ZOOPHYTES.

When the word *Zoophyte* began to be used by natural­ists, it designated a miscellaneous class of beings, which were believed to occupy the space between the animal and vegetable kingdoms, and in which the characteristics of the subjects of each met and were intermingled. They were of a “ middle nature,” not because of their outward resemblance to plants, but because they were deficient in the more obvious qualities of animals, and were apparently more influenced by exterior forces than by any volitions springing up within. Almost insensible and immotive, their weak and obscure life was merely regarded as one of ve­getation, engendered in them by putrefaction or fermenta­tion, and unsusceptible of the volitions and passions which move and agitate higher entities. Thus the term indicated a mingled life or constitution, and had no reference to figure ; but some time after it had been allowed on all hands that the productions in question were “ better than mere vege- tives,” another class of objects, hitherto supposed to be al­together vegetable, was ascertained to be of animal origin ; and as their similitude to mosses and lichens, to sea-weeds and mushrooms, was undeniable, and indeed so remarkable as to have long veiled their nature from us, so the term Zoophyte was transferred to this newly-discovered order, and has since been applied by the majority of English authors to it alone. With continental naturalists, how­ever, the word has still its widest application, embracing, in their nomenclature, not merely those polypiferous beings which cover the bottom of the ocean with a singularly exact mimickry of vegetation, but also the star-fishes and sea- urchins, the sea-figs and sea-nettles or jelly-fish, and even the intestinal worms. It is in this wide acceptation that the word is employed by Cuvier and Blainville ; and we use it here with the same latitude, agreeably to the plan indi­cated in our article Animal Kingdom.

The Zoophytes, then, as defined by Cuvier, form a sub-kingdom co-equal with the two divisions in the animal king­dom named *Radiata* and *Acrita* by Macleay. The classes included in it have less of a common resemblance than the classes of any other sub-kingdom, so that in the great variety of structures which they present to our study, we seek in vain for any one character that shall connect them together. The most general character is that which has conferred upon them the synonyme of “ Radiated Animals,” given because the organs of locomotion, and even the internal viscera, are arranged very often in a circular disposition round a centre, so as to give a sort of radiant appearance to the whole body, or to some part of it. The nervous system is at the best only rudimentary, and is demonstrable only in a few genera of three of the classes. Thus its existence has been shewn in several species of intestinal worms, where it consists of one or two ganglions placed near the mouth, and from which diverge a few filaments, and one or two longer chords that follow down the length of the body. In the more normal Zoophytes, the nervous system forms a circle round the oral aperture, whence slender filaments radiate towards the cir­cumference, rarely dividing into a few branchlets, and losing themselves in the parenchyma long before they reach the periphery. But in the larger number of this sub-kingdom no trace of such a system is discoverable, unless, with Mac­leay, we find it in the “ minute granulations” which bespeck their homogeneous, mobile, and irritable pulp, and “ which may be considered as the nervous molecules dispersed over, or, as it were, confounded with, the substance of these ani­mals, so as to impregnate the whole with sensibility.” This property of animal life they accordingly enjoy in a high degree of development, while their instincts are reduced almost to a nullity ; and in regard to the external senses, it may with truth be said of most of them, that they are “ sans teeth, sans eyes, sans taste, sans every thing.”@@1 They are almost, without exception, indolent and slow of movement, some advancing by the writhings and contractions of a soft body ; some by the play of invisible cilia, which garnish, in set rows, their appendages ; and others by the aid of hollow extensible tentacular suckers ; while many among them are rooted, and as fixed as the plants whose graceful forms they seem to envy, and strive to emulate.

There is, according to Cuvier, no true system of a circu­lation in any Zoophyte ; but Nordmann has delineated a very beautiful system of vessels, apparently sanguiferous, in some intestinal worms ; and a similar one has been shewn to exist in the Planariæ, and in some external parasites, as in the genus Phylline. Among the more regular Zoophytes, we find very generally a system of aqueducts, which per­meate and ramify through the body, but which are distin­guished from any circulatory vessels by having a direct communication with the water in which the animal floats. This system is mainly subservient to locomotion ; but to a certain extent it must supply the purposes of a circulation in higher organisms, for the fresh currents of water which it leads within the body will oxygenate, and render fit for as­similation the nutritive materials that come within their reach and influence. The Holothuriæ afford a good illustration of this double function, for they have two aquiferous systems ; one connected with the intestines, and in correspondency with the organs of respiration ; the other subservient only to the turgescency and relaxation of the organs that perform the offices of feet. This latter system only, it is said, can be discovered in the star-fishes and sea-urchins; while the vascular canals that ramify like veins through the clear gela­tinous bodies of the sea-jellies, originating in the alimentary cavities, and running in divergent lines to the circumference, seem to constitute a system accessory principally to respira­tion and nutrition. In many fixed polypiferous Zoophytes, there are also found ducts for introducing water within the body ; and in others, where these aquiferous ducts have no existence, the surface or appendages of the little creature are clothed with minute vibratile cilia, that constitute a real breathing apparatus.

Some families, such as the holothuriæ, the sea-urchins, and several intestinal worms, as well as some polypiferous Zoophytes, have a mouth, an alimentary canal, and an excre- mentitious or anal orifice; others have a kind of stomach with only one orifice, which is by turns a mouth and a vent ; in a great number there is merely a digestive cavity, exca­vated in the substance of the body, for the reception of the food, which enters sometimes by one and sometimes by several orifices ; and in other Zoophytes of abnormal character there is no mouth, and we suppose that these must imbibe their nutritive matter by pores on the general surface.

The individuals of some species of intestinal worms are male and female, but in general the Zoophytes are hermaphroditical and oviparous. Some are propagated by a sort of gemmation, or by self-division. Many of them are com­pound animals ; a kind of monster, in which often hundreds of individuals consociate, and are organically connected to­gether, so as to make one living mass or commonwealth, that possesses all things in common, and usually shoots up in an arborescent form.

@@@, “ Imperfecta veteribus, nec inepte, dicta animantia, destituuntur capite, auribus, naso, oculis, pleraque pedibus ; ab insectis itaque diver­sissima, a quibus dudum removi naturæ cryptogama.”—Linnæi *Systema Natura,* 1069.