between the bundles of spicules filled up by an areolar sarcode more or less charged with the spicules of the species. Colour when fresh pale or cream-yellow or orange-red on the surface only; when dry light brown or snow-white. Vents indistinct when on the surface of the body in the dead or dried specimens, but evident when at the extremities of the tubular appendages. Excretory canal-system more or less cavernous, well pronounced. Pores in the sarcode which tympanizes the interstices of the villous dermal reticulation. Texture fine, smooth, and villous on the surface, harsh, hard, and coarse internally. Spicules of two kinds, viz. skeleton- and flesh-spicules. Skeleton-spicule of one form only, viz. very stout, simple, curved or nearly straight acerate, or simple acuate, or pin-like with fusiform shaft and subterminal inflation. Flesh-spicule acuate or pin-like, fusiform, with subterminal inflation like that of the skeleton-spicule; or globular, spined stellately, globo-stellate, or simply globular, or simply stellate as in *Geodia* and *Stelletta* respectively,—each in the aggregate forming in their respective species a cortical layer, through which the skeleton-spicules



project, the former arranged vertically, the latter massively. Forms massive, globular, conical, hemispherical, sessile; or sessile, spreading, simple or appendiculate, branched, stipitate.

### Family 3. PACHYTRAGIDA.

#### Group 14. Geodina.

Massive, incrusting; or globular and lobed, sessile; or globular and free or floating. Structure hard externally, more or less reticulate, radiated, and soft internally; may be divided into a cortical, a zonular, and a body- or internal substance. Cortex consisting of a hard, stony crust composed of close-packed little siliceous bodies of a globular or ellipsoidal shape, sometimes more or less compressed, even to discoid thinness; radiated in structure, becoming when mature solid and crystalline throughout, presenting an ornamented surface, in one part of which is a hiliform depression; combined with minute stellates or minute, sinuous, spined, bacilliform spicules; or straight ones more or less inflated in the centre, skittle-like, and spined; or minute, curved acerates more or less inflated in the centre and microspined; or minute, simple acerates or acuates,—all of which are flesh-spicules. Zone consisting of a subjacent cortical mass of spicules arranged parallel to each other and vertical to the body or internal substance, respectively supporting and piercing the cortex, composed of:—1, the “zone-spicule” *par excellence*, very robust, consisting of a shaft and three arms expanded under the cortex, which it thus tends to support; 2, the body- or staple spicule of the whole surface, consisting of a large, smooth, more or less curved acerate, which pierces and passes through the cortex for a short distance; 3, the anchoring-spicule, consisting of a very long delicate shaft and three short terminal arms, which are extended fork-like or recurved anchor-like, more or less plentifully mixed with the foregoing, and often traversing the cortex for some distance, for anchoring; heads often broken off outside, and therefore only found perfect, for the most part, inside the cortex; when outside, the fork-like form has often *four* prongs, opposite, expanded. Body-substance consisting of an areolar sarcodic structure more or less charged with the large acerate spicule before mentioned, together with more or less of the flesh-spicules of the species. Surface even, granular, semi-transparent, and grey when fresh, opaque white when dry. Vents well marked, scattered singly or in groups. Pores in the depressions or small pits of the cortex. Excretory canal-system largely developed, giving the body-substance an open cancellous structure. Texture compact, stony on the surface,

more or less tough within when fresh, but light, cellular, and crumb-of-bread-like when dry. Spicules of two kinds, viz. skeleton- and flesh-spicules,—the latter noticed in the description of the cortex, and the former in that of the “zone” and the “body-substance” respectively. Forms mentioned at the commencement.

#### Group 15. *Stelletina*.

The same, but with no “globular siliceous bodies” on the surface, and therefore no stony cortex, but with a thick dermal layer composed of long fusiform contractile (muscular?) cells; charged with stellates and the flesh-spicules of the species.

#### Group 16. *Tethyina*.

Hemispherical or globular, fixed by an extended or contracted base; or globular and free; or ellipsoidal and fixed, root-like, by tufts of long anchoring-spicules. Surface hirsute from the ends of the spicules, which project through the dermal layer to a greater or less extent, arranged in separate tufts; or reticulately or in lines tending in a spiral direction towards the summit. Dermal layer thick and tough, with or without the flesh-spicule. Internal structure radiate; radii composed of bundles of spicules, which extend from a nucleated centre towards the circumference through a compact areolar sarcode, and in a more or less gyrate course from the base to the summit. Colour grey or brown externally, bright yellow when fresh within or purple throughout, especially on the surface. Vents apical, or scattered over the surface singly or in groups. Pores in the interstices of the hirsute dermal reticulation. Excretory canal-system not well pronounced, probably owing to the compact and contractile nature of the areolar sarcode of the body. Texture tough, hard, and compact throughout, especially in the dermal layer. Spicules of two kinds, viz. skeleton- and flesh-spicules. Skeleton-spicule of two forms, viz.:—1, large, acerate, more or less curved; 2, anchoring-spicule—that is, spicules composed of a long delicate shaft with three arms of equal length extended fork-like in some, and recurved anchor-like in others, like the “anchoring-spicule” of the foregoing families; arms sometimes unequal in length in the fork-like heads, one being much longer than the other two, which are equal. Sometimes the arms of the fork-like form are much expanded, and the shaft of the spicule enlarged altogether, so as to somewhat resemble the “zone-spicule” of the *Geodina*. Flesh-spicule of one kind only, viz. bihamate or C-shaped contort (*i. e.* spiral), for the most part minute and

indistinctly microspined; or large and sparsely, but evidently, spined, especially towards the extremities: sometimes absent altogether. Forms already mentioned.

