

# SCIENCE

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<i>Terminal Programs in the Graduate Schools:</i> DR. CARL E. SEASHORE .....	213	<i>Discussion:</i>	
<i>Obituary:</i>		<i>"Ten-Eighty," a War-produced Rodenticide:</i> E. R. KALMBACH. <i>Pectin Intravenously:</i> DR. W. C. HUEPER. <i>"Isosensitivity" Instead of "Isoimmunity":</i> DR. ELMER L. DEGOWIN. <i>The Gulf Hammock Formation in Florida:</i> DAVID B. ERICSON .....	232
<i>Roscoe Gilkey Dickinson:</i> DR. LINUS PAULING. <i>Albert Edward Edgecombe:</i> PROFESSOR HANFORD TIFFANY. <i>Recent Deaths</i> .....	216	<i>Scientific Books:</i>	
<i>Scientific Events:</i>		<i>An Outline of Politico-Genetics:</i> PROFESSOR TH. DOBZHANSKY. <i>Cosmic Rays:</i> PROFESSOR W. F. G. SWANN. <i>Books Received</i> .....	234
<i>Research Fellowships for India; Plant Breeding at Cornell University; Geography at Syracuse University; Scientific Men Abroad</i> .....	217	<i>Science News</i> .....	10
<i>Scientific Notes and News</i> .....	219		
<i>Special Articles:</i>			
<i>Quantitative Action of Penicillin Inhibitor from Penicillin-Resistant Strains of Staphylococci:</i> DR. WESLEY W. SPINK and VIOLA FERRIS. <i>Inhibiting Factors in the Determination of Penicillin in Human Sera:</i> DR. WILLIAM FRANK ELIAS, HOWARD JOSEPH MERRION and TREVERIAN SPEICHER. <i>Calcium Carbonate as an Antacid for Oral Penicillin:</i> DR. VICTOR P. SEEBERG and MORRIS F. COLLEN. <i>Synthesis of a Compound Identical with the L. casei Factor Isolated from Liver:</i> DR. Y. SUBBAROW and OTHERS. <i>Isolation of an Anti-anemia Factor in Crystalline Form from Yeast:</i> DR. J. J. PIFFNER and OTHERS .....	221		
<i>Scientific Apparatus and Laboratory Methods:</i>			
<i>The Effect of Specific Amino Acids on the Yield of Penicillin in Submerged Culture:</i> P. E. HALPERN, DR. D. SIMINOVITCH and PROFESSOR W. D. MCFARLANE. <i>Automatic Electric Switch for Constant Air Pressure:</i> DR. R. O. FREELAND .....	230		

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## TERMINAL PROGRAMS IN THE GRADUATE SCHOOLS

By Dr. CARL E. SEASHORE

THE STATE UNIVERSITY OF IOWA

A TERMINAL program leading to the master's degree is a program of study designed specifically on a one- or two-year basis as distinguished from the master's degree program leading toward the doctorate, which is designed for the first year on a three-year basis.

The terminal program is tailor-made, designed to fit the individual needs of the student in relation to personal and professional objectives. It is sponsored by a professor who gives particular attention to the organization of terminal programs. It, therefore, becomes student-centered as opposed to subject-centered. It represents a vocational or semi-professional bent but should be distinguished from purely technological courses and be dominantly of a liberal character but

with a vocational aim. The member of the staff who directs the work takes responsibility for the maintaining of standards and a happy balance between concentration in an area and reasonable spread of work within a chosen field, the securing of the privileges involved and personal direction of the thesis. The work on the thesis and the organized reading are designed to introduce the student to bona-fide graduate methods of study. The terminal program ensures adequate consultation between student and staff at the time of registration and personal guidance throughout toward a well-conceived objective.

