cation, the present attempt is only partially successful. The primary objection concerns the various introductory chapters and sections (about half the book) which precede the material on the engineering applications of plasmas. In this reviewer's opinion, this introductory material, carelessly written and often inaccurate, generally does not serve its purpose. Far too much is attempted in the way of supplying needed background material for the reader, yet far too little care has been exercised to make it clear and accurate or to pinpoint its relevance to the later development. Only in the last half of the book, when the author finally feels free to say what has been on his mind all along, does he begin to meet his objective.

Finally, we come to Simon's book, which contains, almost unchanged, a series of lectures given by the author to members of the staff of Oak Ridge National Laboratory near the beginning of Project Sherwood, in 1955. While it served a purpose at the time of publication, it is by now considerably out of date. Only the last chapter, which deals with plasma diffusion across a magnetic field and contains some of the author's own contributions, has not been superseded in other books.

In conclusion, many good accounts of plasma physics are available, at any level of difficulty desired and from a variety of points of view. As befits a subject still in such a state of flux, however, *the* definitive book remains to be written.

Heat, Thermodynamics, and Statistical Physics. By Franzo H. Crawford. 700 pp. Harcourt, Brace & World, New York, 1963. $10.00. *Reviewed by Stuart A. Rice, University of Chicago.*

DESPITE the long history of the subject, there are still published every year numerous textbooks of thermodynamics. The purposes of these texts vary, as does the level of the treatment.

Heat, Thermodynamics, and Statistical Physics is, in general, a fine book. Its virtues include excellent discussions of the various temperature scales, including samples of high-precision data on gas behavior, and a good discussion of the mechanical equivalent of heat and of the specific heats along various thermodynamic paths. The book is reminiscent of older texts on thermodynamics in that there is considerable space devoted to the description of experiments. Along with its strengths, the book has several weaknesses. For example, the author does not use the modern definition of heat in terms of work and internal energy but instead introduces heat via the heat capacity; there is overemphasis on different cycles, engines, and refrigerators; the Helmholtz and Gibbs functions are introduced by the method of Legendre transformation, but the text does not explain the rationale behind the choice of variables nor the relationship between the slopes, intercepts, and envelopes of families of curves. A very large amount of space is devoted to methods of obtaining various derivations, and there is essentially no

chemical thermodynamics treated. Despite the statement in the introduction, the text is not useful for chemists.

The latter part of the book is devoted to a treatment of elementary statistical mechanics. This portion of the text is standard in format except for the treatment of diatomic molecules which is unusually complete and carefully done.

In general, I believe this will be a useful text for an elementary undergraduate course in thermodynamics. The drawbacks I have mentioned are exclusively matters of taste and not of substance. The book should therefore be recommended for examination to all teachers of thermodynamics.

Numerical Mathematical Analysis (5th ed.). By James B. Scarborough. 594 pp. Johns Hopkins Press, Baltimore, 1962. $7.00. *Reviewed by Joseph Hilsenrath, National Bureau of Standards, Washington, D. C.*

FOR the past 30 years, this book, now in its 5th edition, has been widely used for undergraduate courses in numerical methods. Much of its success lies in the fact that it comes quite close to achieving the author's objective which is "to set forth in a systematic manner and as clearly as possible the most important principles, methods, and processes used for obtaining numerical results".

The exposition is clear and detailed. The symbolism is as simple as the subject will allow. A great many examples are worked out in full numerical detail. Derivations are presented from the point of view of exposition rather than mathematical rigor. Aside from the finite difference methods which one would expect in a book of this type, one finds introductory treatments on the solution of ordinary and partial differential equations, integral equations, least-squares curve fitting, statistical and harmonic analysis, and matrix multiplications and inversion. Students of numerical analysis should be grateful to the author and publishers for keeping this book in print.

The Mainstream of Physics. By Arthur Beiser. 468 pp. Addison-Wesley, Reading, Mass., 1962. $9.75. *Reviewed by R. Bruce Lindsay, Brown University.*

THE zeal for providing more effective teaching for college students approaching physics for the first time continues unabated, and new introductory textbooks appear regularly. The trend appears to be in the direction of including a higher percentage of so-called modern physics than was the custom earlier, and this is well exemplified by Professor Beiser's volume. About a third of his book is devoted to topics in relativity, and quantum and nuclear physics. In spite of this relatively large coverage of 20th century material, the size of the book has been kept within manageable limits, and this is much to be commended.

The treatment of classical physics is conventional,