#### Family 4. PACHASTRELLIDA.

##### Group 17. Pachastrellina.

Incrusting, passing into crevices of the rock or other hollow cavities, massive, sessile, thick, flat, or semiglobular and sessile. Structure fibreless, confused—that is, with little or no apparent regularity of the spicules with which the areolar structure of the body is densely charged, and no nucleus. Surface plane, uniformly harsh asperous, with no distinct cortical layer of any kind, saving the thickened dermal sarcode. Colour light grey or dark grey, passing into soot-black, especially on the surface. Vents scattered singly or in groups on the surface. Pores in the smooth interstices of the dermal sarcode, situated between the projecting ends of the spicules. Branched excretory canal-system well developed. Texture asperous. Spicules of two kinds, viz. skeleton- and flesh-spicules. Skeleton-spicule of three forms, viz.:—1, large triradiate, with the shaft or fourth arm aborted or obsolete, or triradiate, with the fourth arm produced, quadriradiate; arms smooth, conical, pointed simply, or furcated once or twice irregularly; 2, smaller, consisting of a three-armed shaft with the arms regularly furcate, and spreading almost horizontally or perpendicularly to the shaft; 3, long, simple, acerate, more or less curved. Flesh-spicules stelliform sinuous and spined, or bacillary and spined; or ellipsoidal, inflated in the centre, and smooth (skittle-like); or acerate and more or less inflated, curved, and microspined; or acerate, smooth, or simple “tricurvate;” or globostellate, with the rays rounded tuberculiform, the whole resembling the siliceous balls of the *Geodina*.

N.B. The once or twice irregularly furcated extremities of the larger triradiate spicule in *Pachastrella abyssi*, Sdt., leads to the more elaborate furcation &c. in the following group, viz. the *Lithistina*.

##### Group 18. Lithistina.

Massive, substony, excavated; dish-shaped, circular, with thick undulating wall, stipitate; or vasiform, with more or less thick undulating wall, which, in some species, may be so plicated meandrinely as to almost fill the centre, and thus produce the appearance of a double flower. Structure more or less confused,

fibreless, composed of a dense mass of spicules imbedded in areolar sarcode; essentially spiculous, and growing, like all other sponges, in concentric layers. Surface even, smooth, or asperous, *not corticate*. Colour grey when fresh or wet, yellowish white or brown when dry. Vents pustular, uniformly scattered, singly or in little groups, on the inner side of the wall only. Branched excretory canal-system well defined, although small in calibre, corresponding in this respect with the compact structure of the sponge. Pores general, in the sarcodic interstices of the dermal layer. Spicules of two kinds for the most part, viz. skeleton- and flesh-spicules. Skeleton-spicule of three forms, viz.:—1. The surface-spicule, consisting of a horizontal head and vertical shaft, the latter directed inwards. Head consisting of three round smooth arms, spread out horizontally and symmetrically furcated, amidst the flesh-spicules of the surface; or with three flattened, irregularly bifurcated and sinuous arms; or with the same denticulated on the borders; or united together laterally, so as to form a disk more or less deeply fissured on the margin, or subcircular; or with the arms sinuously branched, and the branches more or less tubercled, the tubercles simply round or two- or three-spined. Shaft for the most part smooth, straight, round, and pointed, presenting, where it joins the head, a trifold division of the central canal, whose arms (being short, equal in length, and symmetrically disposed) form a very characteristic feature on the surface and in the interior, whereby the original direction of the spicule can be ascertained. 2. Body- or staple spicule of the mass, consisting of a horizontal head and vertical shaft, which thus seems to mark the concentric layers of growth; but otherwise it is so altered from the original surface-spicule that the shaft becomes marrow-bone-like in form, and the arms not only bifurcated and sinuous, but so intensely and irregularly branched and filigreed, and so intimately and intricately interlocked with each other and the branches of the inner end of the shaft of the next layer (which, to a certain extent, so simulates the head in this respect as to be almost undistinguishable from it), that, in the mass, the bodies of the shafts respectively can only be recognized by the comparatively open interval which they form between the lines of dense interlacement caused by the intermixing of their almost equally branched extremities—while, when the mass is broken up, the shaft can only be identified by the trifold central canal before mentioned, when this is visible. At the same time, this trifold canal often presents itself in such a position as to indicate that either the spicules of the mass become more or less confusedly mixed up together like those of *Pachastrella*, or that the shafts

become so branched and altered as to be undistinguishable but for the presence of the trifold central canal. 3. Acerate spicule of the body, beam-like, scattered among the foregoing, long, smooth, curved, finely pointed or fusiform, and acute. Flesh-spicules of various forms, sometimes two or more in the same species, viz. acerate smooth or microspined, cylindrical bent and more or less inflated towards the ends, microspined, or sinuous and blunt-spined tubercle-like.

### Family 5. POTAMOSPONGIDA.

#### Group 19. Spongillina.

Sarcode colourless, greenish or purple. Skeleton composed of a reticulation of spiculo-fibre of two kinds, viz. vertical or large, and horizontal or small. Structure radiating, more or less plumose; interstices filled up by areolar sarcode, flaky when dry, charged with the spicules of the species and the ampullaceous sacs. Colour pale tawny yellow, greenish, or purple. Vents large, scattered irregularly. Branched excretory canal-system well pronounced. Pores spread generally over the surface, in the sarcode which tympanizes the interstices of the dermal reticulation. Texture friable, crushable, crumb-of-bread-like. Spicules of two kinds, viz. skeleton- and flesh-spicules. Skeleton-spicule acerate, curved, smooth, more or less finely pointed. Flesh-spicule of various forms, according to the species. Characterized by the presence of reproductive seed-like bodies, visible to the naked eye, and of a globular or ellipsoidal form (according to the species), with a hiliform depression opening into the interior, corresponding in colour with that of the species, only brighter or more intense; composed of a horny capsule surrounded by a columnar structure of horny cells, or by a layer of flesh-spicules arranged perpendicularly or tangentially (according with the species) to the surface; filled with germinating substance of the sponge, which, under growth, makes its exit through the hiliform opening. *Habitat.* Fresh water.

