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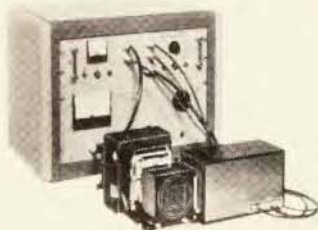
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stances and hence apply only in part to other countries. They incidentally show that science is international and universally applicable only as long as it is not invaded by lawyers, economists, or politicians.

The individual chapters of *Kerntechnik* start with an introduction, proceed to discuss the subject matter in some detail and then cite the literature for more advanced studies. The style is quite uniform, the cross referencing done carefully, and the index is complete. In short, it is a handbook in the best German tradition. To the reviewer's knowledge, no similar one-volume work exists in English. It is therefore recommended to anyone interested in nuclear power, student or experienced worker, for whom German does not form an unsurmountable potential barrier.

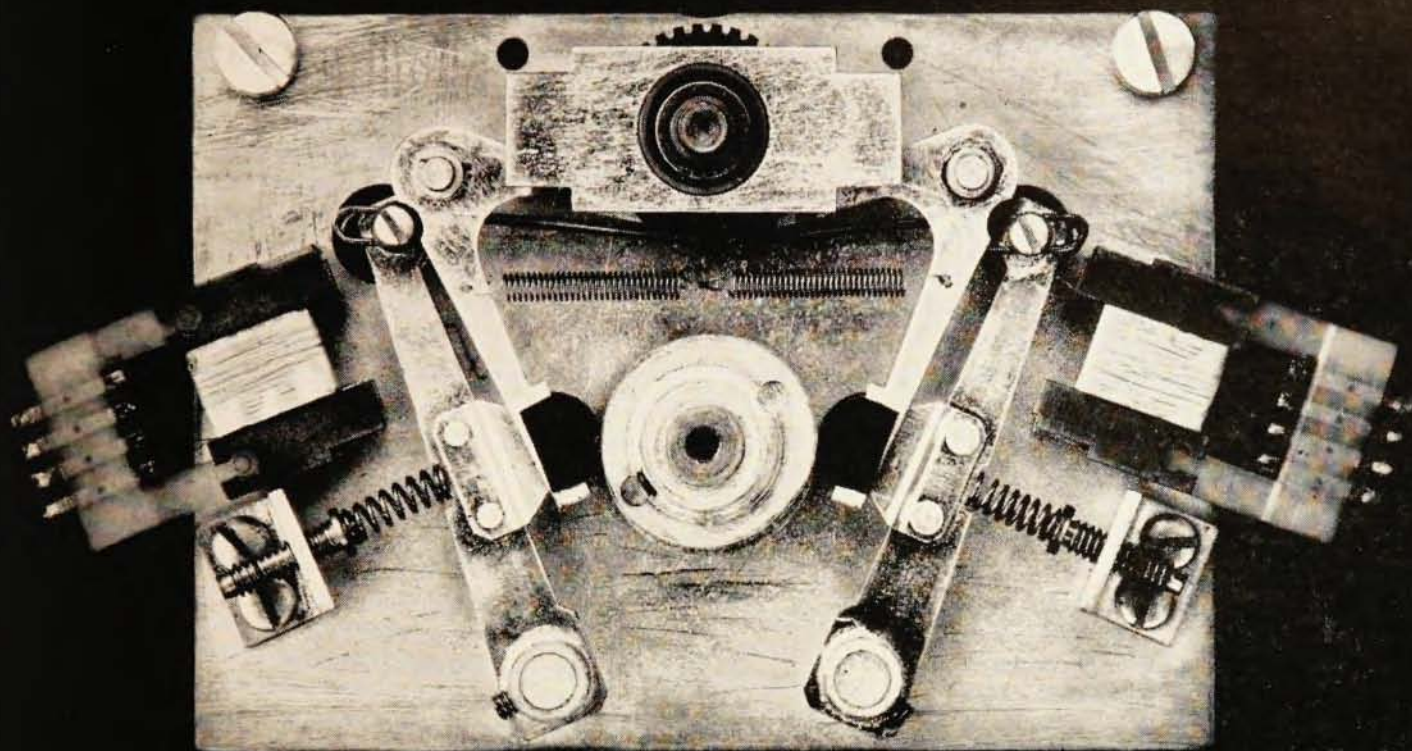
From Nucleus to Universe: A Course of Selected Lectures in Physics and Astronomy (Nuclear Research Found. Summer School for Science Teachers, U. of Sydney, Jan. 1960). Edited by S. T. Butler and H. Messel. 335 pp. Shakespeare Head Press Pty. Ltd., Sydney, Australia, 1960. 84s. *Reviewed by Frank Oppenheimer, Boulder, Colo.*

AS broad in scope as its title suggests, *From Nucleus to Universe* is a collection of lectures that was given as a course for high-school science teachers at the University of Sydney during the winter of 1960.

