

THE EXPLORATION OF THE ATMOSPHERE AT SEA BY MEANS OF KITES.

FOR some years past, kites have been persistently and successfully employed by Mr. A. L. Rotch at his observatory at Blue Hill, U.S.A., for obtaining a knowledge of the movements,

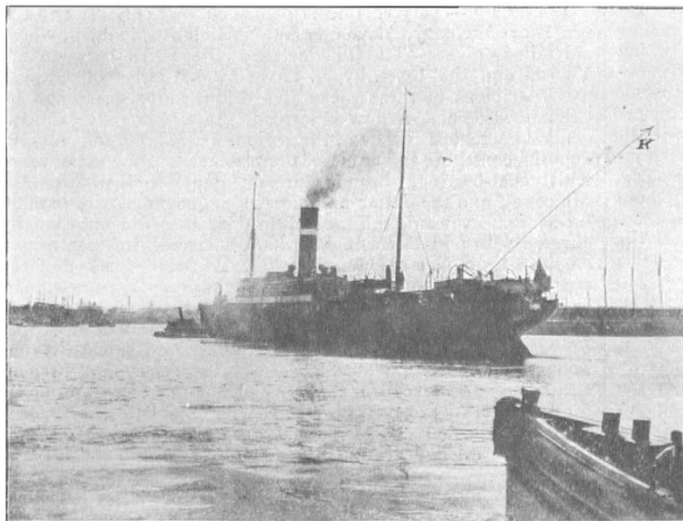


FIG. 1.—S.S. *Commonwealth* leaving Boston (kites were flown from K).

temperature and humidity of the upper air, and heights of three miles have been reached; their use was also systematically begun about the same time on the continent of Europe, especially at M. Teisserenc de Bort's observatory at Trappes, near Paris, where altitudes exceeding those at Blue Hill have been attained. We have also frequently referred to similar experiments both with kites and balloons made at the request of the International Aeronautical Committee. Valuable results have been obtained and published, so far as the land is concerned, and experiments will, we believe, be undertaken in this country under the superintendence of the Royal Meteorological Society. But in order to raise the kites to any considerable height, a wind of certain velocity is necessary. Mr. Rotch's flights were made when the wind velocity on the ground was between twelve and thirty-five miles per hour, and he points out that certain types of weather, such as anti-cyclonic conditions, with very light winds, or stormy conditions, can rarely be studied by that means.

The prediction of weather for a day or so in advance has been brought to considerable perfection by the combined efforts of various meteorological services and the publication and study of synoptic weather charts; but further progress is necessary, and we believe that it is to the investigation of the upper air, especially if, as has been suggested, observations could be carried out in equatorial and trade-wind regions, where the changeable conditions of our latitudes do not exist, that further advance in weather knowledge may be confidently expected.

The plan proposed in a paper recently communicated to the Royal Meteorological Society by Mr. Rotch, and published in its *Quarterly Journal* for January last, with reference to the extension of kite observations to the sea, will doubtless lead to important results, and such observations will show whether the conditions prevailing over the ocean differ materially from those existing over the land. We give illustrations of Mr. Rotch's endeavour to obtain data with kites sent up from the s.s. *Commonwealth* while crossing the Atlantic, through the courtesy of Captain J. McAuley. Fig. 1 shows the vessel leaving Boston on August 28, 1901, and the position from which the kites were flown, while Fig. 2 shows the installation of the kite-reel on the after-deck of the vessel.

The kites can be used on ships to better advantage than on

land. For example, even when the air is calm, by steaming through it at a speed of ten or twelve knots the kites can be raised to the height they would reach in the most favourable natural wind, and attain the altitude of the upper air-currents. During the passage of the *Commonwealth*, anticyclonic conditions mostly prevailed, and the wind blew only four to twelve miles an hour; but as the vessel steamed about fifteen knots, it was possible to use the kites on five days out of eight occupied in crossing the Atlantic. In one of the flights it was found that the air was 5°·6 warmer at a height of 130 metres than it was at the sea-level, and remained so during the afternoon (August 31). Another advantage gained by flying kites from a steamship is that wherever the observations in the upper air may be made there is always the observing station on the ship at sea-level, and not far distant, horizontally, with which to compare them.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

THE Technical Instruction Committee of the City of Liverpool is the recognised local authority through which the Board of Education deals with all the science and art classes in the city with only two exceptions. The Committee carries on its work through many agencies in an organised plan, and every year several important developments are recorded. From the Report for the year 1901 we learn that the committee again renewed the grant of 200*l.* in aid of the scientific work carried on by the Lancashire Sea Fisheries Joint Committee. A permanent sea fisheries laboratory in the zoological department of University College, under the direction of Prof. Herdman, is partly supported by this grant; and trained assistants are constantly at work in this laboratory, investigating fisheries' questions that may arise in connection with the local industries. One of the rooms of the zoological museum at University College is devoted to a permanent fisheries collection, illustrating the local fishing industries, but no part of the grant made by the Technical Instruction Committee is expended on this museum. In connection with courses of lectures to gardeners on plant diseases, given by Prof. Harvey Gibson, a

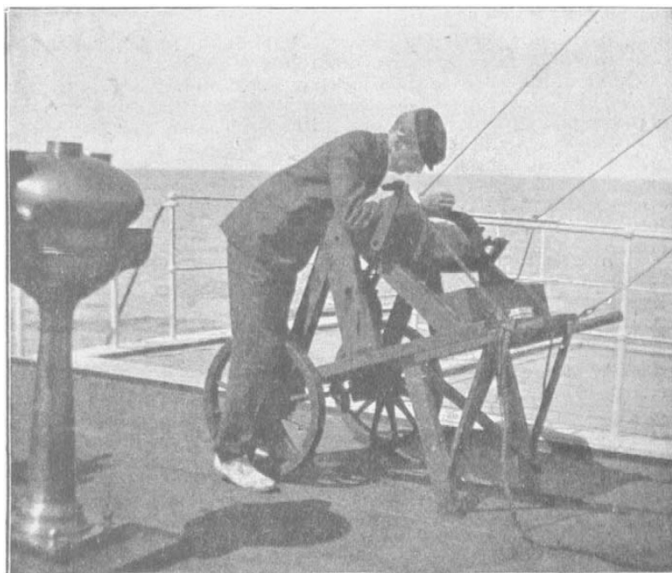


FIG. 2.—Kite-reel on after-deck of s.s. *Commonwealth*.

course of special lectures, followed by practical work in the botanical laboratory, has been arranged in the new Hartley Botanical Laboratory at University College. This attempt to show practical working gardeners the scientific methods of