

essentially on molecular distribution functions, such as have been in general successful in describing the properties of gases.

Lattice theories of the liquid state start from the assumption that there exists in a liquid some kind of order or structure reminiscent of that which characterizes the crystalline solid, though it is recognized that the structure must necessarily be much looser, changeable at any place with time, and decisive in producing the observed properties of the liquid only through the average values calculated from it. The methods discussed by the author are the "cell" theories, in which a regular lattice structure is postulated with all sites occupied, the "hole" theories, in which some of the lattice sites are unoccupied, the "tunnel" type of theory, in which a tunnel, through which a whole line of molecules can move, replaces the single cell, and the "Monte Carlo" theory, which assumes that the volume available for molecular motion is divided up into large cells, each containing many molecules. The last-named method essentially involves averaging over ensembles of molecular configurations.

The author discusses these various methods in turn, devoting indeed most of his attention to the "cell" theories. It is assumed that the reader is acquainted with the basic principles of statistical mechanics. Armed with this equipment he will find the book a useful summary of present knowledge. The shortcomings of the available theories of liquids are candidly set forth, and the challenge which this difficult state of matter still presents to the theorist is clearly presented.

Radio Exploration of the Planetary System. By Alex G. Smith and T. D. Carr. 148 pp. Van Nostrand, Princeton, N. J., 1964. Paper \$1.50.

Reviewed by H. J. Hagger, Albiswerk Zürich, Switzerland.

It is astonishing that most radio astronomers are interested in radio emission from sources in deep space and from interstellar matter, but only a few scientists are eager to learn more about the members of the solar family by using radio telescopes.

A. G. Smith and T. D. Carr, two radio astronomers from Florida Radio Observatory, have undertaken the task of writing a booklet on the radio exploration of our solar system for students and other people having an understanding of physics and an interest in the subject. The first two chapters deal with a historical survey of radio astronomy and with the tools and techniques a planetary radio astronomer uses. In very simple but concise language the basic experimental and theoretical features of the subject are described. In chapter three the authors start with some general remarks on thermal radiation and its relationship to temperature, later on they discuss the temperature measurements taken from planets at different wavelengths. The discrepancies of Venusian temperature measurements are explained from the point of view of transparency of the planet's atmosphere to frequency. In chapter four the most interesting planet of our system, Jupiter, is investigated both with regard to its thermal radiation and to the nonthermal microwave emission which a radiation belt is considered responsible for. In chapter five the authors deal with the sources of planetary radio signals, discussing plasma dynamic explanations for nonthermal radiation, and again Jupiter as a radio source is of topmost interest. At the end of the chapter the question remains open whether or not Jupiter is actually the only planet showing radio emission of nonthermal origin. Radar astronomy, the subject of the next chapter, is mostly used for meteor investigations, but conclusions about the nature of the surface of planets may be drawn from radar echo measurements. The last chapter relates radio astronomy to man's exploration of space and gives an outlook into future projects which may try to answer the question of the existence of intelligent life in other planetary systems.

This booklet may be considered to a certain extent a supplement to Steinberg and Lequeux's book *Radio Astronomy* reviewed previously (*Physics Today*, June 1964, p. 58), but considered separately this booklet stimulates the wish to take part in

planetary exploration by radio. The authors have solved the problem of explaining the radio mysteries of our solar system in a nice and concise manner. The graphs shown are easy to read and to understand, the selected photographs of instruments and objects under investigation are welcome, and the references given and the index are very helpful. Thus I can highly recommend this book to everyone interested in radio astronomy and in our solar system in particular. Even a reader with a non-specialized physics background may easily understand and enjoy the book.

Functions of a Complex Variable and some of their Applications. By B. A. Fuchs and B. V. Shabat. 389 pp. Hindustan Publishing Corporation, Delhi, 1962. Rs 35.00.

Reviewed by J. Gillis, Weizmann Institute of Science, Israel.

It is clear from the material in this book that the Russian original must be excellent. After all it is not easy to say anything terribly new in the classical theory of functions of a complex variable at the level of the advanced undergraduate and early graduate student. Such textbooks can really differ very little from one another except as to titbits of useful explanation and the choice of examples, and in these respects the book under review definitely scores. There is a careful exposition of fundamentals and these are abundantly illustrated by interesting applications, including some to electrostatics and classical hydrodynamics. And one must praise the selection of real integrals evaluated by means of residues. For once we have a book with examples different from those which have appeared with dismal regularity in every previous textbook known to the reviewer.

Unfortunately the standard of the translation is low. The English style is worse than poor, and theorems are stated in such a slipshod manner that the book is more liable to harm students than help them. Thus Liouville's theorem is extended to the proposition, "If the function $w = (z)$ be regular in the whole open plane and does not take up values corresponding to a certain curve in