

able plants. The season was not, however, sufficiently advanced, the mountain being still covered with snow, and, besides, it would have required at least a day or two. We, therefore, returned to Avignon in the evening."

(To be continued.)

*Notice of a New Zoophyte (Cliona celata, Gr.) from the Frith of Forth.* By R. E. GRANT, M.D. F.R.S.E. F.L.S. M.W.S. &c. Communicated by the Author.

WE frequently find on the shore the decayed shells of the common oyster, (*Ostrea edulis, Lam.*) entirely perforated on both sides with small round holes, about half a line in diameter. These holes do not pass in a straight line through the substance of the shells, but open on both sides into chambers, which have been somehow excavated in the interior of each valve: they have probably been perforated by some marine worms, in order to feed on the animal matter connecting the layers of the shell, and to obtain a safe abode, as we generally observe a variety of these animals come from the interior, when such shells are kept a few days in a vessel of sea-water. When these perforated shells are first brought up by the dredges from the oyster-beds of the Frith of Forth, I have almost always found the holes on their surface, and the excavated chambers between the layers, filled with a soft yellow organised matter, which appears not to have been described by naturalists, but whose singular properties entitle it to a minute examination. This yellow fleshy substance occupies the perforated shells of the living oyster, as well as the detached valves of the dead animal; but, in the living oyster, as the perforations are only seen on the outside, and never pass through the innermost layer, there is always a thin layer of shell between the yellow substance and the living animal. On the death of the oyster, and separation of its valves, the inner layer soon becomes likewise perforated, and the yellow matter is then seen projecting through the holes on both sides of the shell at the same time. By removing successively the outer layers, we easily discover that the internal excavations communicate freely with each other, and with the apertures on the surface, and that all

the pulpy matter which fills them, and projects through the superficial openings, is connected within so as to form one continuous fleshy mass pervading the whole shell. This yellow fleshy substance forms a distinct and well marked zoophyte, which I have termed *Cliona celata*, and I have not yet found this animal in any other situation than that above described.

The *Cliona* in the living state consists of a soft, fleshy granular and distinctly irritable substance, of a greenish yellow colour, traversed like many other zoophytes, with minute and regularly formed *spicula*. Its form depends on that of the cavities which it fills; it insinuates itself into their minutest ramifications, and adheres so closely to their smooth parietes, that it cannot be separated without tearing. The parts of the *Cliona* which project through the holes on the surface of the shell are tubular; and on removing the outer layers of the shell, we can perceive several empty canals winding and ramifying from these tubular papillæ, through the body of the zoophyte. During the months of March and April, when these observations were made, numerous small yellow ova were seen in the vicinity of the canals, agreeing much in their form, colour, size and mode of distribution with those of the *Spongia papillaris* and *Spongia panicea*, which were then nearly in the same stage of advancement. The projecting tubular papillæ possess a complicated structure, and a high degree of contractile power, and exhibit a singular series of appearances, when the zoophyte is attentively examined while at rest in pure sea-water. When under water, the papillæ are seen projecting from the apertures of the shell, sometimes to the length of a line and a half; they present a wide circular opening in their centre, and a rapid current of water issues constantly from them, conveying occasional flocculi of a grey membranaceous matter. But on being touched with a needle, or withdrawn from the water, the opening gradually closes, the current ceases, and the whole papilla continuing slowly to contract, is withdrawn completely within the aperture of the shell. The papillæ, viewed in their contracted state, present a smooth, rounded, shut extremity; but when they begin to advance beyond the surface of the shell, their extremity becomes flat and slightly dilated, assumes a villous appearance, with open fissures, radiating from the centre to the margin of the papillæ, and at length a mi-

nute circular opening is perceived in the centre of the villous surface. The papilla advances from the shell, and its central opening enlarges in proportion to the healthy state of the zoophyte, and the purity and stillness of the water; its flat downy radiated surface gradually diminishes by the widening of the central opening, till only thin margins are left around the orifice, and the current is again seen to play briskly from it. In recent specimens of the *Cliona* dredged from an oyster-bed near the shore at Prestonpans, and examined under the most favourable circumstances on the coast, I have twice observed polypi of extraordinary minuteness and delicacy placed around the margin of the orifice, and which, kept in constant motion, advancing and withdrawing themselves into the substance of the papilla, while the current flowed from its central opening. The polypi were perfectly invisible to the naked eye in an ordinary light and position; but by suspending the *Cliona* in a crystal jar with clear water, and placing it between the eye and a candle, or the sun, they were seen like filaments of silk or asbestos constantly rising and sinking on the margin of the papilla. On cutting off a papilla, and placing it under the microscope in sea-water, the polypi continued their motions, and were seen to consist of a long, slender, transparent, cylindrical, tubular fleshy body, at the farther extremity of which were placed about eight short broad tentacula, slightly dilated at their free ends, which were constantly inflecting and extending themselves irregularly, while the polypi advanced or retreated. In two entire and fresh specimens, the polypi continued visible and in motion for more than twenty-four hours in a jar of water at Prestonpans; but I have not yet succeeded in perceiving them in any of the numerous specimens which I have preserved alive in the water procured from New-haven. The spicula of the *Cliona celata* are *siliceous*, and have a very close resemblance to those of the great *Spongia pateræ*, or Neptune's cups of the Indian ocean, many splendid specimens of which are preserved in the Museum of the University; when procured separate, by removing the animal matter with the blow-pipe, or with nitric acid, we observe them to be long, slender, cylindrical, tubular, slightly curved, shut at both ends, a little fusiform in the middle, acutely pointed at one end, and terminated by a small hollow round head at the other. They are

about the fourth of a line in length, and appear through the microscope as minute curved pins spread irregularly through the whole fleshy substance of the animal: they do not impede the irritability of that substance, as, on tearing off a portion of it partially from the shell, we observe it slowly contract its dimensions, and a portion of it entirely detached, soon becomes contracted and more hard to the feel.

This zoophyte, though one of the least attractive in its external appearance, and one of the most common inhabitants of our coast, presents to the comparative anatomist a new and very interesting combination of properties; it is closely allied to the *Alcyonium* by its contractile fleshy texture, and by its distinct though microscopic polypi; and it is allied to the *Sponge* by its siliceous tubular spicula, ramified internal canals, tubular papillæ, regular currents, and the distribution of its ova. It differs, however, from the *Alcyonium*, in not presenting a free surface, covered with a coriaceous integument, marked with stellate pores for the lodgment of distinct polypi; and it differs from the *Sponge* in the obvious contractility of its papillæ and general texture, in its possessing distinct polypi, and in its surface not being free, and covered with open angular pores. It constitutes a distinct genus, forming a connecting link between the *Alcyonium* and the *Sponge*, and throws much light on the nature of the latter zoophyte. I have termed this genus *Cliona*, (from κλειω, *claudio*), from its most obvious and remarkable property of retracting and shutting the papillæ when irritated; and the above described species, the only one I have met with, is named *celata*, from its concealed and secure habitation within the substance of oyster-shells. It has an extensive distribution in the Frith of Forth, occurring abundantly in the oyster-beds at Prestonpans, off Inchkeith, and in the Roads. I have only found it in the shell of the common oyster, and it may be questioned whether the sharp siliceous spicula, and constant currents of its papillæ, do not exert some influence in forming or enlarging the habitation of this zoophyte.