

descriptions of the contributions of other investigators. This is especially true in chapter 5, which does not discuss some important ideas about the subsequent stages of unsteady flows over blunt bodies impulsively set into motion from a state of rest (that is, the eventual development of an interactive flow structure).

Another minor criticism is that the writing style and level of detail are somewhat uneven between sections. For example, the treatments in chapters 1, 4, and 5 and in most of chapter 2 are extremely detailed, whereas all of section 2.4 and certain parts of chapter 3 are much less detailed and therefore tend to be somewhat cryptic. Also, while section 3.3, on the influence of angle of attack, is well coordinated with preceding sections, the authors were not completely successful in coordinating some of the other sections. For example, Goldstein's wake equation is derived in great detail (as equation 1.64) in chapter 1 and reappears in chapter 3 as equation 3.1.11, but with very little explanation and no mention of the earlier derivation. There is also a certain amount of repetition, with ideas reintroduced as if they had not been previously discussed, and with results rederived from different points of view in different parts of the text. This is not necessarily a deficiency, because it allows the individual sections of the text to be read independently of each other. Moreover, the authors were not completely successful in their attempt to unify the notation.

Having said all that, I should also point out that the book is very clearly written, with scrupulous attention to analytical detail—somewhat surprising in view of the cryptic style that many Russian authors seem to prefer. The book is also amazingly free of typographical errors, which is especially laudable in a text containing so much mathematical analysis. The authors also do an excellent job of pointing out connections between different types of flow separations, and they even show how one type of separation can evolve from another. This information is not readily gained by simply reading the literature.

While the high-Reynolds-number theory of laminar separation discussed in this book is certainly of great theoretical interest, it is important to note that it is very difficult to maintain such flows at the large values of the Reynolds number where the theory applies—especially near a trailing edge, where the flow has ample opportunity to become turbulent. And, while laminar separations are quite common in the vicinity of a leading edge, the resulting separated flows are highly

unstable and tend to become turbulent before they reattach—which then affects the laminar flow in the vicinity of the separation point. The hope is that the asymptotic analyses developed in this book will apply at Reynolds numbers for which laminar flow can be maintained in the laboratory—and the authors give a number of experimental comparisons to suggest that this may be the case.

More than half of the book is concerned with steady separations, which (except for the marginal separations considered in chapter 4) usually exhibit the well-known "triple-deck" structure that was independently discovered by Art Messiter, Keith Stewartson, and Victor Neiland. Many of the developments described in the first half of the book were enabled by this breakthrough discovery (even though triple-decks were originally introduced to deal with unseparated flows).

Some aspects of supersonic (compressible) triple-deck theory, which is allegedly not the subject of this book, are actually covered in chapter 7, which is ostensibly devoted to numerical methods for solving triple-deck problems. The inclusion of this chapter is a very good idea, but its connection to the preceding chapters leaves something to be desired. However, the advice about the relative merits of the various methods (and other matters), which is given in its last few paragraphs, should be very helpful to any reader interested in carrying out numerical computations of separated flows.

In conclusion, I believe that this book, written by some of the top contributors to the field, will be an invaluable reference for anyone who wants to learn about the asymptotic theory of laminar separations.

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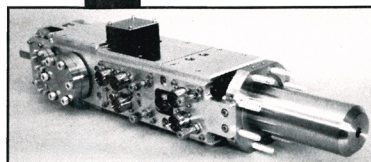
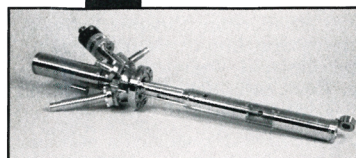
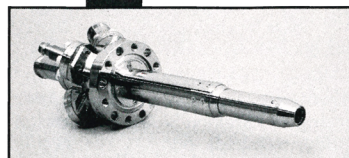
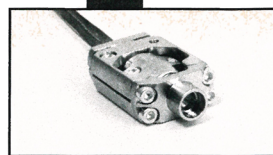
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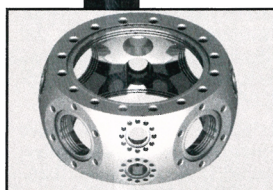
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