by a simple filling of the shell, but seem to be due to a chemical combination. There were in these deposits none of the smooth pale yellow and green casts so abundant in the Green Muds along continental shores. If these red coloured casts be treated with warm hydrochloric acid and the iron thus extracted, a number of colourless globules are obtained, which have resisted the action of the acid. It has been found that these casts consist of hydrated silicate containing alumina, lime, magnesia, and alkalies. The mean diameter of the minerals rarely exceeded 0·10 mm., and were usually much smaller; these were felspars, black mica, augite, hornblende, and magnetite. The great bulk of the residue after removal of the carbonate of lime, however, consisted of pumice stone in a fine state of division, with amorphous matter. Radiolaria and Diatoms made up about 1 per cent. of the whole deposit.

The trawling at 1350 fathoms gave many rounded fragments of pumice, from 6 to 8 cm. in diameter, covered with oxide of manganese, and the branch of a tree several feet in length which was carbonised in some places (see Diagram 13).

There were many very productive hauls with the surface nets between the Fiji Islands and the New Hebrides—Pteropods, Heteropods, and pelagic Foraminifera being specially abundant. With the exception of a very large cylindrical species of *Coscinodiscus*, Diatoms were very rare both on the surface and at the bottom. It was observed that the larger Foraminifera, such as *Sphæroidina dehiscens*, *Pulvinulina menardii*, and thick-shelled *Orbulinæ*, were procured in greatest abundance when the tow-net was dragged at a depth of 80 or 100 fathoms.

New Hebrides to Raine Island.—The deposits between the New Hebrides and Raine Island (see Chart 27 and Diagram 13) varied greatly with depth, and were very interesting. At 2650 fathoms not a trace of carbonate of lime could be detected either by the microscope, or by treating the Red Clay with weak acid. At 2450 fathoms there was 1 or 2 per cent. of carbonate of lime, consisting of a few broken fragments of Foraminifera. At 2440 fathoms there was a Red Clay on the surface with 5 per cent. of carbonate of lime, but three inches beneath the surface a much lighter coloured deposit containing a very large number of Foraminifera, and 32 per cent. of carbonate of lime. At 2325 fathoms there was 32 per cent. of carbonate of lime, consisting of the dead shells of pelagic Foraminifera and a few Coccoliths and Rhabdoliths. The condition of things at 2440 fathoms is worthy of special remark. It very frequently happened during the cruise that the deeper layers contained less lime than the surface ones, but only on two or three occasions did it happen that there were more calcareous shells in the deeper layer of the deposit as in this case. The surface layer, it will be observed, was the same in nearly all respects as the deposit in 2450 fathoms 80 miles to the eastward, and the deeper layer resembled that at 2325 fathoms still farther to the eastward, or the deposits in a lesser depth towards Raine Island, which contained over 50 per cent. of carbonate of lime, so that possibly a subsidence of the bottom had taken place subsequent to the