Mr. Gregory sent with this coral a very interesting specimen of *Hyalonema Sieboldii*. It is attached to a sponge which shows on the surface the numerous circular and oblong (this form being perhaps produced by compressing the open mouths) oscula, surrounded by a slightly raised edge, which are figured in Professor Schultze's plate. The presence of these oscules shows that the prominences in the bark cannot be "the oscule" as Dr. Bowerbank supposes.

The coil is very short, very thick, and formed of a large number of short spicules. These spicules, though short, are complete; for they taper at the tip, and exhibit the usual appearance of perfect spicules; otherwise it might have been supposed that this was only the base of a longer coil. The coil is a full inch in circumference at the base, and spread out towards the end. It has unfortunately been entirely deprived of its bark, except just where it emerges from the sponge, where there is a narrow imperfect ring of the bark, with small-sized circular prominences, being the contracted polypes, which are raised considerably above the surface, and have a small central impression. The coil is about 8 inches long; but one or two of the spicules are nearly one inch longer.

Every specimen that I see of this production more and more confirms my first idea that the coil and bark constitute a coral which is connected with a parasitic sponge.

XXXII.—*On a new Free Form of* Hyalonema Sieboldii, *and its manner of growth.* By Dr. J. E. Gray, F.R.S., V.P.Z.S., F.L.S.

Mr. W. Cutter has most kindly sent to me for examination a series of seventeen specimens of *Hyalonema Sieboldii*, which he had just received from Japan. They are all in good condition, better than most specimens when they arrive. The bark in all but one is decidedly in its natural state; this, on the other hand, certainly has been entirely stripped of its bark, and fresh bark recently stripped from some other specimen has been artificially put on to it; it would almost appear as if the coil of two specimens had been twisted together into one.

The series shows two very distinct varieties—one the kind hitherto known, which is found affixed to a sponge, and the other a free form of the coral, which is covered with bark to the very base of the coil. Of the sixteen specimens in their natural state, nine belong to the first, and six to the latter or free variety.

The attached variety is generally of a larger size and greater diameter; but they are known, even when the sponge is absent, by the basal portion sunk in the sponge being conical and tapering to a fine point formed of the very slender ends of the spicules. Six specimens of this variety have the sponge attached to the coils. The sponges vary considerably in size; but they are all more or less oblong, and most of them show more or less distinctly, according to the care that has been taken of them when they were collected and packed, the circular oscule, with its prominent edge, that is well represented in Professor Schultze's plate in his essay on the coral. The three other specimens have the naked conical base of the coil, and have, no doubt, been separated from the sponge when they were collected.

The six specimens of the free variety are all rather smaller and more slender than the majority of the other specimens; they have the lower half of the coil covered with bark to the base. The coil in these specimens does not suddenly taper to a fine point, as in the specimens that are taken out of sponges, but is only a very little smaller in the diameter of the base than in the middle length of the specimen. The bark of these specimens has never been removed, the tubercles or papillæ being regularly disposed and of a nearly uniform size; and there are generally two, and sometimes three, papillæ or animals quite at the end, which is more or less truncated, and in the dried specimens sometimes bent up or recurved.

There can be no mistake as to the end of the coil that is covered with the bark*; for it is easy to determine the different

* I am aware that Dr. Bowerbank states that M. Bocage has mistaken the upper part of the Portuguese specimen for the lower; but this is only a proof of the very cursory and incomplete manner in which he examined the Portuguese specimens in the British Museum; for any one who is acquainted with the structure and organization of the spicules of *Hyalonema* cannot possibly mistake one end of them for the other. The statement is as inaccurate as his assertion that the bark, the papillæ, and the animal of the Portuguese and Japan specimens are alike, or his declaration that the papillæ or contracted animals are oscules, and have no tentacles nor cnidia, in defiance of the observations of Brandt, Schultze, and Bocage, as well as myself. It is rather a difficult matter attempting to discuss a scientific question with Dr. Bowerbank. For example, when I say "*Hyalonema* [meaning the coil] has no sponge-structure," he replies, "Brandt, Schultze, &c., have proved that *Hyalonema* [meaning the sponge to which the coil is attached] has sponge-structure," which I never denied (P. Z. S. 1867, p. 905). When I said, "silica is not exclusively secreted by sponges, as the advocates of the sponge theory seem to believe," he replied, "no one ever asserted that silica is exclusively secreted by sponges;" yet a little lower down in the same page (P. Z. S. 1867, p. 904) he argues that the spicules of *Hyalonema* must have been secreted by sponges, as silica is only secreted by the *Protozoa*—that is, sponges.

