

Shell smaller and less ventricose than the last; the spire proportionably longer; umbilicus closed; the marginal rim very close below the notch; the edge of the inner lip is quite smooth. Colour rufous brown, obscurely banded with whitish. Aperture rosy.

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VI.—*On the Australian Haliotidæ or Ear-shells, with Remarks on other Species.* By WILLIAM SWAINSON, Esq., F.R.S. and L.S., &c. [Read 10th May, 1854.]

HAVING accidentally met with Mr. REEVE'S monograph of the genus *Haliotis*, and observing several points which require either correction or elucidation, I have thrown together the following notes, which, as they chiefly refer to such species as I have met with in this hemisphere, will probably be considered worthy a place in the Transactions of the Society.

The geographic distribution of animals should ever form one of the first objects of study with the philosophic naturalist. On this subject I find the following introductory passage:—"It is a curious circumstance in the geographic distribution of the *Haliotides*, that few, if any, are to be found where *Chitons* abound, as if they exchanged places, to a certain extent, in the two hemispheres. There are a few species from California, but along the western coast of South America, where *Chitons* are most abundant, not any are found, and only one small species, the *H. pulcherrima*, at any of the islands of the Pacific. They inhabit the

coasts of China, Japan, &c., but the greater number of species, and the most remarkable, are from New Zealand and the continent of New Holland, displaying all the peculiarity of design which invariably characterize the Fauna of those isolated regions."

To the greater part of these opinions my own knowledge and experience is quite opposed. So far as regards the Australian and New Zealand coasts, (where, according to our author, "the greater number," and "the most remarkable," of the Ear-shells are found), the number of Chitons is numerous and most remarkable.

In a very limited portion of Cook's Straits I have found more than a dozen species of Chitons, some of them so remarkable as to constitute types of new divisions; and I have sometimes gathered them from the very same fragment of rock on which were young Ear-shells intermixed. Again, if New Holland is as rich in Haliotidæ as the writer supposes, it is equally rich in Chitons, not indeed described in books or systematic works, (which have doubtless been our author's authority), but in nature and fact. On looking over my friend Mr. G. B. Sowerby's, jun., figures of these shells, and the index he has given of their localities, I believe there are not more than six or seven described as inhabiting the whole of Australia, and yet I possess figures and descriptions of more than thirty species discovered in Port Jackson alone, besides thirteen others I procured or detected further north of that locality, near the estuary of the Hunter River. This relative proportion between the Haliotidæ and Chitons in number, but not in species, I have likewise found to prevail on all the coasts of New Zealand.

In regard to our Australian and New Zealand Ear-shells possessing, as it is stated, "all the peculiarity of design which invariably characterizes the Fauna of those isolated

regions," I confess my perfect ignorance of the meaning of the author. I cannot myself detect a single point or peculiarity of design by which our Australian species can be distinguished from any of the others, but very many in which they perfectly agree. For instance, the large volutions of the *H. midæ*, found at the Cape of Good Hope, are precisely the same as those of the common *Haliotis rubra* of the Australian seas, while the small numerous depressed spiracles of the American *Haliotis Californiensis* find a perfect counterpart in those of our *Haliotis glabra* of Tasmania, here erroneously called *H. albicans*. The only peculiarity, in short, that can be found among all the Australian species, noticed as such by Mr. REEVE, lies in the following: viz. *H. tricostatus*, Lam. *Hal. pulcherrima*, Auct., and our *Haliotis costata*, here erroneously called *Hal. Emma*. These three species, together with some others, are indeed so peculiar, that, if not deserving the name of De Montford's genus, *Padollus*, they ought at least to have formed a separate division of the group, or, at the very least, not to have been confusedly mixed up, as they are here, with the other species. Thus far in regard to the author's ideas of the geographical distribution of these shells, which, in respect to those we have met with in the Australian seas, are the very reverse of correct. I have invariably found that the Chitons and Ear-shells accompany each other on the same coasts, and generally on the same rocks,—but as the former inhabit for the most part such rocks or stones as are always left dry at low water, or at least at neap tides, they are easily detected and collected; whereas the Ear-shells usually, when old, retire to situations where they are never exposed to the atmospheric air, and consequently are seldom seen, except by those who know their peculiar habitat. It is to this cause, and this alone,

that we attribute the apparent deficiency of these shells where Chitons have been found in abundance.

Confining our remarks now to the Australian Ear-shells, we may commence with

*Haliotis rubra* \*

of Dr. Leach, whose name should supersede all others, since he was the first who described it as a new species. Why it is here called *Nævota* does not appear, for there is no author quoted for this name; and if it is one of the author's, it is quite superfluous.

This is the most common species of the Australian and Tasmanian coasts, and we have found it in both colonies.

It is very doubtful whether the variegated specimens are mere varieties. In a series now before us of twenty-three adult shells, and in many other stages of growth, there are only two that possess these markings, and they have other indications of being a distinct species. New Zealand is given as one of its habitats, but this we believe to be altogether a mistake, never having seen or heard of the species in those islands.

