

SCIENCE

VOL. 99

FRIDAY, JUNE 30, 1944

No. 2583

The Long and Short of Nutrition: PROFESSOR HENRY A. MATTILL 521

Obituary:

Henry Andrew Buehler: DR. EDWARD L. CLARK.
Oscar Milton Stewart: DR. HERBERT M. REESE.
Recent Deaths 525

Scientific Events:

Industrial Research Committee of the Federation of British Industries; Standards for Photographic Cinematographic Equipment; Fellowships of the National Foundation for Infantile Paralysis; The Gibson Island Conference on Cancer 527

Scientific Notes and News 529

Discussion:

Nomenclature of the Rh Blood Types: DR. ALEXANDER S. WIENER. *Notes on Starring in American Men of Science:* PROFESSOR STEPHEN S. VISHNER. *Fishery Depletion:* PROFESSOR A. G. HUNTSMAN. *Research on Physical Chemistry in the U.S.S.R.:* J. G. TOLPIN. *Education in Science Museums:* DR. ROBERT H. MOREY 532

Scientific Books:

Optical Activity: DR. MAX BERGMANN. *Plastics and Synthetic Resins:* L. M. DEBING. *Manometric Measures:* DR. CHARLES N. FREY 537

Special Articles:

Essential Fatty Acids and Lipotropic Action of Inositol: DR. J. M. R. BEVERIDGE. *Studies on the Toxicity and Activity of Streptothricin:* DR. HARRY J. ROBINSON, OTTO E. GRAESSLE and DOROTHY G. SMITH. *The Tidal Air of Laboratory Animals: THE PERSONNEL OF U. S. NAVY MEDICAL RESEARCH UNIT No. 1. A New Male-Sterile Mutant in the Tomato:* DR. CHARLES M. RICK 539

Scientific Apparatus and Laboratory Methods:

A Simple Drop Recording System: DR. STEPHEN KROP and DR. WALTER MODELL. *A Simple Method for Quieting Paramecium and Other Small Organisms:* DR. G. B. MOMENT 544
Science News 10

SCIENCE: A Weekly Journal devoted to the Advancement of Science. Editorial communications should be sent to the editors of SCIENCE, Lancaster, Pa. Published every Friday by

THE SCIENCE PRESS

Lancaster, Pennsylvania

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 25, D. C.

THE LONG AND SHORT OF NUTRITION¹

By Professor HENRY A. MATTILL

STATE UNIVERSITY OF IOWA

MODERN nutrition was getting under way about the time of World War I; it is about as old as the science of aviation. The origins of both can be dated somewhat earlier, but in the intervening years of gradual development the few voices that were raised in high prophecy were drowned out by the derision of scoffers. Many of the classical nutritionists who had dealt with protein and calories snorted at the simple techniques of the new school as representing a bankruptcy of brains. "Anybody can feed animals, anybody can do vitamin work." It may be admitted that anybody could have done some of it, that some of it should perhaps not have been done by anybody, but to-day it stands justified. Not only has the "importance of little things" in the diet been revealed, but remarkable progress has been made in the understanding of how these little things work. With the

growth of the concept of vitamins there have been amazing advances in the study of enzymes, some of which contain vitamin components in the molecule or require them as co-enzymes. Through the jungle of cellular oxidation trails are gradually being blazed; the uninitiated traveler can not yet readily find his way, but the paths are being cleared and markers and guide-posts are being placed. The new vantage points thus provided have suggested new approaches to the study of the metabolism of all the foodstuffs, in particular, of minerals and of protein.

Discoveries in physics, in theoretical and organic chemistry and the new techniques growing out of them have furnished new tools for the solution of old problems. They have also created new problems, and have raised more questions than they have answered. Levene² once said, "so long as life continues the human mind will create mysteries." But we can also

¹ From an address on the Annual Sigma Xi Day at the University of Rochester on February 22, 1944.

² P. A. Levene, SCIENCE, 74: 23, 1931.

SCIENTIFIC APPARATUS AND LABORATORY METHODS

A SIMPLE DROP RECORDING SYSTEM

MANY types of drop recorders have been devised. Most are difficult to maintain. Some utilize the force of the falling drop, while others utilize the conductivity of the drop to complete an electrical circuit. With the usual arrangement in the case of the latter a sensitive relay is required to actuate the recording device.