### HEXACTINELLIDA.

For the characters of the Groups into which the Families of the Hexactinellida have been divided, see the illustrations respectively pp. 199 and 200; and for all known species, see 'Annals,' 1873, vol. xii. p. 349 &c.

*Classification of the Spongida into Orders, Families, and Groups (provisional).*

Class **SPONGIDA**, Huxley.

| Orders.                 | Families.   | Groups.   |
|-------------------------|---|---|
| I. CARNOSA .....        | <ul style="list-style-type: none"> <li>1. HALISARCIDA.</li> <li>2. GUMMINIDA.</li> </ul>                            |   |
| II. CERATINA .....      | <ul style="list-style-type: none"> <li>1. LUFFARIDA.</li> <li>2. APLYSINIDA.</li> <li>3. PSEUDOCERATIDA.</li> </ul> |   |
| III. PSAMMONEMATA ..... | <ul style="list-style-type: none"> <li>1. BIBULIDA .....</li> <li>2. HIRCINIDA .....</li> </ul>                     | <ul style="list-style-type: none"> <li>1. Euspongiosa.</li> <li>2. Paraspongiosa.</li> <li>3. Hirciniosa.</li> <li>4. Callhistia.</li> <li>5. Penicillata.</li> <li>6. Rigida.</li> <li>7. Subrigida.</li> <li>8. Foliata.</li> <li>9. Dactylifera.</li> <li>10. Fenestrata.</li> <li>11. Platyfibra.</li> <li>12. Peraxiata.</li> <li>13. Incrustata.</li> <li>14. Otahitica.</li> <li>15. Sarcocornea.</li> <li>16. Arenosa.</li> </ul> |

- 17. Pseudoarenosa.
- 18. Chalinohircinina.
- 19. Armatohircinina.

3. PSEUDOHIRCINIDA .....

- 1. Digitata.
- 2. Palmata.
- 3. Reptata.
- 4. Spinifera.
- 5. Tubulodigitata.
- 6. Aculeata.
- 7. Subaculeata.
- 8. Ciliata.
- 9. Bivalvata.
- 10. Complanata.
- 11. Plicata.
- 12. Solida.
- 13. Clathrata.
- 14. Dictyalia.
- 15. Digitifera.
- 16. Fistulodigitata.

1. CHALINIDA .....

2. CAVOCHALINIDA .....

3. ACERVOCHALINIDA .....

4. PSEUDOCALINIDA .....

IV. RHAPHIDONEMATA .....

- 1. Pluriformia.
- 2. Plumohalichondrina.
- 3. Microcionina.
- 4. Echinoclathrata.
- 5. Baculifera.
- 6. Multiformia.
- 7. Durissima.

1. ECTYONIDA .....

2. AXINELLIDA .....

V. ECHINONEMATA .....

TABLE (continued).

| Orders.                       | Families.                    | Groups.             |
|-------------------------------|------------------------------|---------------------|
| VI. HOLORHAPHIDOTA .....      | 1. RENIERIDA .....           | 1. Amorphosa.       |
|                               |                              | 2. Isodictyosa.     |
|                               |                              | 3. Thalyosa.        |
|                               |                              | 4. Crassa.          |
|                               |                              | 5. Fibulifera.      |
|                               |                              | 6. Halichondrina.   |
|                               |                              | 7. Hyndmanina.      |
|                               |                              | 8. Esperina.        |
|                               |                              | 9. Hymedesmina.     |
|                               | 2. SUBERITIDA .....          | 10. Cavernosa.      |
|                               |                              | 11. Compacta.       |
|                               |                              | 12. Laxa.           |
|                               | 3. PACHYTRAGIDA .....        | 13. Donatina.       |
|                               |                              | 14. Geodina.        |
|                               |                              | 15. Stelletina.     |
|                               |                              | 16. Tethyina.       |
|                               |                              | 17. Pachastrellina. |
|                               | 4. PACHASTRELLIDA .....      | 18. Lithistina.     |
|                               |                              | 19. Spongillina.    |
| VII. HEXACTINELLIDA .....     | 1. VITROHEXACTINELLIDA ..... | 1. Patulina.        |
|                               |                              | 2. Tubulina.        |
|                               |                              | 3. Scopulifera.     |
| 2. SARCOHEXACTINELLIDA .....  | 4. Rosettifera.              | 4. Rosettifera.     |
|                               |                              | 5. Birotulifera.    |
| 3. SARCO-VITROHEXACTINELLIDA. |                              |                     |
| VIII. CALCAREA.               |                              |                     |



## Key to the foregoing Classification of the Spongida\*.

Class **SPONGIDA**, Huxley.Order I. **CARNOSA**.Family 1. **HALISARCIDA**.

- Halisarca Dujardini*, Johnston, British Sponges, 1842, p. 192; Ann. & Mag. Nat. Hist. 1873, vol. xii. p. 25.  
*H. lobularis*, Schmidt, Spong. adriat. Meeres, 1862, p. 80; Ann. & Mag. Nat. Hist. 1874, vol. xiii. p. 433.

Family 2. **GUMMINIDA**.

