

3rd. True unisexual species; the females are large, the males very small and (probably) short-lived.

Scalpellum ornatum, Gray.

regium (Wyv. Thoms.) Hoek.

parallelogramma, Hoek.

nymphocola, Hoek.

tritonis, Hoek.

Scalpellum vitreum, Hoek.

moluccanum, Hoek.

eximium, Hoek.

darwinii, Hoek.

carinatum, Hoek,¹ &c.

Of all the genera of Cirripedia, *Scalpellum* is no doubt the one which presents the greatest amount of variety as far as the sexual relations are concerned. In this regard it even surpasses the genus *Ibla*, Leach, of which we know, through the aid of Darwin, that it presents two instances of sexual differentiation only, viz., unisexuality in the one species and hermaphroditism with accompanying rudimentary males in the other. It is well known that the genus *Scalpellum*, by means of *Scalpellum villosum*, Leach, sp., and by means of *Scalpellum trispinosum*, Hoek, blends with the genus *Pollicipes*, Leach, and also that the latter genus is one of the oldest, if not the oldest, of the genera of Cirripedia. All the known species of *Pollicipes* are true hermaphrodites as are other Cirripedia, and, moreover, *Pollicipes* seems to be a genus which only contains shallow water species. With a little imagination it does not appear to be very difficult to trace the way in which sexual differentiation took place in the genus *Scalpellum*. Originally there were only hermaphrodite species, inhabitants of shallow water. They resembled more or less the species of the genus *Pollicipes*. In some of the species specimens attached themselves to each other² as well as to other objects, and they developed all into ordinary hermaphrodite specimens. In one of these species, however, young specimens attached to full-grown older ones, though developing into animals of the ordinary shape with a capitulum and a peduncle, did not acquire the size of the older specimens, and lost their female genital apparatus. In a following stage, we see that the little creatures which by their smallness are enabled to hide within the valves of the older hermaphrodite specimens, lose their valves and are reduced to a rudimentary state in all respects, except so far as the male organs are concerned. Finally, we observe in the latest stage that the original hermaphrodite specimen loses its male genital apparatus and becomes unisexual. In the latter species we have large and relatively long-lived female specimens, and small and short-lived males.

I feel sure that some serious objections may be advanced against this reasoning, and

¹ The bodies of *Scalpellum tritonis*, *Scalpellum vitreum*, *Scalpellum moluccanum*, *Scalpellum eximium*, *Scalpellum darwinii*, and *Scalpellum carinatum*, have not been investigated by means of transverse sections. Their unisexuality is based only on the total absence of a penis and on their general resemblance to the investigated unisexual species.

² Specimens of *Scalpellum vulgare* are attached to various horny corallines, and occasionally to the peduncles of other individuals. Darwin, *Lepadidæ*, p. 226, 1851.