

of shells were therefore operated upon together, so as to yield an average sample; and No. III. represents the composition of a portion of this, from which the salts soluble in boiling water had been removed; whilst No. IV. is that of a second portion of the same without preliminary washing.<sup>1</sup>

The large percentage of carbonate of magnesia indicated by the foregoing figures is a matter of some significance, though it may be easily accounted for by the proportion of magnesium salts existing in sea-water. Happening to have in my possession a sample of a Tertiary deposit described by Karrer and Sinzow (see p. 133) consisting almost exclusively of the shells of one of the simpler types of porcellanous Foraminifera, *Nubecularia*, it appeared worth while, notwithstanding their fossil condition, to ascertain their composition. Clean specimens free from any adherent matrix were selected, and their analysis gave the following result.

*Nubecularia novorossica.* (Fossil.)

Silica, . . . . .	0·5
Ferric oxide, . . . . .	0·2
Alumina, with phosphates of lime and magnesia, . . . . .	0·9
Carbonate of lime, . . . . .	72·4
Carbonate of magnesia, . . . . .	26·0
	100·0

How far these proportions may correspond with those which existed in the living shell it is of course impossible to say.

The peculiar texture to which we apply the term "porcellanous" is an invariable feature of the MILIOLIDÆ, and the shells of the larger group of calcareous Foraminifera (*Hyalina*) present no structure in the least degree similar. The peculiarity may be due to physical conditions attendant on the mode in which the shell-substance is deposited; but, on the other hand, it may be dependent on chemical composition, perhaps on the presence of a certain amount of secreted silica. This has been suggested as a possible explanation by a number of observations which need not just now be dwelt upon. The uniformity of the porcellanous shell-texture as a characteristic of the entire series, notwithstanding some known differences in composition, is, so far as it goes, somewhat against a chemical theory; but the subject is one which is worthy of further investigation.

We may now pass to the ASTRORHIZIDÆ and LITUOLIDÆ, two Families in which the test is constructed to a greater or less degree of foreign bodies. In some genera of ASTRORHIZIDÆ the investment consists of a chitinous envelope protected by a compact layer of mud of nearly uniform thickness; in others the organic envelope has grains of sand more or less embedded in its substance, the test still retaining its flexibility notwithstanding its arenaceous incrustation; but in the larger portion of the Family, as well

<sup>1</sup> The analyses III. and IV. were made by Dr. J. Gibson, of Edinburgh University, for Mr. Murray.