

# SCIENCE

VOL. 73

FRIDAY, MAY 1, 1931

No. 1896

<i>Sugars in the Service of Chemistry:</i> DR. P. A. LEVENE .....	459	<i>Scientific Apparatus and Laboratory Methods:</i>	
<i>Michael Faraday. II:</i> DR. W. F. G. SWANN.....	462	<i>A Modified Form of Kundt's Tube:</i> PROFESSOR R. C. COLWELL. <i>An Inexpensive Glass Marking Pencil:</i> CHARLES B. DEWITT .....	480
<i>Obituary:</i>		<i>Special Articles:</i>	
<i>Norifumi Okamoto:</i> PROFESSOR DAVID EUGENE SMITH. <i>Memorials; Recent Deaths</i> .....	468	<i>The Effects of Ultra-violet Light on Paramaecium:</i> L. B. RENTSCHLER. <i>The North American Lung Fluke:</i> FRANKLIN GERHARD WALLACE. <i>A Preliminary Note on the Occurrence of a Color Mutation in the House Mouse (Mus musculus):</i> JOSEPH M. MURRAY .....	480
<i>Scientific Events:</i>		<i>Science News</i> .....	10
<i>The Zoological Society of London; The American Association of Museums; Decrease in the Number of Schools of Medicine; Delegates to the Ninth International Dairy Congress; The American Philosophical Society</i> .....	470		
<i>Scientific Notes and News</i> .....	472		
<i>Discussion:</i>			
<i>Erasmus Darwin and the Biologic Control of Insects:</i> PROFESSOR WILLIAM A. RILEY. <i>A Mathematical Proof:</i> PROFESSOR G. A. MILLER. <i>More about Twisted Grain in Trees:</i> ARTHUR KOEHLER. <i>Publication of Industrial Research:</i> WATSON DAVIS. <i>The Life of Books:</i> DR. JOSEPH LEIDY II .....	475		
<i>Reports:</i>			
<i>The Milton and Clark Awards at Harvard University</i> .....	478		

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

## THE SCIENCE PRESS

New York City: Grand Central Terminal  
Lancaster, Pa. Garrison, N. Y.  
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.

## SUGARS IN THE SERVICE OF CHEMISTRY<sup>1</sup>

By Dr. P. A. LEVENE

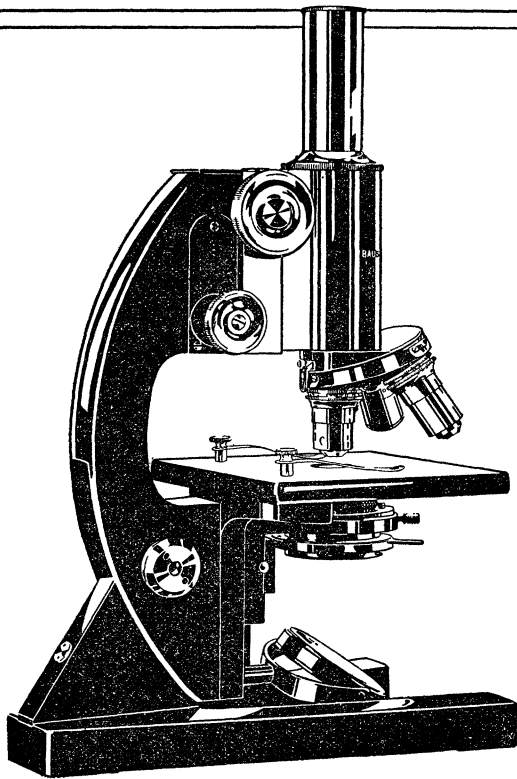
ROCKEFELLER INSTITUTE FOR MEDICAL RESEARCH

SUGARS are the most popular topic of chemical literature to-day. There must be a reason for it, and the question arises—What is it? The importance of carbohydrates in our daily life, the numerous uses made of them in our foodstuffs, in textiles, in building materials, in the many substitutes for the more costly natural products may sound like a logical answer to the question. Indeed, it may be claimed that the progress of civilization can be measured by the extent of the uses made of carbohydrates for constructive and destructive purposes. Yet the answer would be only partially correct. It would be hard to believe that men of the type of Scheele, Baeyer, Fischer and van't Hoff devoted themselves to the problems of sugar chemistry for reasons purely practical.

<sup>1</sup> Delivered before the Chemical Society of Washington on the occasion of the award of the Hillebrand Prize to C. S. Hudson, March 26, 1931.

Admitting even for the sake of argument that to many workers the incentive was the applied phase of sugar chemistry, the great activity in this special field of work could not pass without leaving a deep impression on chemical philosophy. Indeed, it should be an easy matter to defend the thesis that every important industrial research extended over a long period of time must furnish a contribution to chemical philosophy which by generations to come will be adjudged to be of greater moment than the practical end which by its very nature can be of temporary value only. The history of chemistry furnishes many instances supporting this thesis, but it suffices to mention the trivial practical task which suggested to Dumas the theory of substitution.

With this thought in mind it may be proper to review briefly the contributions made by sugar chemistry to chemical theory.



B &amp; L MICROSCOPE GS

## To those who know microscopes:

THE GS is a laboratory microscope built to provide a maximum of balance, stability and sturdiness. Optically it is the same as other B & L laboratory microscopes. The stand makes this instrument the personal preference of many who prefer a somewhat heavier, more rugged microscope.