By the use of a bell-ringing transformer actuated by house current in place of the relay, the apparatus becomes entirely free of troublesome contacts and moving parts. This has the advantages of being simple, non-mechanical, sensitive to electrolyte solutions of low concentration, easy to construct and maintain, and useful under a wide variety of conditions. It is made of a few common pieces of inexpensive and readily available equipment.

The electrode gap of a conventional falling drop "capsule" such as that described by Gibbs¹ is arranged in series with the primary of an ordinary A-C bell-ringing transformer and a 110 V A-C source; the 6-10 volt secondary actuates the recording device. The drop (1 per cent. NaCl solution) closes the electrode gap in the primary circuit. It is displaced from a flask of suitable size by the fluid whose rate of flow is being studied. The fluid system is closed and air excluded from it. There is virtually no evolution of gas at the primary gap because of the alternating character of the current. Considerable dilution of the electrolyte solution is possible before effective conductivity is impaired.

In classroom demonstrations, the kymographic record of the drops is not clearly visible to students at a distance. Therefore in demonstrations we also use an electric light bulb which flashes when contact is made. This is provided by placing a 7½ watt 110 V lamp between the electrode gap and the transformer primary, in parallel with the primary.

STEPHEN KROP
WALTER MODELL

CORNELL UNIVERSITY MEDICAL COLLEGE

A SIMPLE METHOD FOR QUIETING PARAMECIUM AND OTHER SMALL ORGANISMS DURING PROLONGED OBSERVATION

Paramecium is notoriously difficult to immobilize while alive. This is evidenced by the papers of J. S. Lee¹ and J. B. Buck² presenting beautiful though somewhat elaborate methods to bring this animal under control.* Consequently it seems worth while to

¹ O. S. Gibbs, *Jour. Lab. and Clin. Med.*, 12: 686, 1926-27.

² J. S. Lee, *SCIENCE*, 94: 332, 1941.

³ J. B. Buck, *SCIENCE*, 97: 494, 1943.

* While this was in press a valuable additional paper appeared. D. A. Marsland, *SCIENCE*, 98: 414, 1943.

record a very simple but effective technique adapted from Lieutenant W. G. Downs,³ who originated the method in connection with preserving Giemsa blood films and quieting mosquito larvae.

A solution of completely hydrolyzed, medium viscosity polyvinyl alcohol is prepared by stirring the powdered alcohol into water until the solution is as thick as heavy molasses—approximately 12 to 14 grams of dry alcohol in 100 cc of water. This should be done over a steam bath and the solution left until all bubbles rise to the surface after which the solution will be glass clear. The solution should then be poured into a wide-mouthed stoppered bottle where it will keep indefinitely. The above holds for "Type B Grade RH-349-N" available at about \$1.00 a pound from the E. I. du Pont de Nemours Company, Electrochemicals Department, Niagara Falls, N. Y. Other forms of polyvinyl alcohol, e.g., grade "RH-349-N," can be used but go into solution with much more difficulty and remain cloudy.

In use, two drops of a thick suspension of parameciums, as from a rich boiled lettuce culture,⁴ are placed on a slide and two drops of the polyvinyl alcohol solution added. The whole is thoroughly stirred with a needle and covered with a cover glass. The animals are brought almost to a standstill at once and will remain so in good condition for over four hours. Abrupt and striking reversals of ciliary beating and many other details are clearly visible. The frequency of pulsation of the contractile vacuoles usually becomes slower after three hours. The cover glasses are self-sealing because the polyvinyl alcohol dries to form a firm membrane that prevents further evaporation. The slides can be cleaned merely by soaking briefly in water.

Stentor coeruleus presents a handsome object when immobilized by this method. The same holds for the larger hypotrichs and various small aquatic oligochaetes like *Nais* and *Chaetogaster*.

G. B. MOMENT

GOUCHER COLLEGE

³ W. G. Downs, *SCIENCE*, 97: 539, 1943.

⁴ L. H. Hyman, *Trans. Amer. Micro. Soc.*, 60: 370, 1941.

