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Book Reviews

Thermonuclear Power. By T. S. Green. Published by George Newnes Limited, London. 168 pp., (45 shillings).

Although the title of this book might suggest that it is about how one might produce thermonuclear power, the fact is, unfortunately, that thermonuclear power doesn't exist. Serious research has been conducted for some ten years now with the hope that some way might be discovered to use the energy released in the fusion of light nuclei for the production of useful power. Doubtless progress has been made; however, it is impossible to estimate how much progress has been made since no one is quite sure in what direction the goal is. The problem in thermonuclear development has not turned out to be simply the development of the technology. What has proven to be a serious obstacle is the lack of knowledge of plasma physics. This field is almost as old as atomic physics, but until the last few years very little knowledge of the behavior of plasmas actually existed. Most of the attempts at producing thermonuclear plasmas have failed because the plasmas have not behaved as expected. As a result, a large part of thermonuclear research in the last few years has been in what one might call fundamental plasma physics. There is no doubt that considerable progress has been made in this field, and, since an understanding of plasma physics is essential to the development of thermonuclear power, progress has certainly been made in that direction also.

This relatively short book (160 pages) by T. S. Green is a rather clear and concise discussion of past and current research on thermonuclear power. Although the author occasionally goes to some detail in discussing certain aspects of particle behavior, the book is in no way a technical treatment of the subject. As the author explains in his preface, the purpose of the book is to acquaint scientists working in other fields with the overall problems of thermonuclear research. The book accomplishes this task very well. Any book that attempts to survey an active field of research is of necessity somewhat outdated by the time it is published, as this book is to some extent as far as the details of the results achieved. There are new experimental and theoretical results which might change the direction of some of the effort in this field. However, the book should remain useful for some time to anyone who would like to spend a few hours finding out what is going on in an important, if not too promising, field of endeavor.

A person familiar with thermonuclear research might find some of the author's comments about past failures interesting. In fact, if one reads the book carefully, he will notice that the philosophy behind the approaches to the problem has changed. This change has been brought about by the discovery that the problem is considerably more complex than it appeared at the start. Some of the attempts at producing a thermonuclear plasma have been rather ambitious, and in the early stages of the work, the general opinion was that success was just a matter of time. The failures of the early attempts have had the effect of causing the workers in the field to take a more scientific attitude toward the problem. Since Professor Green does occasionally assume the role of a critic the book is more interesting than it would be if it were simply a description of experiments and results.

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About the Reviewer. W. B. Ard received his Ph.D. degree from Duke University in 1955. Before joining the Thermonuclear Division of Oak Ridge National Laboratory as a Physicist in 1962, he served as Associate Professor of Physics at the University of Alabama and at the University of Florida.

Semiconductor Counters for Nuclear Radiations. By G. Dearnaley and D. C. Northrop. John Wiley and Sons, (November 11, 1963). 331 pp. $8.75.

Nuclear detection devices and the associated electronic techniques have been for many years in a continual state of development and evolution.