- Chondrilla nucula*, Sdt. Spong. adriat. Meeres, p. 39.  
*Corticium candelabrum*, Sdt. *ib.* p. 42.  
*C. australiensis*, Carter, Ann. & Mag. Nat. Hist. 1873, vol. xii. p. 23, pl. i. fig. 12.  
*C. abyssi*, Carter, *ib.* p. 18, pl. i. fig. 1.

Order II. **CERATINA**.Family 1. **LUFFARIDA**.

## One Group only.

- Luffaria*, Duchassaing de Fonbressin et G. Michelotti, 'Spong. de la Mer Caraïbe,' Harlem, 1864, 4to, p. 59; Natuurk. Verh. Holland. Maat. Wet. te Harlem, vol. xxi. 1864.  
*L. fistularis*, D. et M. *op. cit.* p. 60, = *Spongia fistularis*, Esper, 1794, pls. xx. & xxi., = *Verongia*, Bowerbank, 1866, Monograph of British Spongiadæ (Ray Soc. pub.), vol. ii. p. 15, vol. i. pl. xii. fig. 266; also 'Annals,' 1845, vol. xvi. p. 403, pl. xiii. fig. 7. See remarks on, 'Annals,' 1872, vol. x. p. 102.  
*L. ramosa*, C. MS. See Part III. (A large species with *solid* branches.)  
*L. sessilis*, C. MS. *Ib.* (A sessile species.)

Family 2. **APLYSINIDA**.

## One Group only.

- Aplysina aërophoba*, Nardo ap. Sdt. *op. cit.* p. 25, Taf. iii. fig. 2.  
*A. carnosa*, Sdt. *ib.* p. 26, Taf. iii. fig. 3.  
*A. corneostellata*, C. Annals, 1872, vol. x. p. 105, pl. vii., ? = *Darwinella aurea*, Archiv f. mikroskop. Anat. 1865, p. 344, Taf. xxi.

Family 3. **PSEUDOCERATIDA**.

## One Group only.

- Ianthella*, Gray, Proc. Zool. Soc. Lond. July 1869, p. 49, = *Spongia flabelliformis*, Esper, Taf. xiii. &c.

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\* One or two species of each family and group respectively will be here inserted for illustration, where any have been described; but where none have been described, reference will be made to species which will be described in the Third Part of this communication.

*Aplysina capensis*, C. MS. Incrusted species. See Part III.  
*A. chalinoides*, C. MS. Faced with proper spicules. *Ib.*

### Order III. PSAMMONEMATA.

#### Family 1. BIBULIDA.

##### Group 1. EUSPONGIOSA.

*Spongia officinalis* &c.

##### Group 2. PARASPONGIOSA.

*S. officinalis*, var., &c.

#### Family 2. HIRCINIDA.

##### Group 3. HIRCINIOSA.

*Hircinia typica*, Nardo ap. Sdt. *op. cit.* p. 32. (A type specimen is in the British Museum.)

*H. variabilis*, Sdt. *ib.* p. 34. (*Ib.*)

*H. panicea*, Sdt. *ib.* p. 32, Taf. iii. fig. 11, = *Stematumenia*, Bk. *Annals*, 1845, vol. xvi. p. 407, pl. xiv. figs. 1 & 2, also good figures of the same in *Mon. Brit. Spong. op. cit.* pl. xii. fig. 256 and pl. xxviii. fig. 381. (Character based on a parasite, viz. *Spongiophaga communis*, 'Annals,' 1871, vol. viii. p. 330, = *Polytherses*, D. et M. *op. cit.* p. 67, pl. xii. f. 5, *P. campana*\*)

##### Group 4. CALLHISTIA.

*Halispongia choanoides*, Bk. *Proc. Zool. Soc.* 1872, pl. vi.

For other species see Part III.†

##### Group 5. PENICILLATA.

For species see Part III.

##### Group 6. RIGIDA.

For species see Part III.

##### Group 7. SUBRIGIDA.

For species see Part III.

##### Group 8. FOLIATA.

For species see Part III.

##### Group 9. DACTYLIFERA.

For species see Part III.

##### Group 10. FENESTRATA.

For species see Part III.

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\* As many species of this group consist of nothing but the fibrous skeleton in which the alga (*Spongiophaga communis*) has replaced the sarcode, and many of the Hircinida are subject to the same change, it is questionable if they all belong to the group "Hirciniosa."

† The number of references to the third part of these "Notes" for illustration will show how much remains to be done in describing even the different kinds of Sponges already in our Museums.

## Group 11. PLATYFIBRA.

*Sarcotragus foetidus*, Sdt. *op. cit.* p. 36. (A type specimen is in the British Museum.)

For other species see Part III.

## Group 12. PERAXIATA.

For species see Part III.

## Group 13. INCRUSTATA.

For species see Part III.

## Group 14. OTAHITICA.

*Spongia othahetica*, Solander and Ellis, 1786, 4to, pl. lix. figs. 1 & 2. (The original specimen is in the British Museum.)

*Halispongia ventriculoides*, Bk. Proc. Zool. Soc. 1874, pl. xlvii.

(The Ventriculites were Hexactinellids, and had the structure of *Myliusia Grayi*, Bk., according to Mr. W. J. Sollas, Quart. Journ. Geol. Soc. Feb. 1873, p. 65, fig. 2, and Schmidt, 1870, Spongienf. atlant. Gebiet. Taf. ii. fig. 16.)

*H. Mantelli*, Bk. Proc. Zool. Soc. 1874, pl. xlvii.

*Spongionella Holdsworthii*, Bk. *ib.* 1873, pl. v., = *Spongia papyracea*, Esper, 1797, Taf. 65.

