

# SCIENCE

VOL. LXXII

FRIDAY, OCTOBER 3, 1930

No. 1866

<i>Specialization in Science</i> : PROFESSOR FRANCIS RAMALEY .....	325
<i>Ecological Aspects of the Transition from Old Forests to New</i> : THORNTON T. MUNGER .....	327
<i>Obituary</i> :	
<i>Recent Deaths; Memorials</i> .....	332
<i>Scientific Events</i> :	
<i>The Whipsnade Zoological Garden; The National Arboretum; The First Transcontinental Fruit Transportation Laboratory; Course in the Radiological Diagnosis of Cancer; International Highway Engineers' Tours</i> .....	333
<i>Scientific Notes and News</i> .....	336
<i>Discussion</i> :	
<i>History of Science Source Material in College Libraries</i> : PROFESSOR E. H. JOHNSON. <i>Are Batholiths Up-Bulges of Sial?</i> PROFESSOR ALFRED C. LANE. <i>Another Capture on the New Jersey Coast of the Basking Shark, Cetorhinus maximus</i> : DR. E. W. GUDGER. <i>Observations of Lightning</i> : HAMILTON CRAIGIE. <i>Cocos and Valency</i> : DR. HENRY LEFFMANN .....	340
<i>Scientific Books</i> :	
<i>Kräusel's Die Paläobotanischen Untersuchungs-methoden</i> : PROFESSOR E. C. JEFFREY .....	344
<i>Scientific Apparatus and Laboratory Methods</i> :	
<i>An Individual Jacobsen Germinator</i> : HENRY I. BALDWIN. <i>Detection of Fungus Mycelium in Mildewed Cotton Fabrics</i> : M. W. JENNISON .....	345
<i>Special Articles</i> :	
<i>Changing the Chirp-Rate of the Snowy Tree Cricket Oecanthus niveus with Air Currents</i> : H. A. ALLARD. <i>Fruit-Bud Formation in the Strawberry in Spring in Southeastern States</i> : GEORGE M. DARROW and GEORGE F. WALDO .....	347
<i>Science News</i> .....	x

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.

## SPECIALIZATION IN SCIENCE<sup>1</sup>

By Professor FRANCIS RAMALEY

UNIVERSITY OF COLORADO

IN the organic world it is the generalized type which gives rise to higher forms while extreme specialization means an end of progress. To illustrate from the field of botany: the mosses have been called an evolutionary failure for, although they have adopted a thousand forms, these all are too highly specialized to allow of really important advance. In the whole moss class there is a clinging to certain particular features—no freedom to produce or even to suggest anything non-moss like. Mosses have rung changes upon non-essentials but have always kept their own special pattern. The liverworts did not thus specialize but retained their plasticity, varying in many directions and at last giving rise to the remarkable *Anthoceros* (horned liverwort), which is almost a

lycopod. And although the paleontologists may not find the "missing link" which connects liverworts and lycopod there can be no doubt that the generalized liverworts, not the specialized mosses, gave origin to the next plant division.

Among animals, also, specialization stops progress. Neither the intelligent and betrunken elephant tribe, nor the swift-footed, one-toed horse, nor the cunning members of the wolf and dog family with their great body specialization and highly developed sense organs produced the "lords of creation." Rather was it some simple creature with primitive hands and feet and jaws which began that great advance leading by one path to the grinning chimpanzee and ferocious gorilla or, by another turn, past a long series of half-human beasts to present-day man. Here, as always, the specialized types early reached a limit beyond which they could not go while generalized forms retained the

<sup>1</sup> Condensed from the address of the retiring president of the Southwestern Division of the American Association for the Advancement of Science, eleventh annual meeting, Tucson, Arizona, April 23, 1930.

# Industrial Chemistry

## An Introduction

An Elementary Treatise for the Student and General Reader

BY EMIL RAYMOND RIEGEL, PH.D.

*Professor of Industrial and Physical Chemistry, University of Buffalo*

Admirably suited to the needs of a college course in industrial Chemistry

649 pages

Illustrated

Price \$9.00

THE ever-growing application of Science to industrial ends brings with it a need by workers in any one branch for accurate but easily understood information concerning other branches, both with regard to the technical processes involved, and to the economic position these branches may tend to occupy in relation to their own.

Dr. Riegel's book concerns itself strictly with what is thought to be the best method of making industrial chemistry understandable to both the student and the general reader. It is balanced, all the chapters being on the same level of scholarship, detail of treatment, theoretical and technical information. The economic position of each industry is clearly shown by statistical figures of recent date.