The primary purpose of this type of organization is the standardization of two types of master's de-

does not obtain, however, and our western civilization is particularly noted for rapid transformations. When empires fall, or when ruling classes are overthrown, woe befalls their members unless they change their behavior speedily. A consistent genetic trend may, therefore, be expected in the evolution of human psychic traits, namely, that genotypes will be selected which permit more and more plasticity, and less and less fixity, in personality characteristics. The end result of this trend will be that the genotypic differences in personality traits will become quite unimportant compared to their phenotypic plasticity. This should not be construed to mean that mankind tends to become genetically uniform; the trend is not toward genotypic uniformity but toward phenotypic plasticity. Natural selection favors above all else the ability to become rapidly adjusted to circumstances which change not only from day to day but, in a modern society, from minute to minute. Genetic differences may be retained, provided that they permit themselves to be eclipsed by the phenotypic plasticity. Whether or not this trend has already run its full course must be settled by investigation and not by speculation. All that we can be reasonably sure of is that the evolutionary pattern of the human species is so different from those of the higher animals (not to speak of the lower ones) that judgments by analogy with respect to the psychic traits have little value. It may be that the non-pathological hereditary differences in behavior found among men are merely the uneroded remnants of genotypic specializations that were moulded by natural selection to fit the conditions of ages long past. Genotypes now emerging will perhaps predispose every individual to respond to every challenge that his environment may offer as a social rather than a solitary being.

TH. DOBZHANSKY

COLUMBIA UNIVERSITY

### COSMIC RAYS

*What Are Cosmic Rays?* Revised and enlarged American edition. By PIERRE AUGER. Translated from the French by Maurice M. Shapiro. vii + 128 pp. 22 plates. Chicago: University of Chicago Press. 1945. \$2.00.

THIS book, as stated in the translator's preface, is written "primarily for the reader who lacks a technical knowledge of physics, but who wants to keep in touch with current developments in science." It represents a revised and extended presentation of a book entitled "Rayons Cosmiques," published by the Presses Universitaires de France, Paris, 1941.

The first chapter, "Story of Discovery," introduces briefly the fundamental concepts associated with ionization and allied phenomena, together with their

measurement, and leads up to the problem of an extra-terrestrial radiation. The second chapter, "The Heroic Epoch," traces the main steps which have been concerned with unravelling the general nature of the cosmic radiation. The third chapter, "Showers, Pairs, Bursts, Stars," enters into greater detail concerning the phenomena covered in its title. The fourth chapter, "Time Takes Its Toll of Cosmic Rays," discusses in further detail the nature of the particles which are associated with cosmic ray phenomena and the energies encountered in these particles. The last chapter, "The Sky's the Limit," deals further with cosmic-ray energies, particularly in relation to the evidence provided by "extensive showers," and further discussion is given of the extra-terrestrial origin of the primary cosmic ray particles and of the origin of the particles formed in the atmosphere, together with the interrelationships of the various particles.

While the book is written in elementary style, very easy of comprehension by a person with a limited knowledge of physics, it will not be so readily understood by the layman, to whom such expressions as "field," "electron volt energies," etc., represent an unfamiliar language. The style is vivacious and entertaining. Naturally, there are lacunae. In a small book of 128 pages one can hardly expect an approach to completeness of citation of the various experiments and ideas which have played a part in our present understanding of cosmic rays.

