The conditions of pressure at great depths are very extraordinary. Pressure increases at the rate of about 1 ton on the square inch for each thousand fathoms of increasing depth; so that the inhabitants of the floor of the ocean at its average depth of about 2500 fathoms, sustain a pressure of $2\frac{1}{2}$ tons on each square inch of surface, compared with the 14 lbs. of atmospheric pressure sustained by the inhabitants of the upper earth. Sea-water is, however, almost incompressible, so that its density at 2500 fathoms is scarcely perceptibly increased. At a depth of a mile, under a pressure of about 159 atmospheres, sea-water, according to the formula given by Jamin, is compressed by the $\frac{1}{144}$th of its volume. Any free air suspended in the water, or contained in any compressible tissue of an animal, would be reduced, at a depth of 2500 fathoms, to a mere fraction of its bulk; but an organism permeable throughout, and supported through and through and on all sides by incompressible fluids at the same pressure, need not necessarily be incommoded by that amount of pressure. We have been long familiar, chiefly through the researches of the late Professor Michael Sars, with a long list of animals of all the marine invertebrate orders living at depths of from 300 to 400 fathoms, and consequently subject to a pressure of 1120 lbs. on the square inch; and off the coast of Portugal there is a great fishery of sharks (*Centroscymnus cœlolepis*, Boc. and Cap.) carried on beyond that depth.

Other physical conditions, such as the specific gravity (salinity) of the water, the relative proportions of the dissolved salts, the total amount of gases dissolved in the water, and the relative proportions of free oxygen and carbondioxide, vary slightly in different parts of the ocean and at different depths; but although such differences are often valuable in tracing the source from which the water occupying a certain area or stratum is derived, they apparently never occur to such an extent as to affect animal life.

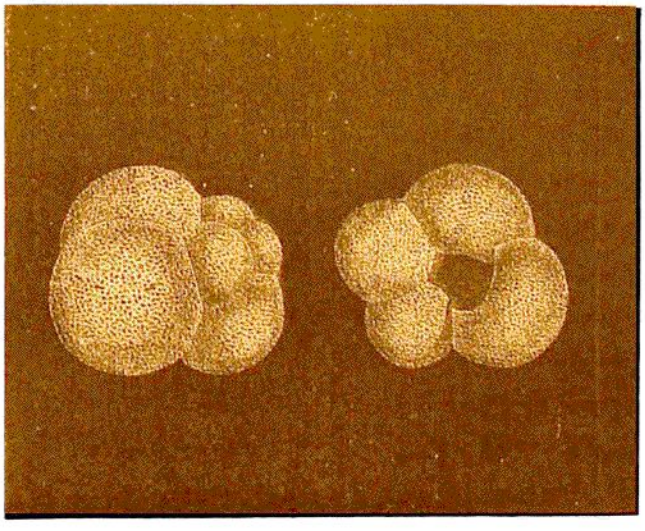

Fig. 18.—*Globigerina bulloides*, D'Orb.

The Nature of the Bottom.—The element next in importance to temperature in regulating the distribution of the abyssal fauna is the nature of the bottom. Two kinds of sediment, very different in their character, may be said broadly to cover the area inhabited by the abyssal fauna. The first of these, the now well-known *Globigerina Ooze*, is a fine calcareous deposit, somewhat resembling the chalk of the Cretaceous period in its microscopic character, and composed to a great extent of the shells, more or less broken or decomposed, of pelagic Foraminifera, chiefly of the