ends of the separate spicule, and, from the same character, equally if not more easy to determine the ends of the coil of spicules. The spicules of *Hyalonema* are elongate, unequally fusiform: that is to say, thicker in the middle portion and tapering at each end; but the lower tapering part of the spicules is much the longest, and it tapers to a much more slender and finer point—the end above the thickest part tapering very gradually and being truncated before it reaches to a slender point. The consequence is that the coil is always much thicker in the upper part, from the greater thickness of the spicules, than in the lower one.

Since I have seen these specimens, I have a strong belief that the *Hyalonema Sieboldii*, fig. 1. pl. 1 of Brandt's 'Symbolæ,' and most probably of *Hyalochæta Possieti*, t. 2. f. 6, are free corals, with the basal end covered with bark; but he did not so regard them. I may also observe that the spicules figured (t. 2. f. 12 & 13) are represented on the plate with what he calls the upper part or free end of the spicule towards the bottom of the plate.

The specimens of this variety are exactly like the free specimens that M. Bocage found on the Portuguese coast; and they show that both the Japanese and the Portuguese species are sometimes found free, without any sponge at the base, and at others growing from a mass of sponge; and it has been lately observed that sometimes even two corals will grow from the same sponge.

I think this goes far to show that the attachment of the coral to the sponge is not a necessity, but only a frequent habit, and to prove that the coil of spicules is not a development of the spicules of the sponge to which it is attached. If this were the case, the sponge, which would be so important to its development, would always be present; for if the coil is the development of the spicules of the sponge in which it lives, how are the spicules developed when there is no sponge at the base to develop them?

The coil itself cannot be a sponge, as it is destitute of sarcode, inhalant pores, and excurrent oscules—the distinctive characters of sponges.

On the other hand, if we regard the spicules as the secretion of the animal that invests them, all these difficulties disappear; and every part of the structure leads to this conclusion.

This series of specimens is very instructive; and I have been able to secure a part of them for the British-Museum Collection, so that they may be examined by any one interested in the controversy.

First, all the specimens, like all the others received from

Japan, have the tubercle or papilla formed by the contracted animal cylindrical, prominent, and truncated, and very unlike the slightly raised elongated oblong papilla of the contracted animal of the Portuguese specimens of *Hyalonema lusitanicum*; and the bark of all of them is covered with a sand-like coat, very different from the smooth bark of those which inhabit the Atlantic Ocean.

Secondly, it is interesting as showing that the Japanese species, like the Portuguese one, sometimes lives free, and has the base of the coil entirely covered with animals, some of them being situated on the very extremity of the base. Indeed, from the number of specimens of this form that have been brought home in this collection, it may be as common as those that live in sponges; but, not being of such a large size, the latter may be preferred both by the collectors and the persons who purchase them and bring them over to this country.

In the collection there are two anomalous specimens. One of them differs from all the other specimens of both varieties in the coil being much more slender, formed of a comparatively small number of spicules, and very much longer than any of them. The coil is about 24 inches long, and scarcely half an inch in circumference. The bark that remains on the coil is thinner than usual, but is studded with regular, equal-sized, normal-shaped papillæ, but of a smaller size than in the other specimens.

The other specimen has been evidently manipulated by the Japanese; and though the base is covered with papillæ, it is clear that the coil (or, rather, the two united coils of which it appears to be formed) belongs to corals that were attached to a sponge. This coil is very thick, and formed of very numerous spicules; the lower half and the conically attenuated base is covered with short strips of bark that have been artificially applied round it when the bark was in a fresh or moist state; the papillæ on the bark, being probably taken from more than one specimen, are of very unequal sizes, and, from manipulation, of irregular form. The eggs of two sharks have also been artificially attached to this specimen.

Specimens which have been thus artificially doctored are easily known from those that are covered with the proper bark of the coil. In the latter the papillæ or contracted animals have a regular arrangement and a uniform shape and size; while the tubercles or papillæ of the bark that has been artificially applied are irregularly arranged and generally more or less distorted by the manipulation.

