

face specific gravity due to differences of salinity along the section are very small, and that, with the exception possibly of Station CCCXXIII., which is abnormal in many respects, they depend mainly on the rain-fall.

The difference between the mean surface specific gravity, the temperature reduced to $15^{\circ}56$ C., and the mean bottom specific gravity under the same conditions is also very slight. The actual specific gravity at every point is practically determined by the temperature; and consequently the bands of equal density are, like the bands of equal temperature, virtually continuous with those of the Southern Sea.

The Amount of Carbonic Acid contained in Sea-water.—I give in Appendix C to this chapter a table of carbonic acid determinations from Mr. Buchanan's "Laboratory Work;" and the substance of the few following remarks on the subject is taken from his preliminary report ("Proceedings of the Royal Society," vol. xxiv., p. 602 *et seq.*).

The carbonic acid, when boiled out of the water, was received by baryta-water of known strength; its consequent loss of alkalinity was measured by hydrochloric acid of corresponding strength. Having observed that the presence of sulphates in sea-water is one of the potent agents in the retention of the carbonic acid ("Proceedings of the Royal Society," vol. xxii., p. 483 *et seq.*), Mr. Buchanan always added 10 cubic centimetres of a saturated solution of chloride of barium to the water before commencing the operation. This facilitates greatly the liberation of the carbonic acid, and also causes the water to boil tranquilly, even to dryness, without showing any tendency toward bumping. The quantity of water used has been almost invariably 225 cubic centimetres, and the property possessed by sea-water of retaining its carbonic acid with great vigor makes it possible to perform the determination of it even a couple of days after its collection.

As in the great majority of cases, where the carbonic acid