

SCIENCE

VOL. 92

FRIDAY, JULY 5, 1940

No. 2375

<i>Scientific Research, the Hope of the South:</i> DR. GEORGE D. PALMER	1	<i>With a Wet Crushing Mill:</i> DRS. JOHN C. WIRTH and F. F. NORD. <i>The Action of Type-specific Antibody upon the Pulmonary Lesion of Experimental Pneumococcal Pneumonia:</i> DR. W. BARRY WOOD, JR. <i>Growth Response of Plants to Riboflavin and Ascorbic Acid:</i> RAYMOND DENNISON	15
<i>Scientific Events:</i>		<i>Scientific Apparatus and Laboratory Methods:</i>	
Field Program of the Canadian Bureau of Geology and Topography; The Cook Observatory; The Illinois-Indiana Section of the Society for the Promotion of Engineering Education; Officers of the American Institute of Electrical Engineers; Recent Deaths	5	The Use of Plastic as a Substitute for Cover Glasses; V. SUNTZEFF and IRENE SMITH. <i>Erratic Potentials of Electrodes Sealed in Glass Tubing:</i> PROFESSOR A. B. GARRETT, ERNEST HOGGE and RAY HEIKS	17
<i>Scientific Notes and News</i>	8	<i>Index to Volume 91</i>	i
<i>Discussion:</i>		<i>Science News</i>	8
A Possible Explanation of Deep-Focus Quakes: PROFESSOR JOSEPH LYNCH. <i>Resistance to Sulfanilic Derivatives in Vitro and in Vivo:</i> JEROME S. HARRIS and DR. HENRY I. KOHN. <i>Collecting Subtropical Plants and Animals in Northern Ohio:</i> CHARLES OTTO MASTERS. <i>Collection of Unorthodox Curiosa:</i> ABERT G. INGALLS	10		
<i>Scientific Books:</i>			
The Pageant of Electricity: PROFESSOR GORDON FERRIE HULL. <i>Aging:</i> PROFESSOR C. M. MCCAY	12		
<i>Societies and Meetings:</i>			
The New Hampshire Academy of Science: PROFESSOR W. W. BALLARD. The New York State Geological Association: GEORGE H. CHADWICK	14		
<i>Special Articles:</i>			
Alcoholic Fermentation by Fusaria Juice Obtained			

SCIENCE: A Weekly Journal devoted to the Advancement of Science, edited by J. MCKEEN CATTELL and published every Friday by

THE SCIENCE PRESS

Lancaster, Pa. Garrison, N. Y.
New York City: Grand Central Terminal
Annual Subscription, \$6.00 Single Copies, 15 Cts.

SCIENCE is the official organ of the American Association for the Advancement of Science. Information regarding membership in the Association may be secured from the office of the permanent secretary in the Smithsonian Institution Building, Washington, D. C.

SCIENTIFIC RESEARCH, THE HOPE OF THE SOUTH¹

By Dr. GEORGE D. PALMER

UNIVERSITY OF ALABAMA

I WISH, first, to discuss the importance of scientific research to the nation as a whole; second, to contrast the scientific research done in the North and the Far West with that done in the South; and third, to suggest ways of building up scientific research organizations in the South or in any other region.

We all know about the "Report on Economic Conditions of the South" prepared by the National Emergency Council for President Roosevelt, and his statement that "The South presents right now the Nation's number one economic problem." This report emphasizes our poor ranking in education, housing facilities, etc., but barely mentions our low ranking in the field of scientific research. This is all the more

remarkable since we now know that the present status of the United States as the leading nation is due primarily to the unbeatable combination of business and scientific research, backed by our great resources.

Big business to-day is exploiting the fruits of our scientific research laboratories—our last remaining frontiers, our so-called "inner frontiers"—as during the past century it exploited our exterior—or geographical—frontiers. There is one big difference now—we shall never run out of "inner frontiers." Success in one field of scientific research immediately presents many new and worth-while fields.

