

tion. The near infrared up to $1.5\ \mu$ and the intermediate infrared up to about $10\ \mu$ can be observed with photo-detectors, but beyond about $10\ \mu$ 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



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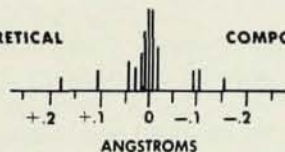
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*Unretouched photograph taken with a
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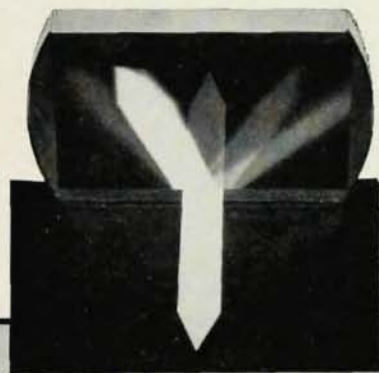
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success. They write as working scientists armed with firsthand knowledge. Their text is logically arranged, well expressed, accurate, and up to date. It is an excellent example of what can be done in scientific exposition with the simplest mathematical equipment (which is, moreover, summarized in the Appendix).

"Designed," as the jacket informs us, "as a textbook for physical sciences offered to liberal arts students," it is actually a closely packed summary of the current physical picture of the universe. Its thirty chapters would have to be assimilated at the rate of about one a week in a year's course—an extremely concentrated diet. Whether the average liberal arts student, exposed willy-nilly to a course in science, could profitably consume the whole of it seems doubtful. Actually it could provide the bases for several surveys of physical science—perhaps one devoted to physics and chemistry, another to astronomy and geology.

The book has, indeed, another use, to which the reviewer has put it immediately. It will take a place on the teacher's desk as an invaluable work of reference, especially for such "liberal arts" courses as are described on the jacket. The information is well arranged, easy to find, and beautifully illustrated with diagrams. The examples are real and make a demand on the student's intelligence. There is a first-class bibliography and the index is all that an index ought to be—and too often is not. The writing is accurate and terse—a welcome change from the vague popular style affected by many general books on science.

Correction

The February issue of *Physics Today* contained a review of A. Efron's textbook *Basic Physics* (Rider Publisher, Inc., New York, 1957) in which the price was listed as \$8.95. We are informed that although the publishers originally set the price at \$8.95, it was reduced to \$7.60 by the time the book appeared in print.

Books Received

EXPLORING THE ATMOSPHERE'S FIRST MILE: Proceedings of Great Plains Turbulence Field Program (Aug.-Sept. 1953, O'Neill, Nebr.). Vol. 1, Instrumentation & Data Evaluation. Vol. 2, Site Description & Data Tabulation. Edited by Heinz H. Lettau and Ben Davidson. 578 pp. Pergamon Press, London & New York, 1957. \$20.00.

KERNINDUKTION. By A. Lösche. 605 pp. Veb Deutscher Verlag der Wissenschaften, Berlin, Germany, 1957. DM 39.60.

ECONOMICS OF ATOMIC ENERGY. By Mary Goldring. 179 pp. Philosophical Library, Inc., New York, 1957. \$6.00.

ATOMIC ENERGY IN MEDICINE. By K. E. Halnan. 157 pp. Philosophical Library, Inc., New York, 1957. \$6.00.

PROTECTION AGAINST NEUTRON RADIATION UP TO 30 MEV. NBS Handbook 63. 88 pp. US Govt. Printing Office, Washington, D. C., 1957. Paperbound \$4.00.

BIOGRAPHICAL MEMOIRS OF FELLOWS OF THE ROYAL SOCIETY, Vol. 3. 328 pp. The Royal Society, London, England, 1957. 30s.

1956 NATIONAL SYMPOSIUM ON VACUUM TECHNOLOGY TRANSACTIONS (Chicago, Ill., Oct. 1956). Edited by Edmond S. Perry and John H. Durant. 234 pp. Pergamon Press, London and New York, 1957. \$12.50.

