

CORRESPONDENCE

To the Editor of the JOURNAL OF THE ROYAL AERONAUTICAL SOCIETY.

In re Wilbur Wright Lecture

Dear Sir,—As one who was able to join in the chorus of congratulations to Professor Melvill Jones on his delivery of the Wilbur Wright Lecture on the 31st May last, may I be allowed to add one or two remarks on the subject matter?

Three forms of discontinuity or stalling were shown. There is yet a fourth; this takes place over the centre of certain sections as, for example, double sections or sections with “wash-out” trailing edges.

The cinema made very living; by means of smoke jets, the flow of air over aerofoils, which is best seen, however, in the laboratory and which, I think I am right in stating, were first shown by a series of photographs in the AERONAUTICAL JOURNAL, Volume XIV, October, 1910, and Volume XIII, October, 1909.

These photographs, showing various forms of “surfaces of discontinuity,” or more colloquially, “stalling,” were the result of a series of experiments made by me which led to my discovery of the use of “rider” planes or “slots” and their later developments, *i.e.*, the automatically opening slot and rotating “riders” or rotors, as set forth respectively in the following journals:—

Flight.

November 20th, 1914	...	...	pages	1134-1136
September 13th, 1928	...	...	„	782-784
June 20th, 1930	...	...	page	668
July 18th, 1930	...	...	„	820

The Aeroplane.

July 16th, 1930	...	...	page	202
September 24th, 1930	...	...	pages	718-722

The Aeronautical Journal.

Volume XXXIV	...	...	pages	682-683
„ XXXIV	...	...	„	839-844
„ XXXV	...	...	„	113-115
„ XXXVI	...	...	„	332-334

The connection that I wish to draw between this Wilbur Wright Lecture and the publications quoted is this:—The lecture demonstrated that “the alternations of the flow between the two (front) forms (of discontinuity) are very rapid when thought of in terms of measurement of forces on a small model, but they are surprisingly slow in terms of the distance travelled by the aerofoil through the air. Either kind of flow can and generally does persist when the aerofoil travels through a distance of twenty or more times the length of its chord.”

It is this time element which enables rotor rider planes to exercise such outstandingly stabilising effects and also to provide a maximum amount of control over a wider range than the slot, or slot and ailerons. (See AERONAUTICAL JOURNAL, January, 1934, pages 59 to 65, and February, 1934, pages 138 to 161.)

The reason appears to be that while it is true that time is taken to change from one form of flow to another, it is equally true that time is taken to change from a steady to a turbulent or discontinuous flow or vice-versa. However, the passage of a moving plane over the surface of a stalled aerofoil cuts through the eddies and ensures a steady flow which "persists" for a time. If the moving plane travels again over the surface before incipient turbulence again sets up, the flow continues to remain steady. These moving rider planes may conveniently take the form of rotors which sweep out a "living slot" on aeroplanes or "surfaces of revolution" over the noses of aircraft provided with air-cooled engines.

Yours faithfully,
A. P. THURSTON.

11th June, 1934.