cannot, however, at all agree that these groups are of generic rank, and prefer for the present to adopt the generally recognized views on the subject. On this point, when criticising my own arrangement of the Vesper-Mice[1], Dr. Winge writes[2]: "It is not right to recognize *Habrothrix*, *Oxymycterus*, and others as *subgenera*, and yet at the same time to admit *genera* of such a low grade as *Sigmodon* and *Neotoma*[3], which might almost be united to the Old-World *Cricetus*, or as *Rheithrodon* and *Ochetodon*, which do not even deserve subgeneric distinction."

In answer to this, I can only say that my error, if error it be, in allowing genera of such a low grade as these quoted, will not be mended by the recognition of more groups, of lower rank still,—groups which I and all other previous authors have only looked upon as subgenera at most. In fact on this point I feel, with Dr. Coues[4], that the proper way out of the difficulty will be rather by the lumping together of many of the present low-grade genera than by the recognition of more still less strongly marked generic groups.

EXPLANATION OF PLATE V.

Fig. 1. Skull of *Deomys ferrugineus*; natural size.
2–5. Ditto, upper, lower, side and front views; twice natural size.
6–7. Left upper molars of ditto; magnified about 7 times.
8. Right lower molars of ditto.
9–10. Left upper molars of one of the Cricetinæ (*Cricetus frumentarius*) and one of the Murinæ (*Mus mettada*); magnified about 5 and 7 times respectively.

5. On a new *Pennatula* from the Bahamas. By G. Herbert Fowler, B.A., Ph.D., Assistant to the Jodrell Professor of Zoology, University College, London.

[Received February 14, 1888.]

(Plate VI.)

A fine example of a new *Pennatula*, sent by Mr. Blake, the late Governor of the Bahama Islands, to Prof. E. Ray Lankester, has been handed to me for description: I propose for it the name of

Pennatula bellissima, sp. n. (Plate VI.)

Pennatula with 25–29 autozooids on a mature leaf, each with eight strong marginal spines, arranged in 2–3 rows, and continued on to the dorsal surface of the rachis as a single row of immature

[1] P. Z. S. 1884, p. 448. [2] *L. c.* p. 144.

[3] I do not think that Dr. Winge can have had a specimen of *Neotoma* before him when writing this remark, as of all the groups of American *Criceti* none is so distinct or so absolutely different from the rest as this is. The form in which his disparagement of *Sigmodon* and *Neotoma* is put, however, is a singular comment on the results of the present paper.

[4] Mon. N. Am. Rod. p. 32 (1877).

autozooids, which are devoid of tentacles. Siphonozooids richly set all over the ventral surface of the rachis except in the median ventral groove, one row running from this surface halfway up the concave borders of the leaves, while a second row passes dorsally and anteriorly between the leaves to meet with the row of immature autozooids on the latero-dorsal surface. Leaves triangular in outline, charged with long, fusiform, salmon-pink spicules.

The colony, as is so frequently the case with Pennatulida, is imperfect above, the top presumably having been bitten off and the wound scarred over. The dimensions given below are therefore in some points unreliable.

The *colour* of the greater part of the colony is of a beautiful salmon-pink, shading off to a whitish yellow on much of the stalk and rachis, and also in the centres of the leaves—parts where the spicules, to which the colour is due, are more thinly scattered.

The *stalk*, which expands slightly below, is on its upper third expanded into the bulbous enlargement so constantly met with in the genus, and is here of the same brilliant salmon-pink tint as the polyps and leaves. The *rachis* is marked both dorsally and ventrally by a deep groove which is entirely free both from siphonozooids and immature autozooids.

The *siphonozooids* (fig. 1) are placed mainly on the ventral surface of the rachis, where they are roughly arranged in oblique ventro-dorsal rows. They are especially massed at the bases of the leaves, from which points start two rows of siphonozooids, the one running about halfway up the concave (lower) border of the leaf itself; while

Fig. 1.

A young leaf showing the triangular shape, the dorsal row of immature autozooids, and the ventral row of siphonozooids appearing as small spikes. Natural size.

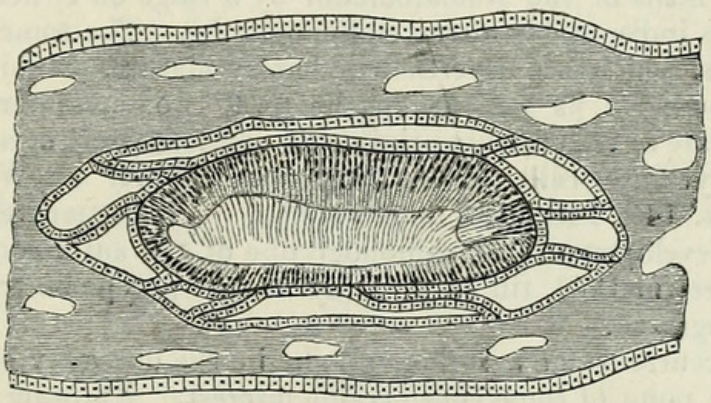
the other passes upwards on the rachis between the leaves, and, bending still further upwards, generally meets the line of immature autozooids at an acute angle on the latero-dorsal surface of the rachis, close to the line of attachment of the leaf next above. The siphonozooids are not separable into two types by size or other character, and are indistinguishable from the immature autozooids at the point

where the two meet. No lateral stripe of siphonozooids is to be found below the lowermost leaves. In transverse section the siphonozooids agree with that figured by Hickson (Phil. Trans. vol. 174, pl. li. fig. 10), and exhibit a strong siphonoglyphe (ciliated groove) at the abaxial end of the stomatodæum.

