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IX.—*On two Vitreohexactinellid Sponges.*

By H. J. Carter, F.R.S. &c.

[Plate IX.]

The following descriptions of *Eurete farreopsis*, n. sp., and *Myliusia Grayi*, Bk., respectively have been made more especially for two purposes, viz. the former to show the mode of growth in *Farrea occa*, which has not yet been described from a *living* specimen, and the latter to illustrate the only known *living* species possessing the structure of the Ventriculidæ that has come to notice.

I am indebted to my friend Dr. J. Millar for the specimen of *Eurete farreopsis*, which has been whitened at the expense of the soft parts—for sale, not for the purposes of natural history,—and, from being very delicate in the last-formed portions, has been much broken. Nevertheless sufficient remains for description and for the accompanying illustration of the the general form, which has been taken from a photograph; while the elementary parts more particularly have been obtained from minute shreds of dried sarcode still left about the skeleton, in which are wrapt up the rosettes and smaller spicules of the species.

The specimen of *Myliusia Grayi*, Bk., belongs to the British Museum; and through the obligingness of Dr. Günther I am enabled to give an illustration of this, also delineated from a photograph. It was taken alive, as the presence of the sarcode in many parts indicates; but, appearing very insignificant from its smallness, it has not received that treatment which its

importance as the only *living* representative of the Ventriculidæ in structure deserves; nevertheless with what remains of this also there is, as will be seen, abundance left for description and illustration. It has already been described and named by Dr. Bowerbank (Proc. Zool. Soc. May 13, 1869, p. 335, pl. xxv. fig. 1), who has given a most faithful illustration of its general structure, to which I would refer the reader; but as neither the general form of the specimen itself, including its elementary composition, has been illustrated, nor the resemblance of the latter to that of the Ventriculidæ pointed out, it seems to me that a more detailed record of this precious little sponge is desirable; and this I have endeavoured to supply.

Eurete farreopsis, n. sp. (Pl. IX. figs. 1–7.)

Vitreohexactinellid. Skeleton. General form bush-like, fixed, sessile, composed of many tubo-branches anastomosing clathrously. Colourless, translucent, becoming white from increasing density of structure towards the base. Branches short, thick, cylindrical, hollow, formed of a delicate thin reticulated wall thickening from the growing margin towards the base or oldest part, widely separate, dichotomous, anastomosing as before stated. Orifices of branches respectively circular at first (fig. 2, *a*), then expanded (fig. 2, *b*), afterwards funnel-shaped (fig. 2, *c*), becoming elliptical and contracted in the centre (fig. 2, *d*), where, by the union of the approximated parts of the margin, two circular orifices are formed which grow into two short, round, tubular branches in opposite directions (fig. *e*), to divide again after the same manner, and so on—or to anastomose with other neighbouring branches, when each branch still gives off two others, so that at the point of junction there are four branches instead of two. Where union takes place, either by the approximation of the two opposite parts of the margin or by direct anastomosis, a raphe is formed. General structure of the wall reticular, the longitudinal lines of fibre, which are the largest, remaining parallel while the tube is round (fig. 2, *a*), but radiating upon the same plane successively where the orifice becomes expanded (fig. 2, *c*, *d*). External surface rough, from the projection of the arms of sexradiate spicules which have not become enveloped by the vitreous fibre; internal surface still rougher from the same cause; mid structure or wall composed of sexradiate spicules woven into a reticulated tissue by the vitreous fibre, of which the meshes are subquadrangular, and, as before stated, the longitudinal fibres largest; varying in thickness from an extremely thin layer of minute sexradiate spicules in

