

genera *Globigerina*, *Orbulina*, *Pulvinulina*, *Pullenia*, and *Sphæroidina*—the two latter in smaller proportions. The ooze contains everywhere, in addition to the foraminifera which form its bulk, a quantity of mineral matter consisting of fragments of pumice, minute

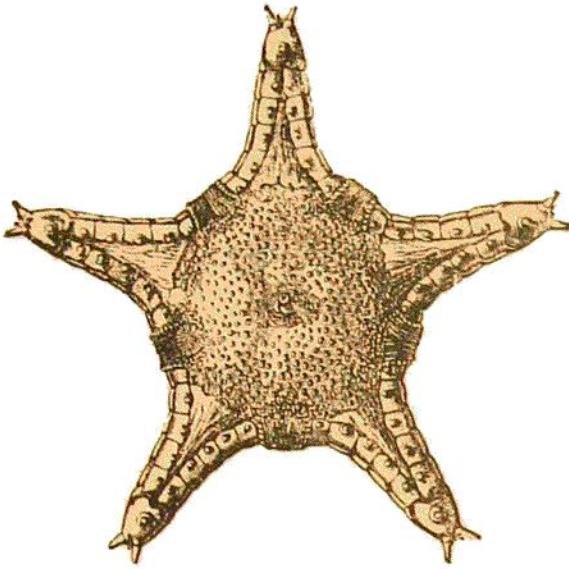


FIG. 19.—*Porcellanaster ceruleus*, Wy. T.

particles of felspar, particles and crystals of other minerals due to the disintegration of volcanic rocks, such as sanidine, augite, hornblende, quartz, leucite, and magnetite, and rounded concretions of a mixture of the peroxides and protoxides of manganese and iron. The globigerina ooze is essentially a calcareous deposit, so that it affords abundant material for the calcareous shells and skeletons of animals inhabiting the region where it is being laid down. The foraminifera belonging to the group of which the ooze is composed live only on and near the surface, and are in all cases dead when they reach the bottom, as we have satisfied ourselves by the careful obser-

vations of several years. They still contain, however, a quantity of organic matter in the shell-chambers, and incorporated in the substance of the shell; and they, consequently, afford sufficient food for many groups of abyssal animals which are nourished entirely by passing the ooze through the alimentary tract. The globigerina ooze is accordingly a deposit favourable to the support of animal life, and it is probably partly due to this circumstance that the abyssal fauna appears to attain its maximum in the shallower depths at which the ooze occurs.

At depths greater than 2000 fathoms the carbonate of lime of the shells of *Globigerina* is removed by the excess of carbon dioxide in the sea-water; the mineral matter assumes a larger proportion in relation to the lime of the shells; the ooze becomes gradually darker, effervescing less freely with acid; until at length it gives place to a more or less homogeneous "red clay." The distribution of these two great formations may be broadly defined thus:—The "globigerina ooze" covers the ridges and elevated plateaus in the ocean, and generally occupies a belt at depths down to 2000 fathoms round the shores, outside the belt of shore deposits; and the "red clay" covers the floor of the deeper depressions. An intermediate band of what we have called "grey ooze" occurs at depths averaging perhaps from 2100 to 2300 fathoms. At one time I believed that the red clay consisted almost entirely of the insoluble "ash" of the falling organisms left after the whole of the calcic carbonate had been removed. My colleague, Mr Murray, has studied very carefully the distribution of volcanic débris over the floor of the ocean, and it is his opinion that the "red clay" is formed chiefly by the decomposition of