This book is sufficiently thorough to be valuable to the technical man, and sufficiently simple to be appreciated by the layman.

### A Collection of Chemical Lecture Experiments

H. F. DAVISON

*Assistant Professor of Chemistry, Brown University, Providence, R. I.*

139 Pages Price \$2.50

"A COLLECTION of 69 elementary lecture-table experiments by an exceptionally able demonstrator. Not intended to be exhaustive; the experiments included are new, or are modifications of old ones, and attention has been given to simplification of apparatus and economy of time in demonstrating. In the author's opinion, 'any experiment which takes over five minutes will be of doubtful value.' Set-ups are shown, where necessary, and an introductory chapter on 'The art of lecture table demonstrating' offers valuable suggestions to teachers." (Book Review Digest.)

### Volumetric Iodate Methods

GEORGE S. JAMISON

96 Pages Price \$2.50

THIS work brings together the various procedures and applications of the volumetric iodate methods employed in routine analyses and research work.

DETAILED descriptions are given of the determination of antimony, arsenic, copper, mercury, molybdenum, tin, zinc, hydrazine, hydrogen, peroxide, sodium thiosulphate, various peroxides, tetrathionates, sulphurous acid, sulphites, dichromates, etc. The simplicity and convenience of the method are well known, and as chemist to the Bureau of Chemistry, U. S. Dept. of Agriculture, the author is able to write with the advantage of great experience. [A bibliography is included.]

### Advanced Laboratory Manual of Organic Chemistry

MICHAEL HEIDELBERGER, B.S.,  
A.M., PH.D.

*Associate in Chemistry, Rockefeller Institute*

103 Pages Price \$2.50

THIS manual is designed to simplify the task of the advanced chemistry student. It provides a brief advanced course in manipulative organic chemistry; embodying experiments scattered as widely as possible over important types of substances and reactions. The aim has been to select experiments of greater difficulty than those ordinarily included in elementary manuals, but also to avoid those problems, so difficult or involved as to discourage rather than interest the student.

**THE CHEMICAL CATALOG COMPANY, INC.**  
417 Fourth Avenue New York, U. S. A.

# ISIS

INTERNATIONAL REVIEW DEVOTED to the  
HISTORY of SCIENCE and CIVILIZATION

*Quarterly Organ of the History of Science Society*

Edited by **GEORGE SARTON, D.Sc.**

Harvard Library 185,  
Cambridge, Massachusetts, U. S. A.

"ISIS" is the most important journal of its kind published anywhere in the world. It contains original papers, chiefly in English, subsidiarily in French, German, Italian, Latin; shorter articles; and an abundant bibliography. Much attention is paid to Oriental science and civilization.

A new feature is the inclusion of addenda and errata to Sarton's "Introduction to the History of Science," Vol. I. From Homer to Omar Khayyám (1927). Thus the readers of "ISIS" can easily keep their knowledge on the subject up-to-date.

The price of each volume is \$6.

Members of the History of Science Society receive free of charge every number published within the year, at least one volume. In the year 1927 they received *two* volumes (1110 pages, 28 plates), including 27 papers, 73 shorter items, and 2828 bibliographical notes.

Annual dues, \$5

SECRETARY: **F. E. BRASCH**

Library of Congress, Washington, D. C.

*Specimen numbers may be obtained, as long as the supply lasts, from the Secretary.*

## SCIENTIFIC SURVEY OF PORTO RICO AND THE VIRGIN ISLANDS

The results of the natural history survey of Porto Rico and the Virgin Islands conducted by The New York Academy of Sciences, in cooperation with the Government of Porto Rico, are being published.

Thirty-one parts, distributed through eleven octavo volumes, have been issued, including documents on Geology, Physiography, Paleontology, Descriptive Botany, Plant Ecology, Mycology, Mammalogy, Ornithology, Herpetology, Ichthyology and Entomology.

Schedules, advertising these parts in detail, with announcements of the parts in preparation, may be obtained from the Recording Secretary of The New York Academy of Sciences, 77th Street and Central Park West, New York City. The price of each part is \$2, the thirty-one parts published costing \$2.

## 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.

## FINE SHELLS

I have one of the largest stocks in the World, 25,000 species. Prices right. Collections furnished of any size, or sent on selection. Look them over in your own home, and pay for what you keep. Send one dollar bill and get fine four-inch land shell, with one of its eggs, white, blown, 1 inch long, fine for teaching. Have hundreds others just as interesting. Get started buying this class of material and you will find teaching easy.

