

SCIENCE

VOL. 101

FRIDAY, MAY 18, 1945

No. 2629

<i>Shall We Lose or Keep Our Plant and Animal Stocks?</i> : PROFESSOR WALTER LANDAUER	497	<i>nary Tract</i> : PROFESSOR GEORGE N. PAPANICOLAOU and VICTOR F. MARSHALL. <i>The Adsorption of Thrombin on Fibrin</i> : DR. WALTER H. SEEGER, MARIE NIEFT and EUGENE C. LOOMIS	515
<i>Disease of the Heart</i> . DR. ALFRED E. COHN	499	<i>Scientific Apparatus and Laboratory Methods</i> : <i>An Easily Assembled Machine for Making Cotton Plugs for Culture Tubes</i> : PROFESSOR ORTON K. STARK. <i>Microviscometer</i> : DR. ELLIOTT R. WEYER. <i>The Use of Double-Cycle A and B Scales on Straight Slide Rules</i> : DR. CARLTON E. BROWN	521
<i>Obituary</i> : <i>Recent Deaths</i>	502	<i>Science News</i>	12
<i>Scientific Events</i> : <i>The Argentine Declaration; Rehabilitation of the Physically Handicapped; The American Chemical Society; The American Academy of Arts and Sciences</i>	502		
<i>Scientific Notes and News</i>	504		
<i>Discussion</i> : <i>Comparative Scientific Strength of Universities</i> : DR. GEORGE GAYLORD SIMPSON. <i>The Effect of Motion Pictures on Body Temperature</i> : DR. N. KLEITMAN. <i>Growing Rubber in Costa Rica</i> : RAFAEL W. KEITH	506	SCIENCE: A Weekly Journal, since 1900 the official organ of the American Association for the Advancement of Science. Published by the American Association for the Advancement of Science every Friday at Lancaster, Pennsylvania. <i>Editors</i> : JOSEPHINE OWEN CATTELL and JAMES CATTELL. <i>Policy Committee</i> : MALCOLM H. SOULE, ROGER ADAMS and WALTER R. MILES. <i>Advertising Manager</i> : THEO. J. CHRISTENSEN. Communications relative to articles offered for publication should be addressed to Editors of Science, 34 Gramercy Park, New York 3, N. Y. Communications relative to advertising should be addressed to THEO. CHRISTENSEN, Advertising Manager, Smithsonian Institution Building, Washington 25, D. C. Communications relative to membership in the Association and to all matters of business of the Association should be addressed to the Permanent Secretary, A.A.A.S., Smithsonian Institution Building, Washington 25, D. C. Annual subscription, \$6.00 Single copies, 15 cents	
<i>Scientific Books</i> : <i>Individuality</i> : PROFESSOR H. S. JENNINGS	509		
<i>Reports</i> : <i>War Research at Mellon Institute, 1944-5</i> : DR. W. A. HAMOR	510		
<i>Special Articles</i> : <i>Crystallization of Southern Bean Mosaic Virus</i> : DR. W. C. PRICE. <i>Inactivation of the Irritant Toxicants of Poison Ivy and Related Compounds by Tyrosinase</i> : PROFESSOR IRWIN W. SIZER and CLEMENS E. PROKESCH. <i>Urine Sediment Smears as a Diagnostic Procedure in Cancers of the Uri-</i>			

SHALL WE LOSE OR KEEP OUR PLANT AND ANIMAL STOCKS

By Professor WALTER LANDAUER

THE UNIVERSITY OF CONNECTICUT, STORRS, CONN.

GENETICISTS have learned to produce hereditary variations at will; they have succeeded in multiplying greatly the frequency with which mutations occur; but they have not yet brought under control the direction of these events. The future may well hold the secret of how to overcome the randomness of changes in the hereditary substratum of organisms, and we may thereby master the fashioning of plants and animals "according to plan." Until this time has arrived, however, we shall do well to keep in mind the words of William Bateson, "Variation leads; the breeder follows." The art of breeding, the art of producing new combinations of genes, rests entirely on the raw materials—the mutations—as they are provided by nature.