P.S. I have no doubt there has been a considerable importation of specimens of *Hyalonema*. Mr. Cutter has sent me

twenty additional specimens, which he has just purchased, to examine. Twelve of them are imbedded in larger and smaller fragments of sponge; and the coils vary greatly in diameter and length, and in the quantity of bark on them. Two belong to the free variety; one is not in a good state: the other confirms me in the opinion that the *Hyalochæta Possieti*, figured by Brandt, is a free variety; for it nearly resembles this figure; but the polypes are not quite so long nor quite so much clustered.

When examining these specimens I was induced to re-study the whole question and to re-read Professor Max Schultze's well-reasoned and very interesting paper on the genus in the 'Annals & Mag. Nat. Hist.' for March 1867 (xix. p. 153), and made the following notes, feeling satisfied that Prof. Schultze, like myself, is only desirous of arriving at the truth as to the structure of this most interesting marine production, and that we chiefly differ from observing the specimens in different states and from a different point of view.

I think that Prof. Max Schultze overestimates the similarity of the *Palythoa* on the *Axinella* and the animal of *Hyalonema*. The *Axinella* is not "*always covered* with this parasite;" the animals are scattered singly or in groups on the surface of the sponge, forming irregular tubercles, which caused Esper to call the sponge *Spongia tuberculata*. I cannot consider it "the most perfect analogy to the parasitism of *Palythoa fatua* in *Hyalonema*;" there the polypes form a uniform continuous bark, the inner coat of which surrounds each of the siliceous spicules with a sheath of corium. (See Brandt, t. 4. f. 14.)

There can be no doubt that the idea of our *Hyalonema* being a sponge arose in MM. Valenciennes and Milne-Edwards's minds from the examination of very imperfect specimens; for the latter states that "the polypes, which we have observed in a dry state *on different parts of the axis*, appear to be only parasites belonging to the order Zoantharia." One of the three figured in Prof. Schultze's work is destitute of any bark; and the other two only have very small quantities of the bark on the coil near the sponge. Well-preserved specimens generally have about half the length of the coil covered with animals. They seem more abundant in England than on the Continent. I have had through my hands, since I first described the genus in 1835, between 300 and 400 specimens.

Dr. Max Schultze observes:—"Thus, therefore, we have every imaginable proof of the mutual relation of the 'Glass Rope' and the sponge, which may be briefly recapitulated as follows:—

"1. The long siliceous threads are in structure indubitable sponge-spicules. They must therefore have been produced in a sponge." [I have shown that in structure and function they are unlike any sponge-spicules known. See Ann. & Mag. Nat. Hist. 1868, i. p. 292.]

"2. Such a sponge, likewise with siliceous spicules, occurs constantly at the lower extremity of the 'Glass Rope,' in organic connexion therewith." [Bocage and I have shown that many most perfect specimens of *H. Sieboldii* and *H. lusitanicum* are found that never had any sponge connected with them (see species figured, Brandt, t. 1. f. 1; t. 2. f. 6), though Dr. Max Müller regards the sponge as something *permanently constant*.]

"3. The sponge at the lower extremity of the long threads has very characteristically constructed spicules, inasmuch as their axial canal always possesses one or two perpendicular transverse canals. The same characteristic structure is also displayed by the longer and shorter threads of the 'Glass Rope.'" [This character is common to the spicules of many sponges, and may be common to these and the spicules of *Hyalonema*, which, as stated above, differ from the spicules of all known sponges in the structure of the end and in their mode of growth and function. The reason why I did not refer to this point in my former paper is that I did not, and even now do not, regard it as so important as Prof. Schultze seems to consider it. The existence of a transverse canal being common to siliceous spicules of a sponge and of *Hyalonema* did not appear to me to decide that the latter were not secreted by a polype. The value of microscopic observations depends on the accuracy and knowledge of the observer; and we must not decide beforehand that a siliceous spicule with a transverse canal cannot be secreted by a polype because we have not before observed one, especially when the spicule has other characters that separate it from all sponge-spicules, as is the case with the long spicule of the coil of the *Hyalonema*.]

