

THE MECHANICS OF THE AEROPLANE: A STUDY OF THE PRINCIPLES OF FLIGHT

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The mechanics of the aeroplane: a study of the principles of flight by Émile Auguste Duchêne

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ÉMILE AUGUSTE DUCHÊNE

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**A STUDY OF THE PRINCIPLES
OF FLIGHT**

BY
CAPTAIN DUCHÊNE

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TRANSLATORS' PREFACE

Books on aeronautics may be roughly divided into two classes: the former written from an exclusively mathematical standpoint, and hence intended for but a small circle of readers; the latter, of a more elementary and popular character, do not, as a general rule, pretend to treat the problem of the aeroplane from its more serious technical and scientific aspects.

The present work belongs to neither of these categories. Its purpose is to explain in terms as simple as possible, and with a minimum of formulæ, the main principles of dynamic flight; to give the ordinary reader an insight into the various problems involved in the motion and equilibrium of the aeroplane; and to enable him to calculate in the simplest possible manner the various elements and conditions of flight.

At the outset of this work it may be well to provide against possible misconception by explaining that it in no way aspires to present in final and conclusive form the intricate problems which constitute the complete theory of the aeroplane—in view of the comparative youth of the science, such an attempt cannot be made for many years to come.

In consequence, the calculations it contains are approximate only; their numerical value, in fact, is founded on the basis of experiments so few in number that, even though their results be correct, they cannot well be accepted as final.

A few words of explanation in regard to the author's treatment of his subject may be required. In the first

place it is necessary to state—and the statement will be amply borne out by a perusal of the work—that throughout recourse has only been had to the simplest elements of mathematics and mechanics. All the mathematical knowledge required to follow the various arguments and calculations is, in fact, such as is possessed by almost every schoolboy.

The author, Captain Duchêne, is one of that brilliant band of French engineer officers whose contributions to the science of aeronautics have played a part of inestimable importance in the development of the aeroplane. Born in Paris on December 27th, 1869, he entered the Génie in 1890, after passing through the usual course at the École Polytechnique. He received his captaincy in November 1897, and was attached to the fortress of Toul, at that time one of the centres of military aerostation in France. Five years ago he was transferred to the staff at Paris.

The present work was awarded the Monthyon prize in 1911 by the Academy of Sciences. Although it may have lost in the process of translation some part of that lucidity and terseness of expression that form the most admirable and characteristic features of many French scientific works, we hope that the original value of Captain Duchêne's book remains unimpaired in its English form; that it may serve to correct much loose thinking and misapprehension at present prevailing, and that it may succeed in its endeavour to establish a firm connection between theory and practice.

J. H. L.
T. O'B. H.

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