the *growing* margin of the orifices at the circumference to a lamina 1-24th inch thick in the fixed or oldest portions at the *base*. Spicules of three kinds, viz. skeleton-, subskeleton-, and flesh-spicules. Skeleton-spicule sexradiate; arms spined throughout, pointed in the smallest, inflated at the extremities in the largest specimens, 5- to 40-6000ths inch long with proportionate thickness (fig. 4). Subskeleton-spicules of two forms, viz.:—1, acerate, straight, fusiform, attenuately pointed, spined throughout, spines all inclined one way and more or less closely applied to the shaft, 200- by 2-6000ths inch in its greatest diameters (fig. 5) : 2, scopuline spicule, consisting of a shaft and head (fig. 6 and fig. 3, *e*); shaft cylindrical, abruptly pointed at the free end, quadrangularly inflated at the other, microspined throughout, most evidently towards the free end, 68- by 1-6000th inch in its greatest diameters (fig. 6, *a*); head consisting of four arms respectively supported by the four angular projections at the end of the shaft, at first running parallel or slightly curved towards each other and then expanded; arm much thinner than the shaft, inflated globularly at the extremity, microspined throughout, especially towards the inflation, where the spines are long and inclined backwards, leaving the convexity of the inflation smooth or bald, 11-6000ths inch long (fig. 6, *b*, *c*). Flesh-spicule a hexactinellid rosette, each arm bearing four capitate rays expanded *en fleur-de-lis*, 7-6000ths inch in diameter (fig. 7 and fig. 3, *f*), or without extended arms, the latter being reduced to a central point, from which the rays radiate in all directions so as to present a globular form, 15-6000ths inch in diameter (fig. 3, *g*). Skeleton-spicules free and minute at the growing margin, afterwards becoming larger and enveloped in the vitreous fibre, or distributed throughout the whole structure, from the youngest to the oldest developed part, in a minute form, where one arm is frequently attached vertically to the smooth fibre (fig. 3, *d d*). Acerate subskeleton-spicule sparsely distributed. Scopuline spicule very numerous. Flesh-spicules also numerous. Vitreous fibre *smooth* between the knots (fig. 3, *a a a*), which are globular and spino-tuberculated all over, except where interrupted by their union with the fibre (fig. 3, *b b b*), or by the projection of one or more arms of the sexradiate spicule in the form of large spines, thickened or elongated, pointed or inflated at the extremity, and spinulated throughout (fig. 3, *c c c*); thickest smooth fibre 15- to 19-6000ths inch in diameter. Size of specimen $3 \times 4 \times 2$ inches. 3 inches high. Last-formed tubo-branch (viz. at the summit) 4-12ths inch in diameter : first-formed branch (viz. at the base) 2-12ths inch in diameter.

Hab. Marine, fixed on hard objects.

Loc. Philippine Islands.

Obs. The patulous ends of the tubular branches, accompanied by the plumose or radiating structure of the *lamina* out of which they are formed at this part, and the dichotomous manner of the branching itself, closely ally this species to *Farrea occa*, whose structure and mode of growth is also thus explained. In a specimen, too, of the latter growing upon a branch of *Lophohelia prolifera* dredged up on board H.M.S. 'Porcupine,' the fixed end (which, unlike the *single* layer forming the tube above, is composed of *massive* reticular tissue) presents a number of minute hexactinellids, each of which has one arm attached to the fibre, as in *Eurete farreopsis*. This is also the case in *Farrea infundibularis* (Ann. & Mag. Nat. Hist. 1873, vol. xii. p. 448, pl. xvii. fig. 1), whose structure, in many respects, is so very like that of *Eurete farreopsis* that one can only be considered a variety of the other; but I do not observe this remarkable feature in either of the *Aphrocallistes* or in *Aulodictyon Woodwardii*, Kent.

On account of the absence of the sarcode in the specimen above described, I am unable to state the position which the subskeleton- and flesh-spicules respectively and relatively presented. Nor am I able to say any thing of the dermal or growing layer of sexradiate spicules, which in these specimens is generally washed off with the rest of the sarcode to give them a more attractive appearance in the market, thus leaving nothing but the bare skeleton with a few fragments of dried sarcode here and there, in which, however, some of the minute spicules are almost sure to be retained.

Possessing a broom-like or scopuline spicule, I am able to place this species among those characterized by a "scopuline shaft" (Ann. & Mag. Nat. Hist. 1873, vol. xii. p. 559), and with *Farrea occa*, as characterized by the tubular branches being patulous at their orifices (ib. p. 360).

Like as the general form of this specimen is to that given by Marshall of Semper's *Eurete simplicissima* (Zeitschrift f. wissensch. Zoologie, xxv. Bd. 2nd Supp. Taf. xii. *c*), there is no part of the detail of the structure given by Marshall in Taf. xiv., except the attachment of the sexradiate to the vitreous fibre (fig. 32, *a*), which can be identified with it (*E. farreopsis*). What value may be due to the absence of the scopuline shaft and rosette in *E. simplicissima* (p. 185), I am unable to say, seeing that the reappearance of the spicules in the centre of the vitreous fibre in Marshall's illustrations (Taf. xiv.) indicates that the specimen had perished long

