

Much criticism would be invidious; it may, however, be suggested that several of the authorities quoted are scarcely those on whose work much reliance can be placed.

In some few instances the author's own arguments appear inconclusive, as, for example, on page 224, where he does not seem to have quite a clear understanding as to the relative pressure intensities required to be borne by front and rear surfaces in order to ensure automatic longitudinal stability.

It is, however, not too much to say that this is one of those books which should be studied by everyone interested in aeronautical science.

H. F. L.

L'Aviation. By Paul Painlevé and Emile Borel. (Paris: Alcan, 1910; pp. 266; 3.50 francs.)

As an elementary text-book of the science, "L'Aviation" will not easily be surpassed, and students looking for a reliable guide to the science of flight cannot do better than procure it. The principal contents are "Le Vol des Oiseaux," "Les Orthoptères et les Hélicoptères," "Les Aéroplanes sans moteurs," "L'Aéroplane," "La Manœuvre de l'aéroplane," and "Le Rôle de l'angle d'attaque." About 80 pages at the end are devoted to theory in the shape of concise notes, which should be of considerable value to lecturers and engineers. We have studied the book very carefully, and have no hesitation in accord- ing it the highest possible praise.

Aeronautical Classics.—No. 3. "The Art of Flying." By Thomas Walker. (London: Aeronautical Society of Great Britain, 1910: 1s. net.)

The third number in this series, which has met with a gratifying reception from the Press, and is being translated into French and Russian, is a reprint of both the original editions (1810 and 1831), with all the illustrations and facsimiles of the title pages. It is to be hoped that the care and trouble obviously expended by the honorary editors upon this admirably got-up series will be rewarded by the support of all members. The profits (if any) are being devoted to the upkeep of the Library.

Model Balloons and Flying Machines. By J. H. Alexander, M.B., A.I.E.E. (London: Crosby Lockwood, 1910. 3s. 6d. net.)

The *raison d'être* of Mr. Alexander's little book is the instructions for building model flying machines, which are elaborated by five sheets of working-drawings. These are quite good, and the directions given are particularly clear and explicit. The historical part of the book does not call for serious criticism. Most of the proper names are wrongly spelt, and, among other things, the statement that "the brothers Tissandier, in 1875, voyaged, in 24 hours, in an airship from Paris to Bordeaux" seems to call for some explanation.

Bibliography of Aeronautics. By Paul Brockett. (Washington: Smithsonian Institution; London: W. Wesley, 1910. 8s. 6d. net.)

The Smithsonian Institution, to which aeronautical science owes so much, has increased the debt by the publication of a monumental Bibliography of Aeronautics. Mr. Brockett, the Assistant Librarian of the Institution, who edits the volume, deserves well of the whole aeronautical world. His immense labours are amply demonstrated by the fact that there are 13,187 entries covering the subject up to July, 1909. The book will be invaluable to librarians, pressmen, and all those in any way interested in the science.

CORRESPONDENCE

"THE FLIGHT OF BIRDS" AND "THE CONQUEST OF THE AIR"

To the Editors of the *Aeronautical Journal*

SIRS.—It is to be wished that the writers of aeronautical papers, when they do find it necessary to introduce considerations involving mathematics or theoretical mechanics, would give rather more attention than they sometimes do to seeing that their statements are clearly and explicitly put forward.

On page 63 of the April issue appears the statement, regarding bird flight: "When the wings strain forward the centre of gravity moves forward slightly. When the wings move backward for another stroke the centre of gravity moves slightly in the same direction." This statement appears at first sight at variance with the fundamental laws of mechanics, and, indeed, I fully believed at first that it was absurd. What was probably meant was

somewhat as follows: When the wings move forward the bird's motion is being retarded; when they move backwards it is being accelerated. The result is to produce an oscillatory motion of the centre of gravity in addition to the uniform motion of translation. But in harmonic oscillations the displacement is in the opposite direction to the acceleration. This gives a forward displacement of the centre of gravity in the forward stroke and a backward displacement in the backward stroke as stated.

As another instance, I would call attention to the correspondence on page 89. It seems fairly obvious that the trouble has arisen largely, if not entirely, through a confusion between "motive force" and "horse power," the former of which is equal and opposite to the resistance to be overcome, while the latter is equal to the former multiplied by the velocity of its point of application multiplied by a certain constant. With resistance varying as the square of the speed the motive force will vary as the square and the horse power as the cube of the speed. In neither of these cases is the meaning very obvious without some such explanation.

G. H. BRYAN

EMANUEL SWEDENBORG'S MSS.

SIRS,—I have pleasure in forwarding to you a translation of the notes that you ask for. The original of the document preserved at Linköping may be seen in facsimile at the Swedenborg Society's House at No. 1, Bloomsbury Street. I am not sure that they have a copy of the *Dædalus*, in which the published account appeared, but there is a copy in the British Museum. I think it is to be found under the head of Periodicals. It is an exceedingly rare work. It is to be published in facsimile by the University of Upsala as a part of their celebrations of the bi-centenary of their Scientific Society. It is not, however, to be ready till November.

JAMES R. RENDELL

ANALYSIS OF FOREIGN PUBLICATIONS

ABBREVIATIONS

Aeron. , Aeronautics (New York)	L'Aér. , L'Aéronaute (Paris)
Aircraft , Aircraft (New York)	L'Aérop. , L'Acrophile (Paris)
C.-V. , Le Cerf-Volant (Paris)	Rev. Aér. , Revue Aérienne (Paris)
D.Z.L. , Deutsche Zeitschrift für Luftschiffahrt (Berlin)	Rev. de l'Av. , Revue de l'Aviation (Paris)
Flug , Flug und Motor Technik (Vienna)	Tech. Aér. , La Technique Aérienne (Paris)
	W.L.Z. , Wiener Luftschiffer-Zeitung (Vienna)

AERODYNAMICS

- Du rôle du vent dans l'aviation. (Lorenç.) "L'Aérop." May 15
 Etude des parcours aériens. (Delens.) "L'Aérop." June 15
 Recherche du centre vélique en aéronautique. (D'Amans.) "L'Aér." April 30
 Sinusproblem und Verhältniss der Flugarbeits-grössen bei ebenen und gewölbten Flächen. (Lynkeus.) "Flug." May 10 and May 25
 Sur la résistance de l'air. (Bourlet.) "L'Aérop." April 15.
 Sur l'équilibre et la descente rectiligne de l'aéroplane. (Lecornu.) "L'Aér." April 30

AEROPLANES

- L'Aéroplane Drzewiecki. "L'Aér." June 25
 L'Aéroplane G. Brunet. "L'Aér." April 30
 L'Aéroplane "Louis Bréguet." "L'Aérop." June 15
 L'Hydro-Aéroplane "Henri Fabre." "L'Aérop." June 1
 Le biplan Maurice Farman. "L'Aérop." June 1
 Le Monoplan "Etrich 1910." "L'Aérop." June 15
 Le Monoplan "Paul Zens." "L'Aérop." May 15
 Le nouvel aéroplane de Sir Hiram Maxim. (Espitallier.) "Tech. Aér." April 15
 The Baldwin Biplane. "Aircraft." July
 The Thomas Biplane. "Aeron." June

ATMOSPHERE

- Beobachtungen über die Lichtintensität bei einer Ballonfahrt. (v. Schrötter.) "W.L.Z." July 1