It is this scientific research, chiefly in the fields of applied chemistry and physics, backed by excellent industrial organizations, which has enabled us gradually to forge ahead of all other countries. Our nation

¹Address of the retiring president of the Alabama Academy of Science, Birmingham, Alabama, March 29, 1940.

repetition of this procedure on several days, left them unchanged. The effects of sunlight, weak acids and weak alkalies are very slight.

The plastic is obtained in sheets which can be cut in such a way that their size and shape are the same as those of cover glasses. These slips are kept covered on both sides with sheets of tissue paper. They are, as a rule, clean, but if cleaning should be necessary, they may be dipped in 50 per cent. alcohol, one at a time, and dried immediately. Thick, paper-filtered Canada balsam serves as mounting medium. The use of an excessive amount of xylol should be avoided.

The most objectionable feature in the use of plastic in the place of cover glasses is their tendency to "curl" during the process of drying. If the slips are kept in the oven overnight at a temperature of 37° C., from three to five per cent., sometimes even a larger number, of the cover slips may pull away at the edges. To overcome this difficulty as much as possible it is necessary, after mounting, to dry the slides slowly at room temperature for five to six days, in order that the Canada balsam may be well hardened before placing the slides into slide boxes. In this way as a rule a fairly satisfactory result is obtained, although the smoothness of the plastic is not always equal to that of cover glasses.

After the appearance of the article by H. O'Brien,³ we substituted isobutyl methacrylate polymer for Canada balsam. The solution found suitable was approximately 1 part of isobutyl methacrylate polymer⁴ to 2½ parts of xylol. These experiments are still in an early stage, but it seems that this change improves the results. Under these conditions the drying requires not more than one day and, so far, no curling of the plastic cover slips has occurred.

V. SUNTZEFF
IRENE SMITH

WASHINGTON UNIVERSITY SCHOOL OF
MEDICINE

ERRATIC POTENTIALS OF ELECTRODES SEALED IN GLASS TUBING

OUR attention has been drawn to the erratic potentials that are observed in the potentiometric titration of dilute solutions in which platinum electrodes, sealed in glass tubing, are used. These erratic potentials were particularly obnoxious near the end point of a titration. We have noted them specifically in the potassium dichromate-stannous chloride and the thallous chloride-potassium iodate titrations. Complete elimination of this erratic behavior was obtained by removing the glass tubing from the electrode, or, by allowing only the wire (electrode) to touch the solution being titrated or the electrolyte of the cell being studied.

³ Harold C. O'Brien, *SCIENCE*, 91: 412, 1940.

⁴ The isobutyl methacrylate polymer prepared by du Pont Company.

A general investigation has indicated that the erratic behavior of electrodes sealed in glass tubing is much more prevalent than one would normally be led to believe is true. Apparently most observers have attributed the erratic potentials to some peculiarity of the reaction involved rather than to the physical structure of the electrode assembly. Particularly does this seem to be a source of trouble in the erratic behavior of certain E.M.F. cells built for special purposes. This phenomenon may be crucial in these cases, for not only are fluctuation or drifts introduced but the induced potentials may be large (300 mv) and irreproducible.

The cause of this trouble has not been entirely established. It may be due, partially or entirely, to strains in the electrodes as a result of the glass-metal seal. This may result in a variable junction potential as a result of the solution being in contact with the same metal in different standard states; this could be reduced to a constant value or eliminated by a very careful annealing process. The disturbance is definitely in the region of the glass-metal-solution interface. Elimination of this interface seems to eliminate the source of trouble. In potentiometric titrations, where the electrodes must be subject to frequent cleaning by burnishing in a flame or treatment with hot aqua regia, we have found it highly desirable to eliminate the glass casing for the electrodes or to construct the electrode in such a manner that the solution does not come into contact with the metal-glass interface. This may also be necessary for many other types of cell measurements. Our recent experiences with this phenomenon have been such that we are certain that it is of a general nature and requires consideration where cell data are being obtained.

