years at Yale. Its chief novelty is contained in the analysis of recent problems involving the solution of the Vlasov equation in finite geometries.

In a short second paper Bernstein presents an interesting treatment of electron distribution functions in weakly ionized plasmas.

Perhaps the most unique of the three articles in the volume is the last one in which E. G. Harris, of the University of Tennessee, shows the value of treating nonlinear phenomena in plasmas by the quantum mechanical method, even though he pushes all his calculations to the classical limit. In a way this would seem a curiously complicated way of treating classical plasma phenomena, but Harris demonstrates with considerable skill that much is to be gained by the quantum-mechanical viewpoint even in dealing with classical problems.

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The Story of Quantum Mechanics

By Victor Guillemin
332 pp. Scribner's, New York, 1969. $8.95

This book is more than an account of quantum mechanics and its development. The author also discusses such varied subjects as Newtonian mechanics, electromagnetism, the solid state, and elementary particles, and he speculates about the existence of quarks, the nature of space and time, the meaning of causality, and whether Man has free will. The author paints with a wide brush, overlooking detail, in order to present the layman with a panoramic picture of modern physics, its origins, and its philosophical implications.

Victor Guillemin, a student of Arnold Sommerfeld in the early days of quantum mechanics, is well suited to his task. On the whole, he succeeds in bringing to the reader a feeling for the remarkable structure of quantum mechanics and the magnificent achievements of such men as Newton, Maxwell, Planck, Einstein, Rutherford, Bohr, Schrödinger, Heisenberg, and Dirac. But because Guillemin's subject is so big, it is inevitable that he treats some topics in so perfunctory a manner that he would have done better to omit them altogether. For example, he devotes only short paragraphs to the laser and the semiconductor, and only a single sentence to superconductivity.

The author stresses the idea of symmetries in physics, both exact and approximate. Without going into the mathematical details, he partially succeeds in conveying to the reader an idea of the connection between symmetries and conservation laws. In discussing the breaking of parity and charge-conjugation symmetries, he considers the possibility that the combined symmetry CP still holds. Unfortunately, he neglects to mention an experiment that is intepreted as a breakdown of CP invariance: the observation that the long-lived neutral K meson decays into two pions.

Guillemin's discussion of philosophy ranges from Socrates to William James. Much of what the author says is controversial, but his discussions are well presented and stimulating.

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Electrodynamics of Particles and Plasmas

By P. C. Clemmow, John P. Dougherty
457 pp. Addison-Wesley, Reading, Mass., 1969. $17.50

For many years the standard book on classical electrodynamics has been that of J. D. Jackson (Wiley, New York, 1962). Now two applied mathematicians, P. C. Clemmow, a lecturer in the department of applied mathematics and theoretical physics at Cambridge University, and J. P. Dougherty, a University lecturer at the same institution, have covered much of the same material but aimed rather more specifically towards plasma physics.

This new book, as did Jackson's, treats the mathematics of electrodynamics with almost no reference to experimental observation or laboratory approaches to these problems. Both books are aimed at the beginning graduate student and can be used as a text covering the theoretical background of electrodynamics. At the end of each chapter Clemmow and Dougherty have presented problems that will be useful to test students on their grasp of the material. My own preference is to develop problems that are suggested by the text material rather than by an extension of it. The authors clearly do not have this same point of view because many of the problems are derivations of formulas presented in the appropriate chapters. In addition to the usual material covered in a course on electrodynamics, such as Cerenkov radiation, gyro radiation, magneto-ionic theory and the Boltzmann equation, these authors go fairly deeply into microinstabilities, magnetohydrodynamics and advanced kinetic theory.

If this book is used as a text in plasma physics, the student will have to rely almost wholly upon the instructor to demonstrate the relevance of this material to the real world, because the approach is highly theoretical. Although reference is given to

current literature in plasma physics, there is very little to help the student associate the textual material of the chapters with the unnumbered references at the end of each chapter. This has the effect of making the volume a textbook in theoretical physics rather than a reference book in plasma physics. But this is not a criticism of the book because the authors quite explicitly state that this is their announced purpose.

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Digital Electronics For Scientists

By H. V. Malmstadt, C. G. Enke
545 pp. Benjamin, New York, 1969. $9.50

Continuing in the style of their earlier book *Electronics for Scientists* the authors have produced another excellent introduction to practical electronics useful in the laboratory. This time the discussion is essentially limited to switching circuits. After a description of the switching characteristics of diodes and transistors the basic digital modules, logic gates, flip flops, and multivibrators, are described and then applied to many illustrations of concepts and devices important in modern instrumentation. As in *Electronics for Scientists* the discussion is qualitative rather than analytical, but while this is a defect in the earlier book it suits the present subject very well, because switching circuits are easier for a novice to understand than are linear circuits. One can expect after reading this book to have a feeling of some degree of practical competence, and for this reason I recommend it highly to graduate students and scientists looking for an introduction to this increasingly important field.

Approximately one quarter of the book contains suggested laboratory experiments to be carried out on the apparatus designed specifically for this purpose by the authors in collaboration with the Heath Company. Entirely apart from any questions about the merit of coupling experiments to specific apparatus, the fact is that many people using this book will have other preferences, and it would have been beneficial to them if this considerable number of pages had been removed from the text and published separately. In fact, the two books by these authors together comprise a good introduction to electronics; by eliminating the experiments from both books, and with some revision of text, enough pages could be saved to permit combining them into one outstanding book.

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