

# SCIENCE

VOL. 89

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*The American Association for the Advancement of Science:*

*Preliminary Announcement of the Milwaukee Meeting:* Edited by DR. F. R. MOULTON ..... 469  
*Science Versus Unemployment:* DR. ROBERT I. ALLEN ..... 474

*Scientific Events:*

*The Darwin Library at Down House; Standards of the American Society for Testing Materials; Conferences on Theoretical Physics and Spectroscopy; The Boston Society of Natural History; In Honor of Glover Morrill Allen; Presentation of the Willard Gibbs Medal* ..... 479

*Scientific Notes and News* ..... 481

*Discussion:*

*A Dilemma in Vitamins:* DR. VILHJALMUR STEFANSSON. *A Quantitative Measurement of the Natural Rate of Growth of Calcite Crystals in Geodes:* DR. LEROY T. PATTON. *Pantothenic Acid—A Vitamin:* PROFESSOR ROGER J. WILLIAMS. *The Effect of X-Ray on the Coccidia of the Rabbit:* RALPH F. HONESS ..... 484

*Scientific Books:*

*The Geological Sciences:* PROFESSOR KIRTLEY F. MATHER. *Chemistry of the Carbon Compounds:* PROFESSOR MARSTON T. BOGERT. *Season of Birth:* PROFESSOR STEPHEN S. VISHER ..... 486

*Special Articles:*

*Ocean-bottom Currents off the California Coast:* PROFESSOR F. P. SHEPARD, DR. R. REVELLE and R.

S. DIETZ. *Inhibition of Gastric Secretion by Extracts of Normal Male Urine:* J. S. GRAY, E. WIECZOROWSKI and DR. A. C. IVY. *Nicotinic Acid in Swine Nutrition:* L. C. MADISON, DR. R. C. MILLER and T. B. KEITH ..... 488

*Scientific Apparatus and Laboratory Methods:*

*A Precision Device for Faradic Stimulation:* DR. FREDERICK A. FENDER. *An Apparatus for Removal of Deleterious Bacteria from Certain Protozoan Cultures:* WALTER STEWART ..... 491

*Science News* ..... 10

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## THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

### PRELIMINARY ANNOUNCEMENT OF THE MILWAUKEE MEETING

Edited by DR. F. R. MOULTON

PERMANENT SECRETARY

FROM June 19 to June 24, inclusive, the association will meet in Milwaukee, Wisconsin. This will be the one hundred fourth meeting of the association, exclusive of the meetings of the Pacific Division and the Southwestern Division. The Southwestern Division from May 3 to May 6 held its nineteenth meeting in connection with the dedication of the McDonald Observatory, near Alpine, Texas. The Pacific Division will meet at Stanford University, California, from June 26 to July 1, inclusive. Thus three meetings of the association will have been held in widely separated parts of the country within two months. The combination of the meeting of the Southwestern with the dedicatory programs of the great new observatory illustrates the possibilities of joint meetings of the

association with other organizations to the advantage of science.

The approaching meeting in Milwaukee is the first one held by the association in that city. Milwaukee, with about 650,000 inhabitants, is the twelfth city in population in the United States. It is delightfully situated on the shores of Lake Michigan at the entrance to the summer vacation area of the northern lakes. Milwaukee has many fine hotels and an auditorium building containing several meeting halls with seating capacities ranging from 300 to 8,000. Adequate and excellent accommodations will be available for all persons attending the meeting, and rooms for the sections and affiliated societies will be abundant and conveniently located.

