Mr. Du Bois, with whom I was hunting last season in the Amaswazi country, and who knows that part of Africa perhaps better than any other man, informs me that a variety of the Buffalo, smaller and with a red tinge on its skin, used to exist along the Bomba hills; and in fact I saw such a skin brought in for sale by one of the natives. The Hon. W. H. Drummond, in his book on the Large Game of South-eastern Africa, says, p. 33, "A herd of Buffalo, or, more correctly speaking, several herds, that exist in a district known as the Umbeka, on the north-east of Zululand, are famed as having a tinge of red in their colour, and as being smaller and more dangerous than any others."

June 5, 1877.

Prof. W. H. Flower, F.R.S., V.P., in the Chair.

The following papers were read:—

1. Description of five new Species of Sponges discovered by A. B. Meyer on the Philippine Islands and New Guinea. By the late J. S. Bowerbank, F.R.S., F.Z.S.[1]

[Received May 14, 1876.]

1. Ophlitospongia meyeri, sp. nov.

Sponge fistulous; pedicel short and stout. Surface very rugged and tuberculous. Oscula numerous, dispersed within the cloacal cavity. Pores inconspicuous. Dermal membrane spiculous; tension-spicula acuate, dispersed or subfasciculate, large and stout, same size as those of the skeleton; retentive spicula bidentate equianchorate, very minute and slender, denticuli long, apices obtuse, few in number, dispersed. Skeleton: Fibre rigid, stout and abundantly spiculous; rete irregular and open; spicula acuate, and a few accrate, stout and rather long; fibres profusely armed with stout attenuato-acuate basally and apically spined internal defensive spicula, projected at nearly right angles and in all directions from the fibres. Interstitial membranes spiculous; spicula same as those of the dermal membrane. Gemmules membranous, spherical or oval, black and opaque.

[1] Communicated to the Secretary by Dr. A. B. Meyer, with the subjoined remarks:—

"The enclosed paper of the late Dr. Bowerbank on five new sponges from the Philippines and New Guinea was finished June 1876, and was intended by the author for the 'Proceedings' of the Zoological Society. He sent the paper over to me for inspection; and I returned it, after having added a few notes. He then became ill and died, without having been able to forward the paper to your address. Dr. Bowerbank's family now return the paper to me, and I forward it to you with the hope that the Society may accept it."

Colour, in the dried state, nut-brown.

Hab. Kordo, Island of Mysore, Geelvinks Bay, New Guinea (*Dr. A. B. Meyer*).

Examined in the dried state.

Type in the Dresden Museum.

Dr. Meyer observes :—"In life, of the gayest green, red, and yellow colours, which fade away very quickly.

The form of this sponge is that of a single long fistulous body which has apparently been attached to the side of a mass of calcareous matter by a short stout pedicel, and has then curved upwards to about eight inches in height. Its external diameter rather exceeds two inches; and its internal one averages one and a half inch. Externally it is very rugged and prominently tuberculous, while its inner surface is smooth and even, with numerous dispersed oscula for discharging their effete streams into the large cloacal cavity, which exceeds seven inches in depth.

The oscula within the great cloacal cavity are numerous, and appear to be equally distributed throughout the whole of its length; they rarely exceed a line in diameter.

The external surface of the sponge abounds in porous cavities or depressions; but the true inhalant pores of the dermal membrane that lines them are inconspicuous, and I did not detect a single open one on any part of the dermal membrane when mounted in Canada balsam. The dermal membrane is abundantly spiculous. The tension-spicula are acuate, stout and long, and as large as those of the skeleton; they are dispersed or subfasciculated; occasionally, but rarely, a few of the attenuato-acuate internal defensive spicula occur among them; but I could not detect any acerate spicula. The bidentate equianchorate retentive spicula are very slender and minute, their denticuli are long and obtusely terminated; they vary greatly in size, the smallest ones frequently not exceeding half the size of the larger ones. The largest I found measured $\frac{1}{1500}$ inch in length; of the smaller ones, one measured $\frac{1}{2727}$ inch, and another $\frac{1}{3000}$ inch in length. The fibre of the dermal rete is not so abundantly spiculous as that of the skeleton. The latter frequently assumes quite the appearance of a *Desmacidon* from the abundance of its spicula.

The skeleton-spicula are of two forms, acuate and acerate, the latter form being of rather rare occurrence; both forms are rather variable in length: they are very numerous and closely packed in the fibres; their average length is $\frac{1}{187}$ inch.

