

Turning now to the Sub-family ROTALINÆ:—As may be inferred from what has been already stated, *Patellina* exhibits the nearest approach to the Spirilline simplicity of structure. In certain cases the test of *Patellina* consists partially or entirely of a non-septate or imperfectly septate spiral tube, the coils of which are disposed so as to form a cone; but in more typical specimens, and in all the larger species, the outer layer is constructed of distinct spirally-arranged or annular segments, subdivided into chamberlets, and the centre of the cone is filled either with a deposit of clear shell-substance or with a mass of closely-packed minute chambers. The allied genus *Cymbalopora* presents a structure in many respects similar, the conical varieties being composed of small segments, arranged spirally at first but subsequently in annuli, each segment communicating with a central or umbilical hollow, the weaker varieties assuming a depressed or irregularly spreading contour like the true *Planorbulina*.

The genera *Discorbina*, *Planorbulina*, *Pulvinulina*, and *Rotalia*, which, so far as number of species or abundance of individuals is concerned, constitute the bulk of the Family, form four parallel groups, the mutual relationship of which is best understood by a comparison of their collateral species. The closest affinity in every case subsists between the different members of the same series, and the most correct view of each genus is obtained by grouping the species round a central type, of which they are regarded as the successive modifications. The types selected for the purpose by Profs. Parker and Jones, to whose researches we are largely indebted for our present knowledge of this portion of the subject, are *Discorbina turbo*, d'Orb., sp.; *Planorbulina farcta*, F. and M., sp.; *Pulvinulina repanda*, F. and M., sp.; and *Rotalia beccarii*, Linné, sp. The degree of resemblance between the corresponding varieties or "isomorphs" of the parallel series varies greatly in different cases. In some it is an agreement in little else than external contour, whilst in others the likeness is sufficient to be a source of difficulty in determining the generic position of specimens; but it is seldom that the true relationship is not betrayed by the presence, to a greater or less extent, of some of the conspicuous characters of the typical form.

What is known as a "Rotaline" or "Rotaliform" shell is one consisting of numerous segments arranged in an inequilateral spire, the whole of the segments being visible on one side of the test, those of the outermost convolution only on the other. In some cases the superior¹ or spiral face is convex or conical and the inferior flat; in others the two

¹ The terms "superior" and "inferior," as applied to the ROTALIDÆ, are used in the sense defined by Williamson, as follows:—"The primordial segment usually occupies the apex of each trochoid form; and to the lateral surface on which this segment appears may be assigned the term *superior*; whilst the opposite one, or that in the direction of which the animal is extending its growth, may be designated the *inferior* lateral surface. There are a few exceptional cases, as, for example, the British *Truncatulina*, and the foreign genus *Faujasina* [*Rotalia schroeteriana*], which simply represent an equilateral or nautiloid shell cut in half, the intersection being in the plane of the centre of the primordial segment. Hence the surface in the centre of which the primordial segment appears instead of being conical, is flat; whilst the opposite one, in which the animal is extending itself, is more or less conical; the former being that by which the animal attaches itself to other bodies. Notwithstanding the apparent incongruity of applying the terms