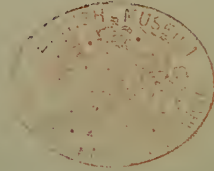


**REPORT**

OF THE

**TWENTIETH MEETING**

OF THE



**BRITISH ASSOCIATION**

FOR THE

**ADVANCEMENT OF SCIENCE;**

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**JOHN MURRAY, ALBEMARLE STREET.**

1851.

The author added descriptions and figures of new species, viz. *Pagurus Dillwynii* and *Pandalus Jeffreysii*.

*A List of Sertularian Zoophytes and Polyzoa from Port Natal, Algoa Bay, and Table Bay, in South Africa; with Remarks on their Geographical Distribution, and Observations on the Genera Plumularia and Catenicella.*  
By GEORGE BUSK, F.R.S.

The 17 species of *Sertulariadae* belonged to the following genera, viz. *Sertularia*, 9 species; *Plumularia*, 5 species; *Thuiaria*, 1 species; *Antennularia*, 2 species. The species of *Sertularia* were, as far as they could be ascertained,—1. *Sertularia argentea*; 2. *S. rosacea*; 3. *S. polyzonias*; 4. *S. abietina*; 5. *S. operculata*; 6. *S. nigra*; 7. *S. arbuscula*?; 8. *S. unilateralis*?; 9. *S. Gaudichaudi*. With respect to the first six of these, no remarks appear to be called for, as they correspond in all respects with the species of the same name in the British Fauna. The *Sertularia operculata* of South Africa is undoubtedly the same species as the British, although from a rather general deviation from the more usual toothing of the margin of the cell, which obtains in specimens from the southern hemisphere, this variety has been denominated *Sert.* or rather *Dynamena bispinosa* by Mr. Gray. This species appears to be of a cosmopolitan character, occurring in Europe, South Africa, Australia, New Zealand, and in at least one of the South Sea Islands; specimens from the latter locality, differing merely in colour, which is in them deep brown. The seventh species, here named *S. arbuscula*, is most probably that species, which is one of those described by Krauss, but stated by him to come from New Holland. This statement may, however, probably turn out to be incorrect, as the species in question does not occur among those sent home from H.M.S. Rattlesnake from Australia. The eighth species, which does not appear to have been previously described, is characterized by the position of the double series of cells toward one side of the rachis, in consequence of which the polypidom affords something of the aspect of a *Plumularia*. It may prove to be the *Sertularia unilateralis* of Quoy and Gaimard, although in their figure of that species the cells are much wider apart than in the specimen from Algoa Bay. The species of *Plumularia* are:—1. *Plumularia formosa* (Busk); 2. *Plumularia*, sp. ?; 3. *P. falcata*; 4. *P. pennatula*?; 5. *P. cristata*. There is a sixth very small species, but so closely resembling *P. cristata*, that it is not deemed advisable at the present time to separate them. The species named *P. formosa* is of a beautiful feather-like habit, growing in simply pinnate fronds of a deep brown colour, from two to nearly six inches high. As it does not appear to have been hitherto distinctly described or named, it is designated as above, with the following characters:—

*P. erecta*, pinnata, subincurvata; cellulis crenatis, dentatis, rostro antico elongato basi utrinque spicato; processu rachidis antico inferiori canaliculato: processibus lateralibus rachidis, canaliculatis, brevibus. Capsulis ovarialibus, elongatis, costatis. Hab. Africa austr.

The second species also appears to be unnamed, but as, from its size and remarkable habit, it can scarcely have escaped notice, it is thought better not to name it on the present occasion. It has a remarkable shrub-like aspect, having a very thick and strong stem, irregularly branched, the ultimate ramules pinnate, pinnules small in proportion to the size of the rachis. The cells are cup-like, with several shallow indentations, and a sharp ascending point anteriorly. The anterior rachidian process, and also the two lateral ones, are long and of uniform diameter.