For other species, which are very numerous and varied, see Part III.

## Group 15. SARCOCORNEA.

? *Cacospongia cavernosa*, Sdt. Sp. adriat. Meeres, p. 28. (A type specimen is in the British Museum.)

## Group 16. ARENOSA.

*Dysidea fragilis*, Johnston, *op. cit.* p. 187, = *Spongelia*, Sdt. Spongienf. atlant. Gebiet. 1870, p. 77.

*Spongelia incrustans*, Sdt. 1862, Spong. adriat. Meeres, p. 29, Taf. iii. fig. 7.

## Family 3. PSEUDOHIRCINIDA.

## Group 17. PSEUDOARENOSA.

For species see Part III.

## Group 18. CHALINOHIRCININA.

For species see Part III.

## Group 19. ARMATOHIRCININA.

For species see Part III.

## Order IV. RHAPHIDONEMATA.

## Family 1. CHALINIDA.

## Group 1. DIGITATA.

*Halichondria oculata*, Johnst. *op. cit.* p. 94, pl. iii., = *Chalina oculata*, Bk. Mon. Brit. Spong. *cit.*, = *Spongia polychotoma*, Esper, 1794, Taf. xxxvi.

## Group 2. PALMATA.

*Halichondria palmata*, Johnst. *op. cit.* p. 92, pl. ii.

## Group 3. REPTATA.

*Halichondria simulans*, Johnst. *ib.* p. 109, pl. viii.

## Group 4. SPINIFERA.

For species see Part III.

## Family 2. CAVOCHALINIDA.

## Group 5. TUBULODIGITATA.

For species see Part III.

## Group 6. ACULEATA.

*Tuba*, Duchassaing de Fonb. et Michelotti, *op. cit.* 1864, p. 44, = *Siphonochalina*, Sdt. 1868, Spong. Küste v. Algier, p. 7.

*Tuba sororia*, D. et M. *op. cit.* pl. viii. fig. 1.

*T. digitalis*, D. et M. *ib.* fig. 2.

*T. armigera*, D. et M. *ib.* fig. 3.

(These are good illustrations. Fig. 2 appears to have been affected by a parasitic polype, to which these sponges are very liable.)

?*Spongia cancellata*, Esper, 1794, Taf. vi.

?*S. muricata*, Esper, *ib.* Taf. vii.

?*S. aculeata*, Linn., and *S. villosa*, Pallas, Esper, *ib.* Taf. vii. a.

## Group 7. SUBACULEATA.

*Tuba*, D. et M. *op. cit.* p. 44.

?*T. tortolensis* and *T. longissima*, D. et M. *ib.* pl. ix. figs. 2 & 3.

## Group 8. CILIATA.

*Tuba*, D. et M. *op. cit.* p. 44.

*T. plicifera*, D. et M. *ib.* pl. x. fig. 2.

*Spongia compressa*, Esper, Taf. lv.

For other species see Part III.

## Group 9. BIVALVATA.

?*Spongia agaricina*, Esper, Taf. lix.

For other species see Part III.

## Group 10. COMPLANATA.

For species see Part III.

## Group 11. PLICATA.

For species see Part III.

## Family 3. ACERVOCHALINIDA.

## Group 12. SOLIDA.

For species see Part III.

## Group 13. CLATHRATA.

For species see Part III.

## Group 14. DICTYALIA.

For species see Part III.

## Family 4. PSEUDOCHALINIDA.

## Group 15. DIGITIFERA.

For species see Part III.

## Group 16. FISTULODIGITATA.

For species see Part III.

## Order V. ECHINONEMATA.

## Family 1. ECTYONIDA.

## Group 1. PLURIFORMIA.

*Ectyon sparsus*, Gray, Proc. Zool. Soc. 1867, p. 515; Annals, 1871, vol. vii. p. 270, pl. xvii. fig. 1 &c.

*Chalinopsis clathrodes*, Sdt. 1870, Spongienf. atlant. Gebiet. p. 60. (A type specimen is in the British Museum.)

*Agelas dispar*, D. et M. *op. cit.* p. 76, pl. xv. figs. 1 & 2.

*Clathria oroides*, Sdt. (like *Ectyon sparsus*), 1868, Spong. Küste v. Algier, p. 9. (A type specimen is in the British Museum.)

*Echinonema typicum*, C. MS. See Part III. ? = *Tenacia clathrata*, Sdt. 1870, *op. cit.* p. 56 (a type specimen is in the British Museum), ? = *Spongia cactiformis*, Lam. 1816, Anim. sans vertèbr. p. 370.

*Clathria compressa*, Sdt. 1862, *op. cit.* p. 58, Taf. vi. fig. 1.

*Dictyocylindrus ramosus*, Bk. 1864, *op. cit.* vol. ii. p. 103, vol. iii. (1874), pl. xvi., = *Raspalia*, Sdt.

*Spongia muricata*, Esper, 1794, Taf. iii., = *Trichentrion muricatum*, E. Ehlers (Prof. Zool. Erlangen), 1870, 'Esper'schen Spong. in der Zool. Samml. der k. Universität Erlangen.

*Acarus innominatus*, Gray, Proc. Zool. Soc. 1867, p. 544; Annals, 1871, vol. vii. p. 273, pl. xvii. figs. 4 &c.

For other species see Part III.

## Group 2. PLUMOHALICHONDRINA.

*Halichondria plumosa*, Johnst. *op. cit.* p. 103, = *Hymeniacidon plumosa*, Bk. Mon. Brit. Spong. *cit.* vol. ii. p. 195.