I have been often told that Prof. Schultze has shown a series of spicules gradually passing from the form in the sponge to that in the coil. I cannot find any one showing any passage from one to the other, nor the slightest approach to one with the ring of spines, or the peculiar appearance of the end or fracture. There is a considerable difference in form between the cruciform spicules of the sponge at the base and that on the bark—so great as to have induced Brandt to call one *Spongia spinicrux* and the other *Spongia octancyra*; yet probably the sponge on the bark is only an extension of the sponge at the base, like the sponge found between the ends of

the spicules of the top of the coil. Sponges permeate and overrun everything in their neighbourhood.

Prof. Max Schultze observes that no one who has opened the sponge and examined the extremely fine ends of the long siliceous threads in the axis of the sponge "can doubt that the most intimate organic union exists between the porous sponge and the 'Glass Rope,' and that both, therefore, form an organic whole." (Ann. & Mag. Nat. Hist. 1867, xix. p. 155.) If Prof. Schultze means that some particles of the sponge extend themselves up between the spicules of the coil, that is, no doubt, true; but as we all know that sponges will extend themselves up between all kinds of structure, I cannot regard that as any proof of organic union. And I suspect that this is what he does intend when he refers to the examination of imperfect specimens which had been removed from the sponges (p. 155); and he seems not to have seen any specimen that never had a sponge attached to it (though such are now known to exist), and erroneously suspects that M. Bocage's specimen, which is now in the British Museum, was imperfect.

It is curious that neither Prof. Schultze, Dr. Bowerbank, nor any of the advocates of the spicules being developed from the sponge has ever attempted to show how the spicules are developed by the sponge, whence they originate, or to show any connexion between the individual sponge-spicules and the spicules of the coil, or that there is any connexion between the pores and tubes of the sponge and the coil. As far as I have seen, the coil under the bark is a solid body composed of many closely packed spicules united together by fibrous corium like the lower surface of the bark, and which surrounds each and at the same time unites all the spicules into a mass destitute of any pores or canals; and the end of the coil in the sponge, in the four or five specimens that were cut open for the purpose of examination, has always been separated from the cavernous part of the sponge by a thick, very hard, compact coat formed of felted spicules. As this coat and the cavernous structure of the sponge are not represented in Schultze's t. 2. f. 1, I suspect it is rather a diagram than a representation of a specimen.

Prof. Max Schultze states, "As yet only *lime* salts are known in the skeletons of polypes." (Ann. & Mag. Nat. Hist. 1867, xix. p. 154.) And Dr. Bowerbank observes, "I believe that the animal power of organizing siliceous matter to form either an internal or an external skeleton will be found to be strictly confined to the great subkingdom of the Protozoa." (Proc. Zool. Soc. 1867, p. 904.)

These authors have overlooked the analysis of coral quoted

from Dana, in which it is shown that as much as 23 per cent. of silica is found in the Madrepores; and silica is also found in the axis of *Gorgonia* and other corals, forming an essential part of their organic structure. (P. Z. S. 1867, p. 120.)

Prof. Lovén, who adopts Prof. Schultze's theory, that the sponge is an integral part of the organism, when describing a true sponge from the North Sea which he regarded as a *Hyalonema*, came to this conclusion from the study of the form and structure of the Japan sponge as described by Prof. Schultze, which had been overlooked or not properly appreciated by Prof. Schultze himself and other zoologists, myself among the number, which, I think, fully prove that the sponge is not affixed to marine bodies and placed at the base, but at the apex of the glassy coil, the base of which he believes to be affixed to some marine body, regarding the siliceous coil, as seen in museum specimens, as only a fragment that has been accidentally broken from its other fixed part. This latter notion is inconsistent with what we know of the habits of the genus, and also with the structure of the spicules of the different specimens, which always taper towards the end in a most uniform and regular manner, very unlike an accidental break of a coil of spicules produced by an external force.

Dr. Lovén says that the circular holes on the outer surface of the sponge (the chimneys or *oscula* of Prof. Schultze) "cannot be the pores for the exterior current." But I think that if he had been able to examine the sponge he would have found that they are connected with the *oscula* in the internal cavities of the sponge. (See Lovén, Ann. & Mag. N. H. 1868, ii. pp. 81, 89.)

It was difficult to understand how what are here called the "free" *Hyalonemata* keep themselves erect on the sea-bottom; for it is clear they must do so, as the similar size and development of the polypes show that they must be all equally within the reach of food. (See P. Z. S. 1867, pp. 119, 902.) The direction and manner in which the polypes on the apex are developed shows that this cylindrical coral must be permanently erect.

