

# SCIENCE

VOL. 96

FRIDAY, AUGUST 7, 1942

No. 2484

*The American Association for the Advancement of Science:*

*The Twenty-sixth Annual Meeting of the Pacific Division:* Edited by PROFESSOR J. MURRAY LUCK 121

*The Resources of the Continents:* DR. KIRTLEY F. MATHER ..... 125

*Obituary:*

*William John Peters:* DR. JNO. A. FLEMING. *Deaths and Memorials* ..... 127

*Scientific Events:*

*The Endowment of an Institute of Social Medicine at Oxford; Finances of the Johns Hopkins University, 1936-1942; The King of England's Birthday Honors List; Dr. Aleš Hrdlička; Research Grants of the Wisconsin Alumni Research Foundation; Louisiana State University Unit of the Military General Hospital* ..... 128

*Scientific Notes and News* ..... 131

*Discussion:*

*Color Blindness and Borderline Cases:* DR. ELSIE MURRAY. *War-time Scientific Manpower Production:* PROFESSOR JOHN S. NICHOLAS. *Russian-English Technical Dictionary:* DR. E. J. RUSSELL ..... 133

*Scientific Books:*

*Leukemia in Animals:* DR. JACOB FURTH ..... 136

*Societies and Meetings:*

*The American Diabetes Association:* DR. R. T. WOODYATT ..... 138

*Reports:*

*Project Grants of the Geological Society of America* 138

*Special Articles:*

*The "Sulfanilamide Effect" of Substances Devoid of Sulfo Groups:* PROFESSOR JULIUS HIRSCH. *Enzyme Action:* DR. H. C. EYSTER ..... 139

*Scientific Apparatus and Laboratory Methods:*

*The Chemical Composition of Liver Preparations:* DR. JOSÉ ERDOS ..... 141

*Science News* ..... 10

SCIENCE: A Weekly Journal devoted to the Advancement of Science, edited by J. McKEEN CATTELL and 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.

## THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

### THE TWENTY-SIXTH ANNUAL MEETING OF THE PACIFIC DIVISION

Edited by Professor J. MURRAY LUCK

SECRETARY

THE twenty-sixth annual meeting of the Pacific Division, American Association for the Advancement of Science, was held at Salt Lake City, Utah, during the week of June 15, 1942. The meetings extended over six days.

It was a notable week and an occasion deserving of record. Despite the exigencies of war and the pressing obligations of an unparalleled emergency, almost 400 scientists of the far western states were able to gather together for the purpose of friendly intercourse and the ever-necessary exchange of information from many fields of scientific research.

The meetings were of a particularly high quality

throughout. General sessions commenced on the morning of June 15 with a symposium on "The Great Basin, with Emphasis on Glacial and Post-Glacial Times," in which three papers were presented by men whose studies have been largely centered upon the problems under discussion. The three papers were as follows: "The Geological Background," Dr. Eliot Blackwelder; "The Zoological Evidence," Dr. C. L. Hubbs and Dr. R. R. Miller, and "Climatic Changes and Pre-White Man," Dr. Ernst Antevs. The papers presented were of great interest, and it was thought by many that this symposium was one of the finest in the history of Pacific Division meetings.

where.<sup>1</sup> From one kilogram of fresh liver I obtained 5.8 grams of yellowish brown powder as a silver salt. From the analytical results the presence of three free COOH groups, eighteen -CO-NH- groups and a molecular weight of approximately 10,000 was deduced.

