

grown from their short, thick, Dendritine type; and also of that peculiar variety of *Vertebralina striata* in which the later chambers curve round and embrace the earlier spiral portion (*Renuclites opercularis*); nor is the mode of growth essentially different in *Orbiculina*, which shows this tendency in *O. adunca* and its varieties, and becomes perfectly cyclical in some individuals,—a feature which is the typical character in *Orbitolites*.

[To be continued.]

XI.—*Note on the Comparative Size of Marine Mollusca in various Latitudes of the European Seas.* By R. M'ANDREW, F.R.S.

IN the 'Natural History of the European Seas,' by the late Prof. Edward Forbes, edited and continued by Mr. Godwin-Austen, I meet with the following passage, treating of the shells of Piedmont:—"It is remarkable," says Mr. Jeffreys, 'that examples of the same species are smaller than those found in the British seas: *Tellina balaustina*, *Jeffreysia diaphana*, and *Rissoa pulcherrima* are instances of this.' The diminution in size which is to be observed with respect to many other species, such as *Corbula nucleus*, when traced from north to south, is the more remarkable because the converse does not take place as to southern forms in their range north. *Haliotis tuberculata*, which extends through the whole Lusitanian zone, is larger at Guernsey, which is the extreme northern limit, than elsewhere. *Ringicula auriculata* and *Maetra rugosa* are larger in Vigo Bay than in the Mediterranean, though at Vigo they are both outliers; and *Tellina balaustina*, which has its numerical maximum in the Mediterranean, is largest about the Hebrides."

I do not question the correctness of Mr. Jeffreys's remark applied to the shells collected by him on the coast of Piedmont; but to infer from it, and from the other instances cited by Mr. Austen, that Mollusca generally, or any large proportion of them, whether belonging to northern or southern latitudes, increase in size as they advance northward, and none in a southerly direction, is a grave error, which I feel called upon to dissipate, as far as this end can be accomplished, by a statement of the results of my own experience bearing upon the point; because, in order to advance our knowledge, I look upon it as more essential to get rid of existing fallacies than even to establish new facts.

Corbula nucleus diminishes in size when traced northward as well as southward from the British seas, and is as large at Lisbon, or even at Malaga, as upon the shores of North Drontheim.

The size attained by *Haliotis tuberculata* in Guernsey is certainly remarkable; but that it is not owing entirely, if at all, to northern position, may be inferred from the fact that it does not vary in dimensions progressively with the latitude. When inhabiting the coasts of the Bay of Biscay, it is no larger than in the neighbourhood of Gibraltar.

With respect to the *Ringicula* of Vigo, it is questionable whether it is the same species as *R. auriculata* of the Mediterranean, as, in addition to its extra size and solidity, it differs in being destitute of striæ, with which the other is furnished; and Mr. Woodward has suggested the possibility of its identity with a fossil species. If it should prove to be *R. auriculata*, the same observation will apply to it as to the *Haliotis*, that the increase in size is not progressive.

Touching *Maetra rugosa*, we require more information with regard to its distribution. In Vigo Bay, dead shells, certainly of large dimensions, are not unfrequent; but, after diligent search, I could never succeed in obtaining a recent specimen there. The other localities from which I have procured the species are Faro in Algarve and Cadiz; one or two stray valves in the Mediterranean, and the same at Mogador. In Faro, where the specimens found on the shore are much more recent than in Vigo, they are nearly, if not quite, as large; while at Cadiz, only thirty miles further south, they are smallest.

The Arctic species belonging to the genera *Trichotropis*, *Trophon*, *Margarita*, and *Admete*, with some others, when they extend into the Boreal and Celtic regions, are diminutive. *Pecten Icelandicus* attains its largest dimensions on the coast of Finmark, and is of very diminished size and solidity from Spitzbergen. *Margarita alabastrum* (Boreal) does not appear to vary in size from the North Cape to the seas of Zetland. *Arca rari-dentata* is generally distributed on the northern coasts of Norway, where it is very much larger than in the Hebrides; and a few specimens which I have obtained as far south as Gibraltar are still more minute. This species inhabits only deep water, which accounts for the extent of its range southward.

Trochus cinerarius and *T. tumidus* have their greatest development in number and size on the northern coasts of Norway, and are found progressively and uniformly smaller as we proceed southward. *Trochus lineatus*, which I have never encountered north of the British Isles, attains its largest dimensions in the neighbourhood of Vigo.