It is quite possible that the *Hyalonemata* live with the siliceous filaments sunk in the sand; and that might explain why we have never seen, even in the most perfect and well-developed specimens, the coil of siliceous spicules covered with the polypes and the bark-like crust for more than half its length, and that always on the upper part of the coil.

A dealer, more than two years ago, showed me a number of coils in the state in which he received them from Japan, in which the exposed filaments of the coil were covered with

mud; and he said that the collector told him that they lived with part of the coil sunk in the mud. I did not credit the account then, but I see reason to do so now.

I believe that it will be found that the coral grows erect, with the part of the coil not covered with animals sunk in the mud, like the Sea-pen or *Pennatula* (the siliceous spicules, not being liable to disintegrate or change in structure, are well adapted for such a mode of life in their uncovered state), and that the sponge when present is a parasite that grows at the apex, and not, as has hitherto been considered, at the base of the coil of the coral.

If this theory is the true one, as I believe it to be, the family and genera may be thus characterized:—

Hyalonemadæ.

Social zoanthoid polypes, secreting a central siliceous internal axial coil for their support. The upper half of the coil covered by a uniform cylindrical bark regularly studded with retractile polypes. The polypes are developed at the apex and are directed upwards as the coral grows; those on the bark near the naked part of the spicules are degenerate or less developed than those on the other part of the bark; they appear to die off below as the lower part of the coil sinks deeper in the sand.

The axis consists of numerous siliceous threads or spicules extending from end to end and coiled together into a cylindrical rope-like form.

The spicules, as far as they are covered with the bark-like polypes, are each surrounded and separated from each other by a thin sheath of corium, the whole forming a dense cylindrical coil enclosed by the external bark formed of the united polypes.

The part not covered with the bark consists of the lower half of the same spicules, which are separate and distinct from each other, forming a beautiful tuft of glassy filaments.

Each spicule is formed of a great number of concentric coats with a central canal, like the spicules of sponges; but the ends of the spicules are unfinished and truncate, showing the laminæ of which they are formed, the inner laminæ projecting beyond the others, and the outer being the shortest. (Brandt, t. 2. f. 12, 13, 15; Schultze, t. 2. f. 3, 4, 5.)

The spicules are linear-elongate, subcylindrical, unequally fusiform, tapering at each end, the end that is enclosed under the bark being the longest and most slender*. (Brandt, t. 2. f. 12, 13, 14, 15.) The surface is smooth, but near each end

* The fractured or imperfect ends, the concentric ridges and spines on the surface, and the spicules being surrounded with *corium* at once

there are concentric ridges edged with a series of spines that are directed towards the middle of the length of the spicule. (Schultze, t. 2. f. 4, 5). These spicules are lengthened as the coral grows.

The corals live erect at the bottom of the sea, with the free part of the spicules sunk in the mud or sand.

The upper part of the coral is often taken possession of by a cup-shaped parasitic sponge (*Carteria*). The sponge destroys the polypes; and the ends of the spicules form a short rapidly tapering cone, which is separated from the sponge by a number of spicules felted together, forming a hard case which separates the end of the coil from the rest of the sponge.

The coils of spicules, as left when the polypes die and the bark has rotted or been eaten away by fishes, &c., are often found in the sea, as are also the separate spicules.

M. Bocage makes a statement that is otherwise difficult to understand. He says, "I have several specimens of *Hyalonema* with other parasites: two are covered with an Antipatharian, three absolutely destitute of polypes and sponges, one embraced by the foot of an *Actinia* of what seems to me a new species." (Ann. & Mag. Nat. Hist. ser. 4. vol. ii. p. 37.) Dr. Semper has lately named a single specimen of *Hyalonema* he received from the Philippines *H. Schultzei*, because it is destitute of polypes and bark, but attached to a sponge.

They have been found in a fossil state in Mountain Limestone, retaining the siliceous character of the coil.

HYALONEMA, Gray, Proc. Zool. Soc. 1835, p. 64; Ann. & Mag. Nat. Hist. 1850, vi. p. 306; P. Z. S. 1867, p. 118 (not Lovén, Ann. & Mag. N. H. 1868, p. 90); Brandt, Symbol. 14 (1859); Wyville Thomson, Intell. Observ. 1867, p. 81.

Hyalochæta, Brandt, Bull. Acad. Pétersb. 1857, p. 17; Symbol. 17 (1859).