**WALTER F. WEBB**

202 Westminster Road

Rochester, N. Y.

The  
Century Biological Series  
ROBERT HEGNER, *Editor*

## PLANT PHYSIOLOGICAL CHEMISTRY

By **RODNEY B. HARVEY, PH. D.**

*Head of the section of Plant Physiology  
and Agricultural Botany in the Minne-  
sota Agricultural Experiment Sta-  
tion, and Associate Professor  
of Plant Physiology and  
Botany in the Univer-  
sity of Minnesota*

This is the first book published in English which deals with the chemical physiology and chemical mechanism of plants. It is unique in that it treats the subject of plant chemistry from the physiological rather than the chemical point of view.

The book has been organized under the following headings: Introduction; General Metabolism; Carbohydrates; Fats, Phosphatides, and Waxes; Proteins; Photosynthesis; and Respiration.

*Plant Physiological Chemistry* is designed especially as a text for college courses in plant physiology and chemistry. It is also a valuable reference book.

8vo, 413 pages, illustrated.

Price, \$6.00

## THE CENTURY COMPANY

353 Fourth Ave.  
New York

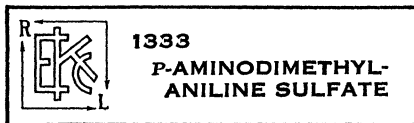
2126 Prairie Ave.  
Chicago

## The Estimation of Hydrogen Sulfide

with

THE reaction between hydrogen sulfide and p-aminodimethylaniline forming methylene blue is the basis of a colorimetric method for determining  $\text{H}_2\text{S}$ . The hydrogen sulfide is absorbed by bubbling through a zinc acetate solution which is subsequently treated with the acidified organic reagent. After standing for two hours the color produced is matched against standards in a colorimeter or in Nessler tubes.

The coupon below will bring information regarding the preparation and use of this reagent.



1333

P-AMINODIMETHYL-  
ANILINE SULFATE

Eastman Kodak Company, Chemical Sales Department  
365 State Street, Rochester, N. Y.

Gentlemen:

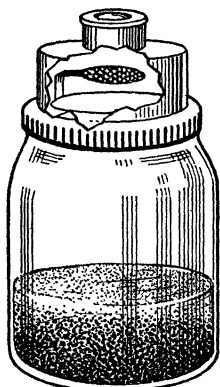
Please send me information regarding the use of Eastman p-Aminodimethylaniline Sulfate for determining hydrogen sulfide.

Name.....

Street and Number.....

City and State.....

## Apparatus for studying and demonstrating radio-activity



**5297 Radioscope, Hammer.** Uses the scintillation method—the most sensitive of all for detecting radio-activity in waters, ores, etc. Brilliant scintillations are produced by the alpha particles striking phosphorescent zinc sulphide. Price, complete, \$10.00.

**5299 Spintariscopes, Radium Apparatus, Hammer.** Illustrates vividly the disintegration of radium. Flashes of light are produced by the alpha rays as they strike phosphorescent zinc sulphide. Price, complete, \$4.00.

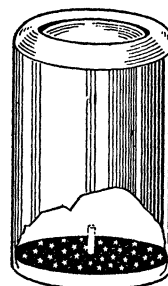
**5301 Phosphorescent Zinc Sulphide, Special Grade.** Guaranteed to be the most responsive to radium of any on the market. 5 gram bottles, each, \$3.50. 25 gram bottles, \$10.00.

**5303 Phosphorescent Zinc Sulphide, Grade A.** Extra strong phosphorescence. 5 gram bottles each, \$2.00. 25 gram bottles, each, \$4.00.

**5305 Radium Luminous Material (Radium Paint).** This is the class of material used on the finest instruments for permanent night illumination. 1/2 gram bottle, \$5.00.

**5306 Triboluminescent Zinc Sulphide.** Phosphoresces a bright golden yellow after being exposed to light or after rubbing. 5 gram bottles, each, \$2.00. 25 gram bottles, each, \$4.00.

**5307 Phosphorescent Calcium Sulphide.** Also known as Canton's Phosphorus and Balmain's Luminous Paint. 25 gram bottles, each, \$2.00.



**THE DENVER FIRE CLAY COMPANY**

DENVER



COLO. U.S.A.

BRANCHES AT SALT LAKE CITY, EL PASO, AND NEW YORK

Special prices on all grades of  
phosphorescent materials  
in large quantities

Send for Bulletin No. 178