

and minerals, which make up a large part of the muddy matters settling on the bottom beyond the mud-line around continental shores, would readily yield under the action of sea-water the chemical elements that are deposited in the form of glauconite in the chambers of Foraminifera and other calcareous organisms.

*Other Casts of Foraminifera.*—In the Tables of Chapter II. it will be observed that imperfect casts of Foraminifera are very frequently recorded in the residues after the removal of the Foraminifera by dilute acid. In the great majority of instances these are of a reddish or brownish colour, and appear to be formed of a substance which lined with a thin coating the internal chambers of the shells. They hold together with some tenacity in water, but immediately collapse when dried upon a platinum foil, and sometimes they become black or burn, leaving a small reddish residue. At other times phosphates can be detected in these imperfect casts. As a general rule, a few red-coloured more or less imperfect casts of the internal chambers of Foraminifera may be found in nearly all calcareous deposits, but internal casts are only present in abundance in those regions where glauconite is in process of formation, and have been fully referred to above.

At Station 176 in the South Pacific, large numbers of peculiar casts were observed in a Globigerina Ooze from 1450 fathoms, which are markedly different from the glauconitic casts. The Foraminifera, in the deposit from this station, presented a very mottled aspect under the microscope, some of them being white or rose-coloured, as is usually the case in a Globigerina Ooze, while others were brown or black, from a deposit of the peroxides of iron and manganese on their outer surfaces. When a section is made through these black or brown-coloured specimens, three zones can be distinguished: at the centre an internal cast of the shell, then the white carbonate of lime shell itself, and outside this an external cast of the same nature and aspect as the internal one, to which it is connected by little pillars filling up the foramina of the shell (see Pl. XI. fig. 1). When the carbonate of lime is removed from such specimens, it is seen that the external cast is in general not thicker than the hollow space left by the removal of the shell, and that this external cast can be partially separated from the internal one by the use of a little force. The general appearance of these external and internal casts is represented in Pl. XXIV. fig. 4, and it will be observed that they differ, owing to the presence of the external casts united to internal casts by little pillars, from the specimens represented in the other figures on the same plate, where we observe only internal glauconitic casts. The red-coloured casts from this station offer considerable resistance to the action of acids and mechanical effort, which seems to show at once that we are not dealing with a cast made up merely by a simple filling of the shell with fine mud or clay. The red casts, when examined in thin sections by transmitted light, are yellow or brown, scattered over by a fine granulation, which is not affected between crossed nicols. When treated with warm hydrochloric acid we obtain, by elimination of the iron, colourless globules that appear to have almost completely resisted the action of the acid, and are in all likelihood composed