## Group 3. MICROCIONINA.

*Microcionia atosanguinea*, Bk. *op. cit.* vol. ii. p. 138, vol. i. pl. xxxiv. fig. 369, = *Scopalina*, Sdt.

*Halichondria maculans*, Johnst. (Johnstonian Collection in the British Museum), = *Hymenaphia stellifera*, Bk. *op. cit.* vol. ii. p. 146, and vol. i. pl. xxxiv. fig. 370.

## Group 4. ECHINOCLATHRATA.

*Halichondria seriata*, Johnst. *op. cit.* p. 125, pl. xiv. fig. 2, = *Chalina seriata*, Bk. *op. cit.* vol. i. p. 376, and vol. ii. pl. xvii. fig. 287.

For other species see Part III.

## Group 5. BACULIFERA.

*Caulospongia plicata*, Kent, Proc. Zool. Soc. 1871.

*C. verticillaris*, Kent, *ib.*

## Family 2. AXINELLIDA.

## Group 6. MULTIFORMIA.

*Halichondria hispida*, Johnst. *op. cit.* p. 4 (Johnstonian Collection, British Museum), = *Dictyocylindrus hispidus*, Bk. *op. cit.* vol. ii. p. 108, and vol. iii. pl. xvii.

*Axinella cinnamomea*, Sdt. *op. cit.* 1862, p. 61, Taf. vi. fig. 2.

*Acanthella*, Sdt. *ib.* p. 60, Taf. vi. fig. 7. *A. acuta*, Sdt.

*Halichondria ventilabrum*, Johnst. *op. cit.* p. 107, pl. vii., = *Phakellia ventilabrum*, Bk. *op. cit.* vol. iii. pl. xxii.

*Hymenaphia vermiculata*, Bk. *op. cit.* vol. ii. p. 141, and vol. iii. pl. xxvi. fig. 1. (There is an erect form of this species, which thus passes into *H. ventilabrum*.)

## Group 7. DURISSIMA.

For species see Part III.

## Order VI. HOLORHAPHIDOTA.

## Family 1. RENIERIDA.

## Group 1. AMORPHOSA.

*Halichondria panicea*, Johnst. *op. cit.* p. 114, pl. xxxi., = *Halichondria panicea*, Johnst., Bowerbank, 1864, *op. cit.* vol. iii. (1874), pls. xxxix. & xl.

## Group 2. ISODICTYOSA.

*Isodictya rosea*, Bk. *op. cit.* vol. ii. p. 282, vol. iii. pl. xlix. fig. 12.

*I. varians*, Bk. vol. ii. pl. xx. fig. 309, see for characteristic arrangement of the spicules of this group.

## Group 3. THALYOSA.

*Thalysias*, D. et M. *op. cit.* p. 82.

*T. subtriangularis*, D. et M. *ib.* p. 85, pl. xvii. fig. 1.

*Isodictya mirabilis*, Bk. Proc. Zool. Soc. 1873, p. 319, pl. xxviii.

? *Spongia clavata*, Esper, 1794, Taf. xix.

*Schmidtia clavata*, Balsamo-Crivelli, 1863, Atti d. Soc. Ital. d. Sc. vol. v. tav. iv. fig. 11.

## Group 4. CRASSA.

? *Reniera calyx*, Sdt. 1862, *op. cit.* p. 76, Taf. vii. fig. 12. (A type specimen is in the British Museum.)

For other species see Part III.

## Group 5. FIBULIFERA.

*Reniera fibulata*, Sdt. 1862, *op. cit.* p. 73, Taf. vii. fig. 9. (A worldwide species.)

## Group 6. HALICHONDRINA.

*Halichondria incrustans*, Johnst. *op. cit.* p. 122, pl. xii. fig. 3. See also Bowerbank, *op. cit.* vol. iii. pl. xlv. fig. 7, &c.

## Group 7. HYNDMANINA.

*Halichondria Hyndmani*, Bk. *op. cit.* vol. ii. p. 255, and vol. iii. pl. xlvi. figs. 7-15.

## Group 8. ESPERINA.

*Halichondria ægagropila*, Johnst. *op. cit.* p. 119, pl. xi. fig. 1 (Johnstonian Collection, British Museum), = *Desmacidon ægagropila*, Bk. *op. cit.* vol. iii. pl. lxiii. figs. 8-4.

*Hymeniacidon macilenta*, Bk. *op. cit.* vol. iii. pl. xxxiii. figs. 7-13.

*Esperia*, Nardo ap. Schmidt, *op. cit.* 1862, p. 53 *et seq.*

## Group 9. HYMEDESMINA.

*Hymedesmia Johnstoni*, Bk. *op. cit.* vol. i. p. 276, pl. xviii. fig. 293, = *Desmacidon Johnstoni*, Sdt. *op. cit.* 1870, p. 53, Taf. v. fig. 17.

? *Desmacidon titubans*, Sdt. *op. cit.* 1870, p. 55, Taf. v. fig. 18. (A type specimen is in the British Museum.)

## Family 2. SUBERITIDA.

## Group 10. CAVERNOSA.

*Cliona celata*, Johnst. *op. cit.* p. 125, = *Raphyrus Griffithsii*, Bk. (the free form), *op. cit.* vol. ii. p. 354, ? = *Alcyonium tuberosum*, Esper, Taf. xxiii.

*Raphiophora patera*, Gray, Proc. Zool. Soc. 1867, p. 524, = "Neptune's Cup," = *Potérion*, Harting, 1870, Mém. sur le Genre, 4to, Utrecht, Natuurk. Verh. Provin. Utrecht Genootschap. v. Kunsten en Wetenschappen (excellent illustrations).