before it was picked up for preservation, and therefore might have lost, with its sarcode, most, if not all, of these spicules. But where it is stated, a little further on, that neither *Sclerothamnus* nor *Aphrocallistes* possesses a rosette, it would have been more to the purpose if Mr. Marshall had said that he had not found any in *his* specimens, since a knowledge of this kind of sponges points out that the scopuline shaft has hitherto never been found present without a rosette or its representative. Indeed I have stated, from actual observation, that *Aphrocallistes Bocagei has a rosette* (Ann. & Mag. Nat. Hist. 1873, vol. xii. p. 360, pl. xiii. figs. 9 and 10); and *Sclerothamnus Clausii*, which I now find to be my *Farrea densa* (*op. et loc. cit.* p. 51, pl. xvii. figs. 5 and 6), appears in *my mounted specimen* with its rosettes attached to it, as well as the head and part of the shaft of one of the scopuline spicules. At the time of figuring the fragment of *F. densa*, I could only be certain of the characteristic spine, as I was not sure that the rosettes and scopuline shafts belonged to it; but now that I have seen an entire branch, &c., I see also that they *do* belong to it, and that *Farrea densa* (= *Sclerothamnus Clausii*) *does* possess a rosette. When the description and illustrations of the whole specimen, "nearly three feet high," have been published this identity will be more evident.

The peculiarities of *Eurete farreopsis* are the globular tuberculated knots of vitreous fibre (fig. 3, *b b b*), which, with the centrally developed spine, looks like a bossed omphalic shield, and the globular inflations respectively at the ends of the scopuline arms very much like a "bald head" (fig. 6, *c*), while the form of the rosette flesh-spicule is that which generally accompanies the scopuline shaft (Ann. & Mag. Nat. Hist. 1873, vol. xii. pl. xiii. fig. 9), occasionally varied, as in the present instance, where the arms are reduced to a mere point and the diameter of the rosette much larger (fig. 3, *g*). The acerate spicule (fig. 5), too, with closely applied spines all directed the same way, is still more common among the Hexactinellida. To the presence of the minute sexradiate, one arm of which is attached to the vitreous fibre (fig. 3, *d d*) by an extension from the surface of the latter, I have already alluded as a remarkable feature in this kind of sponge-skeleton.

Mr. Marshall's criticisms generally of my papers on the Hexactinellida and Lithistida, and on my "Notes introductory to the Study and Classification of the Spongida," respectively (*op. et loc. cit.*), I have neither time nor inclination to reply to, especially as the author's amount of knowledge of the subject

does not appear to me to be equal to my own; so I must leave them for a future generation.

Since the above was written, I have received from Mr. T. Higgins a microscopic specimen of a Hexactinellid sponge purchased by the Liverpool Free Museum from Mr. Gerard, and said to have been collected by Dr. Meyer in the Philippine Islands. It is *Eurete farreopsis*, and is fellow to Dr. Millar's specimen above described, as I have now ascertained by an examination of the entire specimen.

Myliusia Grayi, Bk. Proc. Zool. Soc. 1869, p. 335.
(Pl. IX. figs. 8–17.)

Vitreohexactinellid. General form hemispheric; general appearance enteromorphous or cerebriform; sessile; consisting of tortuous anastomosing tubular canals or passages separated by equally tortuous labyrinthic intervals. Tubular canals or passages now terminating on the surface in round patulous or long tortuous gutter-like openings. Colour white, translucent, slightly yellowed by the presence of dried sarcode. Surface of tubular passages, both externally and internally, covered with a dermal layer of small sexradiate spicules, whose horizontal arms overlapping each other form a continuous quadrilateral meshwork. Margin of the openings of the passages on the surface fringed with the spined arms of long, thin, sexradiate spicules mixed with still larger (?acerates), whose shafts are uneven but not spined, unless it be microscopically in some parts. Pores and vents not discernible, from the mutilated state of the surface. Internal or body structure of the wall of the tubular passages composed of lozenge-shaped or lantern-like knots of vitreous fibre applied end to end, three or more layers deep, thus forming a laminate mass of trapezoids united to each other at their angles in successive rows (fig. 10), with cylindrical intervals between them crossing each other more or less rectangularly (fig. 10, *h h*); traversed by the branches of the excretory canal-system, and when fresh probably more or less divided into cavities by soft porous expansions of the sarcode (now dried) bearing the ampullaceous sacs or groups of spongozoa. Spicules of two kinds, viz. skeleton- and flesh-spicules. Skeleton-spicules of three forms, viz.:—1, small, sexradiate, arms not inflated at their junction, attenuately pointed and thickly spined throughout, about 15-1800ths inch long by $\frac{1}{2}$-1800th inch thick at the base (fig. 13); 2, much larger, sexradiate, the same, but with the arms slightly inflated at the extremity and 30- to 100-1800ths inch long (fig. 16); 3, still much larger (? acerate

