

SCIENCE

VOL. 98

FRIDAY, AUGUST 20, 1943

No. 2538

<i>Research and Therapeutics</i> : DR. AUSTIN E. SMITH	161	<i>Societies and Meetings</i> :	
<i>The Introduction of New Viewpoints and Scientific Concepts in General Botany</i> : DR. J. FISHER STANFIELD	164	<i>The Annual Meeting of the Royal Society of Canada</i> : PROFESSOR DAVID A. KEYS	178
<i>Obituary</i> :		<i>Special Articles</i> :	
<i>Leslie Tillotson Webster</i> : DR. J. CASALS and DR. T. M. RIVERS. <i>Walter E. McCourt</i> : DR. LEWIS F. THOMAS. <i>Deaths and Memorials</i>	167	<i>The Production of Folic Acid by Rat Liver in Vitro</i> : LEMUEL D. WRIGHT and DR. ARNOLD D. WELCH. <i>Distribution and Heredity of Variants of the Rh Type</i> : DR. ALEXANDER S. WIENER	179
<i>Scientific Events</i> :		<i>Scientific Apparatus and Laboratory Methods</i> :	
<i>The Ross Institute of Tropical Hygiene; The Budget of the University of Wisconsin; Affiliated Hospital Units for Civilian Defense; The Association of University Professors of the Allied Countries; The British Standards Institution; A Research Committee on Climatology</i>	168	<i>The Demonstration of the Protozoan Parasite of Quail Malaria by Fluorescence Microscopy</i> : ROBERT L. PATTON and ROBERT L. METCALF	184
<i>Scientific Notes and News</i>	171	<i>Science News</i>	8
<i>Discussion</i> :			
<i>The Mosses of Luray Cavern, Virginia</i> : WALTER B. LANG. <i>The Heath Hen</i> : JAMES H. PANNELL. <i>Numbering Book Illustrations</i> : DR. ALBERT K. KURTZ and DR. JACK W. DUNLAP. <i>New Words in Science</i> : HAROLD WARD. <i>National Learned Society Groups</i> : DR. LOUIS C. KARPINSKI	173		
<i>Scientific Books</i> :			
<i>Samuel F. B. Morse</i> : PROFESSOR GORDON FERRIE HULL. <i>Alaska Diary</i> : PROFESSOR W. M. KROGMAN. <i>Timber</i> : PROFESSOR DAVID A. KRIBS	175		

SCIENCE: A Weekly Journal devoted to the Advancement of Science, edited by J. McKEEN CATTELL; WARE CATTELL, assistant editor. 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, D. C.

RESEARCH AND THERAPEUTICS¹

By Dr. AUSTIN E. SMITH

SECRETARY, COUNCIL ON PHARMACY AND CHEMISTRY, AMERICAN MEDICAL ASSOCIATION

DURING the year 1942 nearly one tenth of the entire population became a hospital bed patient. One person entered a hospital in the United States as a patient every two and a half seconds. Surgical operations were performed at a rate of one to each 5.6 seconds and the hospital birth rate exceeded three live babies to the minute.

This represents only a part of the total illness in this country and is, of course, only a fraction of the illness prevalent throughout the world. By the time the war is over such figures when compared to world-wide statistics will be infinitesimal. At the recent National Conference on Planning for War and Post-war Medical Services a number of papers were presented to show post-war medical needs. Obviously the papers could not be specific in details as exact esti-

mates for post-war needs are impossible to determine at this time, but they did give an indication of the future enormous requirements from the drug manufacturers. Will the demands be met entirely by current drugs or will there be available a host of new agents? With American medicine encountering diseases alien to these shores through participation in world-wide health problems and the return of infected troops, new and more effective agents will have to be provided.

At present the drug-manufacturing industry is faced with many problems—two major ones are increasing reductions of certain basic materials and increasing demands for Lend-Lease, armed forces and civilian use. The probable needs in the early post-war period stagger the imagination. As each manufacturer will have to give careful thought to the optimal use of his supplies, there is afforded a good opportu-

¹ Read before the 1943 Annual Convention of the American Drug Manufacturers Association, Chicago, May 3, 1943.

anti-Rh sera. Thus, it is now possible to anticipate the behavior of a post-transfusion anti-Rh serum if the Rh subtype of the donor is known, while the quality of the anti-Rh agglutinins in sera from mothers of erythroblastotic babies may be predicted by tests on the blood of the husband or infant.¹⁷ On

the other hand, the uniformity in specificity of the guinea-pig antisera is most likely due to the corresponding uniformity of the Rh-like antigens in the red cells of different rhesus monkeys.

ALEXANDER S. WIENER

BROOKLYN, N. Y.

SCIENTIFIC APPARATUS AND LABORATORY METHODS

THE DEMONSTRATION OF THE PROTOZOAN PARASITE OF QUAIL MALARIA BY FLUORESCENCE MICROSCOPY

THE favorable results which have been obtained in development of diagnostic methods for detecting acid-fast bacteria by fluorescence¹ (Hagemann and others) and the results obtained by Bock and Oesterlin² in their studies of the action of anti-malarial drugs have suggested the potential value of this method for the diagnosis of malarial infections from blood smears. Subsequent work by the authors has demonstrated that the human parasite, *Plasmodium vivax*,³ and the organisms of bird malaria, *P. nucleophilum*,⁴ and *Haemoproteus* sp.⁵ (from California Valley quail) can be stained in a satisfactory manner with fluorescent dyes.

Due to the large size of the parasite and the supply of the *Haemoproteus*, the bulk of the work in these laboratories has been done with this organism.

