

SCIENCE

VOL. 76

FRIDAY, SEPTEMBER 30, 1932

No. 1970

<i>Some New Aspects of Plant Nutrition:</i> DR. R. W. THATCHER	281	and A. L. STAHL. <i>A Knockdown "Berlese Funnel":</i> DR. ARTHUR PAUL JACOT	298
<i>The Rise of Genetics. II:</i> PROFESSOR T. H. MORGAN	285	<i>Special Articles:</i>	
<i>Obituary:</i>		<i>The Administration of Ferrous Iodide and Linoleic Acid to Rats Deprived of Vitamin A:</i> DRs. LUCILLE L. REED, LAFAYETTE B. MENDEL and HUBERT BRADFORD VICKERY. <i>Effect of Age and Sex on Resistance of Daphnids to Mercuric Chloride:</i> PROFESSOR JOHN BREUKELMAN	300
<i>Scientific Events:</i>		<i>Science News</i>	6
<i>The David Dunlap Observatory; New Building for Entomology at the University of California; The Junior Science Clubs Section of the American Institute; The Los Angeles Meeting of the American Mathematical Society</i>	289		
<i>Scientific Notes and News</i>	291		
<i>Discussion:</i>			
<i>The Fundamental Particles:</i> PROFESSOR R. M. LANGER. <i>Light a Factor in Rancidity:</i> DR. GEORGE E. HOLM and GEORGE R. GREENBANK. <i>An Unusual Cotton Plant:</i> PROFESSOR A. F. KIDDER. <i>A Meteor in Wisconsin:</i> PROFESSOR G. E. CULVER	294		
<i>Reports:</i>			
<i>Doctorates Conferred in the Sciences by American Universities, 1931-1932:</i> DR. CLARENCE J. WEST and CALLIE HULL	296		
<i>Scientific Apparatus and Laboratory Methods:</i>			
<i>Relation of Anatomy and Method of Extraction to Quality of Satsuma Orange Juice:</i> DRs. HAMILTON P. TRAUB, LEONARD W. GADDUM, A. F. CAMP			

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.

SOME NEW ASPECTS OF PLANT NUTRITION

By DR. R. W. THATCHER

PRESIDENT OF THE MASSACHUSETTS STATE COLLEGE

FOR many years I have been keenly interested in the biochemistry of plant life. My interest in this field was first aroused when I first learned of the antithetical but complementary relationships of plant and animal life as shown by the so-called "cycles" of life, such as the "carbon cycle," the "nitrogen cycle," etc., in which plants take from and restore to the atmosphere or soil the elements which are given to and withdrawn from these same ultimate sources of supply by the processes of animal life. This led to a further interest in the biochemical processes and exchanges of energy in syntheses by plants and in metabolism by animals. Soon it became apparent to me that while these processes are generally antithetical in direction and final results, the route along which they travel and the conditions which determine their velocities are strikingly similar.

For example, the pigments which are associated with the rate, and in a sense the regulators of, energy

changes in plant and animal growth, namely, haemoglobin and chlorophyll, respectively, were shown to be strikingly similar in chemical constitution, being made up of the same pyrrol units linked together in the same general relationships, the only essential difference being in the metallic element through which the linkage occurs, namely, iron in haemoglobin and magnesium in chlorophyll. Moreover, within the past two or three years, it has been shown, as will be discussed later in this paper, that the element copper has apparently the same relation to the production of chlorophyll in chlorotic plants that it has to the regeneration of haemoglobin in anemic animals.

Again, enzymes, or organic catalysts, once they were discovered and the nature and method of their action studied, showed remarkable similarities in the plant and the animal biochemical processes which they initiate or regulate. In fact, the reversibility of the reaction which is accelerated by a particular enzyme

THE WISTAR INSTITUTE BIBLIOGRAPHIC SERVICE

ISSUES

AUTHORS' ABSTRACTS

of all papers appearing in the journals listed below prior to publication of the articles in full. By this advance information biologists may familiarize themselves with *contemporary research* in a minimum of time.

Advance Abstract Sheets are issued twice a month, each sheet containing ten or more authors' abstracts. Subscription rate is \$3.00 per year.

Bibliographic Service Cards, following the Advance Abstract Sheets, also are issued twice a month. In addition to the authors' abstracts, the cards provide subject headings and complete bibliographic reference. The cards are convenient for filing and library records. Price, \$5.00 per year.

