

and *Clypidella*, also *Puncturella* and *Emarginula*; *Dentaliadae* by two or more species; *Tecturidae* by several species of *Acmaea*, also by *Scurra*, *Gadinia* by one and *Nacella* by six or more species; *Chitonidae* by numerous species and great numbers of individuals.

It may be that some of the groups included by the Messrs. Adams in the order referred to, as our knowledge increases, will require to be separated or removed; but so far as the purposes of comparison as made herein are concerned, the result will not be materially impaired.

The total number of marine molluscan species and well-marked varieties within the Californian and Oregonian province, so far as known and determined, is not far from 630, of which about 200 are Bivalves; and of the remaining 430, 123 are included within the Scutibranchs; of this latter number about 40 belong to the Chitonidae, and the same number to the Trochidae.

Of the 247 marine gasteropods enumerated by the late Dr. Stimpson, in the Smithsonian-Institution Check-list, as found from the arctic seas to Georgia, 32 only, or less than one eighth, come within the order mentioned; of this comparatively small number, seven are *Chitons* and fourteen belong to the *Trochidae*, while *Haliotis*\* is without a representative: the *Trochidae* within this province are not characterized by such marked or unique characters as distinguish their relatives on the west coast.

Some revision may be required hereafter in the number of Scutibranchiate species credited to the west-coast province, as forms now catalogued as distinct may, in some instances, be united; but, on the other hand, it is not unlikely that new forms undoubtedly distinct will be detected when the coast is more thoroughly explored.—*Proceedings of the California Academy of Sciences*, October 7, 1872.

#### *The Megalops Stage of Ocypoda.* By S. I. SMITH.

The *Monolepis inermis*, long ago described by Say†, and partially figured by Dana‡, is undoubtedly a stage in the development of *Ocypoda arenaria*. The large size and peculiar structure of this megalops render it one of the most interesting forms of the group of larvæ to which it belongs. It is closely allied to the *Monolepis orientalis*, Dana, from the Sooloo Sea, figured in detail on plate 31 of the Crustacea of the Wilkes's Exploring Expedition. The carapax is very convex above and narrowed toward the front. The front is deflexed and the extremity tricuspidate, the median tooth being long and narrowly triangular, while the lateral teeth are small and obtuse. The sides are high and impressed, so as to receive the three anterior pairs of ambulatory legs. The third pair of ambulatory legs are closely appressed along the upper edge of the carapax, and extend forward over the eyes, the dactyli being curved down over the eyes and along each side of the front. The posterior legs are small and weak, and

\* A solitary specimen of *Haliotis*, of small size, was obtained through dredging in the Gulf-stream, four or five years ago, by Count L. F. Pourtales, of the U. S. Coast Survey, but south of Georgia.

† Journ. Acad. Nat. Sci. Philad. 1817, vol. i. p. 157.

‡ Crustacea of Wilkes's Expl. Exped. pl. 31. fig. 6.



each is folded up and lies in a groove on the latero-posterior surface of the carapax. The external maxillipeds have almost exactly the same structure as in the adult *Ocypoda*; and, as in the adult *Ocypoda*, there is a tuft of peculiar hairs between the bases of the second and third ambulatory legs. This megalops is common upon the coast of the Southern States; it has been found at Block Island; and I have myself collected it, late in August, at Fire-Island Beach, Long Island. In the largest specimen from the last locality the carapax is 9.4 millims. long and 5.6 broad.

A large number of young specimens of the *Ocypoda*, collected at Fire-Island Beach, indicate plainly that they had only recently changed from this megalops. Some of the smallest of these specimens, in which the carapax is 5.6–6.0 millims. long and 6.1–6.5 broad, differ from the adult so much that they might very easily be mistaken for a different species. The carapax is very slightly broader than long, and very convex above. The front is broad, not narrowed between the bases of the ocular peduncles, and triangular at the extremity. The margin of the orbit is not transverse, but inclines obliquely backward. The ambulatory legs are nearly naked; and those of the posterior pair are proportionally much smaller than in the adult.

The adult *Ocypoda* is terrestrial in its habits, living in deep holes above high-water mark on sandy beaches; but the young in the zoëa state are undoubtedly deposited in the water, where they lead a free-swimming existence like true pelagic animals, until they become full-grown in the megalops state. Say mentions that his specimens were found cast upon the beach by the reflux tide and “appeared desirous to protect themselves by burrowing in the sand, in order to wait the return of the tide;” but they were more likely awaiting the final change to the terrestrial state. The tufts of peculiar hairs between the bases of the second and third ambulatory legs, and in the adult connected with the respiration, are present in the full-grown megalops, and are undoubtedly provided to fit the animal for its terrestrial existence as soon as it is thrown upon the shore. The young in the megalops stage occur on the shore of Long Island in August, and perhaps earlier. At Fire-Island Beach, in 1870, no specimens of *Ocypoda* were discovered till the last of August; and those first found were the smallest ones obtained; by the middle of September, however, they were common on the outer beach, and many of them were twice as large as those first obtained. Although careful search was made along the beach for several miles, not a specimen of the adult or half-grown crab could be found. Every individual there had evidently landed and developed during the season. Probably all those living the year before had perished during the winter; and it is possible that this species never survives long enough to attain its full growth so far north.—*Amer. Journ. of Science and Arts*, July 1873.

#### *The Torpedo or Electrical Ray.*

A specimen of this remarkable and somewhat rare fish was brought up in the trawl yesterday off Portland. It was about 40 inches in length.

Weymouth, July 10, 1873.

R. DAMON.



Smith, S I. 1873. "The megalops stage of Ocypoda." *The Annals and magazine of natural history, zoology, botany, and geology* 12, 186–187.

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