Bark sandy. Polypes cylindrical when contracted. Tentacles 20.

1. *Hyalonema Sieboldii*, Gray, P. Z. S. 1835, p. 65, &c. B.M.

H. mirabilis, Gray, P. Z. S. 1857, p. 279; Bowerbank, P. Z. S. 1867, p. 18; Lovén, Ann. & Mag. N. H. 1868, p. 90.

Type, without parasitic sponge on apex:—

H. Sieboldii, Brandt, Symbol. t. 1. f. 1; Wyville Thomson, Intell. Observ. 1867, p. 93, f. 1.

Var. *Possieti*. Polypes produced and clustered.

Hyalochæta Possieti, Brandt, Symbol. t. 2. f. 6–20.

---

separate the siliceous spicules of zoanthoid polypes from the spicules of sponges.

A. With parasitic sponge on apex.

H. Sieboldii, Gray, Brandt, Symb. t. 1. f. 4, 5; Schultze, Hyalonemen, t. 1, t. 2. f. 1, 2.
H. mirabile, Bowerb. P. Z. S. 1867, t. 4. f. 3.

B. Without the sponge, but with the part of the coil deprived of polypes where it had been.

H. Sieboldii, Brandt, Symbol. t. 1. f. 2, 3, 6, 7, t. 2. f. 2.

Hab. Japan.

In examining some thirty-seven specimens which have lately arrived in London from the same locality in Japan, I find the contracted animals vary considerably in form and size. They are generally nearly uniform in size and distance from each other in the same specimen. In one with small close polypes I found a small oblong cluster of some twenty or twenty-five polypes, rather smaller than the others, all crowded together into a mass.

Some three or four specimens had the contracted animals considerably larger and further apart, not quite regularly circular in shape; but they are very different from the contracted animals of *H. lusitanicum*.

One specimen without any sponge had the polypes very irregularly dispersed—some far apart, others very close, and even clustered together forming irregular prominences. This specimen is somewhat like *Hyalochæta Possieti* (Brandt, Symbol. ii. t. 2. f. 6); but the polypes are not quite so long and prominent as in that figure. The study of these specimens and others I have seen induces me to believe that there is only a single rather variable species found in Japan.

Unfortunately all the sponges on Japan *Hyalonemata* I have been able to examine have been in a bad state, with an eroded surface, as if they had been worn by the sea; and that is probably the condition of the ones figured by Schultze, though the oscules are represented as complete; but the surface of the sponge, judging from the sunken part of some of the specimens in the complete state, is covered with a close-grained dermal layer. They have generally been crushed in packing or drying; some exhibit circular perforations on the surface. They vary greatly in shape, some being large and oblong, others contracted, ovate-elongate, like Brandt's t. 1. f. 4, 5. I believe these forms arise from their being squeezed when taken out of the sea, or after being washed. There are three specimens in the British Museum, one only anything like perfect, which, ovate-elongate before it was soaked in water, is conical cup-shaped, with a large conical cavity reaching

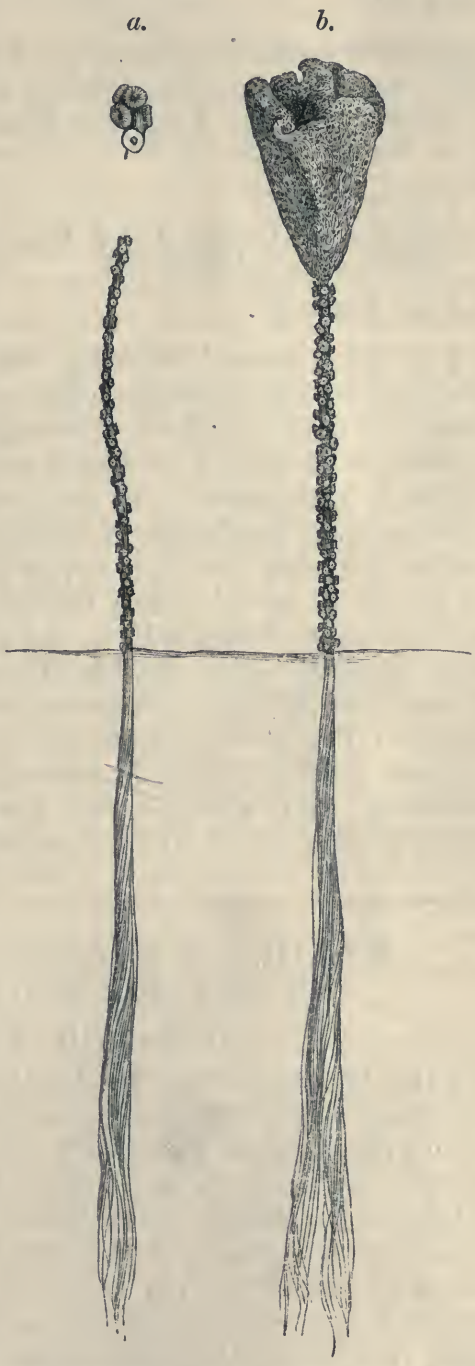
nearly to the apex of the coil. The cavity is partly filled up with irregular contorted plates of different sizes, projecting from the wall of the cavity. The parietes are thin; the upper edge of the cavity is thin, sinuous, and not showing any indication of having been attached to any marine body. The apex of the coil is sunk in one side of the wall of the large cup-like sponge.

