

Temperature, C.	CO ₂ Milli- grammes per Litre.	Remarks.
54.0	63.9	
54.0	80.0	Freshly drawn.
26.0	14.5	Allowed to stand till the temperature fell from 54° to 26° C.
22.0	0.0	Allowed to stand two hours outside of port, while temperature fell to 22° C.
31.5	48.5	From hold tank.
22.0 (?)	0.0	The same allowed to stand some time outside of port.
53.0	65.7	Fresh from condenser.
29.2	80.0	Fresh from hold tank.
18.3	0.0	The same allowed to stand outside port.

The amount of carbonic acid in the freshly collected distilled water is thus very large, notwithstanding the high temperature of the water. The unstable condition of the mixture is shown by the rapidity and completeness with which the carbonic acid disappears when exposed to the air. The results show also in a very evident way that in sea water there can be no appreciable amount of really free carbonic acid. If much more be found than is required for the formation of bicarbonate, then it is retained by some other agency than the absorptive power of the water itself.

With regard to the dissociation tension of carbonic acid in sea water, Professor Dittmar writes: ¹—

“Considering that at a temperature of 18° to 21° C. the dissociation tension of the bicarbonates in sea water is 5 ten-thousandths of an atmosphere, at temperatures not differing by more than one or two degrees from 0° C., such as prevail in the Arctic and Antarctic Regions, it is far more likely than not to fall below 3 ten-thousandths, which is about the partial tension of the carbonic acid in the atmosphere. Admitting this, and assuming that at a given time the ocean everywhere contained its surplus base as sesqui-carbonate, then the water of the tropics would constantly give out carbonic acid to the atmosphere, and tend to raise its 0.0003 atmosphere of carbonic acid pressure to the dissociation tension corresponding to the temperature. Passing now from the Equator, either way, to colder and colder latitudes, this carbonic acid emission becomes less and less intense, until, in a certain belt of temperature which prescribes to the dissociation tension the value 0.0003, this emission becomes *nil*,

¹ Phys. Chem. Chall. Exp., part i. p. 212, 1884.