AIRCRAFT ENGINEERING
Devoted to the Science and Practice of Aeronautics
and to Allied and Subsidiary Branches of
the Engineering Industry

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PRODUCTION AND THE INDUSTRY
Important Lessons to be Learnt from American Practice

A very large proportion of our space this month is taken up by one feature, the great importance and interest of which warrants our taking this unusual course, which has necessitated holding over a number of articles of a more scientific and less immediately practical nature which are awaiting publication.

The lecture read before the Royal Aeronautical Society early last month by Mr. T. P. Wright, one of the leading figures in the American industry, is one of the most outstanding contributions the Society has ever had the privilege of placing before its members and we are grateful to it for allowing us to give it a wider circulation among the members of the aeronautical community in England and abroad and for lending us the blocks from which the very large number of illustrations is reproduced.

All Mr. Wright's lantern slides are reproduced here with the exception of eight only which are photographs of various types of modern American aeroplanes which are already familiar to most of our readers and are not therefore of the extreme informative interest that make the others of such outstanding value.

It is impossible to express adequately the gratitude we feel is due to Mr. Wright for the immense amount of trouble he has obviously taken in preparing this lecture and collecting the large number of photographs used to illustrate it. No paper of anything like this magnitude and containing so much detailed information on aeroplane production has ever been published. A tribute must also be paid to the firms in the American aircraft industry who have collaborated and pooled their knowledge and experience for the benefit of the English industry in a way that is wholly admirable. This open-minded attitude and generosity in laying bare their methods to others has always characterised American industry in all fields, but we know of no instance of this public spirit so outstanding as this.

Another most impressive feature of this lecture is Mr. Wright's own breadth of mind. He is, of course, personally closely associated with the Curtiss-Wright Corporation, of which he is Director of Engineering, but one would have to search for evidence of this in the paper. He has gone far beyond the confines of his own company and has drawn impartially for information on the experience of other companies which, be it noted, are his business rivals. Such largeness of spirit is very unusual and to be recognised with respect and admiration when it appears.

The American methods of producing engineering structures have for long been the admiration of the world and have in some instances been copied in other countries. It has, of course, as we only recently pointed out, until a few months ago been

quite impossible to apply anything approaching mass-production methods to aeroplanes. But, in England at any rate, the number on order for the Royal Air Force have now reached such a magnitude that at least what may be called "series" production is possible. It is interesting to speculate on the fact that owing to these orders there is probably little doubt that the number of aeroplanes being produced in England is considerably in excess of that in the United States -- which is indeed a reversal of the traditional position. This is an important point for English manufacturers to bear in mind, because it indicates that whatever production methods it has been found worth while to introduce — and whatever machines and jigs, etc., it has been found worth while to instal — in American factories will, provided that they are sound and suitable to our needs, a fortiori be necessary for the rapid turning out of the larger number here.

Mr. Wright is particularly interesting on this question of "mass," which he calls "true," production. He says that the introduction of engineers experienced in the large-scale production possible in the motor-car industry has shown that there are a "tremendous number" of motor-car production methods which are applicable to aircraft work and helpful in reducing costs of which the American aircraft industry were not previously aware. Considering the comparatively minute quantities required to be produced by the American aircraft industry compared with the motor-car industry in that country, this is a most significant statement. The aircraft industry in this country -- apart from the "shadow" factories -- have, we believe, already learnt quite a lot in this direction, and we are confident will learn a good deal more from the close study of Mr. Wright's paper which we are sure it will receive. It will be interesting to watch what the effect of the bringing into the field of a man with the personality and experience of Lord Nuffield will be.

It is somewhat surprising to find Mr. Wright by no means over-enthusiastic on the necessity of designing from the start with large-scale production in view. It has for long been one of the chief charges brought against the British designer that he is so hidebound in his outlook, and so divorced from practical considerations, that he sets out to design an aeroplane without regard for the problems he is setting to be dealt with at a later stage in the works. Mr. Wright appears to present him with the reply to this criticism, for he advocates never losing sight of the fact that the chief emphasis, in the design, must be laid on aerodynamic and structural refinement; relying to a considerable extent on the ingenuity of the shop organization to develop a good means of producing the resultant parts. No doubt this attitude on the part of the designer can be and has been, overdone but the ingenuity of the modern works engineer, and the greatly improved tools provided for him by the machine-tool makers, is certainly nowadays capable of dealing with manufacturing problems that would have been deemed impossible only a few years ago.

Mr. Wright also has some words to say on the vexed question of "Standardization." This is a perennially thorny subject on which all that need be said here is that standardization, however desirable on production grounds, should not be carried to the point of hampering progress.

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THE EDITORIAL VIEWPOINT
Aspects of Factory Organization

The more time that is devoted to the studying Mr. Wright's lecture the more points of intense interest to everyone connected with the design and production of aeroplanes appear. The paper is encyclopoedic in its scope and it is astonishing how much has been compressed into so short a compass. In the general section at the beginning of the paper a number of matters of great importance are covered. The whole general organization of a factory is dealt with and we are sure that managing directors and general managers will find Mr. Wright's remarks give them much food for thought. We feel certain, for instance, that some English firms would gain in efficiency from the appointment of what are known in America as "project engineers." The resulting co-ordination of the efforts of the various members of the staffs of the design sections and works organizations seems to us to be of the greatest value. It is obvious that the men chosen to fill these positions must, however, be of outstanding ability with wide experience of all branches of the work and possessed of tact. They would obviously be ideal fields for the activities of the interfering "busybody" type of man who might do infinite mischief by "butting in" on the work of others unnecessarily and creating an undesirable atmosphere of antagonism.

We have already dealt briefly with the point raised on the desirability or otherwise of taking account of ultimate production in the original design of the prototype machine — on the advantage of which Mr. Wright seems by no means certain. A closely allied matter is the influx during the recent expansion into drawing offices of young recruits with insufficient experience of practical shop methods. Here, the recently introduced S.B.A.C. system of scholarships for apprenticeships should do much to help, though the effect will not be apparent for a year or two. This is, of course, bound up with the whole general question of the relative merits of theoretical and practical education — a hotly debated subject on which we have no intention of entering now. Space precludes us from dealing with a myriad other subjects brought up in the paper, both on such general matters as we have touched on and on the most detailed questions of the actual methods of jigging and producing various parts.