These observations on the rain water of equatorial regions prove that it is highly charged with organic matter of animal or vegetable origin which is readily oxidised and absorbs for this purpose the oxygen dissolved in the water. When this water falls upon land the whole of the organic matter is arrested by the soil and utilised in the support of the dense vegetation which characterises these regions. Purified by the most efficient form of filtration, through clean soil, the water joins the stream free from all liability to putrefaction. When it falls directly on the sea, it remains in the surface layer where it is exposed to all the power of the sun's light and heat. In these regions calms prevail, and oxidation may easily go on too rapidly for the immediate replacement of the removed oxygen. The greatest deficiency of oxygen in these regions only amounts to one per cent. In a liquid in a state so near to complete saturation, renewals are only effected slowly.

In distilled or rain water it is admissible to compare the carbonic acid with the oxygen, which is deficient, and to consider them to some extent as mutually interdependent. In sea water no such comparison can be made, because the carbonic acid is present in it in such abundance, and is retained in it by an affinity much stronger than that caused by absorption. While the amount which is present in virtue of absorption from the atmosphere cannot exceed a cubic centimetre and a half, the amount actually present which can be eliminated by boiling with chloride of barium solution rarely falls below 10 c.c. even in the warmest regions and at the surface, while in the cold water of the bottom of the oceans it may amount to as much as 40 c.c. per litre. According to Professor Dittmar's experiments, sea water of the lowest temperature met with cannot contain more than 8·18 c.c. of oxygen per litre, hence the maximum amount of carbonic acid which can be due to the consumption of oxygen by carbon after the water has left the surface is 8·18 c.c. It was rare to meet with water which had lost one-half of its oxygen, while a loss of one-third was not uncommon. Hence not more than from 3 to 4 c.c. of the carbonic acid present in a water from the bottom or intermediate depths is likely to have been produced at the expense of the oxygen which it held dissolved. The carbonic acid eliminated by distillation from such waters varies from 15 to 40 c.c., it is therefore altogether impossible to trace in it the oxygen which is deficient.

The amount of carbonic acid present in the gas tubes along with the oxygen and nitrogen has been extracted by boiling *in vacuo*, and therefore deserves attention. In the gases from surface waters it averages about 15 per cent. of the total gas, there being very few cases even in the coldest waters where it exceeds 20 per cent. In bottom waters it averages 27 per cent., in several cases it exceeds 40, and in one case reached 50 per cent. In intermediate waters from 300 fathoms and greater depths, it averages 25 per cent., the maximum being 40 per cent. The amount of carbonic acid extracted in this way from bottom and intermediate waters is therefore much greater than can be taken from surface water, although the average amount of loosely bound or free carbonic acid as