The Liosphærida comprise all those Sphæroidea in which the surface of the shell is smooth, without radial spines (Pls. 12, 20). The simplest of these are the Ethmosphærida, with one single lattice-shell, enveloping the spherical central capsule. *Cenosphæra*, the most simple form of the Ethmosphærida, may be regarded as the common ancestral form of all Sphæroidea, in an ontogenetical as well as in a phylogenetical and morphological sense. From this simple lattice sphere all other Sphæroidea can be derived either by radial or by tangential growth. If the radial beams, arising from the surface of the simple fenestrated sphere, become connected (at equal distances from the centre) by tangential beams, we get the compound shells of the "Liosphærida concentrica" (with two, three, four, or more concentric spheres). The radial beams connecting these exhibit in many Liosphærida the same regular disposition and number as the external radial spines in the Astrosphærida. Perhaps these forms in a "natural system" would be better united (*e.g.*, Liosphærida with twelve or twenty internal radial beams, and Astrosphærida with twelve or twenty external radial spines); but in many cases (mainly for higher numbers) the certain determination of their number and disposition is very difficult or quite impossible.

The Cubosphærida (Pls. 21–25) represent the large and very important family of Sphæroidea, in which all three dimensive axes are equally distinguished by pairs of spines, corresponding to three axes of a cube or of a regular octahedron, agreeing therefore also with the three axes of the cubic or regular crystalline system. In the majority of the Cubosphærida the six radial spines are accurately opposite each other in pairs in three axes, perpendicular one to another, and commonly they are of equal size and form; but in some genera the three pairs of spines become differentiated, whilst both spines of each pair remain equal. Either one pair is larger than the two others (which are equal), corresponding to the axes of the quadratic crystalline system; or all three pairs are different (corresponding to the three unequal axes of the rhombic crystalline system); the former nearer to the Discoidea, the latter to the Larcoidea. We may suppose, with some probability, that the Cubosphærida are for the most part the common ancestral group of those Sphæroidea, in which a certain number of radial spines or beams is disposed in a regular order; the Staurosphærida may be derived from them by loss of one pair of spines, the Stylosphærida by loss of two pairs of spines, and most Astrosphærida by multiplying the radial spines, six to fourteen or more secondary spines being added to the six primary "dimensive spines." However, in many Astrosphærida (*e.g.*, in those with eight spines, *Centrocubus*, *Octodendron*, &c.) the regular geometrical disposition of the radial spines seems to follow another mathematical order, quite independent of the Cubosphærida.

The Staurosphærida (Pl. 15) are distinguished by the possession of four radial spines, opposite in pairs in two axes, perpendicular one to another. This rectangular cross determines a certain plane, the "equatorial plane," and this brings the Staurosphærida near