

SCIENCE

VOL. 97

FRIDAY, JUNE 4, 1943

No. 2527

<i>Air-Borne Infection</i> : PROFESSOR O. H. ROBERTSON	495	CUNNINGHAM. <i>Kentucky Academy of Science</i> : PROFESSOR ALFRED BRAUER	513
Obituary:			
<i>Ludwig Kallir</i> : PROFESSOR ERIC T. B. GROSS. <i>Harry L. Dember</i> : PROFESSOR GEORGE WINCHES- TER. <i>Minnie Taylor York</i> : PROFESSOR W. G. HUT- CHINSON. <i>Recent Deaths</i>	502	Special Articles:	
		<i>The Vitamin "M" Factor</i> : DR. S. SASLAW and OTHERS. <i>Inositol, a Tumor Growth Inhibitor</i> : DR. DANIEL LASZLO and CECILE LEUCHTENBERGER	514
Scientific Events:			
<i>The American Chemical Society and the War Man- power Commission; The Copernican Quadricenten- nial; Presentation of the First Charles L. Mayer Award</i>	503	Scientific Apparatus and Laboratory Methods:	
		<i>New Objective Method for the Determination of the Circulation Time</i> : DR. BENJAMIN JABLONS. <i>Contraction of Denervated Muscle Produced by d-Tubocurarine</i> : PROFESSOR A. R. MCINTYRE and RAY E. KING	515
<i>Scientific Notes and News</i>	505	<i>Science News</i>	10
Discussion:			
<i>The Mobilization of Science</i> : DR. HARLAN T. STET- SON. <i>The Opposition to the Kilgore Bill</i> : PROFES- SOR L. C. DUNN. <i>Class Distinction among Amer- ican Men of Science</i> : DR. L. H. THOMAS. <i>Is Cor- rect Labelling Undemocratic?</i> : PROFESSOR O. S. GIBBS	508	SCIENCE: A Weekly Journal devoted to the Advance- ment of Science, edited by J. McKEEN CATTELL and pub- lished every Friday by	
THE SCIENCE PRESS			
Lancaster, Pennsylvania			
Scientific Books:		Annual Subscription, \$6.00	Single Copies, 15 Cts.
<i>Relativity</i> : DR. W. F. G. SWANN. <i>Microbiology</i> : THE LATE PROFESSOR ARTHUR T. HENRICI	512	SCIENCE is the official organ of the American Associa- tion for the Advancement of Science. Information regard- ing membership in the Association may be secured from the office of the permanent secretary in the Smithsonian Institution Building, Washington, D. C.	
Societies and Meetings:			
<i>North Carolina Academy of Science</i> : DR. BERT			

AIR-BORNE INFECTION¹

By Professor O. H. ROBERTSON, M.D.

DEPARTMENT OF MEDICINE, UNIVERSITY OF CHICAGO

AN increasing awareness on the part of the medical profession of the rôle played by the air in the transmission of respiratory disease makes it seem appropriate just now to survey briefly the recent rapid growth of knowledge in this field. While it has been long known that bacteria can be carried on air currents, the general belief has grown up that certain physical agents such as sunlight, heat and drying are very effective in destroying such air-borne microorganisms. However, during the past few years our knowledge of the wide distribution of bacteria in the air has been greatly increased. Apparently the whole of our atmosphere is contaminated since microorganisms have been recovered from the stratosphere and from freshly fallen snow in the south polar regions.

¹ An address given before the Rochester Academy of Medicine, N. Y., October 6, 1942.

Some of the most striking evidence of aerial transmission of infection comes from the investigation of the spread of certain plant diseases. Epidemics of wheat-stem rust have been shown to be wind-borne from infected areas far distant. Spores of this infection have been found to be carried as much as 1,000 miles in 48 hours and cause an outbreak of the disease a week or ten days later. Similarly, plant viruses have been shown to be disseminated to some extent by wind, at least in an indirect manner, through the agency of leaf-hoppers and plant-lice.

While we have no evidence that any specific agent of human disease is spread through the outside air, except in the case of insect vectors, there is a growing body of data in support of the conclusion that air transmission within enclosed spaces plays an important rôle in the communication of many bacterial and

those in stupor and coma. The intravenous injection of ether, saccharin or sodium dehydrocholate carry with them not only disadvantages but even dangers.