The uses to which new mutations and varied gene combinations may be put are manifold. Geneticists and biologists generally seek material which will aid in an analysis of development and evolution. Students of human and veterinary medicine are interested in those forms of life which are most likely to contribute to the understanding and control of disease. Breeders of livestock and of crop or ornamental plants search for types which will enhance the pleasures and profits to be derived from their stocks by heightened disease resistance, greater vigor, increased yields or particular esthetic values. The present war has dramatized the need of various industries for plant materials with specified qualities, many of which could not be obtained. Stocks which

electric clock motor. Under a uniform AC potential (110 volts, 60 cycle current) the motor develops a definite amount of power which is sufficient to maintain its own phase relationship with the AC current, plus an additional force, sufficient to overcome the torque resistance of a viscous fluid. When electrical resistance is introduced, however, a point is reached where the current is insufficient to maintain a synchronous relationship.

The motor is mounted in such a position that its rotor turns in a horizontal plane. A cylindrical platform (1 to 2 cm in diameter) is made from lucite or other plastic rod, and is mounted in concentric fashion on the rotor. A similar stationary member is held by bracket above the rotating platform and is provided with a screw mechanism to vary the clearance between the two members. A variable radio-type resistor

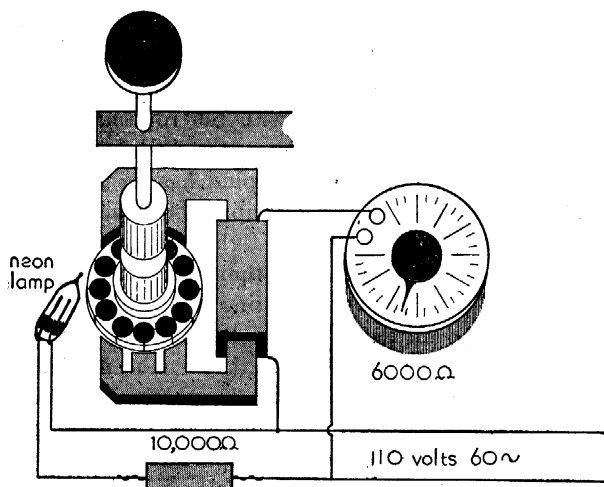


FIG. 1

(preferably wire-wound) is connected in series with the motor, and a small neon lamp is provided, to scan stroboscopically the speed of the rotor.

In making a determination, clearance is first adjusted to a suitable value (± 1 mm) using a gauge metal "feeler." The specimen is then introduced between the opposed surfaces by pipette and the motor is started with no resistance in the circuit. Resistance is then cut in slowly while observing the stroboscopic pattern of the rotor. In the light of the neon lamp it will appear stationary; as the end point is reached this rotor pattern suddenly breaks. The resistor dial setting is then correlated with data derived from determinations upon fluids of known viscosity.

Refinements of this apparatus include a constant voltage source, demountable rotor platforms in various diameters with annular troughs to collect any overflow, stroboscopic disc for scanning in lieu of the rotor itself, resistor dial calibrated in centipoises.

The chief possible source of error lies in torque changes due to heating of the resistor after prolonged

operation. This may be overcome by intermittent use or by use of a precision type variable resistor.

ELLIOTT R. WEYER

RESEARCH CORPORATION,
NEW YORK, N. Y.

THE USE OF DOUBLE-CYCLE A AND B SCALES ON STRAIGHT SLIDE RULES¹

THE index of the single-cycle, movable C scale on straight slide rules is shifted (or replaced by the other index) essentially to extend the length of the single-cycle, fixed D scale, as the figures of the product or quotient sought are outside the single logarithmic cycle (but always in an adjoining one). This shifting may be eliminated, without loss in accuracy, on rules having folded C and D scales (or CF and DF scales) by using these scales essentially to extend the length of the D scale from 1 to 1.314 cycles. On other straight rules the shifting may be eliminated, with reduction in accuracy to half (but still with sufficient accuracy for most purposes), by the use of the double-cycle A and B scales present on practically all slide rules. The use of the folded scales is described in most slide-rule manuals, but the use of the double-cycle A and B scales for multiplication and division is not, or at least it is not stressed, probably because the procedure is only half as accurate as the use of the single-cycle scales and because of the similarity of the procedures to those on the single-cycle C and D scales.

