Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

ACCELERATED MODERNIZATION OF THE U. S. AIR TRAFFIC CONTROL AND NAVIGATION SYSTEM —Air Coordinating Committee—*Office of Technical Services,* 107 p., illus., paper, $1.75. Recommendations concerning the use of new flight procedures, research and development toward systems automation, newly available electronic facilities such as long-range radar and highly accurate navigation devices.

BASIC PSYCHOLOGY: A Study of the Modern Healthy Mind—Leonard Carmichael—*Random House,* 340 p., $3.95. An introduction to modern psychology for the adult reader by the first psychologist to serve in this capacity. Dr. Carmichael's primary research interest has been concerned with the sense organs in relation to the early development of behavior.

BIOGEOGRAPHY: An Ecological Perspective—Pierre Dansereau—*Ronald,* 394 p., illus., $7.50. To provide a new synthesis of the environmental relationships of living organisms for those in the fields of plant and animal ecology, geography genetics, human geography, anthropology and the social sciences.

BIOLOGY—Elsbeth Kroeber, Walter H. Wolff and Richard L. Weaver—*Heath,* 608 p., illus., $4.68. A comprehensive and colorful introduction to biology of eight or ninth grade reading difficulty.

BUTTERFLIES — E. B. Ford — *Collins (Macmillan),* 3rd ed., 368 p., illus., $6.00. British butterflies and their general biology. Extensively illustrated with life-sized color photographs.

DISPOSAL OF INDUSTRIAL WASTE MATERIALS: Papers read at the Conference at Sheffield University, 17th-19th April, 1956, with the Discussions that Followed—Society of Chemical Industry—*Macmillan,* 157 p., illus., $7.50.

THE EDUCATION OF OUR TALENTED CHILDREN: An Address—Rear Adm. H. G. Rickover—*Thomas Alva Edison Foundation,* 31 p., paper, free upon request to publisher, Suite 806, 8 W. 40th St., New York 18, N. Y. Admiral Rickover proposes the establishment by industry and educational foundations of model academic secondary schools for the education of gifted children.

THE ELECTRICAL PRODUCTION OF MUSIC—Alan Douglas, with foreword by H. Lowery—*Philosophical Library,* 223 p., illus., $12.00. Discussing the various means by which musical tones may be produced and modified electrically and noting the directions future research is likely to follow.

ELECTROCHEMICAL PREPARATION OF BORON—Nelson F. Murphy, Richard S. Tinsley and George F. Meenaghan — *Virginia Polytechnic Institute,* Engineering Experiment Station Series No. 115, 18 p., paper, 25 cents. Recent interest in boron has stimulated the search for methods of preparing considerable amounts of the element.

THE FIGHT FOR FOOD—J. Gordon Cook—*Dial,* 208 p., illus., $3.00. More than half the people of the world are getting insufficient food to keep them in proper health yet the population of the world is increasing. This book shows how science can help in every aspect of food production and conservation.

THE FORD FOUNDATION ANNUAL REPORT—H. Rowan Gaither, Jr., President—*Ford Foundation,* 286 p., paper, free upon request direct to publisher, 477 Madison Ave., New York 22, N. Y. Among the expenditures reported here is $14,000,000 devoted to research in mental health and behavioral sciences, and some $401,000,000 for education.

HIGHWAY ADMINISTRATION — *Highway Research Board,* Bibliography 19, 51 p., paper, $1.00. The publications listed are selected and, in general, cover the last ten years.

A NATURALIST IN PALESTINE—Victor Howells —*Philosophical Library,* 180 p., illus., $6.00. Describing Palestine, its flora and fauna, and relating experiences among the Bedouins before this region became divided into two countries, Israel and Jordan.

THE NEW MATHEMATICS: Book I and Book II —Leo J. Brueckner, Foster E. Grossnickle and Elda L. Merton, *Winston,* each book 442 p., illus., $2.32. Clearly written and generously illustrated texts for junior high schools.

NIGHT VISIBILITY 1956—James D. Blythe and others—*Highway Research Board,* Bulletin 146, 82 p., illus., paper, $1.60. Containing eight papers presented at the 35th annual meeting of Highway Research Board, January 1956.

OPENING ENROLLMENT IN HIGHER EDUCATIONAL INSTITUTIONS, FALL 1956—M. Clemens Johnson, C. George Lind and Herbert S. Conrad —*Govt. Printing Office,* Office of Education, Circular No. 496, 46 p., paper, 35 cents. The fall of 1956 marks the fifth consecutive annual rise in both total and first-time enrollment.

ORGANIZING FOR EFFECTIVE AIR POLLUTION CONTROL—Edward R. Weidlein—*Mellon Institute,* 10 p., paper, free upon request to publisher, 4400 Fifth Ave., Pittsburgh 13, Pa. The backing of an enlightened public, as well as enlightened public officials, is essential for effective air pollution control.

OUR ASTONISHING ATMOSPHERE — J. Gordon Cook—*Dial,* 200 p., illus., $3.00. Telling about our atmosphere, "the ocean of gas that envelops the earth, and in which we live like insignificant creatures on the bottom of a vast but flimsy sea."

ROUTE-MAPPING AND POSITION-LOCATING IN UNEXPLORED REGIONS—Wilhelm Filchner, Erich Przybyllok and Toni Hagen—*Academic,* 288 p., illus., $9.00. A new method of route-mapping based upon rough outlines. Its essential function is to create a firm skeleton to which each separate part of the route can be attached and united.

STANFORD RESEARCH INSTITUTE JOURNAL: Vol. I, No. I—Charles A. Scarlott, Ed.—*Stanford Research Institute,* quarterly, 32 p., illus., paper, single copies $1.00, $4.00 per year. Discussing the contributions of research to problems of general interest for leaders in business, industry, education and government.

TELEVISION ENGINEERING: Principles and Practice, Volume Three, Waveform Generation—S. W. Amos and D. C. Birkinshaw—*Philosophical Library,* 226 p., illus., $15.00. Written for the British Broadcasting Corporation, this volume gives the application in television of sinusoidal, rectangular, sawtooth and parabolic waves and shows the mathematical relationship between them.

THE WORLD OF WATER—J. Gordon Cook—*Dial,* 192 p., illus., $3.00. Telling for the layman the story of water as it enters into every aspect of human life, as well as describing life as it exists in the sea.

YOUR WONDERFUL BODY—Peter Pineo Chase —*Prentice-Hall,* 391 p., illus., $5.95. A book for the layman describing the human body and its functions.

Science News Letter, May 11, 1957

GEOPHYSICS

Geophysicist Draws New Picture of Ionosphere

➤ THE IONOSPHERE, the region 60 to 200 miles above the earth that reflects radio waves, is not a three-layer "sandwich," but one continuous layer.

This is the new picture drawn by Dr. Hildegarde Kallmann of the University of California at Los Angeles. Dr. Kallmann, a geophysicist, has been associated in her research with Dr. Joseph Kaplan, also of the University of California.

The ionosphere is the region where gas molecules of the upper atmosphere are broken up into charged particles by the action of the sun's rays. It had been thought that the region consisted of three distinct layers of different electron densities, floating on top of one another just as liquids of different densities would.

In theoretical research, verified by data from instrumented rockets probing the region, Dr. Kallmann has shown the ionosphere is a continuous region where electron density increases gradually with height.

The study has also shown that the various heights at which radio waves of different frequencies are reflected by the region are all much lower than had been previously thought. The height to which a radio wave penetrates the atmosphere depends on its frequency.

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