The *leaves* are placed very obliquely on the rachis, the line of attachment being dorso-ventral. They are approximately triangular in outline, the free sides of the triangle being slightly curved in the usual manner. While the lowermost leaves are placed slightly opposite to each other, those in the middle alternate, and the uppermost are again opposite. There are fourteen pairs of leaves in all, in the sole specimen; of these only the two lowest are rudimentary, that on the left side being less advanced in development than the corresponding one on the right. All the leaves are much contorted, a result probably due to death-struggles.

The *autozooids* (fig. 2) are borne on the uppermost (convex) edge,

Fig. 2.



Transverse section through an immature autozooid. The leaf is bounded above and below by ectoderm, underneath which lies the thick layer of mesoglœa (mesoderm), containing spaces filled by spicules previous to decalcification. The stomatodæum, suspended by the usual eight mesenteries in the cœlenteron, is lined internally by invaginated ectoderm, of which the lower (abaxial) three fifths are formed of long columnar cells, bearing stout cilia, and constituting a siphonoglyphe (*vide* p. 138), × 210.

and in a well-grown leaf are 25–29 in number, arranged in three rows, a median and two lateral. In a less mature leaf, such as that figured, they are fewer in number and form 1–2 rows only. They are 4–7 millim. in length, richly charged with the characteristic spicules, and surmounted by eight strong marginal spines, which may be 2 millim. long. Along the dorsal end of the convex border of the leaf they are continued as a row of *immature autozooids* of varying number, of which the foremost are placed on the rachis, and may even extend to the base of the leaf next above. As has been already stated, they generally meet at an acute angle with the row of siphonozooids which runs upwards from the ventral surface between the leaves.

The appearances seen in a transverse section of the immature autozooids are of some interest, and bear out the conclusions of Hickson (*loc. cit.*) and of Wilson ("Development of *Renilla*," Phil. Trans. vol. 174, p. 723). These immature polyps are not as yet provided with tentacles, but possess stomatodæa and the usual eight mesenteries. Of these latter, the two axial (dorsal) mesenteries, in the youngest autozooids, as in the mature siphonozooids, alone exhibit mesenterial filaments of the characteristic bilobate shape; the cells of which the lobes are constituted contain deeply staining nuclei, and histologically agree with the ectoderm of the stomatodæum from which they are derived. As was shown by Hickson, no siphonoglyphe is recognizable in the mature autozooids of *Pennatula*; but in the youngest autozooids, which are much compressed at right angles to the usual direction (*i. e.*, in an axial-abaxial plane), I find that the whole of the abaxial side of the stomatodæum is clothed by very long columnar cells, with numerous deeply staining nuclei, and bearing long stout cilia, these appearances being entirely characteristic of a siphonoglyphe; this region is marked off from the remaining three fifths of the stomatodæum by a ridge on either side, and constitutes indisputably a true siphonoglyphe. The somewhat older autozooids, which are nevertheless hardly mature, exhibit filaments on the lower six, as well as on the axial two, mesenteries; these filaments are of endodermic origin, and consist merely of an aggregation of pyriform cells, resembling those figured by Wilson (*l. c.* pl. lx. figs. 145, 146), but more swollen. Proportionately to their age and development, the siphonoglyphe of the autozooids becomes less and less marked, till in the fully mature polyps no trace of it is to be recognized.

This occurrence of a siphonoglyphe in the ontogeny of the autozooids is a point of some considerable interest. Knowing so little as we do of the stimulus that causes a developing ovum to recapitulate its ancestral history, we should hardly be justified in asserting that such recapitulation might not also occur in asexual reproduction. The colonial ancestor of the Octactiniæ (Alcyonaria) resembled the existing *Alcyonium* in the absence of dimorphism and the possession of a siphonoglyphe; morphological differentiation, correlated with division of labour, resulted, among such descendants as the *Pennatulida*, in the production of autozooids (nutritive and sexual polyps, devoid of a siphonoglyphe) and of siphonozooids (circulatory or respiratory polyps, incapable of generation and of nutrition, but provided with a strong siphonoglyphe in order to effect the circulation of "chylaqueous fluid" through the colony). If then, as appears to me to be the case, the very considerable size and number of the siphonozooids contrasted with the paucity of the immature autozooids, together with the loss of the siphonoglyphe as maturity is attained, point to the functional uselessness of this organ in the young buds, we are driven to the conclusion that we have here to deal with a case in which asexual ontogeny is repeating phylogeny.