The internal defensive spicula are based on the surface of the skeleton-fibre, from which they are projected at various angles. Their bases and the distal halves of their shafts are abundantly spinous, the proximal half of the shaft being frequently destitute of spines; these organs are well developed and are all acutely conical. The internal defensive spicula are very numerous, and they form a most effective defence against any minute Annelids that might attempt to enter the skelton structures of the sponge. Their average length is $\frac{1}{300}$ inch.

The interstitial membranes closely resemble the dermal one, but

they are not so abundantly furnished with tension-spicula, while the retentive ones are the same in form and about the same in number. These organs are not very readily detected *in situ* while immersed in the sarcode; and from the delicacy of their structure they require a microscopical power of at least $\frac{1}{1000}$ linear to render them distinctly to the eye.

The gemmules of the sponge are rather numerous on the interstitial membranes, and on the inner surface of the dermal one. They are smooth, spherical or slightly oval, and opaque and black, whether viewed by direct day-light, or, when mounted in Canada balsam, by transmitted light. They vary to some extent in size: the smallest of them measured $\frac{1}{3000}$ inch in diameter, the largest $\frac{1}{1300}$ inch; but the average of several measured was $\frac{1}{1500}$ inch in diameter.

2. ISODICTYA ASPERA, sp. nov.

Sponge sessile, multifistulous, fistulæ branching irregularly and usually confluent; parietes thick; surface very rough and irregular. Oscula within the fistulæ. Pores inconspicuous. Dermal membrane spiculous, reticulated; rete irregular, uni- or bispiculous; spicula acuate, same size as those of the skeleton. Skeleton: Rete irregular, diffused; primary fibres multispiculous, secondary fibres irregularly disposed; acuate, stout and rather long. Gemmules membranous, abundant, more or less congregated, spherical, semi-transparent, dark amber-colour.

Colour. In the dried state, dark brown.
Hab. Abu, Philippine Islands (*Dr. A. B. Meyer*).
Examined in the dried state.

Type in the Dresden Museum.
This sponge rather exceeds six inches in height, and is of about the same average diameter.

The fistulæ radiate in all directions from the massive basal attachment, and immediately separate more or less into short stout branches which most frequently become confluent groups. This character of the fistulæ is very unusual, and is very characteristic of the species. The surfaces of the fistulæ are exceedingly rough and rugged; and their substance is very brittle in the dried state. Their distal terminations are open to the full extent of their internal diameters; and their margins are thin. The oscula on the smooth inner surfaces of these organs are distinctly visible by the aid of a lens of about two inches focus.

Portions of the dermal membrane, when mounted in Canada balsam; and viewed with a linear power of about 100, exhibit its reticular structure in a very satisfactory manner; the rete is rather irregular, but very distinctly exhibited; it is most frequently unispiculous; but occasionally two or, rarely, three spicula are combined in some parts of it. The spicula are nearly equal in size and of one form only, rather long and stout acuate. In a portion of the dermal membrane thus examined, there were a considerable number of groups of gemmules, each group consisting of numerous closely

packed specimens, very uniform in their colour and degree of semi-transparency. These organs varied in diameter from $\frac{1}{5000}$ to $\frac{1}{1500}$ inch. Some of these groups of gemmules consisted almost entirely of the larger forms, while in others they were nearly all of the smaller description. They require a linear power of about 300 to render them distinctly to the eye. I have never before seen a similar congregating of the gemmules in any sponge that I have examined.

The general structure of the skeleton is very irregular, the rete in some parts being composed of many more spicula than in others. The spicula of which it is constructed are of the same form and size as those of the dermis. The gemmules were also dispersed singly around the rete to which they were attached; and in size and general character they were in perfect accordance with those grouped on the inner surface of the dermal membrane.

This sponge is the only specimen I have seen of the species; and although its structural characters are exceedingly simple, its external ones are so remarkable, that it cannot well be confounded with any other known species of *Isodictya*.

Polyfibrospongia, genus novum.

Skeleton kerato-fibrous. Fibres solid, cylindrical, aspiculous. Rete symmetrical. Skeleton-lines polyfibrous; primary lines of the skeleton radiating from the base of the sponge to the distal margin; secondary lines disposed at nearly right angles to the primary ones.

Although nearly allied in many respects to the genus *Spongionella*, there is an important difference in the structural arrangement of the skeleton-fibres of this sponge as compared with those of the type forms of *Spongionella pulchella*, which distinctly separates them. In the latter genus the skeleton-structures, both primary and secondary, are composed of single fibres; the primary ones radiating from the base of the sponge, and the secondary fibres being disposed at right angles to the primary ones. This mode of skeleton-structure prevails also in the sponge from the Philippine Islands; but instead of single fibres thus disposed, we find continuous fasciculi, each composed of numerous slender fibres in both the primary and secondary portions of the skeleton-structures. Thus, although the individual fibres of the sponge are very nearly the same as in *Spongionella*, the congregation of the fibres in large diffuse fasciculi constitute an important generic difference; and I therefore propose to make this peculiar mode of skeleton-structure the type of a distinct genus, to be designated as above.

