

Structure of the Calcareous Disk of *Orbitolites complanata*, as seen by reflected light.

Figs. 1-3.—Three young typical specimens, showing the large size of the "nucleus" (originating in the primordial chamber *a*), and the completeness of even the very earliest annuli of chamberlets. Magnified 35 diameters.

Fig. 4.—Ideal representation of a typical disk, laid open in various modes to show its interior structure:—*a*, primordial chamber; *b*, circumambient chamber; *c, c*, concentric annuli of oblong superficial chamberlets; *d*, marginal pores of peripheral annulus; *d', d''*, corresponding pores of inner annuli, once marginal, but now connecting the interior with exterior annuli; *e', e'*, vertical section in radial direction, showing intermediate stratum distinct from superficial layers; *f, f*, floors of superficial chamberlets, with an aperture at either end of each; *g, g*, annular canals running beneath these floors, with large apertures leading to the columnar chamberlets of the intermediate stratum; *g'*, similar canals near the other surface of the disk; *g''*, similar canals laid open through the plane on which they give off the two passages to each superficial chamberlet; *g'''*, annular canals cut through in vertical section; *h*, passage of horizontal section through summit of intermediate stratum, showing the tops of the columnar chamberlets; *i, i, i*, and *k, k, k*, passage of horizontal section through two different planes of intermediate stratum, showing connection between columnar chamberlets of successive zones, by oblique passages running in opposite directions.

Fig. 5.—Vertical section, taken in the radial direction, of a "sub-typical" example, whose earlier development has taken place on the "simple" plan:—*a*, cavity of "nucleus"; from *aa* to *bb* the annular canal single in each zone; from *bb* to *cc* the annular canals double in each zone, and separated from each other by an interposed stratum, the chamberlets of which are generally continuous with those of the superficial planes, much irregularity in this respect showing itself between *cc* and *dd*. Magnified 50 diameters.

Fig. 6.—Central portion of a disk, the first three zones of which, between *aa* and *bb*, are formed upon the "simple" type, each having but a single annular canal and one row of septal passages; at *bb* the "complex" type is assumed, the annular canals being doubled, and separated by an interposed stratum; but the columnar chamberlets of this stratum that lie between the annular canals are continuous from *bb* to *cc* with the chamberlets of the superficial layers, this continuity giving place between *cc* and *dd* to the alternation in their positions characteristic of the most typical Orbitoline disks. Magnified 50 diameters.

Fig. 7.—Tangential vertical section of a typical disk, taken near the thick margin; showing the two layers of superficial chamberlets, the double series of annular canals, and the interposed stratum traversed by the radial passages that open on the periphery as marginal pores. Magnified 50 diameters.

Fig. 8.—Vertical section of a disk, of which the first five zones, *aa* to *bb*, are formed on the "duplex" type, each having but a single annular canal, but a double series of radial passages; between *bb* and *cc* the annular canals are double, and the chamberlets of the interposed stratum are continuous with the superficial chamberlets; while from *cc* to *dd* the superficial chamberlets alternate in position with those of the interposed stratum. Magnified 48 diameters.

Fig. 9.—Vertical section of inner part of typical disk, showing the circumambient chamber, *aa*, immediately surrounded by annuli of the complex type, having the two superficial layers of chamberlets, *b, b*, completely dissociated from the columnar chamberlets, *c, c*, of the interposed stratum. Magnified 48 diameters.

Fig. 10.—Vertical section of inner part of typical disk, showing the circumambient chamber, *a*, communicating by only a single passage with the "simple" chamberlets of the first annulus *b*; but this at once passing at *c*, by the doubling of the annular canal, into the "complex," which is thenceforth maintained, *c-d*, with a progressive increase in the thickness of the disk. Magnified 48 diameters.