The lectures do not constitute a unified and organized course but they present an up-to-date summary of a variety of fields. The book contains lectures by a dozen different authors. There are, however, four outstanding articles: "The Universe and its Origin" by George Gamow, "The Observational Basis for Stellar Evolution" by Bart Bok, "The Origin of the Solar System" by T. Gold, and "The Interior of the Earth" by A. A. Day. In addition there are articles on stellar interferometry, thermonuclear research, cosmic radiation, auroras, meteors, and a final article on Antarctic IGY research.

The series starts with a summary of atomic and nuclear physics. This summary is very sketchy and would almost certainly not accomplish its purpose of making the following lectures any clearer to readers who are completely unfamiliar with these fields, unless supplemented with additional discussion of the subject.

I have found high-school students to be almost universally intrigued by astronomy and cosmology and with the history and structure of the earth. In fact these subjects frequently provide a much better motivation for learning about the basic principles of physics and chemistry than do the more familiar objects and gadgets which are usually described in elementary science texts. The selection of articles in *From Nucleus to Universe*, although not suitable for high-school students, can therefore provide stimulating useful background material for the teachers. I believe that the book would be most useful in connection with institutes for high-school teachers at which the articles could be discussed and explained. The book will prob-



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ably find its greatest usefulness when used for the purpose for which the lectures were originally given; as supplementary, somewhat advanced, material for high-school teachers who are taking part in the many current in-service, summer, and academic-year institutes.

The articles contain up-to-date thinking and observations and techniques and these necessarily involve ideas and concepts that will be unfamiliar to most high-school teachers, but which can be elucidated by additional explanation. One finds sentences which will certainly not be at all clear without some amplification.

In a discussion of the 21-cm neutral hydrogen line Bok says of the ground state, "It possesses no regular 'fine structure' but does have 'hyperfine structure' . . ."

Twiss, in discussing the intensity interferometer, writes, "The differential time delay from the star around the two channels must be small compared with the inverse *post detector* band width rather than the inverse *pre detector* band width as in the Michelson type interferometer."

Gamow can say, "Now if we begin to expand the volume adiabatically all wave lengths will increase in proportion to R . . . Remembering Wien's displacement law for black body radiation we can write. . ."

And Watson Munro writing on thermonuclear reactions will assert, "In the first half cycle the gas is heated to perhaps 200 000 °K within 0.1 μ sec; bremsstrahlung radiation corresponding to a temperature of 10 million °K has been emitted."

These sentence fragments are of course more cryptic out of context than in the book. They are included in this review merely to document the statement that the lectures contain material that will be obscure to high-school teachers unless supplemented by additional class room or lecture discussion.

On the whole the articles are clearly written and exciting.