Like all truly efficient mechanisms, its beauty and grace proclaim its balance and precision. The arm sweeps down in a long arc to join the base at the point that allows the instrument to be in proper balance at any angle of inclination between the vertical and horizontal. The long and heavy V-shaped base gives unusual stability. Write for literature that will bring you complete details about the GS.

**BAUSCH & LOMB OPTICAL COMPANY**

642 St. Paul Street

«

»

Rochester, N. Y.



# BAUSCH & LOMB

Makers of Orthogon Eyeglass Lenses for Better Vision

# Latest McGraw-Hill Books

## **Smail's COLLEGE ALGEBRA**

By LLOYD L. SMAIL, Professor of Mathematics, Lehigh University. 450 pages,  $5\frac{1}{2} \times 8$ . \$2.50

This textbook of college algebra is unusual in that a unified presentation has been secured by basing the arrangement and classification of material and manner of treatment on the *function concept*.

## **Moyer and Wostrel's THE RADIO HAND BOOK**

By JAMES A. MOYER, Director of University Extension, Massachusetts Department of Education; Member of Federal Commission on Radio Education, and JOHN F. WOSTREL, Instructor in Radio Engineering and Supervisor in Charge of Industrial Subjects, Division of University Extension, Massachusetts Department of Education. 886 pages,  $5\frac{1}{2} \times 8$ , 650 illustrations, flexible. \$5.00

The book covers the whole radio field—from the fundamentals of electricity, magnetism and electron theory right down to full details on latest applications, such as television, sound motion pictures and the use of photo-electric cells and vacuum tubes in industry.

## **Fajans' RADIOELEMENTS and ISOTOPES: CHEMICAL FORCES and OPTICAL PROPERTIES of SUBSTANCES**

By KASIMIR FAJANS, University of Munich. *George Fisher Baker Non-Resident Lectureships in Chemistry at Cornell University Series*. 125 pages,  $6 \times 9$ , 34 illustrations. \$2.50

This book presents an explanation of the development of the problem of the origin of Actinium, a discussion in some detail of the phenomena of atomic linkage and the adsorption of ions and a consideration of several applications of the latter phenomenon.

## **North's THE COMMUNITY and SOCIAL WELFARE**

**A Study in Community Organization**

By CECIL CLARE NORTH, Professor of Sociology, Ohio State University. *McGraw-Hill Publications in Sociology*. 259 pages,  $6 \times 9$ . \$3.50

A book discussing the welfare problems of the modern city, the specialized agencies that have been developed to deal with these problems, and the building of adequate and effective welfare programs.

## **Farnham's DETERMINATION of the OPAQUE MINERALS**

By C. MASON FARNHAM. 236 pages,  $6 \times 9$ . \$3.50

This book presents all of the information needed for identifying opaque minerals in polished sections by means of the reflecting microscope.

*Send for copies on approval*

**McGRAW-HILL BOOK COMPANY, Inc.**

Penn Terminal Building

370 Seventh Avenue

New York

## THREE BIBLIOGRAPHIES

by A. S. M. E. Research Committees

### *Woods of The World*

1500 references arranged geographically and indexed by subject; 80 pages. \$1.50 postpaid

### *Effect of Temperature on the Properties of Metals*

Selected annotated references arranged chronologically with author and subject indexes. Vol. I, 300 references 1828–1927; Vol. II, 250 references, 1927–1930. 75c each postpaid

### *Fluid Meters— Their Theory and Application*

An extensive monograph and bibliography on fluid flow and metering. 92 pages; 38 figures. \$2.00 postpaid

*A list of other A. S. M. E. Research Publications of scientific-engineering interest will be sent on request.*

Address all orders to

## The American Society of Mechanical Engineers

29 West 39th Street, :: :: New York, N. Y.

Department M—Publication Sales

## THE MICROSCOPE

By SIMON H. GAGE, of Cornell University

Revised, Dark-field Edition (1927) now Available.

The Old and the New in Microscopy, with a special chapter on Dark-field Methods and their Application.

Postpaid, \$3.50

COMSTOCK PUBLISHING CO., ITHACA, N. Y.

### Microscopical Preparations

96 page Classified Catalogue. Post free. The largest mounters in Great Britain and the only makers of

**EUPARAL** the noted mountant

Flatters & Garnett, Ltd.

309, Oxford Road,  
MANCHESTER, ENGLAND

*"A Magnificent Contribution to the Science"*

### PLANT RUSTS

By J. C. Arthur, Professor Emeritus of Botany, Purdue University, and Six Collaborators.

"The author, widely known through his many years of intensive study of the Uredinales, has undertaken to assemble in the present work all important information now available regarding the Uredinales. As collaborators, he has had a number of other American uredinologists, each an authority in his special field. As a result a work is before us that in every respect must be pronounced thoroughly successful, and will be greeted enthusiastically, especially by all who are interested in the rust fungi from whatever point of view."

—H. Sydow in *Annales Mycologici*.

446 pages. 6 by 9. 186 illustrations. Cloth, \$6.50

**JOHN WILEY & SONS, Inc.**

440 Fourth Avenue, New York