3. Polyfibrospongia flabellifera, sp. nov.

Sponge fan-shaped, pedicel very short, parietes very thin, surface smooth and even. Oscula and pores inconspicuous. Dermal membrane aspiculous, but abundantly supplied with adherent extraneous matters. Skeleton: Primary lines composed of a loosely constructed polyfibrous cord of slender anastomosing keratose fibres; secondary lines constructed the same as those of the primary series;

both series abundantly laden with externally adherent particles of extraneous matters.

Colour. In the dried state, light ochreous yellow.
Hab. Geelvinks Bay, New Guinea (*Dr. A. B. Meyer*).
Examined in the dried state.

Type in the Dresden Museum.
Dr. Meyer observes, "in life brown."

The form of this sponge is that of a contorted fan six inches high by eight and a quarter inches broad. It is based on a short massive pedicel. The thickness of the general expansion of the sponge does not at any part exceed one twelfth of an inch; and the general construction of the skeleton is visible to the unassisted eye. It has lost a great part of its dermal membrane; but considerable portions of it still remain. It is destitute of any spicula usually characteristic of dermal tissues; but it is abundantly supplied by adhesion with adventitious spicula of other sponges and of grains of sand and other such matters. The oscula are scarcely distinguishable; they appear to consist of minute orifices rarely exceeding the size of one of the areas of the skeleton-rete, and they are very irregularly distributed over the inner or concave surface of the contorted sponge. I could not detect any pores in a portion of the dermis mounted in Canada balsam.

The loosely constructed polyfibrous lines of the skeleton are very singular in their structure. They consist of numerous minute fibres, running nearly parallel to each other, and anastomosing at irregular intervals by short connecting fibres at nearly right angles to each other. Neither the primary nor the secondary lines ever appear to be in any degree twisted. The primary lines, on an average, measured $\frac{1}{94}$ inch in diameter, and the minute fibres of which they are composed varied from $\frac{1}{2143}$ to $\frac{1}{1394}$ inch in diameter.

The interior of the sponge appears to be as abundantly supplied with adherent grains of sand and other adventitious substances as the dermal membrane is; but none of such substances were embedded in the keratose fibres of the sponge as in the genera *Halispongia* or *Dysidea*.

4. HALISPONGIA STELLIFERA, sp. nov.

4. Sponge cup-shaped, compressed, parietes thin, pedicel short. Surface even and smooth. Oscula small, slightly raised on low tumid elevations, few in number. Dermal membrane pellucid, aspiculous, but abundantly supplied with adherent extraneous matters. Pores disposed in areas containing from one to two or three of them, each surrounded by numerous minute radiating fibres anastomosing near the pore, but diverging separately towards their distal terminations. Skeleton: Primary lines radiating in nearly parallel lines from the base to the distal margin; secondary lines anastomosing irregularly with the primary ones. Primary and secondary lines both polyfibrous; fibres solid, cylindrical, frequently anastomosing irregularly. Gemmules minute, spherical, dark and opaque.

Colour. In the dried state, grey ochreous yellow.
Hab. Geelvinks Bay, New Guinea (*Dr. A. B. Meyer*).
Examined in the dried state.

Type in the Dresden Museum.
Dr. Meyer observes, "in life brown."

The form of this sponge is that of a closely compressed cup with a considerable complication of parietes on one side; and it does not appear as if it had been more expanded when in the living condition. It is one foot in height and the same at its greatest expansion, and the pedicel is short and stout. When covered by the dermal membrane, the surface both within and without the cup is smooth and even. Near the base of the sponge there are a few oscular orifices slightly elevated on tumid masses; but these organs are inconspicuous on the more fully expanded parts of the sponge. When a portion of the dermal membrane, mounted in Canada balsam, was examined by transmitted light with a power of 200 linear, the porous areas seen were large and well defined; they contain usually one, but occasionally two or three pores, each of which is surrounded by a beautifully regular and very extensive series of apparently minute corrugated radiating lines; some of these pores are open, while others are completely closed. With a higher power this apparent corrugation is seen to consist of minute slender transparent fibres which freely anastomose with each other in the immediate neighbourhood of the pores; but subsequently they diverge freely to a very considerable distance from the pore without anastomosing with each other.