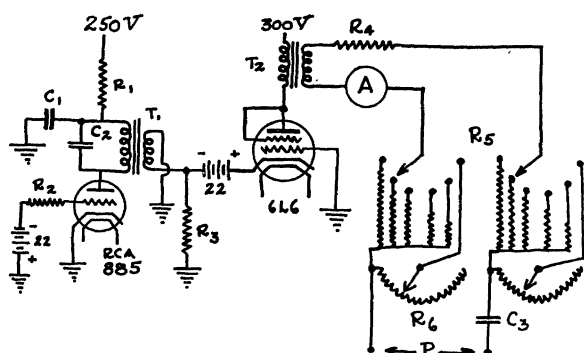


FIG. 2. Circuit. The plate supplies of the two tubes are not shown. These come from a single power pack utilizing an Inca C-65 transformer, a 5Y3 tube, two 12 henry chokes, two 4 microfarad condensers, and a 50,000 ohm resistor from which the 250-volt line is taken. The transformer heats the rectifier filament and supplies the heaters of 885 and 6L6 using a separate secondary and resistances of 3.4 and 1.38 ohms, respectively.  $R_1$ —50,000 ohms;  $R_2$ —20,000 ohms;  $R_3$ —5,000 ohms;  $R_4$ —100,000 ohms;  $R_5$ —ganged resistors of 10 meg, 5 meg, 2 meg, 1 meg and 0.5 meg each;  $R_6$ —two ganged zero to 500,000 ohm resistors.  $C_1$ —0.5 mf;  $C_2$ —0.02 mf;  $C_3$ —0.5 mf; A—zero to 200 copper-oxide rectifier type microammeter.  $T_1$ —Thordarson 67 D 50;  $T_2$ —Thordarson 14 A 29.

fixed negative potential impressed upon the grid of amplifier 6L6 to allow current to flow in this tube,  $T_2$ , and the output circuit. Average current is read directly on microammeter, A. Peak values are arrived at by multiplication by a constant for the unit. The stimulator has been used on patients on the service of Dr. Leo Eloesser at the San Francisco Hospital and on animals for direct and through-the-skin stimulation of peripheral nerves and for stimulation of the cortex cerebri.

It is felt that if faradic current used in a given project is accurately characterized as regards intensity, frequency and wave form there may be more uniformity in results of electrical stimulation of nervous tissue. We are left with two objectionable variables: the physical status, degree of narcosis, etc., of the subject; the complex phenomenon "spread." Concerning the second we are attempting to gather some information in the surgical laboratory at Stanford.

FREDERICK A. FENDER

STANFORD UNIVERSITY SCHOOL  
OF MEDICINE

# AN APPARATUS FOR REMOVAL OF DELETERIOUS BACTERIA FROM CERTAIN PROTOZOAN CULTURES

PROTOZOA cultures periodically become contaminated with deleterious bacteria. When this occurs the metabolic activity of the culture is lowered and often the clone is lost.

The following is a description of an apparatus based on the migration which protozoans show in an electric field towards the cathode. This enables the operator to remove a high percentage of harmful bacteria, and allows the culture to resume its normal growth.

Two platinum wires are fused into the side of a pyrex petre dish. A U-shaped piece of glass tubing is closed at both ends and the longitudinal surface ground, until an open channel results. This channel is filled with sterile hay infusion. The two platinum wires are placed at the extreme end of the glass channel, while the free ends are connected to a suitable electric current.

The protozoa to be partially sterilized are placed near the anode and the current turned on. Under the influence of the electric field the protozoa swim towards the cathode, leaving the bacteria behind them. They are then removed from the fluid by means of a capillary pipette as they near the cathode.

Paramecia treated as described above were no longer seriously contaminated by harmful bacteria. Although far from completely sterilized, they were able to resume normal growth.