Dakin and West<sup>2</sup> separated the inactive part with ammonium sulfate, magnesium sulfate and sodium chloride, and finally precipitated the active part with Reinecke salt. In this way they obtained a compound constituting 1 per cent. of the original dried weight and with a nitrogen content of 15.3 per cent., which they treated as a polypeptide and glucosamine. In a later publication Dakin, Ungley and West,<sup>3</sup> by a more refined method of extraction, obtained a fraction with 16.2 per cent. nitrogen which is characteristic of an albumose type, without glucosamine, and established a molecular weight of 3-5000. Sladek, Saveczycka and Lipschuetz<sup>4</sup> demonstrated the old thesis that free amino groups derived from amino acids exist. Subbarow, Jacobsen and Prochownick<sup>5</sup> have isolated 2 milligrams of a crystalline sulfate from 100 grams of liver, a product which seems to be identical with that described by Lalund and Klemm.<sup>6</sup> Karrer, Frei and Fritsche<sup>7</sup> found in the active fraction a pentose and adenin, and believe that the activity is proportional to the phosphorus content, obtaining a maximum of 3.8 per cent. P.

In 1939 I began some new experiments. The extraction and purification methods were simplified. Each kilogram of milled liver was extracted with one-third volume of water and 6 cc of 20 per cent. sulfuric acid at 35° C. After pressing, this process was repeated at 50° C, 60° C and 70° C. The expressed liquids were mixed together and treated with Ba(OH)<sub>2</sub> at 50° C until a pH of 6.5-6.7 was obtained, warmed to 60° C and filtered. After concentrating in vacuum to one seventh of its volume at 40° C, 99 per cent. alcohol was added until an alcohol concentration of 70 per cent. was reached. After filtering and evaporating the alcohol (in vacuum at 40° C) the liquid was concentrated to half its volume, filtered and precipitated with AgNO<sub>3</sub>. This salt was decomposed with HCl, filtered, and the solution precipitated with alcohol. The precipitate was dissolved in N/10 NaOH to pH 7.2 and with silver nitrate a new silver salt is isolated which has the following composition:

C .....	67.50	per cent.
H .....	6.41	" "
O .....	4.60	" "
N total .....	14.40	" "
N amino .....	1.40	" "
S .....	0.99	" "
P .....	1.06	" "
Ag .....	5.04	" "

The acid part of the substance had a molecular weight of 6,000. It contained three free COOH groups, as did the product obtained several years ago. Remaining are six free amino groups, this number increasing to eighteen after hydrolysis (5 hours of ebullition with HCl or 25 per cent.). From this the presence of twelve bonds of -CO-NH- is deduced. One kilogram of fresh liver gave 2.09 grams of this substance which was extraordinarily active in clinical tests.

For an approximate estimation of the potency of liver extracts the combination of the chemical method (fractional precipitation with alcohol) of Schales<sup>8</sup> and my biological test,<sup>9</sup> based on the influence of phenylhydrazine anemia, was found satisfactory. The results were confirmed by the clinical test of the reticulocyte response.

#### SUMMARY

For the present we can entertain the following ideas regarding the chemical structure of the active fraction of liver in pernicious anemia: it is an amino acid complex with three free COOH groups, it contains sulfur and phosphorus, is soluble in water, acids and bases, precipitates in alcohol at concentration greater than 87 per cent., and has a molecular weight of 6,000.

JOSÉ ERDOS

THE NATIONAL POLYTECHNICAL INSTITUTE,  
MEXICO, D. F.

<sup>8</sup> Schales, *Klin. Wochenschr.*, 16: 277, 1937.

<sup>9</sup> Erdos, *Biochem. Zeitschr.*, 277: 342, 1935.

#### BOOKS RECEIVED

- Biological Action of the Vitamins.* Edited by E. A. EVANS, JR. Pp. ix + 227. Illustrated. The University of Chicago Press. \$3.00.
- HAYNES, WILLIAMS. *The Stone that Burns.* Pp. xii + 345. Illustrated. D. Van Nostrand Company, Inc. \$3.75.
- HOLMES, HARRY N. *Strategic Materials and National Strength.* Pp. 106. Illustrated. Macmillan. \$1.75.
- MOORE, JUSTIN H. and JULIO A. MIRA. *The Gist of Mathematics.* Pp. xii + 726. Illustrated. Prentice-Hall. \$4.00.
- MORRIS, MAX and ORLEY A. BROWN. *Differential Equations.* Pp. xi + 355. Prentice-Hall. \$3.00.
- ROJAHN, C. A. and F. GIRAL. *Preparacion de productos quimicos y quimico-farmacuticos.* Two volumes. Pp. xxxix + 1002. Editorial Atlante, S.A., Mexico, D.F.

