breadth, rather narrower behind than before, the posterior angles obtuse; dorsal channel indistinct, the posterior fovea on each side in the form of a long narrow groove, which extends to the hinder margin; no punctures on the thorax: elytra elongate, striated, the striæ impunctate, those nearest the suture the most deep, the others rather faint: antennæ scarcely reaching beyond the hinder margin of the thorax, and of a red colour, as well as the palpi; legs pitchy red; mandibles pitchy. In one specimen, the thorax is pitchy black, and the elytra pitchy; in the other two specimens, the thorax, as well as the head, is black; in all the specimens the outer margins of the elytra are pitchy, and the reflected portion is pitchy red.

This species is considerably larger than either of the preceding, being equal in size to the *Calathus piceus*.

Sp. 21. *Feronia* (*Argutor*) *Chilensis*, Dejean, Spé. gén. des Coléop., tom. iii. p. 251.

Of this species there are three specimens, two of which are from Valparaiso, and the third is from S. Chiloe.

[To be continued.]

XVII.—*Observations on a Keratose Sponge from Australia.*

By J. S. Bowerbank, Esq., F.G.S.

To the Editors of the Annals and Magazine of Natural History.

Gentlemen,

I am not aware that modern naturalists have published the results of any examination of the structure of the Keratose or Horny Sponges while in that state of perfect preservation, such as they would be if alive, or immediately after their removal from their native element. The skeletons of these curious animals are familiarly known to every naturalist, but in this state they have undergone decomposition of the softer parts of their substance; and the descriptions handed down to us by former writers, based upon the examination of such specimens, have unavoidably led to the propagation of erroneous ideas of their true nature and structure. In a paper read before the Microscopical Society, January the 27th, 1841, I have shown that even in this state they possess a much higher and more complex form of organization than they had hitherto been supposed to exhibit, and that, contrary to received opinions, they are furnished with siliceous spicula, which are imbedded in considerable abundance in some of the larger fibres of their solid horny skeletons.

Since the publication of these facts, I have had the opportunity afforded me by the kindness of Mr. J. E. Gray, of examining a specimen of this class of Sponges which was

brought home from the Swan River, Australia, by that indefatigable naturalist Mr. Gould, preserved in spirit immediately after it was taken from the sea. It is a young specimen of a well-known Australian species, of which I have several specimens, and is represented of its natural size at fig. 1. Pl. III. It is elevated on a short foot-stalk, which, like the body of the sponge, is of a compressed form. In the specimen figured, the greatest breadth of the body of the sponge is but little more than equal to its height; but in the other specimens in my possession it has attained a much greater height, and in one case rather exceeds thirteen inches, including the foot-stalk, which is about two inches long. The height of the body in this adult specimen is to the breadth as three to one.

When removed from the spirit, the sponge has a dense, opake and fleshy appearance, and feels weighty and solid to the touch. Upon taking some very thin slices from about the centre of one of the broadest surfaces of the sponge, and examining them with a power of 120 linear as transparent objects, they presented a highly interesting view of the structure. The horny fibre of the sponge, agreeing exactly in appearance with that of the specimens in my own possession, was seen ramifying in every direction in the form of an amber-coloured network, the interstices of which were filled up with a fleshy substance very similar to that which occurs in such abundance in the freshwater Spongilla and in many other similarly constructed marine sponges, which are inhabitants of the seas of the western and northern coasts of England; and throughout the whole of this fleshy structure siliceous spicula were dispersed in great abundance, as represented in fig. 2. Plate III.

In Spongilla and in the marine sponges of Dr. Fleming's genus *Halichondria,* the spicula are united systematically into bundles so as to form a framework or skeleton, upon which the softer parts of the animal are supported; but in this Australian species they do not appear to assume any definite arrangement, but are dispersed in all directions through the substance of this cellular or fleshy part of the animal. The spicula are transparent and hollow, like those of *Halichondria,* but vary extremely both in size and form. Some of them terminate by a regular bifurcation, fig. 3. Plate III., and thus assume the character of the triradiate calcareous spicula of Dr. Fleming's genus *Grantia*; while in others the bifurcated terminations recurve and assume the form of an anchor with short flukes, without palms, as represented in fig. 4. Plate III.; others assume very much the appearance of the prevailing form of spiculum that is to be seen in many species of *Hali-*

chondria, the curved, double-pointed, needle-formed spiculum, fig. 5. Plate III. The variation in their diameters is exceedingly great, one of the smallest measuring but the seven thousand one hundred and sixtieth of an inch, while the fragment of a large one imbedded near it (fig. 6. Plate III.) was the seven hundredth of an inch in diameter. There are numerous grains of sand and other extraneous matters imbedded in the fleshy substance along with the spicula.