Astarte arctica is as large at Tromsøe, near the southern limit of its range, as in higher latitudes. *A. elliptica* diminishes when traced from Finmark to its southern termination in the British seas. *A. sulcata* attains its maximum on our own coasts, dimi-

nishing in size and frequency as we follow it along the coasts of Nordland and Finmark, as well as to Gibraltar, its most southern locality. The little *A. triangularis* I did not find in northern Scandinavia: it is extremely abundant in some parts of the Hebrides; but, though rare, is of larger size in Gibraltar Bay than I have met with it elsewhere. I take this opportunity of mentioning that I have recorded this species from the Canary Islands; but Mr. Searles Wood, to whom I showed them, believes the Canary specimens (smaller even than the British) to be a different species, and identical with a Crag fossil. *A. incrassata*, a more southern species, is rather larger in the Canaries than in the Mediterranean.

The genus *Crenella* is analogous to that of *Astarte*. *C. discors* and *C. decussata* attain larger growth and are more abundant in the Arctic and Boreal regions than in the Celtic. *C. marmorata*, which ranges from Finmark to the Canaries, is largest and most frequent on the Scottish coast; while the more southern form, *C. rhombea*, is rather larger in the Canaries and Mediterranean than at the northern limit of its range in the British Channel. So with the genera *Nucula* and *Cardium*; *N. lævis*, *C. suecicum*, and *C. fasciatum* become smaller as we follow them southward from their principal habitat in northern Scandinavia. *N. nucleus* is as large at Gibraltar as in Finmark, being eminently a Celtic species; while of *N. decussata* my largest specimens are from Malaga; and *C. rusticum* becomes larger as we proceed south from the British Channel, attains its maximum at Gibraltar, and is smallest in the Canaries. *C. papillosum* is also largest in the Mediterranean, though distributed both northward and southward in the Atlantic. *C. pygmæum* is smaller in the Mediterranean than in Britain, but I have obtained it largest in Vigo Bay.

Venus verrucosa, like *Cardium rusticum*, has its northern limit in Britain, increases in size southward to Gibraltar and the Mediterranean, and is again much smaller in the Canaries. *Mactra stultorum* grows to larger size in Minorea than in Britain. Of *Fusus antiquus*, ranging to within the Arctic Circle, the largest specimens have been obtained in Liverpool Bay. *Littorina rudis* attains as large growth upon the coast of the north of Spain as upon that of Finmark. *Scalaria Turtonis* is larger in Britain than in the Mediterranean or at Madeira. *S. communis*, on the contrary, is larger at Gibraltar than in England.

Bulla hydatis is very diminutive in the Mediterranean compared with British specimens; but those from Vigo (situated south of the shores of Piedmont) are fully equal in size to the British or Irish.

Murex erinaceus grows larger upon the coasts of Spain, both north and south, than in Britain. *Cerithium reticulatum* and

C. perversum are likewise larger in the Mediterranean than in our seas. *Triton nodosum* attains greater size at Malaga than at Vigo or further north, but is smallest in the Azores. *Aclis supranitida* grows larger at Madeira than in Britain.

The southern forms of Mollusca appear to follow the same rule as the more northern. *Murex brandaris*, *Cypraea lurida*, and *C. spurca*, not recorded to have been found north of the Mediterranean, attain larger dimensions in the Canary Islands than in that sea.

There are a few species the larger growth of which appears to be influenced by western longitude or Atlantic exposure. It has been remarked that *Tellina balaustina* is found larger in the Hebrides and on the west of Ireland than in the Mediterranean, where it is much more frequent. I have obtained it at Gibraltar of intermediate size; and a valve dredged off Cape Finisterre in Spain was of the same size as the Scottish and Irish specimens. *Lucina spinifera* is found larger in the Hebrides and west of Ireland than elsewhere; upon the coast of North Drontheim it is quite as small as upon that of Spain. *Solen siliqua*, *Lutraria elliptica*, and some other species, are found of extraordinary dimensions in the outer Hebrides; several others attain larger growth in Bantry Bay than on any part of the English coast.

From the examples I have stated (and there would be no difficulty in adducing more of a similar character) I think we may fairly come to the conclusion, that, although there are exceptions in both directions, and although the size attained by Mollusca may be influenced by various conditions in different localities, as a general rule, each species attains its greatest size, as well as greatest number, in the latitude best suited to its general development; and that, whether a species be Arctic, Boreal, Celtic, or Lusitanian, it will grow largest in the region to which it belongs.

XII.—On some new *Longicornia* from the *Moluccas*.

By FRANCIS P. PASCOE, F.L.S. &c.

IN Mr. Wallace's last collection from Batchian, in the Moluccas, there are about one hundred and fifty *Longicorns*, mostly new to science, but referable (with two or three exceptions) to genera which appear to be more or less frequent in the Indian Islands. The new forms, one of which resembles the South American genus *Onychocerus* in habit, and of which a second species is found in New Guinea (Aru), are confined to Mr. Wallace's private collection, and therefore, unfortunately, cannot now be described; but amongst the others there are a few species which are interesting either as indicating a more extended range of the