<sup>1</sup> Erdos, *Biochem. Zeitschr.*, 277: 337, 1935.

<sup>2</sup> Dakin and West, *Jour. Biol. Chem.*, 109: 489, 1935.

<sup>3</sup> Dakin, Ungley and West, *Jour. Biol. Chem.*, 115: 771, 1936.

<sup>4</sup> Sladek, Saveczycka and Lipschuetz, III. Kongr. Sloven-skih Aptekar. Jugoslavijski, Prague, page 266, 1935.

<sup>5</sup> Subbarow, Jacobsen and Prochownick, *Jour. Am. Chem. Soc.*, 58: 2234, 1936.

<sup>6</sup> Lalund and Klemm, *Acte med. Scand.*, 88: 620, 1936.

<sup>7</sup> Karrer, Frei and Fritsche, *Helv. Chim. Acta*, 20: 622, 1937.

---

## NEW MCGRAW-HILL TEXTS IN RADIO AND COMMUNICATIONS

---

### Microwave Transmission

By JOHN C. SLATER, Massachusetts Institute of Technology. *International Series in Physics*. 312 pages, 6 × 9. \$3.50

In this new book, the first of its kind to be published in this field of growing importance, an attempt has been made to steer a middle course between very elementary and very advanced standards; between the highly theoretical and the completely practical. Microwaves are treated both from the standpoint of conventional transmission lines and of Maxwell's equations. Topics covered include: transmission lines; Maxwell's equations, plane waves, and reflection; rectangular wave guides; the general transmission line problem; radiation from antennas; directive devices for antennas; and the coupling of coaxial lines and wave guides.

### Frequency Modulation

By AUGUST HUND, Consulting Engineer.  
In press—ready in September

Here is a critical engineering treatment of all phases of frequency modulation, from basic principles to the design of commercial apparatus. The practical applications follow closely the latest and best engineering practice. Phenomena and features in frequency modulation are described in comparison with customary amplitude modulation and in comparison with phase modulation. Simultaneous occurrence of frequency modulation with either of the other types of modulation, as well as the simultaneous action of all three types of modulation, are treated in the theoretical part of the book.

### Electrical Fundamentals of Communication

By ARTHUR L. ALBERT, Oregon State College. *In press—ready in August*

This distinctive book is unique in that it deals with electrical fundamentals from the point of view of communications—telegraphy, telephony, and radio. Designed for beginning students, the book is elementary, yet at the same time maintains a high standard of technical accuracy and provides a sound foundation in the subject. Examples illustrating the electrical fundamentals are given throughout the book, and many of these are numerical solutions typical of the problems and circuits found in communication.

### Radio Code Manual

By ARTHUR R. NILSON, Chief Instructor, Nilson Radio School, New York, N. Y.  
178 pages, 6 × 9. \$2.00

Designed for the prospective radiotelegraph operator, this book gives a course in radio code—how to send and how to receive it. This instruction is given in the form of 20 lessons, beginning with the simplest of code characters and leading to the handling of actual messages and press dispatches, weather reports, and distress messages. In addition to code practice in sending and receiving, the book contains a group of seven construction projects, including the building of code oscillators, a telegraph key, and the erection of code lines between two rooms or houses.

### Principles of Aeronautical Radio Engineering

By P. C. SANDRETTO, United Air Lines Transport Corporation. In press—ready in September

The publication of this text will be an event of importance to radio engineers, since it marks the first time that the engineering aspects of aeronautical radio have been adequately treated in book form. The purpose of the book is to provide the student of aeronautical systems and apparatus with information which serves as a guide for the design of equipment, as well as to aid the communications engineer in the solution of the various problems encountered in dealing with aeronautical radio.

