

whether the collection would be good or not before the dredge came to the surface—drawing his inference from the results of his analyses of the gases of the bottom-water. In each case his prediction was justified by the result.

	STATION 17. 1,425 fms.	STATION 19. 1,800 fms.	STATION 20. 1,448 fms.	STATION 21. 1,476 fms.
Oxygen	16·14	17·92	21·34	16·68
Nitrogen	48·78	45·88	47·51	43·46
Carbonic acid . .	35·07	36·20	31·15	39·86
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	100·00	100·00	100·00	100·00
	Good haul.	Good haul.	Bad haul.	Good haul.

In the analyses made of the water in the cold area, and generally in the third cruise, there appears, as might be expected from the various currents, &c., a greater variation in the results than in the other series. In the bottom and intermediate waters the nitrogen appears to be rather in excess of the average, and the carbonic acid has a large range of variation—from 7·58 per cent. at Station 47 (540 fathoms, temp. 43°·8) to 45·79 per cent. at Station 52 (384 fathoms, 30°·6 Fahr.). The average of the surface-waters is much the same as in the other parts of the cruise.

It may be worth notice that in localities where the greatest depth did not exceed 150 fathoms, the results of the gas-analysis of bottom- and surface-water were frequently so nearly the same, whatever the amount of animal life on the bottom, as to lead to the supposition that there might be at that limit a sufficient circulation, either of the particles of the water itself or of the gases dissolved in it, to keep the gaseous constitution alike throughout. The coincidence of this depth with the extreme depth at which fish are usually found to exist in these seas is suggestive.

Organic matter.—With a view to test the method of analysis by permanganate of potash, two or three series of analyses were made where fresh and salt water mixed together, as in Killibegs Harbour, Donegal Bay, &c.; and the results in all cases justified the expectation formed, that the amount of permanganate was an index of the comparative purity of the water, both as regards the “decomposed” and the “decomposable” organic matter.