Occasionally, some subjects whose taste buds are not fully developed may not respond in the desired measure. For that reason, objective tests have been greatly sought. These have ranged from the use of sodium cyanide, histamine, 50 per cent. carbon dioxide, alpha-lobeline ether and, more recently, the use of fluorescein. These drugs are reported to produce objective results, but, as is the case with sodium cyanide, are often open to danger. Calcium gluconate can not be used in cardiac cases that have received digitalis therapy without serious complications.

The danger of complications following the intravenous injection of many of these substances is obviated by a new objective method we have devised. This method is based on the principle that light transmitted through various translucent tissues of the body, such as the ear, finger or toe tips, or flexible skin anywhere on the body (such as that over the calves of the legs, the arm pit or the skin web between the thumb and index finger), can be detected by means of a sensitive photoelectric cell.

The injection of certain non-toxic dyes, intravenously, such as 2 to 4 cc of a 1 per cent. solution of methylene blue, or 1.0 cc of phenol-sulphon-phthalein, acts as a temporary curtain to impede the transmission of light. Interference with the transmission of light by the dye can be observed by the deflection of the indicator of a sensitive galvanometer, connected with the photoelectric cell. The time elapsing between the injection of such a dye into the vein of the arm or leg and its arrival to the point where the light and photoelectric cell have been placed, can be determined by a stop-watch, or can even be recorded objectively, by connecting the leads from the photoelectric cell to a recording galvanometer.

Thus, an objective record determination of the circulation time is made possible, which no other method affords. The fluorescein method, the safest objective method to date, is open to the criticism that several individuals may not note it at the same time. The thickness of the skin or mucous membrane and its blood content may also modify the time of fluorescent visualization. The use of a dye with a light and photoelectric cell set-up, is not only of value in determining the circulation time, but also can be used for the determination of the time required for the blood to be cleared, as demonstrated by the return of the galvanometer needle to its pre-injection point. The determination of the circulation time is recognized today to be of value in differentiating thyrotoxicosis and

cardiac decompensation from other conditions which may be confused with them.

BENJAMIN JABLONS

SECOND MEDICAL DIVISION,
GOLDWATER MEMORIAL HOSPITAL,
NEW YORK, N. Y.

CONTRACTION OF DENERVATED MUSCLE PRODUCED BY d-TUBOCURARINE

FROM a consideration of the physico-chemical properties and especially the polarographic behavior of the alkaloid obtained from *Chondodendron Tomentosum* (d-Tubocurarine), and other quaternary ammonium bases having high reduction potentials, it seemed very probable that the rapid intra-arterial injection of this alkaloid would cause contraction of denervated muscles. This was shown to be true for dog-gastrocnemius denervated ten days previously. A strong contraction followed the close intra-arterial injection of d-Tubocurarine. The contraction was followed by partial relaxation and terminated by a long contracture which persisted for approximately thirty minutes. During the contracture and for a considerable time after the muscle was found to be unresponsive to previously effective quantities of intra-arterially injected acetylcholine. Direct stimulation of the muscle provoked contraction during the period of curarine-induced contracture. Full details of the experiments and a discussion of their significance will be published later.

A. R. MCINTYRE

RAY E. KING

COLLEGE OF MEDICINE, UNIVERSITY OF NEBRASKA,
OMAHA, NEBRASKA

BOOKS RECEIVED

- HARRIS, ROBERT S. and KENNETH V. THIMANN. *Vitamins and Hormones. Advances in Research and Applications.* Illustrated. Pp. xvii + 452. Academic Press, Inc. \$6.50.
- MACLAREN, MALCOLM. *The Rise of the Electrical Industry During the Nineteenth Century.* Pp. xi + 225. Princeton University Press. \$3.75.
- MARGENAU, HENRY and GEORGE MOSELEY MURPHY. *The Mathematics of Physics and Chemistry.* Illustrated. Pp. xii + 581. D. Van Nostrand Company. \$6.50.
- MOVIUS, HALLAN L. *The Irish Stone Age.* Illustrated. Pp. xxiv + 339. Cambridge University Press. Macmillan. \$7.50.
- PERKINS, HENRY A. *College Physics.* Illustrated. Pp. x + 593. Prentice-Hall.
- RATNER, BRET. *Allergy Anaphylaxis and Immunotherapy.* Illustrated. Pp. xi + 834. The Williams and Wilkins Co. \$8.50.
- WALKER, HELEN M. *Elementary Statistical Methods.* Illustrated. Pp. xxv + 368. Henry Holt and Company. \$2.75.
- YERKES, ROBERT M. *Chimpanzees. A Laboratory Colony.* Illustrated. Pp. xv + 321. Yale University Press. \$5.00.