The second specimen is somewhat like the former; but the upper part of the wall is broken away, the parietes are thickened, and there are three unequal conical concavities, the middle one much deeper than the rest.

The third specimen is much more imperfect. It is a square spongy mass, which has been crushed and disintegrated; it has only a moderate-sized central conical concavity; but a great part of the cup is wanting.

As far as I have seen, all the sponges are more or less cup-shaped, with a central conical open cavity.

2. *Hyalonema Schultzei* is probably a distinct species, as it came from the Philippines; but it is described probably from a dead specimen of a coil that had lost its bark and animals.



Hyalonema Sieboldii, growing in the mud, reduced to $\frac{1}{4}$ the natural size. *a.* the contracted polypes on the apex, larger; *b.* the parasitic sponge on the apex.

HYALOTHRIX, Gray, P. Z. S. 1867, p. 119.

Bark smooth. Polypes oblong when contracted, low. Tentacles 40.

Hyalothrix lusitanica, Gray, *l. c.* 1867, p. 119. B.M.

Type *Hyalonema lusitanicum*, Bocage, P. Z. S. 1864, p. 265, t. 22; 1865, p. 662; Gray, Ann. & Mag. Nat. Hist. 1866, xvii. p. 287; Lovén, Ann. & Mag. N. H. 1868, p. 90.

Var. *spongifera*.

H. lusitanicum, Bocage, Ann. & Mag. Nat. Hist. 1868, ii. p. 36; Bowerbank, P. Z. S. 1867, p. 902.

Hab. Portugal.

P.S. Dr. Perceval Wright, who has just returned from dredging for *Hyalonemata* on the coast of Portugal, informs me (Sept. 14) that he believes the coral (*H. lusitanicum*) grows at the bottom of the sea in deep water, with the free part of the coil sunk in the sand. He also mentioned to me that M. Bocage has some specimens of the sponge that grows on the *H. lusitanicum* with a shallow cavity that is covered with a netted lid formed of spicules, like the lid of *Euplectella*. I do not find any trace of such a lid in the three sponges on the *Hyalonema Sieboldii* in the British Museum; but it seems to exist in some specimens of that sponge, as Dr. Lovén says that Prof. Schultze found "the flattened surface of the smaller and younger specimen (No. 4) covered by a network of spicules similar to that which covers the free end of *Euplectella*." (Ann. & Mag. N. H. 1868, ii. p. 89.)

XXXIII.—*On the Boring of certain Annelids.*

By W. C. M'INTOSH, M.D., F.L.S.*

[Plates XVIII., XIX., XX.]

AT the Meeting of the British Association held at Dundee, my friend Mr. E. Ray Lankester read a very interesting paper on "Lithodomous Annelids," or, rather, on the boring of *Sabella saxicava*, Quatref., and *Leucodore ciliata*, Johnst., chiefly with reference to the latter. In the discussion which followed, Mr. Gwyn Jeffreys and I strongly opposed the theory advocated by the author as to the action of a purely chemical agency in the production of the perforations. I specially mentioned that *Leucodore ciliata* bores in aluminous shale—a fact fatal to the chemical (or acid) theory—and am

* Communicated by the Author, having been read at the Meeting of the British Association at Norwich, Aug. 24, 1868.