not in their atmospheric ratio (1 : 4) but in the ratio of approximately 1 : 2. When we come to natural waters, we find that high salinity lowers the absolute solubility of gases somewhat, and that carbon dioxide is greatly affected by the chemical affinity for it of dissolved carbonates. With regard to the latter gas, all hitherto published data are untrustworthy as to the amount in solution in the gaseous, as distinct from the ionised, state, and we are not likely to become better informed until a sound experimental method of measuring the *tension* of the gas in solution becomes universal. The saturation-solubilities of oxygen and nitrogen, at partial pressures of $\frac{1}{5}$ atm. and $\frac{4}{5}$ atm. respectively, as in air, are set down in the following table, expressed in c.c. at 0° and 760 mm. per litre of liquid :—

	Oxygen.	Nitrogen.
Pure water at 0° C.	10·29	18·56
,, ,, at 15°	7·22	13·63
,, ,, at 30°	5·57	10·94
Sea-water (salinity = 3½ per cent.) at 0° .	8·36	14·40
,, ,, ,, at 15° .	5·84	11·12
,, ,, ,, at 30° .	4·50	9·26

In the best-explored lake, that of Geneva, a series of experiments showed the content of oxygen to be 6·8–7·6 c.c. per litre, and nitrogen 14·6–15·9 c.c. per litre, at various depths and at temperatures ranging from 4° to 9° C. There was very little variation from the surface down to 300 metres (984 feet), which is doubtless due to the even vertical temperature of the lake and the complete circulation which it consequently enjoys. The amounts of gas dissolved are seen to be rather below saturation in the case of oxygen, and very near saturation in the case of nitrogen. Very different are the waters of the Caspian: in the South Basin 5·6 c.c. of oxygen at 100 metres (328 feet), tailing down to 0·73 c.c. at 715 metres (2345 feet), are recorded; in the North Basin 2·3 c.c. at 150 metres (492 feet) down to 0·13 c.c. at 575 metres (1886 feet). Here the bottom waters are altogether destitute of oxygen, and there is no animal life below 400 metres (1312 feet). Wherever the bottom waters are inadequately ventilated, reduced sulphur compounds are apt to be generated in the deposits, and this sometimes leads to the presence of an abnormal gas in solution, namely sulphuretted hydrogen.

The quantity of gas held in solution in any part of a lake is governed by a multiplicity of factors. It depends first of all on the circulation of the lake: thus lakes of uniform temperature, especially the shallower ones, are well aërated from top to bottom; lakes with a discontinuity layer (*Sprungschicht*) receive an ample