into its partial pressure in the undissolved residue, and as the coefficient of absorption of oxygen is greater than that of nitrogen, the percentage of oxygen in the dissolved air is greater, and that in the undissolved residue is less, than that prevailing in the natural air. The ratio of the two percentages obviously depends on the relative volume of air used, but we need not trouble ourselves with the somewhat complex general formula, because for our purpose it is sufficient to consider the special case which applies to the ocean surface, and which presents itself when the shaking is repeated with constantly renewed air until the last instalment of air remains unchanged. In this case (which for us is the general case) the volume of air dissolved at a given temperature $t$ by one litre of sea water is a quantity $\lambda$, which is a function only of $t$ and the pressure of the atmosphere, and every c.c. of dissolved gas contains $n_1$ c.c. of oxygen and $n_2$ c.c. of nitrogen, where $n_1$ and $n_2$ depend only on $t$, but change very slowly with the latter.

"According to my own determinations, as fully reported in the Memoir,

"*One litre of Sea Water when saturated with (constantly renewed) air at t° and a pressure of 760 mm. (plus the tension of vapour of water at t°) takes up the following volumes (measured dry at 0° and 760 mm. pressure) of the two gases:—*

| Temperature, Centigrade. | Dissolved Nitrogen and Oxygen in Cubic Centimetres. | | Percentage of Oxygen in dissolved Gas. |
|---|---|---|---|
| | Nitrogen. | Oxygen. | |
| 0 | 15·60 | 8·18 | 34·40 |
| 5 | 13·86 | 7·22 | 34·24 |
| 10 | 12·47 | 6·45 | 34·09 |
| 15 | 11·34 | 5·83 | 33·93 |
| 20 | 10·41 | 5·31 | 33·78 |
| 25 | 9·62 | 4·87 | 33·62 |
| 30 | 8·94 | 4·50 | 33·47 |
| 35 | 8·36 | 4·17 | 33·31 |

"The temperature of the surface water of the ocean never falls very far below 0° C., even in the polar regions (the Challenger registered 27° F. in the Antarctic Ocean), while even in the tropics it rarely rises above 30° C. The corresponding tensions of aqueous vapour are 4·6 and 33·2 mm. respectively. Now the sea, as far as