background in electricity and magnetism and calculus, is oriented toward the physicist, and consequently is able to use its fewer pages to reach a higher level of sophistication than the other text. Students without this background will need extra introductory material, especially if they have had little contact with electronic instruments in their undergraduate laboratory work. *Electronics for Scientists* is an excellent source for this material. It should be possible to trouble shoot many of the more common electronic instruments after having finished Hunten's book. The student using Malmstadt, Enke, and Toren, on the other hand, will find that many of the circuit types are discussed only in their simplest form, while most practical circuits have a profusion of extra components tucked in here and there that often confuse the uninitiated.

More material on the transistor and other solid-state devices would be welcome in both texts, and appendices on transistor equivalent circuits and nomenclature would also be quite helpful. If Professor Hunten would include a chapter on the transistor in his book that was as beautifully clear and informative as his chapter on feedback, he would measureably enhance the value of an already excellent work. His book mentions many tricks of the trade, and brings the reader much closer to current electronic practice than the other text, primarily because it doesn't need to provide as much background material.

Neither book says enough about the limitations imposed on a circuit by the high-frequency cutoff characteristics of vacuum tubes and transistors, but then these limitations are more important in circuit design than they are in understanding and using existing instruments. A brief review of the present frequency, noise level, time resolution, and power capabilities of the various active electronic elements would be valuable in both books, possibly in an appendix. A problem that seems to bother most students is how to go about calculating the performance of an apparently complicated circuit, for example, a straightforward multistage amplifier without feedback but with perhaps a differential stage, bypass and coupling capacitors, etc. As a result, worked-out examples indicating how some components can be ignored and how equivalent circuits can be used to their best advantage would be an improvement in either book.

Aside from the difference in level of sophistication, there is one basic difference separating *Electronics for Scientists* from *Introduction to Electronics*. *Electronics for Scientists* is arranged in such a way that a complete system of laboratory equipment and breadboard components marketed by Heathkit may be used as an integral part of the course. This equipment has been carefully thought out and tested, and is an invaluable addition to the course. It also would be a major item in the budget of many institutions. For a nonlaboratory version of the course, the extra material can easily be omitted. *Introduction to Electronics* gives only an outline of a suitable sequence of experiments in a short appendix.

Neither of the books reviewed treats microwave techniques, nor do they bring the reader quite up to the level where he may read electrical engineering texts easily. The primary extension needed to satisfy the latter requirement is a treatment of the application of Laplace transforms to electronic circuits. Practice in dealing with more complicated circuits would also be helpful. Judicious reading in the excellent references listed in either text could provide this extra material. A book in the spirit of the ones under review but bridging the gap between these books and current professional electronics texts has yet to be written. It should be.

Incompressible Fluid Dynamics. By J. N. Hunt. 127 pp. Wiley, New York, 1964. Paper $4.00.
Reviewed by Allen I. Ormsbee, University of Illinois.

This is an excellent book. In presenting a second level text in incompressible viscous flow theory, the author leads the reader from the derivation of the Navier-Stokes equations through low Reynolds number flows, laminar steady and nonsteady boundary layers, hydrodynamic in-stability, and turbulence and turbulent shear flows.

The writing is straightforward and concise—the author does not make the mistake of trying to prettify what are, in many cases, standard developments. The three chapters on laminar boundary layers are particularly well done. The discussion of hydrodynamic stability is a welcome addition to a text at this level, and the author succeeds in introducing turbulence without confounding the student while holding arm waving to a minimum.

The chapters are followed by homework problems which amplify and often extend the text material.

Relativistic Quantum Mechanics. By James D. Bjorken and Sidney D. Drell. 300 pp. McGraw-Hill, New York, 1964. $11.50.
Reviewed by J. E. Mansfield, Harvard University.

An extended text on Feynman methods has been too long in coming. This one, the first of two volumes, fills this need well and should see wide acceptance.

The program is the development of a propagator theory for particles of spins 0, ½, 1. Feynman rules are developed from a particle-wave equation and Huygens' principle, integrated with appropriate boundary conditions (hole-theory boundary conditions for the Dirac equation). Various couplings are developed heuristically; we are promised a full treatment of invariant couplings in the second volume.

From this point on, the book is mostly a description of calculation with Feynman rules. A large number of problems is treated in a small book. Quantum electrodynamics takes up the first two-thirds, and meson theory and beta decay the last third. The treatment is pedagogically good, with a large section on trace theorems and the like.

In keeping with the division of labor between this book and the one to follow, the renormalization program is defined and implemented, but finiteness in perturbation theory is not treated. This treatment is not as well unified as one might like. The renormalization difficulties are confronted successively as they come up