W. F. G. SWANN

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### BOOKS RECEIVED

- BURNET, FRANK M. *Virus as Organism*. Pp. 134. Harvard University Press, Cambridge, Mass. \$2.00. 1945.
- CARTER, T. D., HILL, J. E., and TATE, G. H. H. *Mammals of the Pacific World*. Illustrated. Pp. xvi + 227. The Macmillan Company, New York. \$3.00. 1945.
- DRINKER, CECIL K. *Pulmonary Edema and Inflammation*. Illustrated. Pp. viii + 106. Harvard University Press, Cambridge, Mass. \$2.50. 1945.
- GRISCOM, LUDLOW. *Modern Bird Study*. Illustrated. Pp. x + 190. Harvard University Press. \$2.50. 1945.
- LANDÉ, ALFRED. *The Physics of Flight*. Illustrated. Pp. vi + 122. Reinhold Publishing Corporation. \$2.50. 1945.
- MANTELL, C. L. and CHARLES HARDY. *Calcium Metallurgy and Technology*. Illustrated. Pp. 148. Reinhold Publishing Corporation. \$3.50. 1945.
- MUDGE, ROBERT W. *Meteorology for Pilots*. Illustrated. Pp. vii + 259. McGraw-Hill Book Company, Inc. \$2.50. 1945.
- PETERS, JAMES LEE. *Check-List of Birds of the World*. Pp. xi + 306. Harvard University Press, Cambridge, Mass. \$5.00. 1945.
- SMART, W. M. *Text-Book on Spherical Astronomy*. Illustrated. Pp. xii + 430. Cambridge University Press. \$4.75. Fourth edition, 1945.
- WRIGHT, RALPH R. *Electronics Laboratory Manual*. Illustrated. Pp. 77. McGraw-Hill Book Company, Inc. \$1.00. 1945.



## Outstanding New Books

### YOUTH, MARRIAGE AND PARENTHOOD

By LEMO D. ROCKWOOD, *Professor of Home Economics, and* MARY FORD, *Assistant Professor of Home Economics; Both at New York State College of Home Economics, Cornell University*

Essentially a presentation of research findings, this study of the attitudes of three hundred and sixty-four university juniors and seniors toward sex education, premarital sex behavior, marriage, parenthood and divorce stresses the relation between the attitudes expressed and selected factors in the students' own backgrounds. The findings of the present study are related to previously made studies and to conditions as they actually exist. September 1945.

Approximately 279 pages; 5½ by 8½; Probable price \$3.00

### INTRODUCTION TO ORGANIC CHEMISTRY

By ALEXANDER LOWY, *Late Professor of Organic Chemistry, University of Pittsburgh,* BENJAMIN HARROW, *Professor of Chemistry, and* PERCY APFELBAUM; *Both at City College, College of the City of New York.*

Thoroughly revised, this new edition has much additional material, a more extended discussion of the electronic concept of valence, and includes such topics as resonance, substitution in the benzene ring, alicyclic ring structures and high polymers. The chapter on terpenes has been rewritten and the list of references revised. September 1945.

Sixth Edition; Approximately 463 pages; 5½ by 8½; Probable price \$3.50

### MANUAL OF CHILD PSYCHOLOGY

Edited by LEONARD CARMICHAEL, *President; Director of the Laboratory of Sensory Psychology and Physiology; Tufts College*

A handbook of facts, established theories, techniques and methodology, which surveys the field of child psychology and evaluates the result of research in the psychology of human development. With nineteen separate chapters, each written by a recognized authority, the book is an advanced scientific manual, giving most complete bibliographical survey of the literature on child development now available. October 1945.

Approximately 1459 pages; 6½ by 8 9/16; Probable price \$6.00

### ELECTRON OPTICS AND THE ELECTRON MICROSCOPE

By V. K. ZWORYKIN, G. A. MORTON, E. G. RAMBERG, J. HILLIER, A. W. VANCE; *All at RCA Laboratories, Princeton, N. J.*

This comprehensive book covers the electron microscope in all its phases. The material was chosen to fulfill a two-fold purpose. The first is to aid the present or prospective microscopist in understanding his instrument and using it to greatest advantage; the second, to present systematically the practical and theoretical knowledge which must form the basis for further progress in electron microscope design. September 1945.

Approximately 759 pages; 5½ by 8½; Probable price \$10.00

### AERIAL NAVIGATION

By H. E. BENHAM, *Director of Ground Training, Pan American-Grace Airways, Inc.*

This book is designed to provide students of aerial navigation with a practical treatment of the subject that is simple yet complete. It explains the latest technique in the field and includes problems applying theory to actual cases. The book is suitable for use in college courses or in airlines' pilot training courses. October 1945.

Approximately 336 pages; 5½ by 8½; Probable price \$3.50

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