

The Airman's Weather-Finder

AIRPLANE traffic between Britain and France has been greatly hampered by fog, that characteristic feature of British weather. It has often been impossible to start, or at least altogether risky to venture into the air, from the starting point at Croydon, even though reports from stations five or ten miles along the route showed clear skies; for no adequate information could be had of the extent and particularly of the depth of the fog.

Through the courtesy of the *Illustrated London News* we are able to show a clever, albeit extremely simple, apparatus, by means of which this uncertain and unsatisfactory condition has been entirely done away with. It is known that human hair contracts sharply on passing from damp to dry air. A group of toy balloons is sent up on a cord through the fog; and they carry a little device by means of which, through the stated property of human hair, a signal is given to those below when the top of the cord emerges into clear, dry air. This signal consists in the dropping down the cord of a metal ring.

The manner in which this scheme is worked out is no less clever than the general idea itself. The ring is held in place on the cord, when the instrument starts its flight by a trigger-like catch. Attached to the butt end of this catch is the hair, which passes over a little pulley-wheel that acts as a fulcrum, and then runs up for some inches through an open cage exposed to the weather. The hair is damp to begin with when the adjustment is made on starting the flight, and so long as it remains in the damp, foggy air it remains damp and nothing happens. When it reaches the clear, dry air above the top of the fog, however, it contracts; and by virtue of the purchase given it in its passage over the fulcrum, it drags the catch-off to one side and releases the ring. The latter is mounted around the cord on which the apparatus goes up, so that it falls, not freely, but down this cord. When it puts in its appearance at the lower end of this, the observers know that the top of the cord has emerged into clear weather; and, knowing how much cord they have paid out, they know how high the pilot must direct his plane in the search for fair weather.

It is contemplated installing this weather-finder at close intervals along the Paris-London route, in conjunction with radio stations. The pilots of the planes will then be advised at all times how high they must go at various parts of their journey to get clear weather, and, among other things, to avoid such accidents as the recent fatal collision in the fog. In addition, the uncertainty surrounding the question of whether a safe start might be made in thick weather would be resolved, and trips that are now lost could be made alike in safety and in comfort.

Limestone, Quicklime and Hydrated Lime for Use in the Manufacture of Glass

CIRCULAR 118 of the Bureau of Standards, for sale by the Superintendent of Documents, Government Printing Office, Washington, D. C., at 5 cents per copy, considers the quality of lime to be used in the manufacture of glass.

The paper points out that different grades of lime are required for the different varieties of glass. Thus, plate glass requires lime containing a high proportion of calcium and magnesium oxides, while cheaper glasses make use of less pure lime.

In conclusion it is recommended that limes be divided into three classes containing 96, 91 and 83 per cent of oxides of calcium and magnesium. It is also necessary that the calcium oxide content shall not vary from day to day, the maximum variation permitted being 2 per cent. All of these figures apply equally to limestone, quicklime and hydrated lime, the percentage being cal-

culated upon the nonvolatile matter of the material. Whichever material is used, it should be fine enough to pass a No. 16 sieve.

It has been further identified, on account of the small quantity present. The rose "George Dickson" was chosen for this investigation on account of its deep red color, which would indicate a fairly large percentage of the anthocyan pigment.