A. B. GARRETT
ERNEST HOGGE
RAY HEIKS

THE OHIO STATE UNIVERSITY

BOOKS RECEIVED

- BAITSELL, GEORGE A. *Human Biology*. Pp. xv + 621. 259 figures. McGraw-Hill. \$3.75.
BOUCHER, PAUL E. *Fundamentals of Photography*. Pp. xi + 304 + iii. Illustrated. Van Nostrand. \$3.00.
CHAPMAN, JOHN M. and others. *Commercial Banks and Consumer Instalment Credit*. Pp. xxiv + 318. National Bureau of Economic Research. \$3.00.
FEARON, WILLIAM F. *An Introduction to Biochemistry*. Second edition. Pp. xii + 475. Mosby.
HESSEL, F. A., WELFORD MARTIN and M. S. HESSEL. *Chemistry in Warfare*. Pp. x + 164. Illustrated. Hastings House, New York. \$2.00.
SHRINER, RALPH L. and REYNOLD C. FUSON. *The Systematic Identification of Organic Compounds*. Second edition. Pp. xi + 312. Wiley. \$2.75.
SMILEY, DEAN F. and ADRIAN G. GOULD. *A College Textbook of Hygiene*. Third edition. Pp. xiii + 539. 131 figures. Macmillan. \$2.50.
STEEDS, W. *Mechanism and the Kinematics of Machines*. Pp. xi + 319. 379 figures. Longmans, Green. \$5.00.

Important New McGraw-Hill Books

Applied X-Rays. *New third edition*

By GEORGE L. CLARK, University of Illinois. *International Series in Physics*. 663 pages, 6 x 9. \$6.00

In the new edition of this well-known book the author, besides bringing the material up to date, has expanded the text considerably to include the remarkable developments of the past eight years. The chapter on interpretation of X-ray diffraction patterns is entirely new, and new chapters have been added on the measurement of intensity, photochemistry, the biological effects of X-rays, etc.

Industrial Microbiology

By SAMUEL C. PRESCOTT and CECIL G. DUNN, Massachusetts Institute of Technology. 515 pages, 6 x 9. \$5.00

This book deals with the fundamentals of the utilization of yeasts, bacteria, and molds for the production of industrially important or potentially valuable products. The authors consider the organisms, methods of their cultivation, conditions of fermentation, end-products, and biochemistry of the fermentation.

Textbook of General Horticulture

By JULIAN C. SCHILLETTER and HARRY W. RICHEY, Iowa State College. *McGraw-Hill Publications in the Agricultural Sciences*. 363 pages, 6 x 9. \$3.00

The object of this book is to set forth the essential principles of horticulture in a manner suitable for a general college course. The authors present a broad picture of the field of horticulture and its relations to agriculture and to the economic, political, and social life of the individual, and then discuss the fundamental plant processes and their application to horticultural practices.

Differential and Integral Calculus

By ROSS R. MIDDLEMISS, Washington University. 416 pages, 6 x 9. \$2.50

Intended for the usual beginning course, this book is unique in that it maintains a high degree of accuracy, and is at the same time exceptionally clear and readable. Throughout, it is the author's purpose to give the student a real understanding of the principal concepts of the subject.

Introduction to Electricity and Optics

By NATHANIEL H. FRANK, Massachusetts Institute of Technology. 395 pages, 6 x 9. \$3.50

The publication of this long-awaited book completes the author's two-volume text in physics for the introductory technical course, the first half of which has been so successfully covered by *Introduction to Mechanics and Heat*. *Introduction to Electricity and Optics* gives a logical exposition of the fundamental principles, emphasizing field theory and the elementary application of these principles to circuits and to the electrical, magnetic, and optical properties of matter. The treatment is quantitative throughout and modern atomic ideas are stressed along with the more classical modes of presentation.

