

HERMAPHRODITE FISHES.

[Translation from Der Naturforscher.*]

It is well known that the combination of two sexes in the same individual is not rare among the lower animals, although far less common than was supposed before the careful and accurate use of the microscope, as, for instance, in the case of many Mollusca and Echinoderms, which were formerly thought to be hermaphrodite, and are now known to be so.

Aristotle announced that the fishes of the genus *Serranus*, a family of percoids, were always hermaphrodite, and this fact has been established by more recent investigations of Carolini in 1787 and Dufosse in 1856. In a paper published by Dr. J. Brock, in Gegenbaur's *Morphologisches Jahrbuch* it is shown that in each of the several species of *Serranus* occurring in the Mediterranean there are certain modifications in the differentiation of the sexual organs into testicles and ovaries, as also the occurrence of a special oviduct in the one and the want of it in the other two species. More recently, in 1876, Syrski has shown that the Gilthead (*Chrysophrys aurata*) is also hermaphrodite. And here, according to Brock, the respective organization of the two organs is again distinct. In general, both in the *Chrysophrys* and the *Serranus*, the testicle lies in the walls of the ovary, but while in the latter the testicle appears only as an appendage of the ovary projecting inward, in the *Chrysophrys* it is much more highly developed, so that, on the other hand, the ovary is to be considered as an attachment to be introduced in the duct of the testicle. Thus in the one genus it is the ovary and in the other the testicle which is most highly developed.

In addition to this Brock states that in a very young specimen of *Serranus* no trace of testicle could be found at all. Continued and repeated investigations on a large number of specimens are desirable.

Dr. E. v. Martens, in referring to these facts, is of opinion that the predominance of the male or of the female organs, hitherto considered as a generic characteristic, may, after all, be only an individual feature, and vary in the same genus and species according to the age or condition of the fish under examination, and that the first stage in the separation of the sexes occurs in a manner similar to what has been observed in many Mollusca.

A periodic separation of the function, at least in the *Serranus*, has been established by Brock, two specimens investigated by him in September having numerous ripe spermatozoids in the testicle, and *vas deferens*; but one had no eggs at all in the ovary, and the other only very young, unripe ones. The fertilization of one individual by another, on account

* Of March 22, p. 116.

of the unequal functions of the two organs, appeared to be the rule, as is the case with many hermaphrodite flowers from the same causes.

Some fishes are only occasionally hermaphroditic, that is to say, among distinctly bisexual fishes hermaphrodites are occasionally observed. Among these belong the mackerel and the carp.

CONTRIBUTIONS TO THE HISTORY OF THE COMMANDER ISLANDS.

NO. 3.—REPORT ON THE MOLLUSCA OF THE COMMANDER ISLANDS, BERING SEA, COLLECTED BY LEONHARD STEJNEGER IN 1882 AND 1883: BY W. H. DALL.

I am informed by Dr. Stejneger that the coast of the Commander Islands, especially Bering Island, is largely rocky, composed chiefly of sandstone, which extends in rocky flats from the shore at the base level of erosion by the waves for quite a distance seaward; from small capes or projections a reef invariably extends seaward, often of volcanic rock. The shore is thus composed of a succession of small bays or bights, none of which afford a harbor, and only one or two an anchorage even for small craft. The beaches at the head of these bays are rocky, or composed of shingle with an occasional strip of sand, the latter especially where streams fall into the sea. There are several lakes at the northern part of Bering Island; the soil is covered with that moss-like coating of sphagnum, reindeer lichen, and *Empetrum* which is characteristic of those regions, with an admixture of the usual boreal herbage, dwarf willows, *Vaccinium*, sedges, and grasses.

These features, taken in connection with the geological character of the rocks, are not favorable to a profuse development of molluscan life of any description.

Upon the wave-worn rocks the stony alga, *Melobesia*, forms crusts, which, by the superposition of successive thin layers, forms masses sometimes 5 or 6 inches thick. In this the boring bivalves find a harbor and congenial quarters. The ponds and lakes afford two *Limnæas* and a small *Pisidium*.

The little black northern slug, *Limax hyperboreus*, is found under protecting chips or pieces of drift-wood near the shore. A few minute helices are its companions. A more exhaustive search would perhaps enlarge the list of Pulmonates, but the usually common and conspicuous genus *Succinea* is singularly absent and hardly likely to have been overlooked. It is quite possible that some of the land shells have been introduced from Kamchatka; the presence of *Patula floccula* is perhaps explainable on this hypothesis, which would account for its absence from the Aleutian Islands.

It is not probable that the Commander Islands have been connected with the mainland of Asia or with any of the Aleutians within recent geological time. The depth of water and the distance which separate