The skeleton is decidedly that of a *Halispongia*. The primary or radial fibres are amply supplied with the usual central lines of embedded grains of sand and other extraneous substances, and more especially so at the surfaces of the sponge. A few adventitious spicula of various sizes and forms are entangled amid the skeleton-fibres, to which also numerous dark opaque spherical gemmules are attached, varying in diameter from $\frac{1}{700}$ to $\frac{1}{175}$ inch in diameter.

The most striking specific characters in this species of sponge are undoubtedly those of the dermal membrane; and it must be observed that they are very difficult to find without the aid of mounting portions of the dermis in Canada balsam; and from the extreme delicacy of the radial lines surrounding the pores, powers of from 200 to 500 linear are required to render them distinctly to the eye of the observer.

5. HYALONEMA ANOMALUM, sp. nov.

Sponge expansively cup-shaped, sessile (?) Surface smooth. Oscula on the inner or exhalant surface, simple, large and numerous. Pores dispersed, inconspicuous. Dermal system expansible; connecting spicula expando-quaternate; radii and shaft attenuating, large and strong. Dermal membrane aspiculous (?). Skeleton: Cup compressed (?), fasciculated, fasciculi loosely compacted; spicula cylindrical, with clavate or thyrsiform terminations incipiently

spinous, very long and slender, and often flexuous, intermingled with single spicula of the same form and size irregularly dispersed. Interstitial spicula varying from cruciform to rectangulated sexradiate, radii cylindrical, incipiently spinous, numerous. Retentive spicula minute sexradiate stellate, radii bi- or trifurcate, attenuated, immersed in the sarcode, very numerous.

Colour, in the dried state, very pale grey.
Hab. Cebu (*Dr. A. B. Meyer*).
Examined in the dried state.

Type in the Dresden Museum.

If one adopts the rule that I have followed in all my previous descriptions of sponges, that the structure and mode of arrangement of the materials composing the skeletons of the Spongiadæ are the legitimate source of their generic characters, this sponge is decidedly a *Hyalonema*, but without the so-called glass rope. This organ in *Hyalonema* is not really a portion of the essential skeleton, but is rather an appendage thereto, and is apparently of the nature of a cloacal organ. Entertaining these views, I have, in accordance with them, referred the sponge in course of description to the genus *Hyalonema*; and from its discrepant structure I have given to it the specific name of *H. anomalum*. The interstitial spicula of both species also agree in being cruciform, with spinous cylindrical radii; and in each their forms are more or less variable in the number of the radii, and in both they are numerously dispersed amid the interstitial structures.

This sponge is $3\frac{1}{2}$ inches in height and 2 inches in width at its distal extremity. In its present state it is somewhat compressed. It has no part of its basal attachment remaining; and it was in this condition apparently when taken from the sea; and from the very small remains of sarcode amid the skeleton-structures it was most probably at that time a dead specimen. What remains of the sarcode of the interstitial membranes is nearly translucent, and occurs in detached masses, each of which is crowded with the minute sexradiate stellate retentive spicula.

The dermal system is furnished with numerous large expando-quaternate connecting spicula, the radial shaft being attenuated. Their mode of arrangement is similar in design to those of *Alcyoncellum speciosum* and *Rossella philippensis*; but their disposition does not appear to be so regular as in either of those species.

The dermal membrane has been nearly all destroyed. A few small portions, in a tolerably good state of preservation, were found on parts of the margin of the cup; and these were spiculous. I found also a small piece of the external dermal membrane *in situ* in a tolerably good state of preservation; and on this there were a few large simple porous orifices irregularly dispersed. This portion of the membrane appeared to be rather abundantly supplied with very minute attenuato-acuate defensive spicula; and intermixed with them a few sexradiate stellate retentive ones were dispersed. The membrane is very thin and delicate in its structure, and it was coated

with sarcode, which appeared to be in a partially decomposed condition.

The skeleton-structure, like that of the spongious base of *Hyalonema mirabile*, is composed of irregularly dispersed fasciculi of long spicula; but the fasciculi are less compact in their structure, and amid them there are numerous single spicula as irregularly dispersed as the fasciculi are. The form of the skeleton-spicula in the sponge in course of description is very long, slender, cylindrical, with incipiently spinous clavate terminations; and intermixed with them there are a few very large and stout acuate ones. The best view of the skeleton-structure is to be seen in portions of the sponge from the inner surface of the cup. At this surface the dermal membrane appears to be aspiculous; but immediately beneath it, in the portion examined, there were numerous groups of sexradiate stellate retentive and defensive spicula, densely packed in detached masses of sarcode. This congregation of spicula in separate masses is probably due to the partial decomposition of a uniform stratum of sarcode in the living sponge in which these minute organs abounded. The sexradiate stellate spicula are exceedingly slender, and average $\frac{1}{1000}$ inch in extreme expansion. They appear to vary considerably in the number of their furcating spicula—some radii being trifurcate, while others are bifurcate; and very few have the full number of the furcating radii.