fusiform, attenuately pointed), unspined, but uneven on the surface and here and there microspined; length unknown; largest fragment 170- by $\frac{3}{4}$-1800th inch in its greatest diameters (fig. 17). Flesh-spicules of two forms, viz.:—1, rosette, globular, consisting of six short arms (the third axis, which is vertical to the other two, is omitted in the illustration for perspicuity), each of which is surmounted by five long capitate rays expanded in a vasiform manner, $4\frac{1}{2}$-1800ths inch in diameter (fig. 14 and fig. 10, *f*); 2, bundles of minute, hair-like, undulating acerates like the tricurvate or bow spicule, about 4-1800ths inch long (fig. 15 and fig. 10, *g*).

The *small* sexradiates become the centres respectively of the trapezoids (fig. 9, *c*), which are thus formed by the extension of a thread of vitreous sarcode from one end of each of the arms of the sexradiate spicule to the other (fig. 9, *a*), strengthened at each attachment by subsidiary threads, which form an irregular reticulation between the main thread and the arm at each end of the latter (fig. 9, *b*); finally increasing in thickness throughout till the trapezoid is fully formed and presents four sides (fig. 10, *a*), with eight lantern-like holes in them, one in each triangular face (fig. 10, *i*), through which the sexradiate form of the original spicule may be seen in the centre *intact* (fig. 10, *c*). Trapezoid about 14-1800ths inch in diameter. Spicules nos. 2 and 3 form the fringe round the apertures which interknits with the body-structure of the lamina internally, the latter, or the supposed acerate form, extending beyond the former, both distally and proximally; while the flesh-spicules are scattered throughout the structure unequally—that is, much more numerously towards the surface. Size $\frac{1}{2}$ inch high by $\frac{7}{8}$ inch in horizontal diameter.

Hab. Marine.

Loc. Island of St. Vincent, West Indies.

Obs. In the Proc. Zool. Soc. Lond. 1859, p. 439, pl. xvi. Radiata, the late Dr. J. E. Gray described and illustrated a vitreohexactinellid sponge, to which he gave the name of "*Myliusia callocyathes*," after Christopher Mylius of 1753. There are two specimens of this sponge in the British Museum, viz. the original one (figured *l. c.*), about $3\frac{3}{4}$ inches in diameter, and the other about $1\frac{1}{2}$ inch wide, numbered "43.2.13.67." Both are stated by Dr. Gray, in his "Notes on the Arrangement of Sponges" (*op. cit.* 1867, p. 506), to have come from the West Indies. To which a third specimen has been added from the "Island of St. Vincent in the West Indies, collected by the Rev. L. Guilding," with the name "Scriviner" (? dealer) on the board bearing the specimen, numbered "40.10.23.11."

In the same 'Proceedings,' but of 1869 (p. 335, pl. xxv.

fig. 1), Dr. Bowerbank figures faithfully a fragment of the latter, which he finds not to be *Myliusia callocyathes*, but, although very like in outward appearance to it, totally different in structure; hence he calls it "*Myliusia Grayi*."

Having subsequently had to examine this sponge for the late Dr. Gray, I saw that its minute structure (fig. 10) was like that of the fossil species figured by Schmidt (Atlantisch. Spongienf. Taf. ii. fig. 16) under the general appellation of fossil spicules from "*Scyphia* and *Ventriculites*" (Ann. & Mag. Nat. Hist. 1873, vol. xii. p. 365). Next I identified the lantern-like knot of *Myliusia Grayi* with Mr. W. J. Sollas's figures of the structure of the Ventriculites (Proc. Geol. Soc. Lond. 1872, p. 65, fig. 2); lastly, with the late Mr. J. Toulmin Smith's representations of the structure of the "Ventriculidæ of the Chalk" (Ann. & Mag. Nat. Hist. 1847, vol. xx. pl. vii. figs. 8–14.

I next observed the lantern-like knot among the "Cretaceous Microzoa of the North of Ireland," figured by Mr. J. Wright (Report of Belfast Naturalists' Field-Club, 1873–74, Append. iii., published 1875, pl. iii. fig. 7). After this I found it myself among fossil sponge-spicules from the Mid Eocene of Brussels, kindly sent me by M. Ernest Vanden Broeck. And it again appears under another form in the beautiful illustrations of the structure of *Cœloptychium agaricoides* by Prof. Karl Zittel of Munich ('Ueber Cœloptychium,' München, 1876, Taf. iii. figs. 7–12). Finally in 1876 I obtained a slice of a Ventriculite from Mr. Ed. Charlesworth, of the Strand, London, and identified it therein myself.