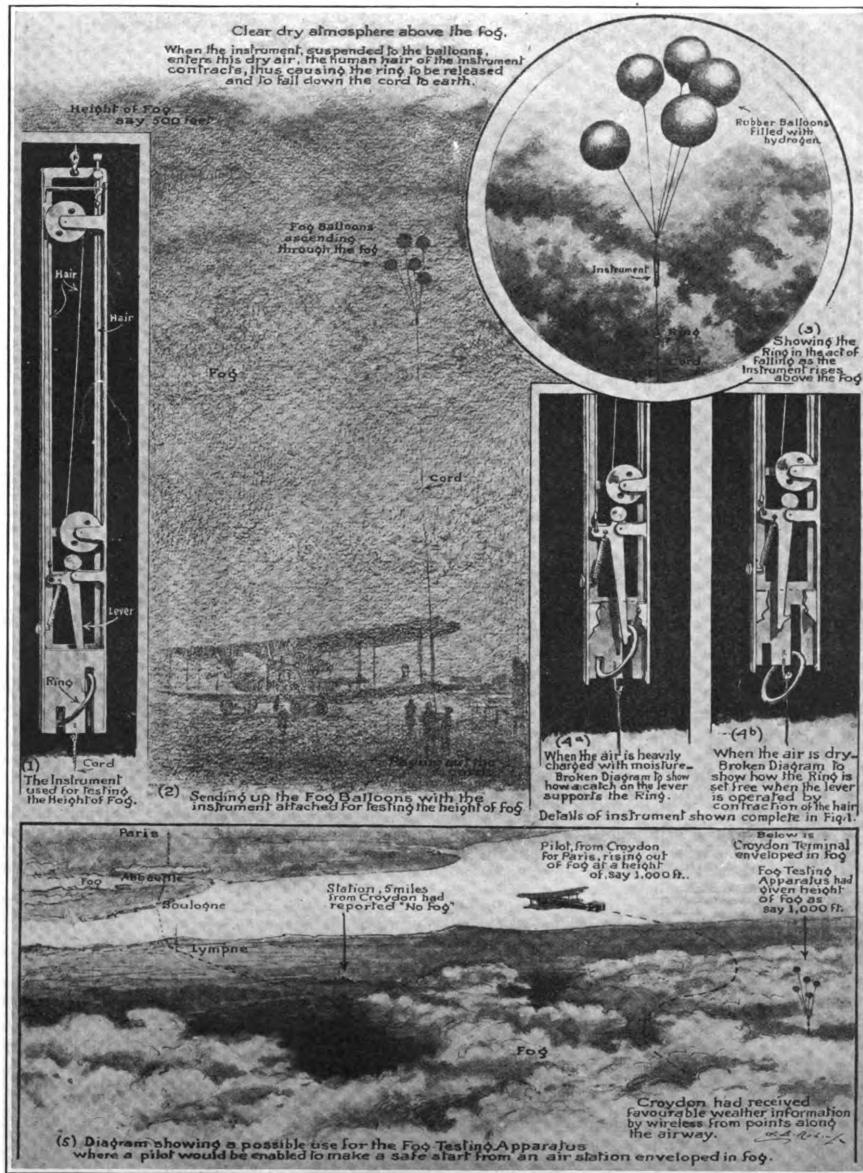
One hundred grams of the petals (which had been first air-dried in the shade, at room temperature, and finally over concentrated sulphuric acid), were allowed to stand in a closed vessel, with about 300 c. c. of methyl alcohol, containing 2 per cent of concentrated hydrochloric acid (to prevent pseudobase formation),

for about 24 hours; the mass was then pressed, to obtain as much extract as possible, and the residue treated with a further quantity of methyl alcoholic hydrochloric acid. After standing some hours, this was filtered, with suction, and as the extraction was still incomplete, the residue was again extracted with the same solvent. The residue, after filtering and washing with the same solvent. They possessed a fine, deep red color, with a bluish-violet tinge at the edge of the solution. The combined filtrates and washings were poured into about three times their volume of ether, well agitated, and allowed to stand for some hours. Practically all the anthocyan pigment separated out as a dark brown, gummy mass, from which the supernatant solution could be readily decanted.

The crude anthocyan pigment was redissolved in methyl alcoholic hydrochloric acid, and reprecipitated with ether (about two and a half times the volume of the alcoholic solution). After standing some hours, to allow precipitation to be as complete as possible, the ether-alcohol solution was decanted off and the precipitate allowed to stand for 24 hours in contact with a mixture of methyl alcohol and glacial acetic acid (to remove impurities capable of being hydrolysed or acetylated), and finally collected on a filter, washed with a small quantity of methyl alcohol (containing 1 per cent hydrochloric acid), and air-dried.

The dark brown powder thus obtained was dissolved in boiling water, an equal volume of ethyl alcohol (containing 3 per cent hydrochloric acid) added, and the solution allowed to cool; the coloring matter separated out in the form of dark brown leaflets, possessing a golden reflex. These were collected and air-dried. For identification purposes the anthocyanin chloride thus obtained was examined for the following properties: viz., crystalline form, color and reflex; color changes on the addition of ferric chloride to aqueous and alcoholic solutions; color of solutions in aqueous acid and alcohol; color changes with alkalis; behavior with Fehling's solution (hot and cold); color of precipitate with lead acetate; and behavior with sodium bisulphate.

On comparing these properties with those given by Willstätter and Nolan for cyanin chloride, they were found to be identical; the anthocyan pigment of the red rose "George Dickson" is, therefore, the di-glucoside cyanin.—G. Currey in the *Proceedings of the Royal Society for March, 1922.*



The details of construction and operation, and some of the suggested uses, of the latest device for sounding the thickness of fogs and locating the clear zone above them