THURSDAY, OCTOBER 13, 1921.

Editorial and Publishing Offices:
MACMILLAN & CO., LTD.,
ST. MARTIN'S STREET, LONDON, W.C.2.

Advertisements and business letters should be addressed to the Publishers.
Editorial communications to the Editor.

Telegraphic Address: PHUSIS, LONDON.
Telephone Number: GERRARD 8830.

The Aeronautical Research Committee.

THE report of the Court of Inquiry into the loss of R38 on August 24 has been issued by the Air Ministry. Its findings are important and disquieting. Having described what actually happened when the accident took place, the Court makes comment on the initiation and development of the design. Briefly summarised, the report states that a great advance on previous British airships was made with insufficient preparation and with an unsuitable organisation. It is stated that further inquiry is being made by the Aeronautical Research Committee. It is of interest, therefore, to turn to the recently issued Report[1] of that body and to read the notes relating to experiments and research on airships. Pages 11 and 21 will be found to be connected intimately with R38 and other airships, and a relevant extract is given later in this article.

In addition to the importance given to it by the accident, the Report of the Aeronautical Research Committee for the year 1920–21 is a document of considerable general scientific interest. Not only does it give an account of work done, but it also furnishes matter for comment on the growth of a new subject, and illustrates a present-day tendency to widen the idea of research to cover anything new. It is self-evident that the pursuit of new things is not necessarily desirable, and if due economy is to be observed, either a return is required to the older usage of "research" to mean progress, or a new word is necessary to express the latter idea.

At present there is a Directorate of Research in the Air Ministry, as well as the Aeronautical Research Committee, and the Report under review indicates a confusion of functions. In many respects the older organisation was better, and consisted of a Technical Department in the Air Ministry, an advisory committee to which it could refer new problems, and research establishments at the National Physical Laboratory and the Royal Aircraft Establishment for the assistance of the Committee. When first formed in 1909 by Mr. Asquith, the Advisory Committee for Aeronautics consisted of a small number of men of science dealing with an undeveloped subject; the state of aeronautics compelled them to look for general knowledge and to leave application to the internal working of the Admiralty Air Department and the Directorate of Military Aeronautics.

During the war, as in many other branches of science, extension of the boundaries of knowledge of aeronautics almost ceased in the endeavour to apply to warfare the results of earlier research, with the consequence that the Advisory Committee became almost wholly occupied with technical matters. The references were so numerous that sub-committees were formed to deal with separate branches of the subject. An organisation essentially of war type has now become a regular part of the peace system of the country, and has been called the Aeronautical Research Committee. On pages 4, 5, and 6 of the Report appear lists of the *personnel* of the various Committees, and, in spite of the repetition of names, the lists indicate a very large body of people acting as advisers. The number appears to be out of all proportion to the staffs available for carrying on research, and can be justified only, if at all, on the ground that the members are there as technical experts, and not as supervisors of research.

The Committee has no executive powers, and work for it is carried out at the National Physical Laboratory through the Department of Scientific and Industrial Research, or at the Royal Aircraft Establishment through the Directorate of Research. In such circumstances it is clear that sympathetic administration is needed if progress is to be possible; at the present moment the con-

[1] Report of the Aeronautical Research Committee for the year 1920–21. Pp. 52. (London: H.M. Stationery Office.) Cmd. 1458. 3*d*.

ditions for success appear to be non-existent. The Report (page 11) says:—

"The Committee have learnt with great regret of the decision to stop or greatly to reduce all work connected with airships, and have addressed a letter to the Ministry pointing out the importance of full-scale research, not only for airship progress, but as an essential part of general aerodynamic theory upon which the design of all types of aircraft depends."

In spite of such letter no change of policy appears to have been considered, and the closing down of all research, laboratory as well as full-scale, would have been complete but for the deplorable accident to R38. It is more than possible that the disaster would have been avoided had the facilities for full-scale research asked for by the Aeronautical Research Committee during the last two years been granted by the Air Council.

As an isolated instance this would be important, but it appears rather as a typical example and a result of bad administrative arrangements in the Air Ministry and related bodies. A further abstract (page 52) says:—

"The evidence given by pilots in the course of this inquiry showed, however, that the handling in the air of large flying boats, particularly those of F type, had given considerable trouble, and it appeared that there was little doubt that the trouble with the F boats was mainly due to weathercock instability. Further it appeared that few data have yet been collected on the lateral stability and control of any type of aircraft. The subject is of such frequent recurrence, in relation to accidents, as to warrant an extended inquiry into the present state of knowledge regarding lateral control and stability: a recommendation to this effect has been put forward, and the matter is being prosecuted."

The reply—in effect—is that the Air Ministry cannot afford to maintain the only staffs capable of such inquiry, and that the information is not considered to be worth one-quarter per cent. of the annual expenditure on the Royal Air Force. The direct saving of the money now lost by the wreck of R38 would have maintained fundamental research in aeronautics for the greater part of a generation. Whilst such a policy is being followed by the Air Council it would be a delusion to suppose that the best of aeronautical research committees could be an effective safeguard against further disasters to military and civil aircraft.

One of the more striking pieces of work detailed in the report for the year is that of the Fire Prevention Sub-Committee. Not until the end of the war was attention adequately directed to the prevalence of fire after a bad landing, and this matter was taken up by the Committee. A glance through the items enumerated on page 40 suggests that matters normally entrusted to the designers of aircraft still require much attention. It should not be necessary at this period of time to include "development of a safe system of engine installation generally" and "the avoidance of rubber and other inflammable material under the cowl" in the programme of a *research* committee.

Of the various sectional programmes, that of the Materials and Chemistry Sub-Committee most nearly approaches scientific research. The assistance of the universities has been invoked and in due course a fruitful return may be anticipated. The Committee has there taken the line of encouraging the individual worker to give of his best. It is a possible line of development, since this branch of aeronautics comes as a natural extension of well-established sections of engineering. The aeronautical engineer is interested in all the mechanical engineering tests of materials, including those on fatigue, but to an unusual degree of refinement. The limits of weight of aircraft for successful flight leave far less room for error in estimating stresses than in application to such a subject as locomotive building for railways.

In relation to aero-engines, which are a normal development from heavier internal-combustion engines, a somewhat similar use of universities and schools of technology is possible. On the other hand, the provision of a high altitude test house is peculiar to aeronautics, and for many years to come training institutions cannot be expected to provide facilities. Both in the case of specialised engine research and aerodynamics generally it appears that facilities are effectively under the control of the Air Ministry, and for progress in the next decade a more enlightened policy appears to be a preliminary requisite.

There is much more of interest in the Report, which as a whole shows the utility of a body of men who can consider a subject in relation to first principles. For its share in such work it will probably be concluded that the Aeronautical Research Committee has justified its existence. It is possible, nevertheless, that a body limited to such functions would be far more effective.