feront in the different families. The rays of the Asterias, as already mentioned, are broadly furrowed underneath, the furrows planted with soft tentacula, which are flexible in every direction, being moved by circular and longitudi­nal muscular fibres, which enter copiously into their struc­ture. In form, these tentacula may be compared to a retort or florence-flask with a long neck : the swollen vesicular bulb is placed within the cavity of the rays on each side of their mesial vertebrated column, while the neck issues from be­tween the interstices of its side-pieces, and protrudes out­wardly. They are hollow, being filled to a certain degree with water, introduced by a set of ramified internal vessels, which constitute an aquiferous system, similar to that which we found in the Holothurae.@@1 When the star-fish wishes to elongate any particular tentaculum, it contracts the vesicu­lar bulb, and the water in it is consequently forced up the neck, distending and stretching it, and putting it in a fit condition to be applied against the ground or any object within reach. To this the extremity is affixed by the ac­tion of the muscular fibres, some contracting the centre of the point into a dimple, and others firmly appressing the edge, so as to give it the form as well as the virtues of a sucker. Now, by shortening the tubes which have been so fixed, the body is drawn towards their insertion ; and by a curious succession of these actions, the creature goes whither it has willed.@@2 It is impossible to follow the exact succession of the retraction and elongation of the suckers, nor indeed do they seem to be called into action after any regulated plan. Some are employed as stilts merely, on which the body is raised up buoyant in the circumfluent medium, while others are pulled in and stretched out to act as legs or feet; and others again seem to be used, more especially for the time, as seekers and feelers, that no prey may pass unawares, while the main object in view is ap­parently only a change of place. But the Ophiuræ pro­gress by a very different apparatus. “ The diverging rays are firm and hard, have few spines, and no channel with suckers; they are used by the animal as legs, and as they are regularly placed, it can move in any direction that suits it. To go towards any particular spot, it uses the two rays that are nearest to it, and another that is most distant from it ; the two first curve at their extremity, so as to form two hooks, which, being applied to the sand, drag the body for­wards, while the posterior is curved vertically, and performs the part of a repelling lever.”@@3 This action of the rays is assisted by some subsidiary organs, which have been hither­to unnoticed. On examining the rays of a living Ophiura, we have noticed that every one of their articulations is fur­nished with a pair of strong sharp moveable claws, similar to those of many insects and crustaceans ; and from their position under the lateral spines on the ventral aspect, not more conveniently placed for taking hold of a plain surface than their form has an obvious adaptation to that act. They are unquestionably organs belonging to locomotion, which seems to us to be further aided by some filamentous tenta­cula that issue from pores in the ventral disc, whose func­tion, though mainly respiratory, may be in a secondary de­gree locomotive, by serving as stayers to support the body, and elevate it above the unevenness and friction of the surface traversed.

The nature and number of the senses bestowed upon the Stellendes is a subject of doubtful inquiry ; for the or­gans of these senses are either so far removed from ours that analogy offers no clue to their function, or the resem­blance is so forced and superficial that it may possibly lead us to very erroneous conclusions. There is no reason to doubt that the species are richly endowed with the sense of touch ; but it is doubtful whether any part or organ pos­sesses that modification of the senses on whose discrimina­tion the luxury of taste depends. It is equally doubtful to us, whether any have visual organs, for that blindness is the lot of most of them is granted. Ehrenberg, however, when examining living specimens of the Asterias violacea, discovered a point of a bright red colour, precisely defined, and situated beneath and towards the apices of each of the five rays. This point he believes to be ocular; and to give scope and direction to the organ, the star-fish curls back the tip of the ray when in the act of progression. Ehrenberg succeeded in tracing some nervous filaments to the apex of the rays, where he also found a small ganglion placed near the eye. In front of this ganglion, towards the mouth, there are some jointed nervous fibres ; but similar articulations are not visible in the nerves situat­ed near the mouth itself, whence this illustrious naturalist concludes, that the noblest part of the nervous system is found towards the apices of the rays.@@4 But what office are we to assign to those anomalous organs, which, in the Echinides, Monro has compared to insect antennæ ? They exist in the Stellendes, principally on the sides of the rays hid among the spines. “ Each consists of a soft stem, bearing at its summit, or (when branched) at the point of each branch, a sort of forceps of calcareous matter, not un­like a crab’s claw, except that the two blades arc equal and similar. When the point of a fine needle is introduced be­tween the blades, which are for the most part open in a fresh and vigorous specimen, they instantly close, and grasp it with considerable force. The particular use of these prehensile organs is not apparent; their stem, it may be remarked, is quite impervious.”@@5

The Stellendes are oviparous, the ovary forming a grape-like cluster, placed near the origin and at the sides of the cæca, for there are two ovaries to each ray. The eggs lie numerously imbedded in a colourless jelly, covered with a thin pellicle, and are at first equally colourless ; but during their progress to complete development, they pass through a great variety of colours, and when fully formed, assume invariably the distinguishing shade observed in the adult animal.@@6 They escape from the body by certain apertures, observable at the side of the mouth in the angle of separa­tion of the rays; and the greater number of the species are said to deposit their spawn in spring. When excluded from the egg, they are, according to Soars, very unlike the parent, for they are then binary, and do not become radi­ated until after some weeks.@@7

The Stellerides are richly endowed with the wonderful property of reproducing parts which they may have lost from accident. In summer, it is asserted by Bosc, the parts pullulate and attain their original size in the course of a few days, while in winter some months are required for such production ; but this is one of those loose assertions in which the works of Bosc abound. The time really re­quired is much longer, though not exactly ascertained, and seasons probably influence it in no great degree. One ray lopt off, or two or three, all grow again ; nay, a single arm.

@@@1 For a description of this apparatus, and of the interior anatomy in general, see the excellent article “ Echinodermata.” in the *Cyclop. of Anat. and Physiology.*

@@@a Reaumur in *lib*. *s. cit.* p. 92. Linck argues logically against this pedestrious property of the tentacula, which he wishes us to believe are solely organs of touch and taste, little tonguelets. *De Stell. Mar.* pp. 13, 14. But logic may prove other things than facts.

@@@3 Kirby’s *Bridgew. Treatise,* i. p. 202. The passage is translated from Reaumur. See Linck. *sup. cit.* p. 95.

*@@@4 Ann. des Sc. Nat.,* n. s. iv. p. 306. Mr E. Forbes also considers these scarlet dots to be ocular (see bis paper on the “ Asteriadæ of the Irish Sea,” in the eighth volume of the *Wernerian Memoirs')* ; but Dujardin retains bis doubts.

@@@5 Sharpey in *Cyclop, of Anat. and Phys.* ii. p. 32.

@@@6 Knox on the *Nat. Hist. of the Salmon,* p. 52∙

*@@@7 Ann. des Sc. Nat.* n. s. vii. p. 248 ; and Lam. *Anim. sans Vert.* 2de edit, iii. p. 257.