It was then that I saw the desirability of illustrating the only known living specimen of the kind, viz. *Myliusia Grayi* in the British Museum; and having obtained permission of Dr. Günther for this purpose, I have done my best to publish it; for the specimen is very small, and, from its insignificant appearance and dirty colour, would be very likely to be lost sight of altogether, since it does not present the attractive bright glassy aspect and sarcodeless character usually possessed by the vitreous sponges after they have passed through the the hands of the dealer.

Although *Myliusia Grayi* presents the convoluted *cerebriform* appearance of *M. callocyathes*, yet its minute structure is totally different, inasmuch as the knots or junctions of the fibre in the latter are solid and round, not hollow and lantern-shaped as in *M. Grayi*. Again, the general structure of *M. Grayi*, although convoluted, is massive and labyrinthic throughout, not cup-shaped or hollow in the axis as that of the Ventriculites; while *Cœloptychium* consists of radiating tubes more or less

branched round a hollow axis or stem, which in the horizontal section resembles *Ventriculites*.

In the evolution of the lantern-like joint it may be observed that this commences on a sexradiate spicule (fig. 9, *c*), the centre of which becomes the centre of the lantern, while the structureless sarcode, which here very much resembles that of the Rhizopoda, creeps crookedly and fungus-like from one point of the sexradiate direct to the other, thus marking out the lines of a trapezium (fig. 9, *b*). After this, subsidiary pseudopodal prolongations are continued from the fixed ends of the threads respectively to the arms of the sexradiate, which in a reticulated form thus further unite the two and act as additional stays to the main ones. After this the silicifying sarcode still goes on adding layer after layer to the original structure, until the whole becomes greatly thickened and the interstices of the reticulation reduced to eight spaces as before mentioned, so as almost to obscure the cross of the original sexradiate in the centre, which, although also thickened by the silicifying sarcode, still remains intact. Thus, in short, the sexradiate becomes as much imbedded in the vitreous sarcode as if it were in radiate fibre.

The fringe of spicules which is or, rather, was (for it now lies in loose pieces about the specimen) attached to the growing margins of the circular and gutter-like openings, is also composed of sexradiates, but much larger than those upon which the lanterns are formed; and while five of their arms interknit proximally with the body-structure of the wall of the tubular tortuous channel, the sixth is free and very long comparatively; while the fringe thus formed is still further lengthened by the presence of many (?acerates) much thicker and longer than any of the rays of the sexradiate, and which, by their uneven surface, seem to represent that form of acerate, so common among the Hexactinellida generally, in which the spines are long and *all inclined one way*—that is, inwardly *in situ* (fig. 5). Still this is of course conjecture; for I have never been able to find more than a fragment of the shaft of these, but never connected with any cross piece so as to indicate that they belonged to a sexradiate spicule. However, the surface is so mutilated that the fragments of this fringe are, as just stated, all loose upon the specimen, and only by their pencil-like form here and there, in which the spicules are held together in their natural position by the dried sarcode, show the manner in which they were arranged when attached to the margin of the circular and gutter-like openings of the tubular channels or passages.

The rosettes are large (especially when compared with those

of the last species, as the illustrations figs. 7 and 14 respectively, which are drawn to the same scale, indicate) and numerous, particularly towards the surface; and the little bundles of minute undulating, fine, hair-like acerates (fig. 10, *g*), which I have so often figured in the Esperiadæ and other sponges of the Holorhaphidota, are also very plentiful, and very frequently present a distinct, tricurvate or bow-like form (fig. 15).

I need not allude further to the differences between this and the foregoing species, viz. *Eurete farreopsis*, as these may be gathered from the descriptions and illustrations respectively.

In the formation of the lanterns from the sarcodic substance one cannot help being struck with the fact that, while this part of the sponge appears to be Radiolarian, the addition of the Spongozoa makes *the sponge*. This "radiolarian" sarcode is the "intercellular substance, which forms the bond of union between the cells" in sponges, that I described and delineated in *Spongilla* in 1849 (Ann. & Mag. Nat. Hist. vol. iv. pp. 87 and 91, pl. iv. fig. 2) as possessing the polymorphic power and contracting vesicles of an *Amœba*.