Send for copies on approval

McGRAW-HILL BOOK COMPANY, INC.

330 West 42nd Street, New York, N. Y.

Aldwych House, London, W.C.2

New Life for YOUR Working Library

APPLIED PHARMACOLOGY

By HUGH ALISTER McGUIGAN, Professor of Pharmacology and Therapeutics, University of Illinois, College of Medicine. 870 pages, 41 illustrations. PRICE, \$9.00

This brand new text, written from the rich experience that comes with more than a third of a century of teaching pharmacology to medical students, is the ideal text and reference work for every day use in daily medical practice. No matter what drug you may want to look up, you will find it here in this volume, together with its clinical use and application. The book is arranged for quick reference—and is dependable, up-to-date, is not too voluminous, but adequate in every way to give you needed information about drug action and therapeutic uses. It is one of the great books of the day.

Designed for practitioners and students, this book appears midway between revisions of the Pharmacopoeia. It emphasizes the theoretical foundations of pharmacology, and equally, the practical application. Theory and practice are happily combined in this book. The explanation of the action of each drug is given, its use in practice and the explanation of its effects.

TEXTBOOK OF NERVOUS DISEASES

The subject of neurology as presented in this English Translation of the Fifth Edition of Bing's "TEXTBOOK OF NERVOUS DISEASES," attains almost the exactness of mathematics. Bing has elaborated on the latest advances in Europe, has unfolded his own immense experience based on minute and painstaking observations, and has brought to the practitioner as has no other textbook writer, detailed, precise therapeutics in an applicable form. By ROBERT BING. Translated by WEBB HAYMAKER. 850 pages, 207 illustrations, 9 in color. Price, \$10.00

COMPENDIUM OF REGIONAL DIAGNOSIS IN LESIONS OF THE BRAIN AND SPINAL CORD

This volume deals primarily with the principles which underlie the localization of lesions in the central nervous system. For many years Bing's text has been the accepted guide in America and Europe. The clarity of its style and description, the soundness of its differential diagnosis, and the wealth of information it contains make it valuable and necessary to you. By ROBERT BING. Translated by WEBB HAYMAKER. 292 pages, 125 illustrations, 7 plates. Price, \$5.00

HISTOLOGIC TECHNIC

This handbook of histological technic supplies specific directions to the beginner and inexperienced worker, and describes the latest improved methods for the experienced worker. The frozen section method has been emphasized, and a major purpose of the work is to present modifications of special staining methods which make their results more quickly available to the pathologist by the use of the frozen section procedure. By ARAM A. KRAJIAN. 272 pages, 44 illustrations, 7 color plates. Price, \$3.50

MANUAL OF NEUROHISTOLOGIC TECHNIC

The growth of neuropathology has been dependent in a large part upon the rapid advances made in the field of neurohistologic technique. At the same time, the array of technical methods recommended for the study of the nervous system leaves the beginner bewildered and discouraged. This compilation is an attempt to bring under one heading various neurotechnical methods which may be carried out in a general pathologic laboratory. By OSCAR A. TURNER. 72 pages. Price, \$2.00

PSYCHOBIOLOGY AND PSYCHIATRY

This book, written at the invitation of Dr. Adolf Meyer, is an attempt to portray the main lines of his teaching. The strong clinical trend in the book needs no apology or defense. It is the basis of all medicine, and whatever laboratory and other special helps are given in extenso are to be considered exclusively in the nature of graphic illustration of what the clinical sense already knows or aims at. The book is divided into four parts: 1. Psychobiology. 2. Psychopathology. 3. Treatment. 4. Historical Appendix. By WENDELL MUNCIE. 770 pages, 69 illustrations. Price, \$8.00

The C. V. Mosby Company
3525 Pine Blvd., St. Louis, Mo.

Sci 7-5-40

Gentlemen: Send me the following book(s):

Dr.

Address