The interstitial spaces of the skeleton are abundantly supplied with cruciform spicula with cylindrical incipiently spinous radii. The normal form of these spicula is evidently rectangulated sexradiate. The greater number of them are cruciform; but a considerable number have the fifth ray, or basal portion of the shaft; and a few of them are completely sexradiate. There is a very great difference in size between the two sets of spicula—those appropriated to the dermal system with attenuated radii, and the smaller and much more abundant ones of the interstitial spaces with cylindrical radii, the expansion of the radii of the dermal ones averaging $\frac{1}{23}$ inch, while those of the interstitial spaces seldom exceed $\frac{1}{128}$ inch in the expansion of the cruciform radii.

The minute attenuato-acuate spicula, which are numerously dispersed on the interstitial membranes, average about $\frac{1}{2000}$ inch in length; and it appears probable that they are really the radiating spicula broken off from the very numerous sexradiate stellate spicula that are crowded together in such great numbers in the interstitial masses of sarcode. The skeleton-spicula are many of them flexuous; their average length is $\frac{1}{23}$ inch, while the diameter of a fully developed one measured only $\frac{1}{6000}$ inch.

The loosely arranged fasciculi of the skeleton-structures of this sponge seem to closely ally it to the spongious base of *Hyalonema mirabile*; while the physiological structure of its expansile dermal system with its quaternate connecting spicula, and, to a considerable extent, its anatomical structure, are in perfect harmony with the corresponding parts of the genera *Alcyoncellum*, *Rossella* and *Geodia*; and the minute rectangulated sexradiate stellate forms of retentive

and defensive spicula are common to several species of *Geodia*, *Farrea*, and to *Alcyoncellum* as well as to this sponge.

If the term hexactinellid, as used by some writers, be adopted as designating the series of sponges which contain the various forms of rectangulate sexradiate spicula, it will embrace a number of genera and species widely differing in the important distinctive characters of their skeletons, upon which the most important characters of their classification must ultimately be founded.

June 8th, 1876.

2. Remarks on the exact Localities of some Birds from the Islands of the South Pacific. By E. L. Layard, F.Z.S.

[Received May 14, 1877.]

In speaking of "the geographical distribution of the Fruit-pigeons in the numerous islands of the Pacific" (P. Z. S. 1874, p. 94), Dr. Finsch has, I think, committed an error which it will be as well to point out. I have only just obtained my back numbers of the 'Proceedings,' or would have alluded to the matter at an earlier date. Late though it is, I know Dr. Finsch will thank me for assisting him with local knowledge to propagate the truth, an end at which I am sure we both aim.

Dr. Finsch says, "*Ptilinopus fasciatus*, Peale, is found on the Feejees, Navigators', and the small island of Uea of the Wallis group." I think, as regards the Navigators' Islands, he is certainly mistaken. The *Ptilinopus* found there is certainly distinct, whatever it is. I have not *original* descriptions to which to refer; but my idea is (taken from Finsch and Hartlaub's own work, and from the plate in the Mus. Godeffroy) that it is *P. apicalis*, Bp. In one of my late communications to this Society (see P. Z. S. 1876, p. 495) I have pointed out the differences, which are constant. The bird which I call *P. apicalis* is never found on Fiji, nor is the Fijian bird which I call *P. fasciatus* ever found in the Navigators'. Tonga has its own species, which I call *P. porphyraceus*; and it, again, is found, or a *very near approach* to it, on Fotuna Island. *P. fasciatus* is found on Viti Levu, Mang-o, and Wakaia Islands.

I must now point out another error into which my friend Dr. Finsch has fallen. He says, "the beautiful *Chrysœna victor*, Gould, is confined to Taviumi[1], one of the smallest islands of the Feejee group." So far from Taviumi being one of the "smallest," it is actually one of the *four largest* islands of the group; and *C. victor* is *not* "confined" to it, but distributed all over the large island of Vanua Levu, and the islands of Rambi, Lanthala, and Kamea. I may add, however, to Dr. Finsch's remarks, that my new *Chrysœna* (*C. viridis*) is, so far as yet known, confined to the island of Kandavu.

[1] I spell this as Dr. Finsch has done. Unlucky island! how naturalists have misnamed it! Both in the 'Proceedings' and in 'The Ibis' it has been spelt half a dozen different ways; but the correct way is Taviuni.—E. L. L.