At regular intervals the authors' abstracts are assembled and published in book form with complete authors' and analytical subject indices. Price, \$5.00 per volume. Liberal discount to subscribers to the Bibliographic Service Cards.

JOURNAL OF MORPHOLOGY
THE JOURNAL OF COMPARATIVE NEUROLOGY
THE AMERICAN JOURNAL OF ANATOMY
THE ANATOMICAL RECORD
THE JOURNAL OF EXPERIMENTAL ZOOLOGY
AMERICAN ANATOMICAL MEMOIRS
AMERICAN JOURNAL OF PHYSICAL ANTHROPOLOGY
JOURNAL OF CELLULAR AND COMPARATIVE PHYSIOLOGY
FOLIA ANATOMICA JAPONICA (Tokyo, Japan)
PHYSIOLOGICAL ZOOLOGY (Chicago, Illinois)
STAIN TECHNOLOGY (Geneva, New York)
ECOLOGICAL MONOGRAPHS (Durham, North Carolina)

The Wistar Institute of Anatomy and Biology
Philadelphia, Pa., U. S. A.

APPARATUS and REAGENTS

FOR LABORATORIES OF
CHEMISTRY and BIOLOGY

Our new 1044-page catalogue illustrates and describes 11,814 Apparatus items and lists 2,762 Reagent items, all controlled in quality, currently priced and stocked for immediate shipment.

ARTHUR H. THOMAS CO.

WEST WASHINGTON SQUARE
PHILADELPHIA, U. S. A.
Cable Address, BALANCE, Philadelphia



Field Equipment for Engineers, Explorers, Hunters, Travelers

Scientific Instruments, Packing Equipment, Skis, Firearms, Clothing, Fiala Pat. Sleeping Bags, Optical Instruments, Astronomic Telescopes, Range Finders, Binoculars, Paulin Altimeters. Write for Catalog "A"

FIALA OUTFITS

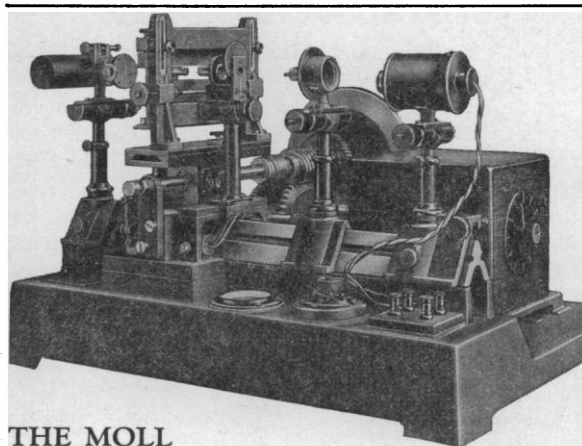
47 Warren St., New York

THE SCIENCE PRESS PRINTING CO.

PRINTERS OF
SCIENTIFIC AND EDUCATIONAL JOURNALS,
MONOGRAPHS AND BOOKS

Correspondence Invited

LANCASTER, PENNSYLVANIA



THE MOLL RECORDING MICROPHOTOMETER

For rapidly and accurately recording the intensity of photographed spectra.

By special arrangement with Kipp & Zonen, we import apparatus of their manufacture and are in position to be of definite service to our customers by relieving them of all details incident to shipping and customs formalities.

Descriptive literature will be sent on request.

JAMES G. BIDDLE CO.

ELECTRICAL and SCIENTIFIC INSTRUMENTS

1211-13 ARCH STREET, PHILADELPHIA, PA.

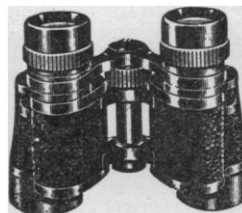
MARINE BIOLOGICAL LABORATORY

Zoology Specimens
Botany Specimens and
Mounts
Protozoan and Dro-
sophila Cultures
Microscopic Slides
Live Marine Aquaria

Catalogues on request
Supply Department

Woods Hole, Mass.

U. S. A.



POCKET PRISM

\$37.50 Stereoscopic
pocket 8 power, 10
oz., 150 yds. field.

NATURE
GLASSES

While we make a specialty of small, light-weight, Galileo and Prism pocket binoculars from \$5 upward, we carry all makes and sizes in new and

used instruments; also microscopes.

Satisfaction guaranteed or money refunded; send for price-list and discount to students and institutions.

Vest pocket Mirakel 7 power monoculars \$9.50; 25 power telescope \$15.50.

J. Alden Loring Box 8 Owego, N.Y.