During the course of investigation positive staining reactions were observed with six fluorochromes. These were applied from saturated aqueous solutions to smears fixed in methyl alcohol as for Giemsa staining. The staining time is from two to five minutes. Alcoholic solutions can be substituted if the smears tend to wash off the slides with the aqueous stain. The

six stains and their effectiveness in differentiating *Haemoproteus* are listed in Table 1.

Altering the pH of the staining medium with phosphate buffers showed a very slight increase in staining intensity in the alkaline region.

The apparatus necessary for fluorescence investigations of this nature is relatively simple. The principal innovation in equipment from ordinary microscopy is the use of a G.E. type H-4 high pressure mercury vapor lamp as the light source and a Corning filter No. 5840 which transmits the light between wavelengths of 310 mμ to 394 mμ. Ultraviolet light in this region is invisible but excites fluorescence in the fluorochromes.

The advantages of this technique if developed for the diagnosis of human malaria are many. The staining process is short, simple and reliable; the parasites, if present, stand out brilliantly as brightly fluorescent objects against a dark field; *Haemoproteus* of bird malaria and the *Plasmodia* of human malaria are readily discernible with dry lenses at magnifications not in excess of 200×; and the factor of eyestrain is greatly reduced.

Circumstances do not permit the full development of these techniques as applied to malarial diagnosis in this laboratory. All the results thus far obtained indicate that the method offers great possibilities in enhancing both the speed and accuracy of malarial diagnosis from blood smears. It also offers an interesting technique for the study of anti-malarial drugs (many of which are fluorescent) and their action upon the parasites.

ROBERT L. PATTON

ROBERT L. METCALF⁶

CORNELL UNIVERSITY

⁶ Now with the Tennessee Valley Authority, Wilson Dam, Alabama.

TABLE 1

Stain	Nuclear color	Parasite color	Leucocyte color	Staining intensity
Beberine sulfate	Bright yellow	Golden	Yellow	+++
*Rivanol	Yellow green	Yellow green	Bright yellow	+++
Primulin yellow	Blue	Blue	Yellow	+++
Coriphosphine O	Orange	White	Bright orange	++
Thioflavin A	Yellow	Yellow	Yellow	++
Auramine O	Yellow	Blue-white	Bright yellow	+

* 2-Ethoxy-6, 9-diamino acridine lactate.

¹⁷ A. S. Wiener, *Amer. Jour. Clin. Path.*, in press.

¹ P. K. H. Hagemann, *Munch. Med. Wschr.*, 85: 1066, 1938.

² E. Bock and M. Oesterlin, *Zbl. Bakt.*, 143: 306, 1939.

³ Furnished by Dr. Martin D. Young and Dr. Mark F. Boyd, U. S. Public Health Service and Rockefeller Foundation, respectively.

⁴ Furnished by Dr. R. D. Manwell, Syracuse University.

⁵ Furnished by Dr. C. M. Herman, Division of Fish and Game, State of California.

BOOKS RECEIVED

- BILLS, ARTHUR GILBERT. *The Psychology of Efficiency*. Illustrated. Pp. xiv + 361. Harper & Brothers. \$2.75.
- SHAPIRO, HARRY. *Applied Anatomy of the Head and Neck*. Illustrated. Pp. xiv + 189. J. B. Lippincott Co. \$5.50.
- THOMPSON, W. H. and M. L. AIKEN. *1000 Preflight Problems*. Illustrated. Pp. xiv + 160. Harper and Brothers. \$0.88, paper-bound; \$1.20, cloth-bound.

Pre-medical texts

*Blakiston Books***BREMER****Textbook of Histology—5th Edition**

This famous text is noteworthy for its clearness and readability, also for the quality and abundance of its illustrations. Emphasis is given to normal functional changes in the cells and to their activities in the living state. By J. L. Bremer, Harvard Medical School. 455 Illus. 580 Pages. \$6.50

LAMBERT**Introduction and Guide to the Study of Histology**

The objective is to impart a knowledge of the subject as a foundation for the further study of physiology and pathology. Comprehensive directions for laboratory study are included. By A. E. Lambert, School of Medicine, State University of Iowa. 185 Illus. 542 Pages. \$5.00

NEAL and RAND**Comparative Anatomy**

In this book the facts are given interest and meaning in terms of human phylogenesis. Descriptions are clear, and many well labeled figures are included. By H. V. Neal, Tufts College and H. W. Rand, Harvard University. 540 Illus. 739 Pages. \$4.75

Chordate Anatomy

This text offers material for a sound morphological course with functional interpretations. 378 Illus. 467 Pages. \$3.50

COLIN**Elements of Genetics**

A modern, well integrated beginner's text in genetics. It includes at the end of each chapter a list of carefully graded problems. By E. C. Colin, Chicago Teachers College. 47 Illus. 386 Pages. \$3.00

STILES**Handbook of Microscopic Characteristics of Tissues and Organs—2nd Edition**

It gives in outline form the main histological characteristics of vertebrate tissues and organs. It is an excellent guide to laboratory study. By K. A. Stiles, Coe College. Illustrated. 204 Pages. \$1.50

MARSHALL**Laboratory Guide in Elementary Bacteriology**

This manual presents 92 experiments grouped under Introductory Technique, Physiology of Bacteria, Applied Bacteriology, Serology and Infection. By M. S. Marshall, University of California. 244 Pages. \$1.75

PATTEN**Early Embryology of the Chick—3rd Edition**

A clear, brief presentation of basic facts for beginning students in embryology. By B. M. Patten, University of Michigan. 87 Illus. 228 Pages. \$2.50

Embryology of the Pig—2nd Edition

The fundamental facts of mammalian embryology are clearly presented in this book. 168 Illus. 327 Pages. \$3.50

The Blakiston Company, Philadelphia 5