

Dissolved  
solids in  
sea-water  
as ions.

	Parts per 1000.	Percentage.
Na . .	10.722	30.64
Mg . .	1.316	3.76
Ca . .	0.420	1.20
K . .	0.382	1.09
Cl . .	19.324	55.21
SO <sub>4</sub> . .	2.696	7.70
CO <sub>3</sub> . .	0.074	0.21
Br . .	0.066	0.19
	35.000	100.00

Dittmar's item CaCO<sub>3</sub>, which was presumably included in order to express the fact that there is on the whole an excess of bases over acids, is obviously incomplete as it stands. From the most recent measurements we gather that a 3 per cent sodium chloride solution, in equilibrium, as regards CO<sub>2</sub>-tension, with air (which holds good approximately for sea-water), dissolves at 25° C. about 0.07 gr. of calcium carbonate per litre. Hence there cannot be as much as 0.13 gr. per litre in sea-water. The surplus base should rather be regarded as a mixture of calcium and magnesium bicarbonates, existing in equilibrium with a certain amount of free CO<sub>2</sub>, and of the products of their hydrolytic dissociation, viz. calcium and magnesium hydroxides. It is the two latter which impart to sea-water its alkaline reaction.

On considering sea-water in its relation to submarine deposits we note that, of all possible combinations of cation with anion, there are three which are much less soluble than any others, and are therefore closest upon saturation and precipitation: these are calcium sulphate, calcium carbonate, and magnesium carbonate.

Calcium  
sulphate.

From what is known of the solubility of gypsum in brines, and allowing for the excess of SO<sub>4</sub>, one would suppose that sea-water is very nearly saturated for this salt, and that addition of, for instance, a sulphate would precipitate it. But gypsum is unknown as a constituent of deep-sea deposits (unless of extraneous origin), so that its solubility-limit is evidently never exceeded under submarine conditions.

Calcium  
carbonate.

Calcium carbonate, on the other hand, occurs, as already stated, in enormous quantities at the bottom of the sea over wide areas. All the lime in it has been derived, by the aid of organic agencies, from the calcium held in solution by sea-water,