A Text of Timely Importance for Pre-medical Students

BAITSELL'S HUMAN BIOLOGY

By GEORGE ALFRED BAITSELL
Professor of Biology, Yale University

621 pages, 6 x 9, illustrated. \$3.75

In these days Baitsell's *Human Biology* is recommended as an especially important and timely text for efficient and thorough preparation for medical training in Army and Navy sponsored courses.

Teachers who have used the text with pre-medical students have commented on the following points:

- **Time is saved.** By using the human organism as the basic type for the presentation of general biological material, *Human Biology* makes use of an ideal arrangement of particular value under present emergency conditions.
- **Interest is gained.** Pre-medical students are primarily interested in learning about man. The use of *Human Biology* as a text capitalizes on this interest and at the same time affords much essential material from general biology.
- **Results are better.** Students who are interested in their subject and in the manner in which it is presented are anxious to work to the limit of their ability in order to become better prepared for the next step in their training.

The general consensus is that *Human Biology* is an interesting, modern, scholarly text ideally adapted to the training of students in the foundations of animal biology.

The Reviewers Say:

"... a needed contribution to a new field of modern science in which acceptable textbooks are few and far between. This distinctly new and refreshing book endeavors to present the pertinent facts of biology from the vantage ground of the most interesting and important organism in the world of life—man himself."—*The Quarterly Review of Biology*

"The book is beautifully written, clearly presented, and well illustrated."—*Ohio Journal of Science*

"... the book is so excellent and comprehensive that it should tend to become one of the most popular physiological and biological textbooks here as well as in America."—*The British Medical Journal*

"It is a real biology with man as the main type."—*Nature*

"Every zoology teacher should consider the desirability of reshaping his course along the lines its content suggests."—*Bios*

If you are planning to teach a course in biology for pre-medical students and have not had an opportunity to examine this text, send for an examination copy.

McGRAW-HILL BOOK COMPANY, Inc.

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

Aldwych House, London, W.C. 2

Two texts particularly well adapted for the general biology courses given to Army and Navy Trainees. Already being used nationally in regular courses.

FOUNDATIONS OF BIOLOGY

By Lorande L. Woodruff

Professor W. R. Hunt, writing in the *Yale Journal of Biology and Medicine* about the recently published Sixth Edition of this text says, "I know of no better text for fundamentals, for a cultural education, or as a stimulus for more study in the biological sciences." "Always a textbook of first class," comments *The Biologist*, "soundly conceived and well executed, this book has summarized the field of biology in such a way that any student is able to form a comprehensive idea of the whole subject." 773 pages, Illustrated, \$3.75

MANUAL OF BIOLOGY

By George A. Baitsell

This manual is designed especially as a companion volume to Woodruff's *Foundations of Biology* but can also be used with any other standard text in biology. 6th Ed., 449 pages, \$2.75

GENERAL BIOLOGY

By James W. Mavor

The Revised Edition of this text is especially well suited to the foundation course in biology prescribed for trainees for the medical services in the Armed Forces. Its contents and organization closely correspond with the course of study outlined for the Navy's pre-medical candidates. 897 pages, Illustrated, \$4.00

The Macmillan Co., 60 Fifth Ave., New York

*New laboratory manual
to be published in June*

LABORATORY EXPLORATIONS IN GENERAL ZOOLOGY

By Karl A. Stiles

This manual provides a full year's work in all aspects of animal biology, covering the important biological facts as well as the techniques for studying them in the laboratory. As teaching aids, the book contains many demonstrations, questions and problems for class discussion, materials for tests, full bibliographies, and a glossary of scientific terms. \$2.50 (probable)