### Mathematics for Electricians and Radiomen

By NELSON M. COOKE, Chief Radio Electrician, U. S. Navy. 604 pages, 6 × 9.  
\$4.00

This outstanding new text—a pioneer in its field—is widely used in radio technician training courses. The book has one dominant aim: to give the electrical and radio student a sound mathematical foundation and to show him how to apply this knowledge to the solution of practical problems most frequently encountered in actual practice. The mathematical scope of the book includes elementary algebra through quadratic equations, logarithms, elementary plane vectors, and vector algebra as applied to alternating-current circuits.

*Send for copies on approval*

---

## McGRAW-HILL BOOK COMPANY, INC.

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

Aldwych House, London, W.C.2



## Choose Your Texts for Fall Classes from These . . .

**AN INTRODUCTION TO BIOLOGY**—by J. C. CROSS, Ph.D., Professor of Biology, The Texas College of Arts and Industries, Kingsville, Texas. 507 pages, 331 illustrations. **PRICE, \$1.90**

**AN INTRODUCTION TO BIOCHEMISTRY**—by WILLIAM ROBERT FEARON, Fellow of Trinity College, Dublin, Member of the Royal Irish Academy. 475 pages. **PRICE, \$3.75**

**FUNDAMENTALS OF BIOLOGY (ANIMAL AND PLANT)**—by WILLIAM C. BEAVER, Ph.D., Professor of Biology, Wittenberg College, Springfield, Ohio. Second Edition. 889 pages, 310 illustrations, 14 color plates. **PRICE, \$4.00**

**LABORATORY OUTLINES OF GENERAL BIOLOGY**—by WILLIAM C. BEAVER, Wittenberg College, Springfield, Ohio. 165 pages, 26 illustrations. **PRICE, \$2.00**

**ESSENTIALS OF ZOOLOGY**—by GEORGE EDWIN POTTER, Ph.D., Professor of Biology, Agricultural and Mechanical College of Texas, College Station, Texas. 532 pages, 204 illustrations. **PRICE, \$3.75**

**LABORATORY OUTLINE FOR INTRODUCTORY ZOOLOGY**—by GEORGE EDWIN POTTER, Agricultural and Mechanical College of Texas. 186 pages, illustrated. **PRICE, \$1.50**

**BACTERIOLOGY OF PUBLIC HEALTH**—by GEORGE M. CAMERON, Ph.D., Associate Professor of Bacteriology, University of Tennessee. 451 pages, 31 illustrations. **PRICE, \$3.50**

**PRINCIPLES OF MICROBIOLOGY**—by FRANCIS E. COLIEN, B.S., M.S., Ph.D., F.A.P.H.A., Associate Professor of Bacteriology and Preventive Medicine, Creighton University School of Medicine; and ETHEL J. ODEGARD, R.N., A.B., M.A., Instructor in Sciences Applied to Nursing, College of St. Theresa, Winona, Minn. 430 pages, 140 illustrations, 18 color plates, 20 tables and charts. **PRICE, \$3.00**

**HANDBOOK OF COMMUNICABLE DISEASES**—by FRANKLIN H. TOP, Director, Division of Communicable Diseases and Epidemiology, Herman Kiefer Hospital and Detroit Department of Health. 682 pages, 73 illustrations, 10 color plates. **PRICE, \$7.50**

**MICROBIOLOGY AND PATHOLOGY**—by CHARLES F. CARTER, B.S., M.D., Director, Carter's Clinical Laboratory, Dallas, Texas. Second Edition. 755 pages, 165 illustrations, 25 color plates. **PRICE, \$3.25**

