

however, the flattening of the spire is followed by the formation of a complete septum across its mouth, traversed by a series of perforations at regular intervals, as in *Peneroplis* (fig. 7), another very decided advance in development is marked; and this might have been followed, as in the preceding case, by a second period of growth upon the newer (Peneropline) plan. But in our *Orbitolites tenuissima* we find it constituting only a transition-stage to the next developmental advance, namely, the subdivision of the chambers into Orbiculine chamberlets; after which, again, development gives place for a time to growth, every addition being a mere multiplication of similar parts. In *Orbiculina* it seems a matter of indifference whether the later growth continues the spiral of the earlier, or changes to the cyclical plan. But in *Orbitolites* the spiral is only a transitory phase; the multiplication of chamberlets producing such a rapid extension of each successive zone, as early to bring about a completion of the annuli, and the establishment of that cyclical plan of growth which is the distinctive feature of the Orbitoline type. When that type has once been reached, the increase of the disk in the horizontal plane to any extent, by the multiplication of its annuli of chamberlets, is a mere process of growth; but the production of the "complex" type from the "simple" involves, as we have seen, a degree of structural differentiation, which marks a great advance in development.

And yet, with all this, the physiological condition of the sarcodic body remains (so far as can be made out) essentially the same. The sub-segmented body of the spiral *Orbiculina* is nourished by the food-particles drawn in through its septal pores, precisely as is the segmented body of *Peneroplis*; and the arrangement of its sub-segments in complete annuli, instead of along the expanded mouth of a spire, cannot make any alteration in the mode either of the reception of nutriment, or of its transmission from the peripheral to the central portion of the body. The adult cyclical *Orbitolites tenuissima* or *Orbitolites marginalis* must feed in exactly the same manner as it did in its young (Orbiculine) spiral phase; and the multiplication of the rows of marginal pores in *Orbitolites complanata*, corresponding with the increased thickness of its disk, merely serves to increase its ingestive capacity, in accordance with the increased requirements of a more bulky body. The animal of each disk, whatever be its mode of obtaining nutriment, can benefit only by the food-particles which come in its way; and its pseudopodial extensions will draw-in these just as well, whether they issue from one, two, or multiple rows of pores,—just as will those of the Peneropline type, whether they issue from the single row of separate passages which traverse the narrow septal plane of the typical *Peneroplis*, from the partially-coalesced multiple passages of the widened *Spirulina*, or from the single large dendritic orifice formed by the complete coalescence of separate passages in the broad septal plane of *Dendritina*.¹

The external conditions under which the FORAMINIFERA exist are so uniform, except as to temperature and depth of water—which seem to affect *growth* rather than *develop-*

¹ See the account of these types given in my Third Memoir, *Phil. Trans.*, 1859, pp. 1-12.