

II. 0·6827 gramme of the substance treated with hydrofluoric and sulphuric acids gave 0·0450 grm. potassium chloride (KCl) and sodium chloride (NaCl), which gave 0·1367 grm. potassium platinochloride (K_2PtCl_6), equivalent to 0·0417 grm. potassium chloride (KCl), corresponding to 0·02634 grm. potassium oxide (K_2O), and 0·0033 grm. sodium chloride (NaCl), corresponding to 0·00175 grm. sodium oxide (Na_2O).

III. 0·3205 gramme of the substance treated with hydrofluoric and sulphuric acids required for oxidation, 0·85 c.c. permanganate of potassium corresponding to 0·00496 grm. ferrous oxide (FeO) [1 c.c. permanganate of potassium = 0·0058355 grm. of ferrous oxide (FeO)].

The two soundings in 2600 fathoms contained respectively 7 and 19 per cent. of carbonate of lime. In 1975 fathoms there was 77 per cent., in 1100 fathoms 84 per cent., and in 275 fathoms 88 per cent. The carbonate of lime in all these consisted essentially of the shells of pelagic Foraminifera, with Cocoliths, Cocospheres, and Rhabdoliths. It will be noticed that the amount of lime was less the greater the depth from which the deposits came, and this was due to the gradual removal of the more delicate and smaller shells. While these small shells and Cocospheres made up most of the deposit at 275 and 400 fathoms, they were very rare at a depth of 2600 fathoms; these organisms appeared to be quite as abundant at the surface over the one locality as the other. The mineral particles were very minute in these soundings, and consisted chiefly of felspars and glassy fragments. As the entrance of Cook Strait was approached, the mineral particles derived from the coast of New Zealand increased both in number and size, and the pelagic shells diminished, while glauconite, which was absent in the soundings from the middle of the section, again made its appearance.

The dredgings along the Australian coast were very successful, and yielded a large number of specimens belonging to characteristic species. In 950 fathoms there were two specimens of *Lætmogone violacea*, Théel, one of the Elaspodous Holothurians. The only other known specimens of this species were subsequently obtained by Mr. Murray at a depth of 555 fathoms in the Færøe Channel, when over three hundred specimens were taken in one haul.¹ Dr. Théel says "it is impossible to discover any characteristic by which these almost antipodal specimens may be distinguished from each other." From 2600 fathoms several Polyzoa, a siliceous Sponge, and some worm tubes were obtained.

The surface nets were continually in use, and the naturalists on several occasions went out in boats to observe the surface life. *Pulvinulina micheliniana* was more abundant than had been previously observed, the best hauls being got when the net was dragged as nearly as possible at 80 fathoms. In the majority of the specimens the brownish-yellow sarcode enveloped the shell, and on two occasions the sarcode was observed thrown out in bubble-like expansions, apparently serving the purpose of a float, similar to what was afterwards observed in *Hastigerina*. Cocospheres were especially

¹ *Proc. Roy. Soc. Edin.*, vol. xi. p. 694, 1882.