**ESSENTIALS OF COLLEGE CHEMISTRY**—by G. H. WHITEFORD, Professor of Chemistry, and R. G. COFFIN, Associate Professor of Chemistry, Colorado State College. Second Edition. 534 pages, 32 illustrations. **PRICE, \$3.50**

**OUTLINE OF LABORATORY WORK IN INORGANIC CHEMISTRY**—by G. H. WHITEFORD, R. G. COFFIN and ELIZABETH M. WING. 222 pages. **PRICE, \$1.50**

### Clip Coupon—MAIL TODAY

**The C. V. Mosby Company**

3525 Pine Boulevard  
St. Louis, Mo.

Sci. 8-7

Gentlemen: Send me the following book(s): .....

☐ Attached is my check.

☐ Charge my account.

Dr. ....

Address .....

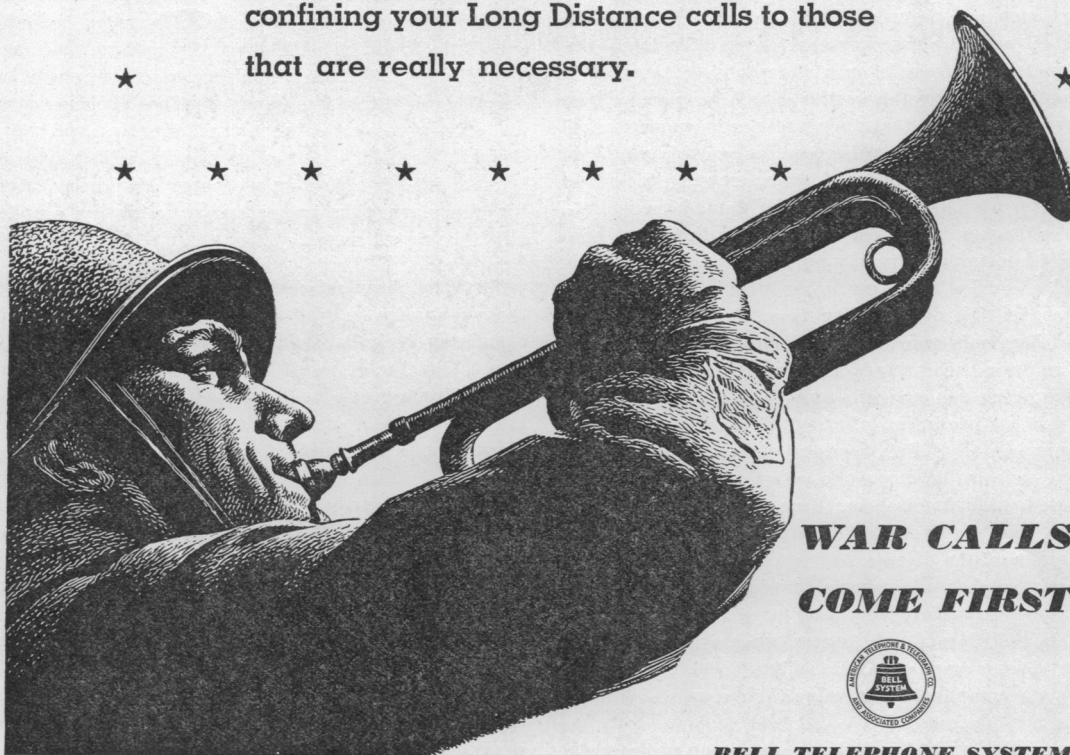
## Clear the Lines for the War

Before you make a Long Distance telephone call today, ask yourself these questions:

1. Is it necessary?
2. Will it interfere with war calls?

The weight of war on the telephone lines is heavier every day. We can't build the new lines to carry it because sufficient materials aren't available. We've got to make the most of the service we now have.

Please give a clear track to the war effort by confining your Long Distance calls to those that are really necessary.



**WAR CALLS  
COME FIRST**



**BELL TELEPHONE SYSTEM**