BOOKS RECEIVED

BABKIN, B. P. *Secretory Mechanism of the Digestive Glands*. Illustrated. Pp. xix + 900. Paul B. Hoeber, Inc. \$12.75.

BEST, CHARLES HERBERT and NORMAN BURKE TAYLOR. *The Living Body. A Text in Human Physiology*. Revised Edition. Illustrated. Pp. xxii + 571. Henry Holt and Company, Inc. \$3.90.

COOLEY, R. A. and GLEN M. KOHLS. *The Argasidae of North America, Central America and Cuba*. The American Midland Naturalist, Monograph No. 1. Illustrated. Pp. 152. The University Press, Notre Dame.

Outstanding New McGraw-Hill Books

General Chemistry

By JOHN ARREND TIMM, Simmons College. *International Chemical Series*. In press—ready in August

A new textbook that should become one of the leading books in the field of general chemistry. The vigorous, almost conversational style and the sound modern treatment of fundamental theory are features of the book.

Laboratory Manual for General Zoology

By TRACY I. STORER, University of California at Davis. *McGraw-Hill Publications in the Zoological Sciences*. In press—ready in July

Designed to accompany Storer's *General Zoology*, this forthcoming manual for the beginning course in zoology contains a great variety of exercises, resulting in unusual flexibility in outlining a laboratory program.

Suggestions for Laboratory Instructors

By TRACY I. STORER. In press—ready in July

Offers suggestions regarding laboratory demonstrations and procedures, to aid the instructor in conducting his classes. Demonstrations are described in detail, and step-by-step explanations of the various exercises are given.

Theory and Applications of Electron Tubes. *New second edition*

By HERBERT J. REICH, University of Illinois. In press—ready in September

Assembles and coordinates present knowledge of the theory and applications of electron tubes. The new edition brings the book up to date as regards the more important developments of the past five years.

Radio. Fundamental Principles and Practices

By FRANCIS E. ALMSTEAD, Lieut., USNR; KIRKE E. DAVIS, Senior High School, Oceanside, N. Y., and G. K. STONE, New York State Department of Education. 215 pages, \$1.80

A simple yet thorough course for beginners, covering vacuum tubes, inductance, condensers, resonance, power supply, receiver and transmitter circuits, amplifiers, wave propagation, antennas, etc.

Methods of Advanced Calculus

By PHILIP FRANKLIN, Massachusetts Institute of Technology. 487 pages, \$4.50

Covers Taylor's series, partial differentiation, applications to space geometry, integration, special higher functions, Fourier series, differential equations, vector analysis, the calculus of variations, etc.

General Meteorology

By HORACE R. BYERS, University of Chicago. 642 pages, \$5.00

Although based upon the author's well known *Synoptic and Aeronautical Meteorology*, this is essentially a new book, meeting the need for a general text embodying the fundamentals as well as the modern developments in synoptic meteorology.

Climatology

By BERNHARD HAURWITZ and JAMES M. AUSTIN, Massachusetts Institute of Technology. In press—ready in August

A treatment of general climatology and of the climates of the earth, written primarily for meteorologists. More than half of the book is devoted to a separate discussion of the climate of each continent and of the oceans, from the point of view of the weather forecaster.

Metallography and Heat Treatment of Steel.

(Vol. III of *Ferrous Metallurgy*.) *New second edition*

By ERNEST J. TEICHERT, E. G. Budd Mfg. Co., on leave from the Pennsylvania State College. In press—ready in July

Includes the fundamentals of metallography, x-ray, Gamma ray, and magnetic testing, as well as all the essentials of physical testing. Deals with the constitution of metallic alloys and emphasizes National Emergency steels.

Explosions, Their Anatomy and Destructiveness

By CLARK S. ROBINSON, Lt. Colonel, Ordnance Dept., U. S. Army, on leave from Massachusetts Institute of Technology. 88 pages, \$1.50

Discusses the destructiveness of bombs and shells in warfare, and with the results of accidental explosions in munition plants and elsewhere. A feature of the book is the description of 125 notable explosions.

Send for copies on approval

McGRAW-HILL BOOK COMPANY, Inc.

330 West 42nd Street, New York 18, N. Y.

Aldwych House, London, W.C. 2