

carbonic acid was first absorbed by a strong solution of caustic potash; and subsequently the oxygen was absorbed by the addition of pyrogallic acid, the remaining gas being assumed to be nitrogen.

The results of the analyses were always corrected to the standard temperature of 0° Cent., and to 760 millimetres' barometric pressure, for comparison among themselves and with others. In nearly every case the duplicate analyses from the same gaseous mixture agreed closely, if they were not identical.

(3) The examination of the sea-water for organic matter was made according to the method detailed by Prof. Miller in the Journal of the Chemical Society for May 1865, with an addition suggested by Dr. Angus Smith. Each sample of water was divided into two; to one of these a little free acid was added, and to both an excess of a standard solution of permanganate of potash. At the end of three hours the reaction was stopped by the addition of iodide of potassium and starch, and the excess of permanganate estimated by a standard solution of hyposulphide of soda. The portion to which free acid was added gave the oxygen required to oxidize the decomposed and easily decomposable organic matter; the second portion gave the oxygen required by the decomposed organic matter alone, which was usually from about one-half to one-third of the whole.

The following is a summary of the total number of observations, analyses, &c., made during the three cruises respectively:—

	First Cruise.	Second Cruise.	Third Cruise.	Total.
Specific-gravity determinations .	72	27	26	125
Duplicate gas-analyses	45	23	21	89
Organic-matter tests	137	26	32	195

Specific Gravity.—The specific gravity of surface-water was found to diminish slightly as land was approached; but the