The possibility of so using the A and B scales must be known to most slide-rule users, but realization of the lower accuracy of this procedure or oversight probably accounts for the rare use of these double-cycle scales for multiplication and division. The reduction in accuracy from their use, for many purposes, is far outweighed by the convenience of not having to decide which index to use and not having to shift indices in multiplying or dividing by the same factor. In multiplying or dividing by the same factor on the A and B scales, after setting the B scale, it is merely necessary to move the indicator, an operation that can be done by one hand on rules which have an indicator that rides along the top of the rule.

CARLTON E. BROWN

U. S. BUREAU OF MINES,
PITTSBURGH, PA.

¹ Published by permission of the Director, Bureau of Mines, U. S. Department of the Interior.

BOOKS RECEIVED

- CARTER, GEORGE F. *Plant Geography and Culture History in the American Southwest*. Illustrated. Pp. 140. Viking Fund, Inc., New York. 1945.
- MOORE, ARTHUR R. *The Individual in Simpler Forms*. Illustrated. Pp. x + 143. University of Oregon Press. \$1.25. 1945.
- WERTHEIM, E. *Textbook of Organic Chemistry*. Second edition. Illustrated. Pp. xiv + 867. The Blakiston Company. 1945.



May 1945 Publications

PRINCIPLES OF RADIO

By KEITH HENNEY, *Editor, "Electronics"*

An elementary presentation of radio principles, revised to include material on such important topics as wave guides, velocity modulation tubes, frequency modulation, Klystrons, ultra high frequency techniques and apparatus. Emphasis is placed on recent developments and future methods. As in former editions, the book is written for the student with little background in radio, and the language is clear and non-technical. Problems are given to show the application of the principles explained.

Fifth edition; 542 pages; 5½ by 7½; \$3.50

PLANE AND SPHERICAL TRIGONOMETRY

By H. A. SIMMONS, *Professor of Mathematics, Northwestern University*, and GREENVILLE D. GORE, *Professor of Mathematics, Central Y.M.C.A. College of Chicago*

This greatly enlarged second edition begins with the trigonometric functions of the general angle, instead of the positive acute angle, and includes precisely the solid geometry needed for the study of spherical trigonometry. The book contains not only theoretical spherical trigonometry, but a large number of applications, including introductory navigation and certain elementary problems of astronomy. There are also chapters on *Complex Numbers* and the *Slide Rule*.

Second edition; Approximately 511 pages; 5½ by 8½; Probable price \$2.75

DYNAMIC METEOROLOGY

By J. HOLMBOE, W. GUSTIN, and G. FORSYTHE; *all at the Department of Meteorology, University of California at Los Angeles*

The theoretical background needed by the practical meteorologist, this textbook contains only that material considered indispensable for the meteorologist and weather forecaster. This is probably the only book that starts from the fundamental principles of physics and develops the tools of thermodynamics and hydrodynamics needed for a thorough understanding of atmospheric processes. Self-contained and presupposing only a general knowledge of physics and calculus, this book introduces and develops the methods of vector algebra and calculus as most naturally expressing the concepts of atmospheric processes.

378 pages; 5½ by 8½; \$4.50

SCIENTIFIC SOCIETIES IN THE UNITED STATES

By RALPH S. BATES, *formerly of the History Department, Massachusetts Institute of Technology*

The only book that gives a complete survey of the evolution of American scientific societies during the past two and a half centuries, covering national, state and local organizations. Proceedings, transactions and other publications of hundreds of scientific societies were used in the preparation of this book. The relation of such historical factors as national growth, to the formation of scientific societies, is discussed in the book.

246 pages; 5½ by 8½; \$3.50

MAINSPRINGS OF CIVILIZATION

By ELLSWORTH HUNTINGTON, *Research Associate in Geography, Yale University*

The three parts of this book take up first the general problem of evolution from geological times down to the present, with special emphasis on the stages preparing the way for the development of civilization. Part two deals with heredity, and discusses the selective action of migration, and the problems of race. The final section takes up the effect of physical environment on the evolution of civilization, emphasizing climate, diet, and density of population as basic factors.

660 pages; 5½ by 8½; \$4.75

JOHN WILEY & SONS, Inc., 440-4th Ave., New York 16, N. Y.