

The calthrops may have been derived from a triæne by shortening of the rhabdome, or from a microcalthrops by increased growth. Possibly it has been in some cases evolved in one way, in others in the other; thus in *Tetilla merguiensis* it probably arises from the protriæne by a reduction of the rhabdome; in *Pachastrella* it has the appearance of an overgrown microcalthrops, but considering the close alliance of *Pachastrella* with *Pæcillastra* (*Normania*), in which both triænes and calthrops occur, the latter possibly derived from the former, this appearance may be misleading, and I prefer to leave the question open.

In concluding this discussion I would point out the purely hypothetical nature of the view which regards the triæne as derived from the rhabdus, and there is a good deal to be said for an opposite hypothesis which would derive the triæne from the microcalthrops; thus *Pæcillastra* may be in a direct line of descent with *Placinastrrella* (*Placinastrrella copiosa*, Schulze), and in this sponge triænes and calthrops, both apparently derived from microcalthrops, occur; and further, it is possible though not probable that the dichotriæne of *Thenea* may have been derived from the trilophous microcalthrops of *Placina trilopha*, Schulze. In that case opposing evidence might be reconciled by attributing a different origin to the Tetillidæ and the Theneidæ. The spiraster in the latter family, however, would seem to preclude such a separation, if as seems probable this spicule has originated from a sigmaspire. If on the other hand we could derive the sigmaspire from the spiraster, the probability of the descent of the triæne from the calthrops would be enhanced, indeed the simplicity which at once follows the adoption of this view is so great that nothing but the stubbornness of the ontological data prevents me from adopting it.

The Lithistid desma, since in some families it commences as a microrabd and in others as a microcalthrops, might be supposed to be of dual origin, and to this view I felt forced when first studying this group; subsequent investigation has convinced me, however, of the truth of Oscar Schmidt's observations, which prove that a gradual transition from the tetracrepid to the monocrepid desma occurs in species of *Macandrewia*.

The study of the transformations of the aster will help us to understand this, for as already noticed we not unfrequently find it passing into a microrabd, and we are led to suppose that the microcalthrops which serves as the crepis of the tetracrepid desma has undergone in the monocrepid desma a similar reduction; such embryonal variation as this would seem to imply is not unknown in other groups of animals.

The transition is supposed to be from the tetracrepid to the monocrepid desma and not in the reverse direction, because several considerations, which will be discussed later, lead us to suppose that the Lithistids characterised by tetracrepid desmas were the first evolved, from Choristida allied most closely to the Pachastrellidæ.