WALTER STEWART

THE JOHNS HOPKINS MEDICAL SCHOOL

## BOOKS RECEIVED

- ASHBY, HELEN, ERIC ASHBY, HARALD RICHTER and JOHANNES BÄRNER. *German-English Botanical Terminology*. Pp. xi + 195. Nordemann. \$3.00.
- COFFMAN, RAMON P. (Uncle Ray) *The Child's Story of Science*. Pp. viii + 246. Illustrated. Putnam. \$2.50.
- CONANT, JAMES B. *The Chemistry of Organic Compounds; a Year's Course in Organic Chemistry*. Revised edition. Pp. x + 658. 35 figures. Macmillan. \$4.00.
- COON, CARLETON S. *The Races of Europe*. Pp. xv + 739. Illustrated. Macmillan. \$7.00.
- HOLMES, ROGER W. *The Rhyme of Reason; an Invitation to Accurate and Mature Thinking*. Pp. xi + 516. Illustrated. Appleton-Century. \$3.75.
- MANGUS, A. R. *Changing Aspects of Rural Relief; Research Monograph XIV, Works Progress Administration, Division of Social Research, 1938*. Pp. xxiii + 238. Illustrated. U. S. Government Printing Office, Washington.
- MILLER, DAYTON C. *Sparks, Lightning, Cosmic Rays; an Anecdotal History of Electricity*. Pp. xvii + 192. 89 figures. Macmillan. \$2.50.
- Report on the Danish Oceanographical Expeditions 1908-1910 to the Mediterranean and Adjacent Seas, under the Superintendence of Johs. Schmidt, Leader; No. 11, Vol. II, Biology*. Illustrated. Høst and Son, Copenhagen. 30 sh.
- ROBINSON, G. CANBY. *The Patient as a Person; a Study of the Social Aspects of Illness*. Pp. xiv + 423. Commonwealth Fund, New York. \$3.00.
- SHAW, SIR NAPIER. *The Drama of Weather*. Revised edition. Pp. xiv + 307. 109 figures. Cambridge University Press, Macmillan. \$3.50.
- ZIMMERMAN, CARLE C. and NATHAN L. WHETTEN. *Rural Families on Relief; Research Monograph XVII, Works Progress Administration, Division of Social Research, 1938*. Pp. xxiv + 161. Illustrated. U. S. Government Printing Office, Washington.

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## Four Distinctive New Books

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### A GERMAN-ENGLISH DICTIONARY

By LOUIS DEVRIES, Iowa State College. 473 pages, 5 x 7, flexible. \$3.00

Intended for the use of students in the agricultural, biological, and physical sciences, this unique dictionary contains 48,000 terms (German-English) pertaining to bacteriology; botany and zoology, including anatomy, embryology, pathology, and physiology; entomology; genetics; forestry; horticulture; agronomy; chemistry; physics; and mathematics. Of exceptional interest is the inclusion of a large number of literary terms needed by the student in science.

### INTERNAL CONSTITUTION OF THE EARTH

Edited by B. GUTENBERG, California Institute of Technology. 401 pages, 6 $\frac{3}{4}$  x 9 $\frac{5}{8}$ . \$5.00

This important new book is Volume VII of *Physics of the Earth*, a series of monographs prepared under the direction of various committees of the National Research Council. Preceding volumes have been published by the Council. *Internal Constitution of the Earth* gives a review of the features of the interior of the earth written by a group of distinguished geologists and geophysicists. Some of the topics covered are: origin of the solar system; elastic properties of rocks and materials in the earth's crust; temperatures in the earth's crust; deep-focus earthquakes; density, gravity, pressure; etc.

### GEOMORPHOLOGY

By A. K. LOBECK, Columbia University. 725 pages, 6 x 9. \$4.50

This long-awaited text in the fundamental principles of geomorphology will be of immediate interest to teachers of geography, geology, and related subjects. Intended for the beginning student, the book covers Rocks and Structures, Weathering, Underground Water, Streams, Alpine Glaciation, Continental Glaciation, Waves, Wind, Organisms, Coastal Plains, Plains and Plateaus, Dome Mountains, Block Mountains, Folded Mountains, Complex Mountains, Volcanoes, and Meteor Craters.

### A SOURCE BOOK IN GEOLOGY

By KIRTLEY F. MATHER, Harvard University, and SHIRLEY L. MASON, Consulting Geologist.

*Source Books in the History of the Sciences.* 690 pages, 6 x 9. \$5.00

The purpose of this book is to give a comprehensive view of the development of geological science during the past four centuries by presenting the significant passages from writings of the great contributors to that science. The excerpts include portions of the work of 130 geologists, each of whom was influential in molding the geological thought of his time. The original statements of many important principles and theories are thus made available.

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In the seven years since the first edition of "Physical Geology" was published the authors, through use of the book in their own teaching and from discussion with other teachers, came to realize that some parts of the treatment should be recast and strengthened. Furthermore, during these years a large volume of fresh geologic literature has appeared, and distinct advances in several aspects of geology have been made.

