

THE SEVENTH WRIGHT BROTHERS LECTURE

THE Seventh Wright Brothers Lecture was presented before the Institute of Aeronautical Sciences, in the U.S. Chamber of Commerce Auditorium, Washington, D.C., on December 17, 1943, by Mr. W. S. Farren, of the Royal Aircraft Establishment, England. The subject of the lecture was "Research for Aeronautics—Its Planning and Application".

The lecturer in the course of his address dealt with the current problems of aeronautical research and outlined the character of the work of the immediate future. He also drew attention to the changes in the nature of the needed research equipment and organization that have arisen from the maturing of aeronautical development. He stated the aim of research to be twofold, (1) the discovery of how to make better aircraft and (2) to produce a theory firmly supported by experimental evidence. In a way these two aims are substantially identical. The improvement of aircraft design depends to a large extent on a very clear understanding of the nature of fluid flow under different conditions, the elastic and plastic behaviour of the materials of the structure and the production of power for propulsion. In brief, better aircraft are a result of the building-up of rational theories firmly supported by experimental evidence.

The achievements of the past twenty-five years in aeronautical research and their application to aircraft were graphically illustrated by a comparison of the S.E. 5, a single-seat fighter of the first World War, with the modern Spitfire, and the Handley Page O/400 twin-engined heavy bomber with the present-day Lancaster. The substantial reduction in the drag, increase of the power and the improvement of structural design were demonstrated with the help of the available data. The structural developments had been the result of outstanding contributions of research in the field of metal monocoque design, both theoretical and experimental.

The lecturer commented on the better status, to-day, of our knowledge of the stability and control characteristics of aircraft, and on the power plant development of recent years. The problems of the immediate future were pointed out to be concerned chiefly with compressibility effects arising from high speeds at great altitudes. Some new data on the effect of compressibility on drag as influencing the true level speed at various heights were presented. Also the critical character of the wing loading

as a function of height was indicated with the help of a diagram.

Mr. Farren emphasised the necessity for close co-ordination among the research workers, the designer, the constructor and the user, in providing information that might be used to improve future designs. From aerodynamics there is the demand for specific information 'covering the whole aeroplane including its propulsion, stability and control'. Structural research should provide schemes of design necessary for precision of form and superficial smoothness, and also discover methods to cope with new strength and stiffness requirements. Again, 'in the future it will be impossible to consider the aeroplane engine and the aeroplane as separate enterprises with conflicting requirements'. The thermo-dynamic problems will be aerodynamic also. Their joint solution will throw up more than enough of the design problems at which the power-plant engineer excels. The aeroplane designer will have to combine the contributions of all the rest into a working proposition. His task will be to provide for pressurized cabins, ice-free surfaces and the large number of new and indispensable aids to control navigation, take-off and landing. The user of aeroplanes also has a responsible role, namely, to encourage the research worker and the engineer in their difficult tasks and to support them to the full with resources in men and material. He has also the duty of contributing operational information that will guide their efforts.

In conclusion, Mr. Farren pointed out that although a great many problems of to-day will require equipment of very large size and complexity, there is still great scope for research workers on a small scale. In any case, all aeronautical research should be a co-operative effort where the assembling and co-ordination of the results of the various groups of workers is of the utmost importance. The solution of each type of problem will naturally be the primary responsibility of groups of specialists, each under a leader. The parts, however, must be welded into a whole and in this welding lies the problem of management for large aircraft establishments. Reviewing the work of the past few years, Mr. Farren felt justified in being perfectly satisfied with the record of achievement and optimistically believed in the complete success of the present effort 'in which the share of research is to provide information by which aircraft and their equipment can be steadily improved and used to greater effect'.

THE INDIAN SCIENTIFIC MISSION

AT the invitation of His Majesty's Government, a Scientific Mission consisting of seven Indian scientists are expected to proceed to England during the first week of October. Sir S. S. Bhatnagar, Sir J. C. Ghosh, Col. S. L. Bhatia, Dr. Nazir Ahmad, Prof. M. N. Saha, Prof. J. N. Mukherjee and Prof. S. K. Mitra

constitute the delegation. The Mission will also visit the United States and possibly the Dominion of Canada.

The principal object of the Mission will be to establish contacts with the scientists of allied nations and "to plan arrangements for collaboration and exchange".