## Group 11. COMPACTA.

*Halichondria suberea*, Johnst. *op. cit.* p. 141, fig. 14, and p. 139, pl. xii. figs. 5 & 6, = *Suberites domuncula*, Sdt.

*H. ficus*, Johnst. *ib.* p. 144, pl. xv. figs. 4 & 5.

*Suberites*, Nardo and Schmidt, *op. cit.* 1862, p. 65.

## Group 12. LAXA.

*Halichondria sanguinea*, Johnst. *op. cit.* p. 133, pl. xiv. fig. 3, = *Hymeniacidon sanguinea*, Bk. *op. cit.* vol. iii. pl. xxx. figs. 5-8. (It is worthy of notice that Dr. Bowerbank found in a British specimen of this red sponge the characteristic flesh-spicule of the carmine *Vioa Johnstonii*, Sdt., Mon. Brit. Spong. vol. i. p. 239, pl. iii. fig. 72.)

*Alcyonium purpureum*, Lam. (This beautiful carmine-coloured sponge from Australia equals the following in the permanency and brilliancy of its colour, and also corresponds with it in the forms of its spicules.)

*Vioa Johnstonii*, Sdt. *op. cit.* 1870, p. 5, Taf. vi. fig. 18. (Observe that these spicules are quite different from those of the *Vioa Johnstonii* of 1862, *op. cit.* p. 78, Taf. vii. fig. 17. The carmine species (of which there is a type specimen in the British Museum) has, in addition to the flesh-spicules figured by Schmidt in 1870, a *pin-like*

skeleton-spicule ; while those figured in 1862 are respectively stellates with an *acerate* skeleton-spicule. See Schmidt's explanation of this, *op. cit.* 1870, p. 5.)

*Grayella cyathophora*, C. Annals, 1869, vol. iv. p. 189, pl. vii.

*Cliona corallinoides*, Hancock, Annals, 1867, vol. xix. p. 238, pl. vii. fig. 3.

Also 'Annals,' 1871, vol. viii. pl. ii. figs. 33-37.

### Group 13. DONATINA.

*Donatia aurantium*, Nardo, 1833, 'Isis,' = *Tethya lynceurium*, Lam. 1816; Annals, 1869, vol. iv. p. 6, pl. ii. fig. 1 &c.

*Suberites appendiculatus*, Balsamo-Crivelli, 1863, *op. cit.* vol. v. tav. vi. figs. 4 &c.

*Polymastia*, Bk. 1866, *op. cit.* vol. ii. p. 58, and vol. iii. pls. 10, 11, 12, & 72.

*Thecophora semisuberites*, Sdt. 1870, *op. cit.* Taf. vi. fig. 2.

*Rinalda uberrima*, Sdt. *ib.* fig. 3.

*Radiella spinularia*, Sdt. *ib.* Taf. iv. fig. 7.

*Trachya pernucleata*, C. Annals, 1870, vol. vi. p. 178, pl. xii. fig. 11 &c.

*Axos Cliftonii*, Gray, Proc. Zool. Soc. 1867, p. 546, = *Dictyocylindrus dentatus*, Bk. *ib.* 1873, p. 321, pl. xxix.

*Xenospongia patelliformis*, Gray, *ib.* 1858, p. 230, and 1867, p. 547.

*Halicnemia patera*, Bk. *op. cit.* vol. ii. p. 96, and vol. iii. pl. xv. figs. 31 & 32.

*Placospongia melobesioides*, Gray, Proc. Zool. Soc. 1867, pp. 128 & 549.

(*Axos Cliftonii*, independently of its form, *Xenospongia patelliformis*, independently of its crust of stellates, and *Placospongia melobesioides*, independently of its crust of *Geodia*-like siliceous balls, will, I think, ultimately have to come among the Suberitida; while the spicules of *Hymenaphia verticillata*, especially that form which is inflated in the centre, at present thus far find their analogue alone in *Halicnemia patera*.)

### Family 3. PACHYTRAGIDA.

#### Group 14. GEODINA.

*Geodia zetlandica*, Johnst. *op. cit.* p. 195; also Bowerbank, *op. cit.* vol. ii. p. 45, and vol. iii. pl. vii.

*Geodia arabica*, C. Annals, 1869, vol. iv. p. 4, pl. i. figs. 9 &c.

*Pachymatisma Johnstonii*, Bk. *op. cit.* vol. ii. p. 51, and vol. iii. pl. viii. fig. 1; Annals, 1869, vol. iv. p. 8, pl. ii. figs. 7 &c.

*Stelletta discophora*, Sdt. *op. cit.* 1862, p. 47, pl. iv. f. 5.

*S. euastrum*, Sdt. 1868, Spong. Küste v. Algier, p. 20, Taf. iv. f. 4.

#### Group 15. STELLETTINA.

*Stelletta Grubii*, Sdt. *op. cit.* 1862, p. 46, pl. iv. fig. 2. (Found also on the rocks at Budleigh-Salterton, South Devon.)

*S. aspera*, C. Annals, 1871, vol. vii. p. 7, pl. iv. figs. 7 &c.

*S. lactea*, C. *ib.* p. 9, pl. iv. fig. 15 &c.

#### Group 16. TETHYINA.

*Tethya cranium*, Johnst. *op. cit.* p. 83, pl. i. fig. 1 &c.

*T. arabica*, C. Annals, 1869, vol. iv. p. 3, pl. i. figs. 1 &c.

*T. dactyloidea*, C. *ib.* vol. iii. p. 15, fig. 1, and 1872, vol. ix. p. 82, pl. x. fig. 1 &c.

