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Several well-known teachers and lecturers have expressed their warm approval of the scheme.

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On a Starfish from the great Depths of the Atlantic, furnished with a Dorsal Peduncle. By M. E. PERRIER.

Among the Stellerida collected during the expedition of the 'Travailleur' in 1880 there are two individuals of a species of Starfish* which present the perfectly exceptional character of being furnished with a dorsal peduncle, exactly comparable, as to its position, to that which supports and fixes to the ground the young Comatulæ and the adult Crinoids of all the other families. While the Crinoids, which are evidently the most ancient of the Echinodermata, are all attached, at least during their youth, the Echinodermata which form the other classes of that subkingdom are free during their whole lives; and it would be particularly interesting to find in that class, which we have every reason to consider the most ancient after that of the Crinoids, traces of a mode of existence which was general among the latter animals, namely fixation to the ground. Some characters of the Starfishes which we have now to speak of seem to indicate that the dorsal appendage with which they are furnished is really the homologue of the peduncle of the Crinoids.

Our two Starfishes, which we propose to name *Caulaster pedunculatus*, are of different ages. The larger one has a radius of only 5 millim. to the extremity of the arms, and of 3 millim. to the summit of the interbrachial arch. In both the summit of this arch is occupied by a sort of fissure furnished with papillæ, separating the marginal plates which belong to one arm from those belonging to the other. The fissures are prolonged upon the disk, on the dorsal surface, each by a double series of spines. These rows of spines converge towards the base of the dorsal appendage. The marginal plates, which are not very visible, only form a single row, as in *Ctenodiscus*; there are five of them to each arm; the madreporic plate, which is tubercular, is enclosed in one of the interbrachial fissures. The arms are short, strongly recurved over the disk, and each terminated by three long spines; the ambulacral tubes, destitute of suckers, are arranged in two series; there are not more than eleven pairs. The dentary plates have the form of simple scales, uniting at their free extremity to be produced into a sort of unpaired conical tooth. The dorsal integument is soft; we cannot distinguish plates of any kind upon its surface. The dorsal appendage, 2 millim. long, and consequently nearly as long as the

* These two starfishes were obtained off the north coast of Spain, one at 1960, the other at 2650 metres.

smaller radius of the animal, is cylindrical and flexible, and its surface is granular. In the larger individual there was nothing to enable us to judge of its true nature; but in the younger of the two individuals of *Caulaster* that we have been able to examine, other characters of more importance from the morphological point of view are superadded to those above indicated. Thus at the base of the dorsal appendage there are four large calcareous plates arranged in a cross, and each bearing a small spine; these plates are arranged nearly in the direction of the arms; a fifth plate alternating with two of them and opposite to the madreporic plate, evidently forms part of the same cycle; and five other smaller plates are placed in the angles left free by the five plates of the first series. We cannot help being struck with the absolute resemblance of these ten alternating plates to those which form the periproct of the Sea-Urchins, which Lovén has compared to those forming the calice of the Crinoids—an opinion that we shall have to discuss shortly. The identity of arrangement of the dorsal plates of *Caulaster* with those of the calice of the Crinoids is evident; the presence in the centre of the double cycle which they form of an appendage resembling the peduncle which occupies the same place in the Crinoids marks this resemblance still more strongly; the homologies of the latter parts are at once established; and we thus find that, by means of *Caulaster*, a close bond of union is established between the Crinoidea and the Stellerida. The character here indicated will appear the more significant because in *Leptychaster*, discovered during the 'Challenger' expedition, the young starfishes, which are developed in a special pouch of their mother, are attached to the walls of this pouch by the centre of their dorsal surface. On the other hand, the rosette of plates which surrounds the dorsal appendage is an embryonic character, since it disappears with age; and this is precisely what ought to take place if we regard the Stellerida as a form of Echinodermata derived from and higher than that of the Crinoids.

The young *Asterice* and *Brisingæ*, as established by Lovén and myself, also present dorsal plates, arranged, at first, like those of the calice of the Crinoidea; we have demonstrated that, in *Brisinga*, the plates of the first series become the odontophores; these plates cease to be visible externally in *Caulaster*. The question is whether they really disappear in this animal, which would lead us to adopt a new type of development among the Stellerida. *Caulaster* is evidently allied to the *Ctenodisci*; in the latter there exists a slight tubercle, which seems to us to be homologous with the dorsal appendage in *Caulaster*; and perhaps we might also compare with it a projecting knob which in *Astropecten* occupies the place where the anus occurs in other starfishes.—*Comptes Rendus*, December 26, 1882, p. 1379.