To the Editor of the AERONAUTICAL JOURNAL.

SIR,—As you invite discussion on the subject of Dr. H. C. Watts' recent paper in your July issue, on the subject of the theories of screw propulsion, I should like to make a few remarks.

In the first place I am in entire agreement with the view held by your contributor with reference to the inconsistency of *régime* of the modern so-called "inflow" theory of the airscrew. As Dr. Watts points out, it is the interference flow which constitutes the only physical inflow, and the neglect of emphasising this cardinal fact has led many writers on the subject into lines of thought which cannot be considered otherwise than as hopelessly irrational. At the same time, however, do not let us overlook an important factor in the evolution of any theory of screw propeller action. I refer to the precise quantity of fluid "handled" by each blade element of each propeller blade. This quantity is up to the present quite unknown *a priori*, and some assumption has to be made for it before any theory can be successfully employed in practice. This being so, we find ourselves in very much the same position as the schoolboy who makes two mistakes in his arithmetic and obtains the correct answer, through one mistake cancelling the other. It is perhaps somewhat pedantic to insist too forcibly on the irrationality of the "inflow" theory and to suggest a substitute theory which, whilst possessing a perfectly rational basis, equally fails in practical application with the first on account of a lack of sufficient knowledge in the assessment of one of the fundamental factors of all screw propeller theory. Considered as a rigid theory, the "inflow" theory is undoubtedly both irrational and inconsistent. Considered purely as a first tentative guess, as an empirical process entirely, the "inflow" theory is not open to the same objection. On the other hand any new theory, which is to be rational in basis, will have to be evolved along lines closely following the conception of a periodic flow set up and maintained by blade interference. Before such a theory can be usefully employed in practice either further knowledge of the subject in general will be necessary or certain assumptions (analogous to those used in the "inflow" theory) will have to be made. Probably the latter course will be followed, at any rate at the beginning. It is then perhaps too early to begin to congratulate ourselves on a new and fundamental discovery which is so obviously an advance on all former theories, particularly the "inflow" theory, for the reason that we shall still find ourselves handicapped by the necessity for making some assumption of a character not materially different from that employed in the despised "inflow" treatment. When further knowledge is reached, the "inflow" theory will naturally fall into oblivion, its place having been taken by a more general statement of the problem evolved upon a basis of interference flow as suggested by Dr. Watts.

I am not quite clear as to the exact manner in which Dr. Watts deduces his figures 3, 4 and 5, from the original figure 2 which is taken from S. Drzeweicki's latest work. Perhaps he would be kind enough to publish this in greater detail.—I am, yours, etc.,

M. A. S. RIACH.