Taking 45 mgrm. as a mean amount of carbonic acid, and 2000 fathoms (3660 metres) as the mean depth of the ocean, this corresponds to a layer of carbon 3·45 cm. thick over the area of the ocean.[1] It is right to observe here in connection with the determination of lime and of carbonic acid in sea water, that the freshly collected sample undoubtedly contains in almost all cases a certain amount of carbonate of lime suspended as living organisms, which, owing to their minuteness and transparency, do not produce any apparent turbidity in the water. The distribution of these organisms is subject to local concentration, so that samples of water taken from neighbouring localities may, and usually do, contain very different amounts of this suspended matter. When these organisms consist, as regards mineral constituent, of carbonate of lime, this carbonate of lime will not be affected by the chloride of barium, but will be subject to the decomposing influence of the boiling solution of chloride of magnesium during the distillation of the sea water, and would account, at least in part, for the continued evolution of carbonic acid during the whole distillation, and for the want of uniformity in the results. Quantitative experiments made by Mr. Murray with the tow-net have shown that as much as 16 tons of carbonate of lime may be suspended in this form in a mass of sea water one mile square by 100 fathoms in depth. These organisms die, the

[1] In a lecture on his Challenger work delivered to the Glasgow Philosophical Society, Professor Dittmar submitted a diagram showing the absolute composition of ocean salts.

Unit = 1 billion tons = $10^{12} \times 1000$ kilogrammes.

Chloride of sodium,	35,990	From Prof. W. Dittmar's analyses and oceanometric data given by Boguslawski.
Chloride of magnesium,	5,034	
Sulphates,	2,192	
Sulphate of zinc,	1,666	
Sulphate of potash,	1,141	
Bromide of magnesium,	100	
Carbonate of lime,	160	
	46,283	
Total bromine (Dittmar),		87·2
Total iodine (Köbbstorffer),		0·03
Total chloride of rubidium (from C. Schmidt's analyses, as reported by Robb, Chemische Geologie),		26·6
Total mass of the ocean,		= 1322355 units.

Prof. Dittmar in the same lecture utilised certain data regarding the solids introduced into the ocean by rivers, which he found in Boguslawski's Ozeanographie, for forming an estimate, however rough, of the rate at which these add to the amount of carbonate of lime. According to Boguslawski's statement of the total water introduced by the thirteen principal rivers per annum on the one hand, and their average content of solids according to Bischoff on the other, it appears that these thirteen rivers contribute about $1{\cdot}3375 \times 10^9$ tons of solids per annum, of which about one half may be said to be carbonate of lime. Assuming the carbonate of lime contributed by all rivers to amount to just so much, and comparing this with the 160×10^{12} tons of the same substances which are contained in the present ocean, it would take $\frac{160 \times 10^{12}}{1{\cdot}3375 \times 10^9} = 119400$ years to bring up the total oceanic carbonate of lime to double its present amount; or 1194 years to increase it by 1 per cent. of its present value.