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*Editorial and Publishing Offices :*

MACMILLAN & CO., LTD.,

ST. MARTIN'S STREET, LONDON, W.C.2.

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

Telephone Number: GERRARD 8830.

Telegraphic Address: PHUSIS, WESTRAND, LONDON.

NO. 2921, VOL. 116]

The Aeronautical Research Committee.<sup>1</sup>

THE report of the Aeronautical Research Committee marks another milestone in the organisation of research in one of the comparatively newer fields. A study of this report, and the list of publications during the year, emphasises the progress that can be achieved by steady systematic team work.

Since the early days of aviation when the first bold pioneer steps were taken, there is scarcely a single outstanding achievement to the credit of any individual worker comparable with those that have occurred in other fields of scientific inquiry, and yet the progress that has been made is little short of wonderful. The modern aeroplane has acquired characteristics of speed and agility, stability and control, load-carrying capacity and strength of structure, a beauty of outline and a cleanness of design, that marks it out almost as belonging to a different species from its prehistoric ancestor of only twenty years ago. It is no criticism of the band of aeronautical enthusiasts to say that much of this result has been achieved in the main by the direct adaptation of well-recognised scientific knowledge and methods to a definite concrete end. An examination of the work of the Aeronautical Research Committee shows, in fact, that the main impetus has been received not so much from any specific first-class discovery of a purely aeronautical nature, but from the large number of points of contact the subject possesses with other branches of science.

Broadly speaking, the matter dealt with by the Committee on the technical side groups itself under the triple interlocking headings of aerodynamics, power, and materials, each of which embodies a network of specialised inquiry. Decentralisation is effected by six sub-committees, namely, aerodynamics, engine, materials and chemistry, accidents investigation, air transport, and structures. The separate branches of the work in each sub-committee are then dealt with in an appropriate panel of that sub-committee. The aerodynamics sub-committee, for example, has separate panels dealing with design, stability and control, airscrews, and sea-planes, while the materials and chemistry sub-committee branches out into panels on elasticity and fatigue, light alloys, fabrics and dopes.

A glance at this scheme of subdivision indicates the extensive range of subjects that bear directly on the specifically aeronautical field, and contribute towards its development. It is evident that the design and organisation of this scheme has been achieved only as a result of careful thought and mature experience. In itself it is an experiment in the organisation of research that is well worth study, while its success is borne out

<sup>1</sup> Report of the Aeronautical Research Committee for the Year 1924-1925. Pp. 44. (London: H.M. Stationery Office, 1925.) 1s. 6d. net.

by the imposing list of concrete advances that are recorded in each annual report.

Among the numerous important papers that have been published by the Committee during the present year, an interesting feature is the rapid progress that is at last being made in the prediction of aerofoil performance. Until the development of the Prandtl vortex theory, an impasse on the theoretical side of this subject had for all practical purposes been reached, and progress in aerofoil design was only to be sought by steady systematic, if arduous, wind channel tests. The development of the Prandtl vortex theory, unsatisfactory as it is in certain respects from an abstract theoretical point of view, has opened the way to classification of aerofoils and allied parts and prediction of performance to a remarkable degree of accuracy. The most recent investigations seem to suggest that even the aerodynamically complicated airscrew will yield up its properties to this remarkable theory.

One of the more important aeronautical problems of recent years is that associated with controllability, especially at low speeds or during stalling. As a result of investigations by the stability and control panel, the characteristics required in an aeroplane to make it controllable when stalled are now understood, and it has been demonstrated that these characteristics can be introduced by means of practical modifications in the organs of control. It appears that conventional aeroplanes are defective in two respects: they have insufficient rudder power, and the ailerons, when applied, effect a turning of the aeroplane and in so doing neutralise their direct effect on roll. It has been found by analysis, and verified by experiment, that either an increase of rudder power or the use of an aileron which does not turn the aeroplane would provide the pilot with sufficient power to regain an even keel from any position and so obviate the fatal spinning dive. The most successful device so far developed seems to be a combination of a Handley Page slot on the leading edge in conjunction with a balanced aileron of the Bristol-Frise type. This advance towards the elimination of one of the most potent causes of accidents is extremely encouraging.

In the actual constitution of the Aeronautical Research Committee, a change has this year been introduced which is likely to have a profound effect on the nature of the researches which are inaugurated. Future membership of the Committee is to be confined solely to members appointed in virtue of their scientific standing rather than as representatives of definite interests, such as, for example, the Society of British Aircraft Constructors. This change goes hand in hand with a modification in the nature of the duties of the Committee, which in future is to advise the Secretary

of State for Air on scientific matters relating to aeronautics rather than on scientific and technical problems relating merely to the construction and navigation of aircraft. In view of the fact that one of the functions of the Committee is to supervise the aeronautical research at the National Physical Laboratory, it will be obvious how far-reaching this change may be in determining the nature and trend of that research.

The work of the Committee is not confined to that conducted at the recognised research stations. Grants amounting to 1500*l.* have been made to enable individual workers to pursue a number of special investigations—experimental research on redundant structures, wind tunnel and theoretical research on skin friction and on the problem of control at low speeds. A sum of 1000*l.* will be available for a similar purpose during 1925–26. From the point of view of widening the field of interested researchers in aeronautical science, no better method could be adopted. It would be interesting to know, however, what machinery there is, if any, for ensuring that such detached workers maintain sufficiently effective contact with the main body of work in progress in aeronautical inquiries adjacent to their own, as the interval between completion of an investigation and publication by H.M. Stationery Office of the numerous R. and M. Reports is often considerable.

Without the financial backing of the Air Ministry, it is evident that the greater part of this extremely valuable scientific work would never have been undertaken at this stage. In the days of its inception, the activities of the Aeronautical Research Committee were naturally dominated largely by military considerations. At the close of the War, when the need for an impetus to commercial aviation became apparent, the nature of these considerations underwent a gradual transformation. The latest orientation of the Committee, where it has practically thrown off the necessity for concentration on problems either of immediate military or of commercial utility, while still retaining intimate contact with both these spheres, is a great achievement for the scientific outlook. It was, moreover, inevitable.

### Solar Sophistry.

*Le Soleil: ses phénomènes les plus importants, leur littérature et leur explication.* Par A. Brester, Jz. Préparé à la publication par les soins du Dr. T. van Lohuizen. Pp. iv+315. (La Haye: W. P. van Stockum et fils, 1924.) n.p.

DR. BRESTER died on June 25, 1919, and this great monograph with pages  $9\frac{1}{2}$  by  $11\frac{3}{4}$  inches, is published after his death by his wife and daughter, and is edited by Dr. T. van Lohuizen. It would, therefore, be unseemly to criticise any defects in the