The next in point of size is a species described by me nearly twenty-five years ago in the catalogue of the Bligh collection, and reprinted in the second edition of Exotic Conchology, as

*Haliotis glabra*,

here very inaccurately figured at Pl. 10, fig. 30, under the new name of *H. albicans*, of M.M. Quoy and Gaimard,

\* Not *ruber*, as quoted by Mr. Reeve, who cites Dr. Leach for this name, but without stating where the Doctor's description is to be found. I have not the book to refer to, but the conchologist will find this shell figured and described in Dr. Leach's Zoological Miscellany, 3rd vol., 8vo., published about 1820.

very many years afterwards. It is stated to be found in New Zealand only, whereas it is strictly an Australian species, common at Port Phillip, and, as Dr. Milligan informs me, in the islands of Bass's Straits: he has also found it on the north coast of Tasmania. Among numerous examples in Dr. Milligan's cabinet there is not one specimen at all coloured like this figure, which, from this and the above circumstance regarding its locality, seems to throw a doubt even on the identity of the species: the description, moreover, is so short, and therefore imperfect, that it is quite impossible to arrive at any conclusion on this point; certain it is, however, that not a single instance has yet come to my knowledge of any species of *Haliotis* being found both in Australia and New Zealand. In a natural arrangement this should be placed close to *H. Californiensis*, and any other which have the open apertures of the spiracles so numerous, and small and depressed. Whether the species called *glabra* by the author, and figured on Pl. 1, fig. 2, should come in with the small-holed species is uncertain; never having seen the species (which I once possessed in England, and is here very well figured), either in Australia or New Zealand, I very much question the correctness of its presumed habitat.

We must here notice another species, stated to be also an inhabitant of Australia, and called, without reference to any authority, *Haliotis rugoso-plicata*,—Plate 3, fig. 7,—a compound name, which, if the rules of nomenclature laid down by the princes of science are to be adhered to, cannot be admitted. True, it is a species apparently answering to this that has been described by Lamarck under the name of *Australis*, but as there appeared some discrepancy I could not reconcile that description with a species in the Bligh collection, and I accordingly considered it expedient to

describe this latter under the name of *H. costata*. This is now nearly twenty-three years ago ; but the author takes no notice of this description, although he quotes another from the very same page : neither is the most remarkable distinction of this species alluded to, which in my original description is thus expressed—“The interior side is very elegant, being marked by fine lines crossing the sulcation of the ribs.”\* The locality is stated to be New Holland ; but I believe this is incorrect, never having found it myself there, or seen it in any of the Australian collections. In New Zealand, however, it is met with in a few localities, but nowhere common.

I can see no difference between the species figured at Pl. 10, fig. 29, under the singular name of *H. Emmæ*, and that described by me in the Bligh catalogue as

*Haliotis carinata*,

and figured by Martini, tab. 14, f. 140, although to neither this description or figure does Mr. Reeve make any allusion. Dr. Milligan has fine specimens from the Tasmanian coasts ; but we do not think that it also inhabits New Holland, as here stated. Of that beautiful species

*Haliotis elegans*,

which is here admirably figured by Mr. Sowerby, I have seen but two specimens, in the collection of my friend G. W. Walker, of Hobart Town, who thinks he procured it on some island in Bass's Straits.

The last species we shall notice in detail is the most splendid perhaps of the whole genus, namely, the

*Haliotis iris*,

which, by some most unaccountable mistake, is stated to inhabit Kangaroo Island, Australia. It is well known, however,

\* Exotic Conchology, 2d. ed., p. 35.

in these colonies to be altogether peculiar to the islands of New Zealand.

The following species, described as peculiar to Australia or New Zealand, I have never seen either living or dead :—

Haliotis.....	<i>squarrosa</i> .....	Australia .....	Pl. 7 fig. 20
"	... <i>Roei</i> .....	New Holland .....	" 4 " 10
"	... <i>excavata</i> .....	Kangaroo Island...	" 8 " 25
"	... <i>ovina</i> .....	* New Holland and Philippine Islands	" 9 " 28
"	... <i>squamata</i> .....	N. W. Australia...	" 12 " 35
"	... <i>diversicolor</i> .....	New Holland .....	" 12 " 39
"	... <i>funebri</i> .....	Ditto.	" 12 " 38
"	... <i>cruenta</i> .....	New Zealand .....	" 15 " 56
"	... <i>Zealandica</i> .....	Ditto.	" 16 " 64
"	... <i>Dringii</i> .....	N. W. Australia ...	" 17 " 65
"	... <i>Lauta</i> .....	Swan River, N.Hd.	" 17 " 68
"	... <i>Papulata</i> .....	N. Australia.....	" 17 " 69
"	... <i>Stomaticæformis</i> ...	New Zealand .....	" 17 " 74

Presuming that the localities of these twelve species are in some degree correct, or at least that they inhabit the Pacific Ocean, we may, with the preceding species, (noticed in detail) take the number to be in all 21, being nearly one-third of all those here described. It consequently follows that the proportionate number of Chitons and of Ear-shells in this part of the world is nearly equal, and that their geographic distribution is in perfect and harmonious union.

It is much to be regretted that in this monograph of a very difficult and intricate group the author has not been at greater pains to clear up entangled synonyms, to make the reader acquainted with what other writers had published on the same subject, and to state with precision and accuracy those few references to other works which he occasionally quotes. There is, for instance, no notice whatever of the admirable figures and descriptions of this genus published by Da Costa and Humphrey in the early

\* I cannot believe that the same species is found in these two widely different localities.

numbers of their general Conchology. Lamarck again, when quoted, has in many instances neither the volume or page specified, and sometimes the name only of an author is given, without any intimation of his work, as De Montford, Leach, Menke, &c.; some, again, of the species described by me in the Bligh collection are regularly cited; but several others, as *H. glabra*, *carinata*, *costata*, and *crenata*, are passed over in silence, as if they never had been published, although most of them, if I mistake not, are to be found in Monograph as new species. We hope the author will himself correct these errors, without leaving to others the necessary but ungracious task of doing it themselves. A monograph, to deserve the name, should not only exhibit with accuracy and impartiality everything that has been done to elucidate the subject-matter, but also, by the fulness and accuracy of its quotations, enable the reader, if he wishes, to test the accuracy of the author himself. Every excuse may be allowed to authors writing where costly publications cannot be consulted, but there is none for him who, being seated in the capital of the British empire, does not avail himself of the ample sources of information within his reach.