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

Dear Sir,—Are not the phenomena described by Prof. B. Melvill Jones in his Wilbur Wright Memorial Lecture (September, p. 760) the same in essence as the familiar alternating " eddy street " behind a cylinder? In the case of a symmetrical body of bad aerodynamic shape, such as a cylinder, if the Reynolds number is high enough, some small irregularity in the airflow decides on which side an eddy shall develop. The presence of this eddy then brings about circumstances favouring the development of the corresponding eddy on the other side; and the process then repeats, at regular intervals, as long as velocity, etc., are unchanged. In the case of a body of good shape, if it be symmetrical (a tail-plane, for example), the alternating eddies presumably still develop; but *they are small and consequently their period is short, so that the forces on the body appear to be constant* by any ordinary method of measurement. In the case of an asymmetrical body of good shape, such as an aerofoil at a small angle of incidence, it appears from Prof. Melvill Jones's investigations that only the one eddy—that near the trailing edge—can develop. It is small, and therefore the drag due to it appears constant, as above. When the aerofoil is stalled, the conditions become such that the other eddy, behind the leading edge, is more and more likely to develop; and it does so suddenly when a chance variation of the airflow temporarily favours its appearance. The two eddies then alternate, as they would behind a cylinder; except that, owing to the asymmetry of the body, they are of unequal size and shape, and therefore presumably of unequal period. The larger will persist for longer at a time than the smaller, if conditions favour equally the development of either. If conditions do not, then the flow may be highly irregular, one eddy repeating itself over and over again, with an occasional intervention of the other eddy when conditions temporarily favour it.

My experimental equipment consists only of a miniature wind tunnel (constructed under the influence of Mr. Farren's interesting and beautiful lecture, reported in this Journal in June, 1932), and I cannot carry the matter further; indeed, I had hoped that someone more able to deal with it would have raised the point. That it represents the facts is supported by Mr. Farren's observation (*l.c.*, Fig. 14, p. 466, June, 1932) that at low Reynolds number stalling begins at a lower angle of incidence than at high Reynolds numbers. This, presumably, represents the condition under which a cylinder trails two symmetrical eddies instead of alternating ones.

Yours faithfully,

(Miss) A. D. BETTS.

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

Dear Sir,

Miss A. D. Betts' letter of October 11th.

Since any change of lift in an aerofoil is necessarily accompanied by a change of circulation and a consequent shedding of vorticity, Miss Betts is certainly correct in associating the alternations of force, which I described in the Wilbur Wright Lecture, with the alternate shedding of eddies. The phenomenon is, however, very different from the regular shedding of alternate eddies which occurs at very high incidences. The intervals between alternations, expressed in terms of distance travelled by the aerofoil, are much longer and more irregular than those associated with the formation of the familiar Kàrmàn street, and the phenomenon is more easily described in terms of two alternative flow patterns, either of which can persist for a relatively long time, but eventually gives way to the other. Using high frequency recording lift balances, we have recently obtained records of the fluctuations of lift and drag whilst aerofoils move at various rates through the critical incidence region, and the difference in the form of the alternations from those which, at higher incidences, are due to the regular shedding of alternate eddies, is very marked.

Yours faithfully,

B. MELVILL JONES.