ELEMENTS OF CLASSICAL THERMODYNAMICS FOR ADVANCED STUDENTS OF PHYSICS. By A. B. Pippard. 165 pp. Cambridge U. Press, New York, 1958. Clothbound \$4.75; paperbound \$2.75.

THE PHYSICS OF CLOUDS. By B. J. Mason. 481 pp. Oxford U. Press, New York, 1957. \$11.20.

ECONOMIC APPLICATIONS OF ATOMIC ENERGY: Power Generation & Industrial & Agricultural Uses. Report of the United Nations Sec'y-General. 108 pp. Columbia U. Press, New York, 1957. Paperbound \$5.50.

NEW SOURCES OF ENERGY AND ECONOMIC DEVELOPMENT. United Nations Dept. of Economic & Social Affairs. 150 pp. Columbia U. Press, New York, 1957. Paperbound \$1.25.

25 NOBEL PREISTRÄGER: ihre wissenschaftliche Leistung und ihre Veröffentlichungen. 70 pp. Friedr. Vieweg & Sohn, Braunschweig, Germany, 1957.

THE SPECTRUM OF ATOMIC HYDROGEN. By G. W. Series. 88 pp. Oxford U. Press, New York, 1958. \$2.00.

FONCTIONS SPHÉRIQUES DE LEGENDRE ET FONCTIONS SPHÉROÏDALES, Part 1. By Louis Robin. 201 pp. Gauthier-Villars, Paris, France, 1957. Clothbound \$10.41; paperbound \$9.70.

ATOMS, ENERGY AND MACHINES. By Jack McCormick. 224 pp. Creative Educational Society, Mankato, Minn., in co-operation with The American Museum of Natural History, 1957.

YEAR BOOK OF THE PHYSICAL SOCIETY, 1957. 132 pp. The Physical Society, London, England, 1957. Paperbound 12s. 6d., postage 7d.

BASIC SCIENCE SERIES. *Energy* by Sir Oliver Lodge; 54 pp.; \$1.25. *Heat* by Alexander Efron; 105 pp.; \$1.50. *Sound* by Alexander Efron; 72 pp.; \$1.25. John F. Rider Publisher, Inc., New York, 1958. Paperbound.

CRYSTAL STRUCTURES. Supplement 3, Chapters 1-8. By Ralph W. G. Wyckoff. Interscience Publishers, Inc., New York, 1958. Loose-leaf \$20.00.

EMULSIONS: Theory and Practice. By Paul Becher. 382 pp. Reinhold Publishing Corp., New York, 1957. \$12.50.

DISLOCATIONS AND MECHANICAL PROPERTIES OF CRYSTALS: Conf. Proceedings (Lake Placid, Sept. 1956). Edited by J. C. Fisher, W. G. Johnston, R. Thomson, T. Vreeland, Jr. 634 pp. John Wiley & Sons, Inc., New York, 1957. \$15.00.

NUCLEAR MASSES AND THEIR DETERMINATION: Conf. Proceedings (Max-Planck-Institut für Chemie, Mainz, July 1956). Edited by H. Hintenberger. 267 pp. Pergamon Press, London & New York, 1957. \$14.00.

SCIENCE AND THE CREATIVE SPIRIT: Essays on Humanistic Aspects of Science. By Karl W. Deutsch, F. E. L. Priestley, Harcourt Brown, David Hawkins. Edited by H. Brown for the American Council of Learned Societies. 165 pp. U. of Toronto Press, Toronto, Canada, 1958. \$4.50.

MÉCANIQUE STATISTIQUE DES FLUIDES: Fluctuations et Propriétés Locales. By Daniel Massignon. 263 pp. Dunod, Paris, France, 1957. 3.900 fr.

A HISTORY OF MATHEMATICS: From Antiquity to the Beginning of the 19th Century. By J. F. Scott. 266 pp. Taylor & Francis Ltd., London, England, 1958. 63s. net.