

Meteorology and Air Routes.

THERE are few forms of transport which are not influenced to some extent by meteorological conditions, but there is none which makes greater demands on meteorological science and practice than the aeroplane and the airship. The importance which is attached by the Air Ministry to the provision of the necessary meteorological advice and organisation in connexion with the development of Empire air routes is rendered evident by a document recently issued under the title of "The Approach towards a System of Imperial Air Communications" (H.M. Stationery Office, price 5s.). This document consists of the memorandum by the Secretary of State for Air laid before the Imperial Conference, 1926, together with the report of the Imperial Air Communications Special Sub-Committee. The memorandum contains appendices giving a clear statement of the principles governing the application of meteorology to air navigation, both as regards investigational work and as regards the provision of a ground organisation along the routes. At the same time, the main portion of the memorandum sets out, in the section on airships, some general remarks on the bearing of meteorological conditions on airship navigation, supported by very interesting examples of the results to date of an intensive meteorological investigation of the projected England-Egypt-India airship routes, illustrated by charts well reproduced in colours. Meteorological work for airships is in the hands of a specially created division of the Meteorological Office, and it is hinted that the aim of the work on the England-India routes is to provide for the airship pilot, information in atlas and handbook form analogous to that which has long been available to seamen.

Examples of average thunderstorm and upper wind conditions show that the 'normal' routes may differ outward and homeward, and also from month to month. Further, the pilot will find that in particular cases departures from the 'normal' route for the month will be advantageous. The memorandum reminds us that "the air and its currents are to the aircraft what the oceans and their currents are to the ships, . . ." and proceeds: "A high wind, even of gale force, should cause no more danger or discomfort to an aircraft in flight in free air than an increase of speed in an ocean current to a surface vessel in mid-ocean; but there are, however, certain atmospheric disturbances, such as tornados or waterspouts, and violent vertical currents associated with thunderstorms and line-squalls, which do constitute a potential source of danger to airships." It is then pointed out that these must be avoided by suitable choice of route, the report continuing: "It is particularly on long distance airship flights that such alteration of route will be made in order to avoid adverse and utilise

favouring weather conditions. It will, in fact, be the rule rather than the exception, for the commander of an airship to choose his route between any two points for each separate flight, having regard to the meteorological conditions prevailing at the time." An example is reproduced from a special series of daily weather charts for a whole year covering Europe, N. Africa, and a large part of Asia, being prepared from past data to study such problems. This shows how the pilot, given the weather chart and forecasts, could have made a quicker passage in better weather from London to the Mediterranean via the west coast of France than by the more direct route via the Rhone valley.

It is not alone the navigation of airships which has made demands on meteorology. Airship mooring is requiring, for its ultimate perfection, a knowledge of the finer wind and thermal structure of the lower layers of the atmosphere and the changes with time, beyond that existing at present. The former is being investigated at Cardington (Beds.) by a special network of electrically synchronised anemometers with very open time-scale, while it is proposed to instal instruments on a mast at Ismailia (Egypt) to give a continuous record of the lapse-rate of temperature in the first 200 feet or so above the desert surface. It is thus evident that airship development is calling for information which is of very special interest to meteorologists, so that the science of meteorology should itself benefit considerably in meeting these demands.

Attention has not been confined to the England-India airship route. An appendix contains the results of a preliminary survey of meteorological conditions with the view of delimiting areas within which main Imperial airship routes may be expected to develop, and these are shown in a chart. The flying areas are in the form of strips, some hundreds of miles wide, extending from base to base. They lie mostly over the sea. In addition to the routes to Canada across the North Atlantic, there are alternative routes to South Africa, namely, via the west coast and via the Red Sea and east coast. Australia and New Zealand are reached both from South Africa and also as an extension of the England-India route. The passage from South Africa is outward by the northern boundary of the 'Roaring Forties' and back in the south-east trade belt. That from India to Australia is wholly across the ocean to south-western Australia, avoiding the well-known Java thunderstorm area.

The recommendations of the Imperial Air Communications Sub-Committee, afterwards adopted by the Conference, take cognisance of the importance of active co-operation of the Dominions in providing meteorological facilities if Imperial Air Routes are to be developed successfully.

Mycology in Great Britain.

THE British Mycological Society is one of the most vigorous scientific bodies in Great Britain, and this is reflected in its Transactions, of which vol. 11, Parts 1 and 2, edited by Carleton Rea and J. Ramsbottom, has recently been published (London: Cambridge University Press, 15s. net). Amongst its most useful activities are the spring and autumn forays, when members visit some specially chosen locality and spend several days studying lichens, mycetozoa, and fungi in the field. These forays are almost unique training grounds for students of systematic mycology, and at the same time give opportunity for the very valuable work of recording local floras and thus adding permanently to myco-

logical science. The published lists, as for example those of the Tintern and Dublin Forays of 1925 which appear in this issue, nearly always show a number of additions to the British flora and not infrequently species new to science.

The present issue contains the president's address, which is of interest as giving the views of a herbarium systematist on certain controversial problems. That such a one can write "one of the great hopes of the systematist is the phytopathologist" shows a very commendable broadening of a point of view more usual in herbaria. Mr. Ramsbottom discusses the 'species concept' at some length but in what cannot be regarded as a very helpful manner, and his sug-