The general plan of the book remains unchanged. Two new chapters have been added: Chapter III, which gives particular attention to mass movement of the mantle (this material has been included in order to give greater emphasis to an important phase of gradation, and to make clear the distinction between such movements and the processes of weathering); and Chapter V, in which the sculpturing of the lands by running water and mass movements of the mantle is treated, following a discussion of hydraulic principles and mechanics of stream work in the preceding chapter. All the chapters have been completely reorganized.

Numerous cross-references are employed, in order to coordinate the subject matter and eliminate needless repetition. The practical aspects of geology, such as its relation to soil conservation and industrial developments, are given particular attention. Technical terms have been eliminated as far as seems consistent with effective and clear treatment. Many new reading references are listed, and new field results are cited to illustrate principles. A special effort has been made to improve the illustrations; some of the figures used in "Outlines of Physical Geology," by the same authors, are included, as well as numerous photographs and diagrams that are new.

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# THE SCIENTIFIC MONTHLY

J. McKEEN CATTELL, F. MOULTON and WARE CATTELL, Editors

## CONTENTS FOR JUNE

GROWTH OF ASIA. PROFESSOR BAILEY WILLIS.

APPLICATIONS OF SCIENCE TO THE METALLURGICAL INDUSTRY. DR. JOHN JOHNSTON.

UP MOUNT KINABALU. II. JOHN A. GRISWOLD, JR.

THE ORIGIN OF LIBERTY. PROFESSOR WALTER WOODBURN HYDE.

EPIC OF LIFE. DR. OSCAR RIDDLE.

THE LAND AND THE PEOPLE. H. H. BENNETT.

EMILE JAVAL—FRENCH SAVANT. DR. JAMES E. LEBENSOHN.

"WHENCE COMETH LIFE?" PROFESSOR WILLIS R. HUNT.

EMINENT MEN. PROFESSOR MAPHEUS SMITH.

BOOKS ON SCIENCE FOR LAYMEN:

*This Earth of Ours; Plants and Animals of the Desert; The Story of a Century; Nature—in One Book.*

THE PROGRESS OF SCIENCE:

*Dr. Frank B. Jewett, President of the National Academy of Sciences; Annual Meeting of the National Academy of Sciences; Milwaukee a Mecca for Scientists in June; Biology at the New York World's Fair; Bok Photographic Museum of the Franklin Institute; Aeronautical Research and Development.*

INDEX.

## CONTENTS FOR APRIL

HUMAN NEEDS AND SOCIAL RESOURCES. PROFESSOR C. MACFIE CAMPBELL.

NATURAL HISTORY OF SANTA CATALINA ISLAND. PROFESSOR T. D. A. COCKERELL.

BEHAVIOR AND SOCIAL RELATIONS OF FREE-RANGING PRIMATES. PROFESSOR C. R. CARPENTER.

PARTICLES OF THE COSMIC RAYS. DR. KARL K. DARROW.

A BIBLIOGRAPHER TURNS DETECTIVE. DR. E. W. GUDGER.

LACEWINGS AND THEIR ALLIES. DR. LEE H. TOWNSEND.

CAUSES OF VIRUS DISEASES IN PLANTS. DR. MELVILLE T. COOK.

CHLOROPHYLL—ITS FUNCTION. DR. FRANK MILTON SCHERTZ.

A COMPASS FOR MANKIND. D. S. BURCH.

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*Meeting of the Australian and New Zealand Association for the Advancement of Science; Award of the Faraday Medal to Dr. W. D. Coolidge; William Bartram's Bicentennial; James Playfair McMurrich; Hard Copper-Cupuloy; "Inferior" Children in Superior Homes; Sleep Longer.*

## CONTENTS FOR MAY

DRUG ADDICTION AS A PUBLIC HEALTH PROBLEM. DR. LAWRENCE KOLB.

UP MOUNT KINABALU. I. JOHN A. GRISWOLD, JR.

LITTLE-KNOWN FOSSILS. CHARLES T. BERRY.

THE IONOSPHERE. DR. E. O. HULBURT.

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