

logical point of view the di- or tri-thalamous condition is nothing more than an abnormal or accidental development of the typical form.

In point of distribution *Orbulina universa* is a cosmopolitan species. It has been taken in the tow-net as far north as the Farøe Channel, and thence southward as far as lat. 32° 24' S. in the Atlantic, and 45° 31' S. in the Pacific. In bottom-dredgings its occurrence has been noted at every latitude from the shores of Novaya-Zemlya, lat. 76° 59' N., almost to Magellans Strait, lat. 50° 10' S. It inhabits all the great oceans, the Red Sea, the Mediterranean, and the Adriatic. In some areas the shells exist in enormous numbers; and at certain points in the North Atlantic, two or three degrees south and south-west of Ireland, explored on the second "Porcupine" cruise, they form one of the most important constituents of the bottom-ooze.¹

The earliest geological appearance of the species is in the Lias of the Moselle (Terquem). It has been noticed in certain Jurassic limestones of the Canton Aargau, Switzerland (Haeusler), and in the Chalk of the Island of Rügen, and at Volsk in Russia (Ehrenberg). It occurs in the Septaria-Clays and in the Upper Oligocene formations of Germany (Reuss); in the Miocene of the Vienna Basin (d'Orbigny, Reuss, Karrer), and of Malta (Brady); in the Salzthon of Wieliczka (Reuss), and in the later Tertiaries of Central and Southern Italy (d'Orbigny, Costa, Terrigi, &c.).²

Orbulina porosa, Terquem (Pl. LXXXI. fig. 27).

Globulina porosa, Terquem, 1858, Foram. du Lias, 1^{ère} mém., p. 633, *vide* Terquem.

Orbulina liasica, Id. 1862, Ibid. 2^{ème} mém., p. 432, pl. v. fig. 4.

„ *foveolata* (?), Seguenza, 1862, Foram. Monotal. Mess., p. 37, pl. i. figs. 1, 2.

„ *neojurensis*, Karrer, 1867, Sitzungsab. d. k. Ak. Wiss. Wien, vol. lv. p. 368, pl. iii. fig. 10.

„ „ Norman, 1876, Proc. Roy. Soc., vol. xxv. pp. 213, 214.

Globigerina (*Orbulina*) *neojurensis*, Brady, 1879, Quart. Journ. Micr. Sci., vol. xix., N. S. p. 76.

„ „ „ Terrigi, 1880, Atti dell' Accad. Pontif., ann. xxxiii. p. 186, pl. i. fig. 16.

The shell of this species is spherical and coarsely perforated, and the pores are surrounded externally by exogenous ridges which mark out the surface into

¹ Samples of the bottom-ooze from "Porcupine" Stations 36 and 42, as they reached my hands, were almost entirely composed of *Orbulina*. It has been suggested that the material from these points had been partially washed on ship-board. I have no certain knowledge that this is the case, but it seems not improbable, inasmuch as in another sample from Station 42, preserved by Sir Wyville Thomson, the same preponderance is not apparent. Nevertheless, it is a significant fact that *Orbulina* do exist in these enormous numbers, and their abundance in proportion to other organisms of similar size is not diminished by the suggested explanation.

² Abich, in a recently published memoir (Geol. Forsch. in den kaukasischen Ländern, II. Th., 1 Westhälfte, p. 240, pl. xi. fig. 8) has described an early Tertiary rock from the region of the Caucasus as an *Orbulina*-limestone ("Orbulinenkalk"). It is evident, however, both from the description and figure, that this is nothing more than one of those calcareous deposits formed of oolitic grains, which are to be met with in formations of every age, from the Silurian