It is sometimes observed that two or three shells or fragments are cemented by the same red substance forming the casts. This substance when sufficiently transparent appears of a yellowish red colour, and gives sometimes aggregate polarisation, but is never extinguished between crossed nicols. Often the casts enclose small mineral particles. With very high powers it is seen that the structure of the grey carbonate of lime casts is granular, and between crossed nicols it is evident that the grains are crystalline. This is one of the few instances in which it has been possible to point out the deposition of carbonate of lime in the shells forming deposits, and it evidently took place in the deeper layers.

Cape York to Arrou Islands.—The deposits in 6 and 7 fathoms around and near Booby and Wednesday Islands (see Chart 31) consisted of quartziferous sand with from 60 to 78 per cent. of carbonate of lime in the form of large numbers of Foraminifera, fragments of calcareous Algæ, Polyzoa, and shells. None of the Foraminifera, however, were pelagic species. It was estimated that from 15 to 30 per cent. of the sands consisted of mineral grains; these were from 0·5 to 1 mm. in diameter. Between Cape York and the Arrou Islands the depth in the Arafura Sea never exceeded 50 fathoms, usually ranging from 28 to 40 fathoms. The deposit was a greenish mud in all cases, containing from 25 to 50 per cent. of minerals, consisting of fragments of quartz, mica, felspars, glauconite, &c., about 0·2 mm. in diameter. In the dredgings there were fragments of sandstone and other continental rocks. The carbonate of lime in these deposits formed from 23 to 38 per cent., and consisted of the shells of *Textularia* and *Rotalia*, fragments of Echinoderms, Polyzoa, and Molluscs. Siliceous organisms made up 2 to 3 per cent.

Arrou Islands to Banda.—The deposits at 800 and 580 fathoms, between the Arrou and Ki Islands (see Chart 32), were Green Muds containing respectively 14 and 40 per cent. of carbonate of lime; at the shallower depth there were indications of two layers, the bottom layer being more clayey with a blue tinge.

The deposits at Stations 192 and 192A were most interesting. At the first of these (140 fathoms) the sounding tube brought up a specimen of Blue Mud, containing about 8 per cent. of carbonate of lime, and in the second (129 fathoms) the trawls, besides pumice stones, contained several large concretions or fragments of a calcareous rock, differing very considerably from the deposit.

The Concretions or Rock Fragments were of two kinds. First, many more or less rounded agglutinations loosely held together, and from 1 to 7 cm. in diameter. Second, several large honeycombed pieces of rock, several decimetres in diameter, and requiring a sharp blow from a hammer to break them.

Those belonging to the first variety are grey or brown, sometimes slightly greenish, granular, and it can be seen with the lens that they are essentially composed of Foraminifera. An examination of thin slides of these nodules shows that they are