Books Received

- NON-LINEAR WAVE MECHANICS: A Causal Interpretation. By Louis de Broglie. Translated from French by Arthur J. Knodel and Jack C. Miller. 304 pp. (Elsevier Publishing Co., Netherlands) D. Van Nostrand Co., Inc., Princeton, N. J., 1960. \$11.00.
- CONFERENCE ON ELECTRICAL INSULATION: Div. of Engineering & Industrial Research, Annual Report 1959. 153 pp. Publ. 756, Nat'l Academy of Sciences—Nat'l Research Council, Washington, D. C., 1960. Paperbound \$4.00.
- PROCEEDINGS OF THE 1960 HEAT TRANSFER AND FLUID MECHANICS INSTITUTE: Preprint of papers (Stanford U., June 1960). Edited by D. M. Mason, W. C. Reynolds, W. G. Vincenti. 259 pp. Stanford U. Press, Stanford, Calif., 1960. \$8.75.
- BASIC PRINCIPLES OF NUCLEAR SCIENCE AND REACTORS. By Alan M. Jacobs, Donald E. Kline, Forrest J. Remick. 262 pp. D. Van Nostrand Co., Inc., Princeton, N. J., 1960. \$6.50.
- FROM ATOMS TO STARS: An Introduction to the Physical Sciences. By Theodore Askounes Ashford. 645 pp. Holt, Rinehart & Winston, Inc., New York, 1960. \$8.50.
- PHYSICS CALCULATIONS. By George I. Sackheim. 267 pp. The Macmillan Co., New York, 1960. Paperbound \$3.50.
- IONIZATION PHENOMENA IN GASES: Conf. Proc. (Uppsala, Aug. 1959). Edited by N. Robert Nilsson. Vol. 1, 554 pp. Vol. 2, 656 pp. North-Holland Publishing Co., Amsterdam, Netherlands, 1960. \$34.50.
- INCOMPRESSIBLE AERODYNAMICS: An Account of the Theory and Observation of the Steady Flow of Incompressible Fluid Past Aerofoils, Wings, and Other Bodies. Edited by Bryan Thwaites. 636 pp. Oxford U. Press, New York, 1960. \$12.00.
- SELECTED SEMICONDUCTOR CIRCUITS HANDBOOK. Edited by Seymour Schwartz. 503 pp. John Wiley & Sons, Inc., New York, 1960. \$12.00.
- INTRODUCTION TO COLLEGE PHYSICS (2nd Revised Ed.). By Rogers D. Rusk. 944 pp. Appleton-Century-Crofts, Inc., New York, 1960. \$8.00.
- THE EXPLORATION OF SPACE: NAS-NASA-APS Symp. Proc. (Washington, D. C., Apr. 1959). Edited by Robert Jastrow. 160 pp. The Macmillan Co., New York, 1960. \$5.50.
- INTRODUCTION TO MODERN NETWORK SYNTHESIS. By M. E. Van Valkenberg. 498 pp. John Wiley & Sons, Inc., New York, 1960. \$11.75.
- PHOTOCONDUCTIVITY OF SOLIDS. By Richard H. Bube. 461 pp. John Wiley & Sons, Inc., New York, 1960. \$14.75.
- HIGH-ENERGY ELECTRON SCATTERING TABLES. By Robert Herman and Robert Hofstadter. 278 pp. Stanford U. Press, Stanford, Calif., 1960. \$8.50.
- THE EXPLORATION OF THE SOLAR SYSTEM. By Felix Godwin. 200 pp. Plenum Press, Inc., New York, 1960. \$6.50.
- INTRODUCTION TO ATOMIC ENERGY. By William G. Atkinson. 68 pp. John F. Rider Publisher, Inc., New York, 1959. Paperbound \$1.35.
- ZUR GENESIS DES DIAMANTEN. By Hans J. Rodewald. 69 pp. Verlag Meier & Cie, Schaffhausen, Switzerland, 1960. Paperbound Fr. 8.50.
- PLASMA PHYSICS: A Course Given by S. Chandrasekhar. Notes Compiled by S. K. Trehan. 217 pp. The U. of Chicago Press, Chicago, Ill., 1960. Paperbound \$1.75.
- HEAT TRANSFER. By Alan J. Chapman. 452 pp. The Macmillan Co., New York, 1960. \$9.00.
- THE DYNAMIC BEHAVIOR OF THERMOELECTRIC DEVICES. By Paul E. Gray. 136 pp. The Technology Press of MIT and John Wiley & Sons, Inc., New York, 1960. \$3.50.
- THEORY OF INERTIAL GUIDANCE. By Connie L. McClure. 340 pp. Prentice-Hall, Inc., Englewood Cliffs, N. J., 1960. \$12.00.
- PHYSICAL METHODS OF ORGANIC CHEMISTRY (3rd Revised Ed.). Vol. 1, Part 2 of Technique of Organic Chemistry. Edited by Arnold Weissberger. 923 pp. Interscience Publishers, Inc., New York, 1960. \$24.50.
- ELECTROMAGNETIC ENERGY TRANSMISSION AND RADIATION. By Richard B. Adler, Lan Jen Chu, Robert M. Fano. 621 pp. John Wiley & Sons, Inc., New York, 1960. \$14.50.
- AERO-THERMODYNAMICS AND FLOW IN TURBOMACHINES. By M. H. Vavra. 609 pp. John Wiley & Sons, Inc., New York, 1960. \$14.50.
- AEROSPACE DICTIONARY. By Frank Gaynor. 260 pp. Philosophical Library, Inc., New York, 1960. \$6.00.
- NUCLEAR REACTOR OPTIMIZATION. By P. H. Margen. 81 pp. Simmons-Boardman Publishing Corp., New York, 1960. Paperbound \$2.75.