Upon examining with a power of five hundred linear the outer surface of the small portions of the sponge which I had removed from the specimen, I observed patches of a very fine reticulated structure, which is beautifully and faithfully represented by the artist Mr. Aldous, at fig. 7. Pl. III. It is composed of a very minute fibre, imbedded in a transparent membrane. The interstices are somewhat irregular hexagons in the piece represented in the figure; but in another part of the same small piece of sponge, which did not exceed the eighth of an inch in length, some of them were nearly square, while others were elongated to such an extent as to assume the form of nearly regular oblong areas. The fibre of this cuticular network has every appearance of being solid; it is extremely minute, not exceeding the ten thousandth part of an inch in diameter. The average diameter of the interstices of the reticulations figured is the two thousandth of an inch, while the fibre of the mass of the sponge varies from the three hundredth to the three thousandth of an inch in diameter; and the smallest spiculum I could find was, as before stated, the seven thousand one hundred and sixtieth of an inch at its greatest diameter. From the whole of these circumstances, there is little doubt that this delicate reticulated membrane is the true cuticle of the sponge. Upon examining a small slice from near the base of the body of the sponge, I had the satisfaction of observing the group of gemmules, or eggs of the sponge, represented by fig. 8. Pl. III.; but I could not, from the cutting in my possession, satisfactorily determine whether they were attached to the fleshy substance of the sponge, or to the fibrous skeleton; although in several of them, which had apparently been disturbed by the removal of the thin slice from the sponge, the point of attachment of the gemmule was very apparent when viewed with a power of five hundred linear. The diameters of the gemmules varied considerably; the largest I could find measured the three hundred and fifty-fifth part of an inch, and the smallest the one thousand one hundred and forty-third of an inch in diameter.

Upon examining another species of keratose sponge in a similar state of preservation, which is in the collection at the

British Museum, I found precisely the same mode of structure to prevail. The horny fibres were completely enclosed in a fleshy or cellular structure, in which numerous slender siliceous spicula were imbedded.

From the nature of the structures exhibited in both of these keratose* sponges, and the prevalence of siliceous spicula in such abundance in the fleshy or cellular structure which surrounds the horny fibres, there is very strong reason to suspect that the fibre of the sponges of commerce will prove, in its natural state, to be surrounded by a similar fleshy matter, and that spicula will be found in a like manner to those I have described as existing in the two species mentioned in this paper.

DESCRIPTION OF THE PLATE.

Fig. 1. The sponge of its natural size.

Fig. 2. The interior of the sponge, as seen with a power of 120 linear; *a*, the horny fibre, surrounded by the fleshy substance; *b*, *b*, spicula imbedded in the fleshy substance.

Figs. 3, 4, 5 and 6. Various forms of spicula found imbedded in the fleshy substance of the sponge.

Fig. 7. A view of the cuticle of the sponge, as seen with a power of 120 linear.

Fig. 8. A view of the interior of the sponge, with the gemmules imbedded in the fleshy substance, seen with a power of 120 linear.

XVIII.—*Notices of European Herbaria, particularly those most interesting to the North American Botanist*†.

The vegetable productions of North America, in common with those of most other parts of the world, have generally been first described by European botanists, either from the collections of travellers or from specimens communicated by residents of the country, who, induced by an enlightened curiosity, the love of flowers, or in some instances, by no inconsiderable scientific acquirements, have thus sought to contribute, according to their opportunities, to the promotion of botanical knowledge. From the great increase in the number of known plants, it very frequently happens that the brief descriptions, and even the figures, of older authors are found quite insufficient for the satisfactory determination of the particular species they had in view; and hence it becomes necessary to refer to the herbaria where the original specimens are preserved. In this respect, the collections of the early authors possess an importance far exceeding

[* The term *keratose* seems objectionable, though sanctioned by authority; since *ose* is not a proper termination for adjectives from the Greek; and analogy would require the κ in κερας to be expressed by a *c*, as in centaur, not kentaur, &c. Would not *ceratine*, or *corneous*, be better?—Ed.]

† Communicated to Silliman's American Journal by the Author, probably Dr. Gray.