

For comparison of barometer and measures of heights, it appears that the aneroid barometer constructed by Goldschmid, of Zürich, would be very useful. It is very desirable that the state of the barometer and thermometer should be read at least every two hours.

II. CHEMICAL OBSERVATIONS.

1. Samples of sea-water should be collected for chemical analysis at the surface and at various depths, and in various conditions. Each sample should be placed in a Winchester quart glass-stoppered bottle, the stopper being tied down with tape, and sealed in such a manner that the contents can not be tampered with.

2. Portions of the same samples should be, immediately after their collection, boiled *in vacuo*, the gases collected, their volume determined as accurately as may be, and a portion, not less than one cubic inch, hermetically sealed in a glass tube, to be sent home at any time for complete analysis.

3. Frequent samples of sea-water taken at the surface, and others taken beneath, as opportunity offers, should have determinations of chlorine made upon them at once, or as soon as convenient.

This operation could easily be carried on in any but very heavy weather. On the other hand, it is not thought that any trustworthy analyses of gases could be made on board ship, unless in harbor or in the calmest weather.

4. Such samples of the sea-bottom as are brought up should be carefully dried and preserved for examination and analysis.

5. The gas contained in the swimming-bladders of fishes caught near the surface and at different depths should be preserved for analysis. In each case the species, sex, and size, and especially the depth at which the fish was caught, should be stated.

III. BOTANICAL OBSERVATIONS.

The duties of a botanist in traveling are twofold, and in the case of the voyage of circumnavigation about to be undertaken by H.M.S. *Challenger* they are of equal importance.

Of these, the one refers to forming complete collections of the plants of all interesting localities, and especially of the individual islands of oceanic groups.