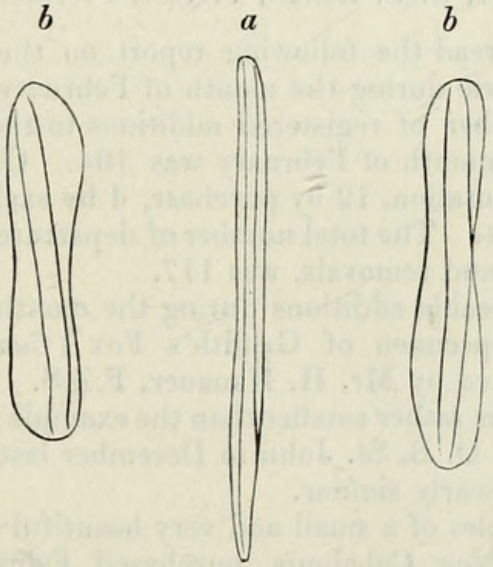
As was described by Wilson (Mitth. Zool. Sta. Neapel, v.) in the buds of *Renilla*, the two axial mesenterial filaments appear before

the remaining six, and supply the young polyp with nutritive fluid from below; this possible function of the siphonoglyphe is therefore forestalled. Further observations on similar conditions—gemmation, fission, reproduction of lost parts, &c.—are much to be desired.

The *spicules* in the polyps, leaves, and rachis, are long and fusiform, and apparently triradiate in section (fig. 3 *a*); they are very long, measuring from ·8 to 1·5 millim. Those which colour the bulbous swelling on the stalk (fig. 3 *b*) are dumbbell-shaped, and apparently surmounted by a strong ridge; they measure about ·14×·01 millim., and are less strongly tinted than those of the feather. The *axis*, which is less hard than is generally the case, is triangular in section and bent in a hook below.

Of *Pennatulæ* previously described, the present species comes

Fig. 3.



a. Fusiform spicule, distributed over the feather and rachis, × 47; *b*. Dumbbell-shaped spicules from the bulbous swelling of the stalk, × 210.

nearest to *P. naresii* (Kölliker, 'Chall.' Rep. Zool. vol. i. p. 2, pl. i. figs. 1, 2). From this, however, it differs in the number of the rudimentary leaves, the absence of wart-like protuberances on the concave border of the leaf, the freedom of the mid-dorsal line of the rachis, as also in several other points; while the row of immature zooids is characteristic of both forms.

At two points easily recognizable on the left-hand side of Plate VI., parts of two leaves have apparently been nibbled away, producing a marked hypertrophy of the remaining polyps.

The dimensions are given in tabular form:—

	millim.
Total length (incomplete)	178
Length of rachis	118
Diameter of rachis	9
Breadth of feather	70
Length of stalk	60
Diameter of stalk	4

	millim.
Diameter of bulbous swelling	7
Length of leaf	45
Width of leaf at base	12

The specimen will be deposited in the British Museum, for purposes of reference.

EXPLANATION OF PLATE VI.

The figure, which is about one sixth larger than the specimen, is from the dorsal aspect, except for an intercalated fragment near the base of the feather, which represents a ventral view. For the drawing I am indebted to the skill of Miss Stone.

March 6, 1888.

Professor Flower, C.B., LL.D., F.R.S., President, in the Chair.

The Secretary read the following report on the additions to the Society's Menagerie during the month of February 1888 :—

The total number of registered additions to the Society's Menagerie during the month of February was 104. Of these 9 were by birth, 74 by presentation, 12 by purchase, 4 by exchange, and 5 were received on deposit. The total number of departures during the same period, by death and removals, was 117.

The most noticeable additions during the month were :—

1. A second specimen of Griffith's Fox (*Canis griffithi*), from Bussorah, deposited by Mr. H. Hanauer, F.Z.S.

This specimen is rather smaller than the example from Afghanistan, received from Sir O. B. St. John in December last (see *suprà*, p. 1), but is otherwise nearly similar.

2. Four examples of a small and very beautiful Finch (*Erythrura psittacea*) from New Caledonia, purchased February 15th. This species is new to the collection, although we have previously had examples of an allied form, the Fire-tailed Finch (*Erythrura prasina*) from Java.

3. Five examples (two cocks and three hens) of the fine Pheasant which I have described and figured in the Society's 'Proceedings' (1885, p. 322, pl. xxii.) as *Phasianus principalis*, presented by Major W. Peacocke, R.E., of the Afghan Frontier Commission, and received February 27. Major Peacocke's specimens were captured at Akcha in Afghan-Turkestan, on the 25th January last, and were brought home at the special request of Sir Peter Lumsden, F.Z.S., who had called Major Peacocke's attention to the desirability of introducing living examples of this splendid Pheasant into Europe.

The Secretary exhibited, on behalf of Lt.-Col. H. M. Drummond-Hay, a specimen of the Desert Wheatear (*Saxicola deserti*), killed near Arbroath, in Scotland, on the 28th of December, 1887, being the third instance of the occurrence of this bird in Great Britain.

The following papers were read :—