to treat many problems (one-dimensional, etc.) in elegant form, the statistical interpretation of the principle of duality and the uncertainty principle of Heisenberg, and the study of discrete and continuous spectra representation of wave functions. Of particular interest is the chapter devoted to linear operators in Hilbert space and the vectors associated with dynamical observables following Dirac's ideas (bra and ket vectors) and the theory of representation of such quantities in matrix form, thus building a general mathematical formalism of quantum mechanics, usually left out in a first course, and the unification of Schrödinger's and Heisenberg's descriptions of quantum phenomena. The last third of the book deals mainly with the solution of Schrödinger's equation in three variables including such systems as the hydrogen atom, two-body problems, and scattering problems by various potential fields. The concluding chapter contains a detailed analysis of the harmonic oscillator in terms of matrix representation theory.

In order to make the book self-contained, several mathematical appendixes are included with the view of facilitating the mathematical parts of the book.

A good feature of this book is the inclusion of carefully selected problems not only illustrating the theory but also complementing the material of the text.

Finally, the reviewer would like to recommend the book to students taking a beginner's course in quantum mechanics, to teachers for broadening the scope of such courses, and also to research workers in understanding the principles and methods of quantum mechanics and for acquiring the necessary knowledge for an understanding of the advanced parts of the field.

Hypersonic Flow Theory. By Wallace D. Hayes and Ronald F. Probstein. Vol. 5 of Applied Mathematics and Mechanics, editor-in-chief F. N. Frenkiel. 464 pp. Academic Press Inc., New York, 1959. $11.50. *Reviewed by R. E. Street, University of Washington.*

THE regime of hypersonic flow is difficult to define precisely. Normally it occurs when the Mach number of flight is large enough, which may be only 3 or might be as high as 10, for the real gas properties of the medium or else nonlinear terms in the equations of motion to become significant. In any case hypersonic flow theory is essentially nonlinear. While many good books on supersonic flow have appeared in the last few years, they have primarily been concerned with the linear theory and have contained only one or two chapters on hypersonic flow.

The present book is the first one on purely hypersonic flow to appear. Even though the subject of high-temperature gas dynamics has been omitted, there was still so much other material left that some topics are outlined rather than fully developed. In particular, the reader is assumed to have a thorough knowledge of compressible fluid dynamics such as the contents of the well-known texts by Liepmann and Roshko or Shapiro. The subject is approached from the fundamental point of view of basic theory. By discussing the physics of the flow and outlining the mathematical development the book reads more smoothly, but the serious student will have to spend considerable time filling in the details. Applications are omitted and experimental data only used to compare with theory. The large number of references given will be useful as the reader is often referred to them for more information.

Some of the topic headings are as follows: shock waves, small-disturbance theory including similitude, Newtonian theory, constant-density solutions, thin shock layers, blunt body flows, shock-expansion theory, tangent-wedge and tangent-cone, viscous flows, weak and strong interaction, vorticity interactions, and finally free-molecule and rarified gas flows. As the first effort to collect and correlate all of these diverse topics, the book is quite an achievement. Considerable new results, due to both authors and as yet unpublished, are incorporated and help the exposition of several topics. In most cases many confusing concepts and statements which have occurred in the literature have been clarified but now and then there is a lapse and some arguments remain unclear. Actually some theories are not too well established, particularly in the case of viscous flow; but this is probably to be expected in a book which takes the reader right up to the forefront of a rapidly developing field. A few more diagrams in the right places would have helped, for instance, in the sections on similitude and strip theory and in the unsteady Newtonian flow. A slightly frustrating feature is that of some 280 references about 35 are unpublished documents which are not always available. In future editions these ought to be eliminated by incorporating the material into the book if it is still important enough.

Other and probably more simple texts will appear in this field but this one will no doubt remain as the principal reference and inspiration to the hypersonic aerodynamicist, at least until present theory is superseded by more complete and mature understanding of a very complex flow regime.

The Measurement of Power Spectra: From the Point of View of Communications Engineering (Reprinted from 1958 Bell System Tech. Jour.). By R. B. Blackman and J. W. Tukey. 190 pp. Dover Publications, Inc., New York, 1959. Paperbound $1.85. *Reviewed by T. Teichmann, Lockheed Missiles and Space Division.*

EVER since the time of Bernoulli it has proved mathematically convenient and physically perspicuous to analyze mathematical functions and physical phenomena into series of suitably chosen vibrations. As the complexity of the problems examined increased, and as extraneous factors, such as inaccurate measurement and noise, began to make their appearance, it became clear that the significant frequency components could not easily or conveniently be obtained by simple