general is a pre-requisite but not necessarily a knowledge of parasitology. Be that as it may, the reader who already knows something about parasites will get fuller enjoyment from reading this interesting and absorbing account, written in the author's inimitable style, of the various host–parasite relationships. Some parasitologists may not agree with all the author's points of view and may have doubts, misgivings and reservations, which would meet with Prof. Cameron's approval and sympathy, for no one knows better than he how one's personal views depend largely not only upon one's idea of what constitutes parasitism, but also upon one's approach to, and interpretation of, any given 'facts' about parasitic life. J. N. OLDHAM

IONIZED GAS IN PHYSICS AND IN ASTRONOMY

Physics of Fully Ionized Gases

By Lyman Spitzer, Jr. (Interscience Tracts on Physics and Astronomy, No. 3.) Pp. ix+105. (New York: Interscience Publishers, Inc.; London: Interscience Publishers, Ltd., 1956.) Paper, 1.75 dollars; hard cover, 3.50 dollars.

THIS slender volume, the third of a series of "Interscience Tracts on Physics and Astronomy", contains a comprehensive and accurate introduction to the study of physical phenomena exhibited by fully ionized gases. Both in electronics and astrophysics the interest in different manifestations of ionized gases has of late been growing; and its urgency has been enhanced by the fact that the behaviour of such gases is likely to be quite different from that of neutral gas of the ordinary kinetic theory. In point of fact, in certain respects it is likely to be simpler; for most quantum-mechanical effects (except, perhaps, for interaction with the radiation field) can legitimately be ignored; and, likewise, the encounters between charged particles in ionized gas become simplified owing to the long-range character of the inverse-square forces involved. Although the basic physical principles are thus simpler than in an ordinary gas, the actual motions of gas particles become more complicated; for the ordinary hydrodynamical equations governing their motion must be coupled with Maxwell's equations. In the presence of a magnetic field this coupling gives rise to a whole class of novel phenomena (hydromagnetics); and even in the absence of such fields the electrical properties of ionized gas admit of motions which have no parallel in neutral gases.

To which of the two fields of science—physics or astronomy—should the present tract be considered to belong? Its subject has, in recent years, become quite *à la mode* among some astrophysicists, who are apt to regard the more thoroughly studied branches of their science as 'worked out', and to whom the vistas opening with the combination of hydrodynamical and Maxwell's equations seem to offer an unlimited ground for practising their physical insight or manipulative skill. Yet the fact remains (which is perhaps not made sufficiently clear by the author of the present book) that the connexion between theories of fully ionized gases and their experimental verification remains still quite tenuous—both in the laboratory (plasma oscillations) and in the study of certain celestial phenomena (sunspots, or magnetic variable stars being the most conspicuous cosmic examples necessitating hydromagnetic treatment for their understanding). Although some observational data are available on certain aspects of these subjects, their discussion has been entirely excluded from the volume under review, and its contents restricted to those topics which may serve for a theoretical understanding of the subject. This deliberate policy may have helped to keep the size of the book within its modest limits; and a restriction to fundamentals will no doubt extend its useful lifetime.

However, the fact that the gap between theoretical foundations and their possible application to practical cases has been left so wide is probably the most serious criticism of the book which can be raised. Some readers may feel that the book does not bring, at times, its subject sufficiently 'down to earth', and its readability leaves occasionally something to be desired; but its accuracy and reliability as a source of theoretical information should be nowhere in doubt. Like its two predecessors already published in the series of these Interscience Tracts, this present book should thus be viewed primarily as a contribution to physical, rather than astronomical, literature. It should, however, be of interest, not only to research students, to whom it is primarily addressed, but also to all physicists and astronomers interested in a gradual merger of two great physical theories—hydrodynamics and electromagnetism—into a single edifice.

ZDENEK KOPAL

THE TRANSITION FROM CLASSICAL TO MODERN PHYSICS

Modern Physics

By Prof. John C. Slater. Pp. xi+322. (London: McGraw-Hill Publishing Company, Ltd., 1955.) 39*s*. 6*d*.

THIS book describes the development of theoretical physics during the past sixty years. An introductory chapter on the atom in nineteenth-century physics prepares the ground for a chapter on electron theory and relativity and another one on the beginning of quantum theory. The next five chapters are concerned with the development of the Rutherford–Bohr atom in the period 1912–26. Up to this stage Prof. J. C. Slater uses only elementary mathematics (easy algebra and occasionally calculus). When he comes to deal with the wave-mechanics and its applications, partial differential equations and solutions in terms of Legendre polynomials are used, though he still avoids matrix multiplication and general ideas of operators. The final chapter, on nuclear physics and fundamental particles, is almost entirely non-mathematical and is perhaps the most clearly expressed in the whole book. Rather little space (about ten pages) is devoted to the special theory of relativity. The general theory of relativity and modern field theory are not included. The numerous examples given at the ends of the chapters (with solutions at the end of the book) are of a kind very useful to the student of average ability.

The author says, in the preface, that he wished to write a book which would be suitable not only for the professional physicist but also for "students of history, of human thought and of general culture". He therefore restricted the mathematics "to a rather low level"—which is in fact an impossibly high level for most students of history and general culture. I cannot share the author's belief that the general