

silicate phillipsite occurs in the pelagic deposits, and is supposed to be a secondary product derived from the decomposition of volcanic rock fragments. Phillipsite is found in the various kinds of deposits in the deep water of the Central Pacific and Central Indian Ocean far from land, and is most abundant in some Red clay areas. It occurs in crystalline form, either as simple isolated microliths, crossed twins, irregular groups, or aggregated into spherulithic groups in which these zeolitic crystals are entangled together so as to form crystalline globules of sufficient size to be distinguished by the naked eye. The distribution of these crystals of phillipsite coincides with that of basic volcanic glasses and basaltic lapilli over the ocean-floor, the decomposition of which, under the action of sea-water, would give rise to the materials afterwards deposited in a free state as zeolitic crystals and aggregates.

Radio-active substances.

Professor Joly has examined for their radium contents a number of deposit-samples supplied by Sir John Murray. He finds that the deep-sea deposits are much richer in radium than the average terrestrial rocks. The Red clays and the Radiolarian oozes, which are laid down in deep water far from land, contain much more radium than the calcareous deposits like the Pteropod and Globigerina oozes. The radio-activity and percentage of calcium carbonate in the deposits stand in an inverse ratio to each other, and the Blue muds contain less than the calcareous oozes, though more than the continental rocks. It seems evident that the quantity of radio-active substances, of manganese nodules, with earbones of whales and sharks' teeth, of zeolitic crystals and cosmic spherules, is greatest where, for other reasons, we believe the rate of deposition to be least.

Deep-sea deposit types.

In the neighbourhood of emerged land the material derived from that land is spread over the sea-floor, becoming finer and finer in texture with greater distance and depth, whereas in the central regions of the great ocean basins land-detritus may be almost totally absent from the deposits, while the calcareous

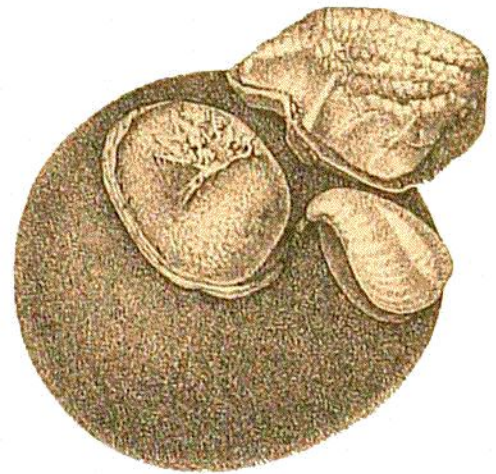


FIG. 135.—MANGANESE NODULE WITH TWO TUNICATES AND A BRACHIOPOD ATTACHED.

"Challenger" Station 160, Southern Ocean, 2600 fathoms.