

The need for editing of this material is obvious. Under the general editorship of J. G. Beckerley, the Van Nostrand Geneva series condenses into six volumes those papers which may be logically combined. *Nuclear Power Reactors* edits thirty-eight of the Geneva papers into two chapters on the economics of conventional and nuclear power and seven chapters which cover the major power reactor types (pressurized water, boiling water, homogeneous, circulating fuel, liquid and gas cooling graphite moderated, and liquid metal cooled unmoderated). As for the material presented, there is no originality in this volume; its utility lies in its editing of existing material into more convenient form. In this it has succeeded quite well and the volume should prove useful to those who deal with power reactors and who wish the more important Geneva papers on the subject in a more convenient form.

Neutron Cross Sections. Vol. 1, Div. 2 of Internat'l Series of Monographs on Nuclear Energy. By Donald J. Hughes. 182 pp. Pergamon Press, London & New York, 1957. \$5.00. Reviewed by Lyle B. Borst, New York University.

If the purpose of this small book is, as the author states, to serve as a supplement and handbook to the extensive compilation of neutron cross sections known as BNL-325, many readers will feel that it has missed the mark.

However in a rapidly expanding field characterized by extensive empirical data and no simple fundamental theory, it has a unique place. It is by far the best epitome of theory illustrated by empirical examples presently in print, and as such will find extensive use particularly among experimentalists.

The book is organized primarily around the optical model of the nucleus, and chapters are devoted to processes involving: fast neutrons; neutron resonances; and thermal neutrons. A separate chapter is reserved for the extensive studies on neutron fission. Techniques are generally illustrative and are largely selected from the author's experience. Chapter references are made primarily to the more specialized technical review articles and no attempt is made to give a research bibliography. In Appendix 3 key references are given to work from the various laboratories. Unfortunately in many cases these are unpublished documents.

The Detection and Measurement of Infrared Radiation. By R. A. Smith, F. E. Jones, R. P. Chasmar. 458 pp. Oxford U. Press, New York, 1957. \$11.20. Reviewed by S. F. Singer, University of Maryland.

In many fields progress depends on the development of techniques. The infrared field is a case in point. The region extends in wavelength from 0.75 micron to 1000 microns and thus covers an enormous range of the electromagnetic spectrum. Its different portions require different approaches both for detection and for produc-

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tion. The near infrared up to 1.5μ and the intermediate infrared up to about 10μ can be observed with photo-detectors, but beyond about 10μ only thermal detectors are of any value. In the uppermost end of the range coherent detectors may be employed. The present volume omits completely references to infrared spectroscopy but concentrates entirely on the means of detection of infrared, the detailed properties of the detectors and amplifiers with discussions of noise and ultimate sensitivity, and then describes materials, components, and instruments.

The volume does not discuss photographic detection techniques, such as special spectroscopic plates, or coherent detectors which are of very limited usefulness, but concentrates instead on thermal detectors, the radiation thermocouple, and the bolometer, including the superconducting bolometer and the Golay cell.

Many different types of thermocouples are described and good tables are provided for characteristics of thermoelectric materials. The same detailed and practical treatment is given to bolometers.

Photoemissive and photoconductive detectors are next discussed, with emphasis on lead sulfide, lead telluride, and lead selenide cells.

There is a description of photoconductive materials giving their spectral response at various temperatures. A short appendix even describes methods of preparation of photoconductive layers for lead sulfide.

Since a limitation is set to the accuracy of measurements by random fluctuations, a very detailed discussion is given of noise in the detection process, in the amplifiers and indicating instruments and its effects on the ultimate sensitivity of infrared detectors. Again the authors provide much tabulated material of practical importance which should allow the research worker to predict in advance what detectors are suitable for a specific application.

A short chapter is devoted to laboratory sources of infrared radiation and gives a comparative discussion to enable one to decide which source fits the purpose best. A large part of the book is devoted to a discussion of infrared optical materials with very many useful graphs and tables. Sources of supply are also given. A large section also is given over to optical components for the infrared again with useful curves for different types of filters depending on reflection, refraction or scattering, interference filters, and polarization filters. The next portion of the book deals with infrared monochromators and spectrometers, some of commercial design, and a very careful discussion of amplifier design for detection. The last chapter gives data on the infrared transmission of the atmosphere.

The whole tone of the book is set so as to aid research workers who want to use infrared techniques for various purposes. There is little or no discussion on infrared spectroscopy since this subject has been covered adequately in the literature. But I know of no comparable book which summarizes the present-day techniques of infrared detection and the practical means for carrying out such work.

High Energy Nuclear Physics: Proceedings of the Seventh Annual Rochester Conference (April 1957). Compiled and edited by G. Ascoli, G. Feldman, L. J. Koester, Jr., R. Newton, W. Riesenfeld, M. Ross, R. G. Sachs, 11 Sections. Interscience Publishers, Inc., New York, 1957. Paperbound \$4.50. *Reviewed by J. C. Polkinghorne, University of Edinburgh.*

The most remarkable discovery of the year covered by the Conference was that parity is not conserved in weak interactions. Two full sessions were devoted to discussing this problem. The first tendency of theorists was to put all the blame on the neutrino and in particular to suppose that it was a "two-state" particle rather than a "four-state" particle like the electron. It was possible to discuss the original experiments of Wu and Ledermann in these terms because they involved neutrinos. However it was a consideration of the $\pi\theta$ puzzle, which involves no neutrinos, that led Yang and Lee to their brilliant analysis and, since the Conference, definite evidence has been obtained that parity is not conserved in baryon decays. In fact the weak decays have continued to provide shocks, for results reported since the Conference have thrown all our previous ideas on β decay into the melting pot. It is to be hoped that future Rochester Conferences will report the resolution of these puzzles.

By contrast, our knowledge of strong interactions has made steady rather than spectacular progress. There is a wealth of evidence on multiple-production processes awaiting interpretation. A curious discrepancy between the value of f^2 required for a dispersion relation plot for $\pi^+ + p$ and $\pi^- + p$ has turned up. If this persists it would seem to indicate that either causality breaks down in an unexpected way or that charge independence fails. In contrast with this latter possibility the results on K -meson photoproduction, which seem to indicate a difference in coupling constant for K -meson-baryon interactions and pion-baryon interactions, have led theorists to speculate that there may be two classes of strong interactions and that the (π) very strong ones may be characterized by higher symmetries than that implied by charge independence.

On the more abstract theoretical side a great deal of work has been done on the properties of propagators and in particular on their domains of analytic continuation.

This is an excellent report with the long review talks providing an admirable complement to the short reports of current research.

Principles of Physical Science. By Francis T. Bonner and Melba Phillips. 736 pp. Addison-Wesley Publishing Co., Inc., Reading, Mass., 1957. \$7.50. *Reviewed by Cecilia Payne-Gaposchkin, Harvard College Observatory.*

To write a basic textbook that shall cover the sciences of physics, chemistry, astronomy, and physical geology is a formidable task, and the authors of the book under review have accomplished it with great