With respect to the species of *Plumularia*, it was remarked that four out of the five belonged to that group of this artificially constructed genus, of which *Plumularia cristata* may be taken as the type, and of which the most striking characteristic hitherto noticed is the pod-like, costate, ovarian capsule. It was pointed out, however, that this group is not distinguished from the rest of the species in this genus, with which it has been artificially associated, by this character alone, but by several others also, sufficient perhaps hereafter to justify the erecting of the group into a distinct genus. Omitting the peculiar and elegant feather-like port of most of these species, there may be noticed more particularly the existence on each side of the rachis of the pinnae, and on a level with the upper part of the cells, of a short curved or straight process, usually tubular, but sometimes only channelled, which is continuous

side  
6034  
Theccaripus  
formosus  
(Busk)

side  
i. 5996  
scarpinus  
9. 10045.

through a rounded opening with the interior of the rachis. Many of the species, but not all, have also a similar tube or process, arising from the rachis immediately below the cell. It is this process which has sometimes been denominated a "bract." Where this anterior process is wanting, there is usually a tube projecting from the cup itself, but in this case the tubular process seems to be of a different nature, supporting at its extremity a small cup-like cell. *P. cristata*, in one of its varieties, affords an instance of this arrangement. Should a division of the genus *Plumularia*, as at present constituted, be eventually made, those species of which *P. setacea* may be taken as the type, would form a second genus, closely allied to *Laomedea*; and *Plumularia falcata* might safely be referred to *Sertularia*. A link between the latter genus and the so-called *Plumularia* in question, might be indicated in the eighth species of *Sertularia* above noticed under the name of *Sert. unilateralis*. The species of *Thuiaria* differs from *Thuiaria articulata* in the exact opposition of the pinnæ, and in the frequency with which the extremities of the pinnæ are furnished with long tendril-like tubes, by which the polypidom clings to surrounding bodies, or one frond to another. As this is in all probability the species referred to by Ellis "as having been sent to him from the East Indies," and as it is undoubtedly distinct from our *T. articulata*, the name of *T. Ellisii* is proposed for it, with the character,—"T. pinnata, pinnis oppositis. Capsulis ovarialibus ovatis, ore rotundo, incrassato." 20 21-7

Of the two species of *Antennularia*, one corresponds with our *Ant. ramosa*. The other species resembles the *Cymodocea simplex* of Lamouroux. It is however clearly an *Antennularia*, and the name of *Antennularia Cymodocea* is proposed for it, with the character,—"Ant. caulibus simplicibus: ramulis biseriatis, utraq̄ue serie, alternantibus." Hab. Af. aust., Australia, &c. 21 77. (oliva)

With respect to the geographical distribution of these Sertularians, it may be remarked that of the nine species of *Sertularia*, six are British forms also; of the other three, one may be common to Australia, and no other locality is known for the remaining two. Of the five *Plumulariæ*, three are also members of the British Fauna; and of the two *Antennulariæ*, one is also British. Thus of the whole number 17, ten are European forms,—a circumstance calculated to excite much surprise. None of the South African *Sertulariæ*, except *Sertularia operculata*, and perhaps *S. arbuscula*, occur among those which have come under the author's notice from Australia or New Zealand.

Of *Polyzoa*, there were noticed 15 or 16 species, viz. 1. *Cellularia*, 2 sp.; 2. *Flustra*, 2 sp.; 3. *Acamarchis*, 1 sp.; 4. *Catenicella*, 3 or 4 sp.; 5. *Serialaria* (*Amathia*), 3 sp.; 6. *Salicornaria*, 1 sp.; 7. *Elzerina*?, 1 sp.; 8. *Crisia*, 2 sp.

The species of *Flustra* are, first, *Flustra* —?, distinguished by all the marginal cells having an avicularium imbedded in them. There appear to be two varieties of this species. The second species is the beautiful *Flustra bombycina*; it is usually parasitic upon sponges or other zoophytes, especially on *Sertularia polyzonias*. The species of *Acamarchis*, is that described by Krauss under the name of *A. tridentata*. It belongs to a group of *Acamarchis*, in which the species are distinguished by their containing a blue colouring matter, as is another set by the possession of a red colour, such as occurs in *Cellularia plumosa* of our seas.

The species of *Serialaria* (or *Amathia*) are—1. *Amathia biseriata* (Krauss); 2. *A. cornuta*; 3. *A. lendigera*; or at all events a species very much resembling that British form.