*T. atropurpurea*, C. *ib.* 1870, vol. vi. p. 176, pl. xiii. fig. 1 &c.

*T. casula*, C. *ib.* 1871, vol. viii. p. 99, pl. iv.

*Tetilla polyura*, Sdt. 1870, *op. cit.* p. 66, Taf. vi. fig. 8.



## Family 4. PACHASTRELLIDA.

## Group 17. PACHASTRELLINA.

*Pachastrella abyssii*, Sdt. 1870, *op. cit.* p. 64, Taf. vi. fig. 4.

*Dercitus niger*, C. Annals, 1871, vol. vii. p. 3, pl. iv. fig. 1 &c. = *Dercitus*, Gray, Proc. Zool. Soc. 1867, p. 542, = *Hymeniacidon Bucklandi*, Bk. *op. cit.* 1864, vol. ii. p. 226, = *Battersbya Bucklandi*, Bk. vol. iii. 1874, pl. xcii. fig. 8.

## Group 18. LITHISTINA.

*MacAndrewia azorica*, Gray, Proc. Zool. Soc. 1859, p. 438, Rad. pl. xv. ; *ib.* 1867, p. 507.

*Corallistes*, Sdt. 1870, *op. cit.* p. 22 &c. See Taf. iii. for illustrations.

For other species see 'Annals,' 1873, vol. xii. p. 437.

## Family 5. POTAMOSPONGIDA.

## Group 19. SPONGILLINA.

*Spongilla*, Lam. 1816, vol. ii. p. 98, = *Badiaga*, Buxbaum, in Spreng. Syst. Veg. iv. p. 374.

*S. fluviatilis*, Johnst. *op. cit.* p. 159, pls. xvii. & xviii.

For Bombay species see 'Annals,' 1849, vol. iv. p. 81, pls. 2, 4, and 5 ; and for species generally see "Monograph" by Bowerbank, Proc. Zool. Soc. 1863, pl. xxxviii.

## Order VII. HEXACTINELLIDA.

## Family 1. VITREOHEXACTINELLIDA.

## Group 1. PATULINA.

*Dactylocalyx pumiceus*, Stutchbury, Proc. Zool. Soc. 1841, p. 86.

## Group 2. TUBULINA.

*Euplectella aspergillum*, Owen, Trans. Zool. Soc. vol. iii. p. 203, pl. xiii.

## Group 3. SCOPULIFERA.

*Aphrocallistes Bocagei*, Wright, Quart. Journ. Microscop. Soc. vol. x. N. S. p. 4, pl. i. 1870.

## Family 2. SARCOHEXACTINELLIDA.

## Group 4. ROSETTIFERA.

*Crateromorpha Meyeri*, Gray, Annals, 1872, vol. x. p. 112.

*Rossella*, C. *ib.* 1875, vol. xv. p. 113, pl. x., see for all known species.

## Group 5. BIROTULIFERA.

*Hyalonema Sieboldii*, Gray, Proc. Zool. Soc. 1835, p. 65.

*H. lusitanicum*, Bocage, *ib.* 1864, p. 265, pl. xxiii.

*H. cebuense*, Higgin, Annals, 1875, vol. xv. p. 377, pl. xxi.

*Holtenia Carpenteri*, Wy. Thomson, 1869, Phil. Trans. p. 701, pls. lxvii.-lxxi.

*Meyerina clavæformis*, Gray, Annals, 1872, vol. x. p. 110.

*Labaria hemisphærica*, Gray, *ib.* 1873, vol. xi. p. 275; *ib.* Higgin, 1875, vol. xv. p. 385, pl. xxii. fig. 3.

Family 3. SARCOVITREOHEXACTINELLIDA.

One Group only.

*Euplectella cucumer*, Owen, Trans. Linn. Soc. 1857, vol. xxii. p. 117, pl. xxi. figs. 1-7\*.

Order VIII. CALCAREA †.

[To be continued †.]

XXIV.—*Descriptions of two new Species of Marginellidæ from the Cape-Verd Islands.* By EDGAR A. SMITH, F.Z.S., Zoological Department, British Museum.

THE two following species were obtained by the British Museum from Mr. P. Furse, of the Control Staff, who collected them whilst stationed at the Cape-Verd Islands. Both belong to that section of *Marginella* to which Hinds, in the Proc. Zool. Soc. 1844, gave the name *Volvarina*, and which contains a group of species having short small spires, narrow linear apertures, the columella furnished at the base with a few oblique folds, and the labrum exteriorly varicose.

1. *Marginella (Volvarina) verdensis*, sp. nov.

Testa elongata, cylindraceo-ovata, nitens, subpellucida, mediocriter tenuis, pallide flavescens (vel albescens), lineis transversis obliquis pluribus fuscis (interdum roseo-rufis) fasciata; anfractus 4; spira brevissima, marginibus convexis; apertura angusta, basi paululum dilatata, longitudinem totam testæ fere æquans; columella superne convexa, inferne plicis obliquis quatuor, suprema minima, proxima sequente paululum majore, tertia maxima perobliqua, ultima (quæ columellæ basim format) aliquanto minore tertiæque juncta, in-

\* For all the "known species" of Hexactinellida see 'Annals,' 1873, vol. xii. p. 357.

† For illustrations of the Calcarea see Hæckel's Monograph, with Atlas, on the Calcispongia, 1872, 'Die Kalkschwämme.'

‡ The above "Key" is now supplied, as it may be some months before the third part of these "Notes," although considerably advanced, is ready for publication—seeing that I have first to describe the remainder of the sponges dredged up on board H.M.S. 'Porcupine,' the illustrations for which, both general and elementary, are completed.