EXPLANATION OF PLATE IX.

Fig. 1. *Eurete farreopsis*, n. sp., natural size; from a photograph.

Fig. 2. The same. Five diagrams, to show the mode of growth, commencing with *a*, simple cylinder with circular orifice; *b*, the same, with orifice expanded; *c*, the same, with orifice become funnel-shaped; *d*, with orifice elliptical and contracted in the centre, like the figure 8; *e*, approximated sides united so as to form a simple cylinder on each side, with circular orifice, *f f*, like that of *a*.

Fig. 3. The same, minute structure of the wall, magnified. *a a a a*, fibre; *b b b b*, knots or points of junction of the fibre; *c c c*, occasional spines on the same; *d d*, minute hexactinellid spicules which the fibre has attached to itself; *e*, scopuline spicule; *f*, small rosette, common form; *g*, large rosette, occasional form. Scale 1-24th to 1-1800th inch.

Fig. 4. The same, form of staple sexradiate spicule.

Fig. 5. The same, spined acerate.

Fig. 6. The same, scopuline spicule. *a*, shaft; *b*, arm; *c*, head of arm, more magnified, to show the form and arrangement of the spines.

Fig. 7. The same, usual form of the rosette. (The third axis, which would be vertical to the others, has been omitted for perspicuity.)

N.B. Figs. 4 to 7 inclusively are on the scale of 1-24th to 1-6000th of an inch.

Fig. 8. *Myliusia Grayi*, Bk., natural size; from a photograph.

Fig. 9. The same: four knots or trapezoids, magnified, to show their earliest appearance. *a*, trapezoid; *b*, reticulated threads of silicifying sarcode extending from point to point of the sexradiate spicule, *c*. (The vertical axis of the latter omitted here also for perspicuity.)

Fig. 10. The same: four knots or trapezoids, magnified, to show their form under full development. *a*, trapezoid with reticulated

threads of silicifying sarcode all run together into solid fibre, thus enveloping the sexradiate spicule, *c*, in the centre, which is otherwise hollow; *d*, spine or arm of sexradiate increased in size by the silicifying sarcode, but not enveloped in the fibre; *e*, end of vertical arm of sexradiate truncated; *f*, rosette; *g*, bundle of minute hair-like undulating acerates, frequently tricurvate or bow-shaped; *h h*, cylindrical intervals or channels between the trapezoids; *i*, lantern-like hole, reduced to eight in each trapezoid.

N.B. Although both these figures, viz. 9 and 10, are drawn upon the same scale (viz. 1-24th to 1-1800th inch), it must not be assumed that the trapezoids are as regularly formed throughout the mass; hence they must, to a certain extent, be viewed more or less as diagrammatic.

Fig. 11. The same: oblique view of the trapezoid of fig. 9, showing all the arms of the sexradiate spicule *within* the reticulated threads of silicifying sarcode.

Fig. 12. The same: diagram of trapezoid to show the sexradiate cross as it exists in the trapezoid of fig. 10.

Fig. 13. The same: staple form of dermal sexradiate, scale 1-24th to 1-1800th inch.

Fig. 14. The same: rosette, more magnified.

Fig. 15. The same: tricurvates, more magnified.

Fig. 16. The same: large sexradiate spicule of the fringe.

Fig. 17. The same: fragment of large uneven spicule in the fringe.

X.—*List of the Species of Crustacea collected by the Rev. A. E. Eaton at Spitzbergen in the Summer of* 1873, *with their Localities and Notes.*

By Edward J. Miers, F.L.S., F.Z.S., Assistant in the Zoological Department, British Museum.

A small collection of Crustacea, made by the Rev. A. E. Eaton during a voyage with B. Leigh Smith, Esq., to Spitzbergen, in 1873, was presented to the Trustees of the British Museum in the following year. The species are most of them well-known Arctic forms; but the specimens generally are of a large size and in an excellent state of preservation. The value of the collection is further enhanced by the exact locality of nearly every specimen being recorded.

The crustacean fauna of the Scandinavian and adjacent arctic seas appears to have been investigated more thoroughly than that of any other great region of the globe, if we may judge from the amount of literature relating to it; for in the Introduction to his 'Skandinaviske og Arktiske Amphipoder' (Christiania, 4to, 1872), A. Boeck enumerates no less than 273 publications in which animals of this order alone are referred to in connexion with this area.

In 1863 A. v. Goës published a list of the Decapoda inhabiting the region mentioned, with remarks on the geographical