The *Salicornaria* is identical with our *S. farciminoïdes*, as is one of the *Crisiæ* with the British *C. denticulata*. The other *Crisia* is a peculiarly beautiful, pearly species, unlike any British form. The genus here doubtfully designated under the name *Elzerina* (Blainville), resembles *Salicornaria* in many respects, but is horny instead of calcareous. Two or three other species, referable to the same genus, occur in Australia, but the South African one does not appear to have been found there. Of the three or four species included under the name *Catenicella*, one will probably hereafter constitute the type of a distinct genus, but as it possesses many characters in common with the others, the separation is deferred. One of the species here called *Catenicella*, is most probably the *Menipea cirrata* of Lamouroux, or the *Cellaria cirrata* of Ellis and Solander, of which a figure is given in their work, which is copied by Lamouroux. Great confusion appears to exist in this genus up to the present time; but it would occupy too much space in this abstract to enter upon the con-

sideration of the historical part of the subject. The genus is a very important one, especially as regards the relation of the South African Fauna with that of Australia and New Zealand, and may be thus defined:—

Polypidom growing from the base with a more or less distinct stem, consisting of a congeries of horny tubes. The branches dichotomous, composed of calcareous cells arranged in linear series, and arising, one from the upper and back part of another, a *flexible* joint intervening between them. At the dichotomous divisions of the branches, which take place after a variable number of cells, the duplication of the series is effected by one of the cells giving off laterally a second sessile cell, from the upper and back part of which, as in the parent cell, the subsequent cell and series arise. It is in respect of the mode of division of the branches, that the species above referred to differs from the others, and would appear to constitute a distinct generic form.

The openings of the cells are all on one face of the branch, and vary in different species in shape, &c., as does the sculpture on the cells, their form and size, &c. The cells are always furnished with lateral appendages or alæ, which in most species support longer or shorter spines, which apparently are readily detached; but in some cases the lateral appendages assume the form of cup-like cavities or are Avicularia. This genus appears to be in great measure confined to the southern hemisphere, and there is probably no species of it in the European Fauna. A species is described and figured in the great French work on Egypt (*Catenicella Savignyi*), but this may probably have been obtained from the Red Sea. It approaches very nearly to one of the South African species. There is also in the Mediterranean a Polyzoon, named by Audouin *Eucratea Lafontii*, and also figured in the work just cited, which however differs from *Eucratea* in having flexible joints and in other respects, and which would seem to be allied with that among the South African forms, which differs in its mode of division from the other true *Catenicella*.

The principal seat of this genus would appear to be in the Australian seas, for in the rich collection of zoophytes sent home from H.M.S. Rattlesnake, not less than sixteen distinct species of this genus occur, all differing however from the South African. And from New Zealand another species has been named by Mr. Gray *Catenicella bicuspis*, which is probably distinct from any of the Australian forms, though closely resembling one of them.

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*Examples of Exuviation, or the Change of the Integuments of Animals in the Crustacean Tribes.* By Sir JOHN GRAHAM DALYELL, Bart.

All animals are invested by a skin, an external covering or integument of various quality. In general the skin simply expands with the growth of the subject which it invests, but where the integument is not susceptible of such enlargement, nature has provided effectual substitutes in its place. This is most favourably illustrated by the history of the crustacean tribes.

While occupied with the *Cancer Mænas*, the Shore or Harbour Crab, a dingy brown specimen, A, of medium size, with one limb white, was put outside the window on a summer evening, in a capacious glass vessel of sea-water. In the morning, a form exactly resembling its own, only somewhat larger, lay in the vessel. This was a new shell, exuviation having taken place in the night. The resemblance was complete; every organ, even the white limb, was seen in both. The natural colour of this species is green, or it is often variegated green and white, and is sometimes reddish.

Another specimen, B, was caught of smaller size, the opposite extremities of the limbs being only 13 lines asunder, its colour green, with three white patches on the back. In the course of little more than a year five exuviations took place at irregular intervals, the new shell and animal being successively larger on each. The third shell came in uniformly green, the white being entirely obliterated. The limbs expanded two inches and a half on the fourth exuviation.

As this subject was a male, a female of about the same size was introduced into its vessel soon after the fifth exuviation, but only after they were gorged with food, to avert hostilities. Both gave unequivocal symptoms of satisfaction. Their union followed, the breast-plate or (more properly) the apron of each being folded back. This female underwent several exuviations. Its shell was originally of a beau-