

TIRED and aching neck muscles—the result of bending your head over the microscope to view through the ordinary straight eyepiece can now be eliminated. Spencer Lens Company presents inclined eyepiece called the "Single Inclinocular," for use on monocular microscopes.

It is so built that the eyepiece is tilted at just 30° from the vertical—the angle which permits greatest comfort in observing specimen. This Spencer Lens "Single Inclinocular" is of particular value when observing continuously over extended periods of time or in the case of examining liquid specimens when the stage must be horizontal.

A point to remember—with the Spencer Lens Single Inclinocular, the size of the regular field is **not** reduced.

Folder M-50 completely describes this "Single Inclinocular"—write for it today!



- BRANCHES: New York, Chicago, Boston, Washington, Minneapolis, Los Angeles, San Francisco.
- PRODUCTS: Microscopes, Microtomes, Delineascopes, Visual Aids, Optical M e as u r i n g Instruments.



# The "POINTOLITE" LAMP



150 c. p. A. C. "Pointolite" Lamp Diameter of bulb 3 inches

#### BIDDLE SPECIALTIES

Laboratory Rheostats High Vacuum Pumps Speed-Measuring Instruments

Siemens & Halske Precision Instruments and Oscillographs Wolff Potentiometers

## gives a steady and brilliant light from a very small source

THE light from the "Pointolite" Lamp comes from a very small, white-hot bead of tungsten. As the bead remains in a fixed position after the lamp is started, it can be placed right at the focus of a condensing lens or ot  $\ldots$  optical system. There is no flicker; the field of illumination is distributed evenly; and the lamp requires no attention whatever after starting.

"Pointolite" Lamps are giving excellent results in many lines of scientific and laboratory work—particularly in conjunction with photomicrographic outfits, projection microscopes, photometers, galvanometers, etc. For d.c. circuits "Pointolite" Lamps are made in 30, 100, 500 and 1000 c.p. sizes, while for alternating current we have the 150 c.p. lamp here illustrated.

Please write for new descriptive Bulletin 1280-PS.

At Philadelphia headquarters we maintain a working exhibit of our leading specialties and welcome visitors during office hours.

> JAMES G. BIDDLE CO. ELECTRICAL AND SCIENTIFIC INSTRUMENTS

1211-13 ARCH STREET, PHILADELPHIA. PA.

# **CLEARANCE SALE**



#### CRATED READY FOR SHIPMENT

This stock going at COST PRICES while it lasts.

During the past eight months Sheldon Company have kept their full crew of workmen employed.

This policy has produced an *overstock* of Sheldon high grade SCHOOL FURNI-TURE of the most popular designs.

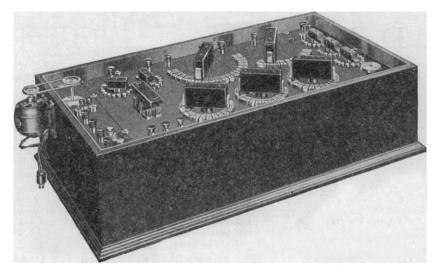
This stock includes:

- 826 Chemistry Tables and Instructors' Desks
- 391 Physics Tables
- 336 Biology Tables
- 1023 Cooking Tables
- 1700 Commercial Tables
- 289 Sewing Tables
- 1068 Benches
- 2177 Art and Drawing Tables 454 Cases

Write or wire for special prices.

E. H. SHELDON & COMPANY Muskegon, Michigan

# An Improved Feussner Type POTENTIOMETER



RANGE, o to 1.89999 volts. So designed that six of the contact resistances usually in the potentiometer circuit have been eliminated. Includes Brooks "self-checking" feature so arranged with two dials that standard cell setting can be made to 10 microvolts, the limit of the potentiometer, thus increasing the precision of the instrument. Rheostat for regulating measuring current an integral part of instrument.

COILS of manganin selected for temperature coefficient of less than 0.000015 between 20° C and 30° C. Wound on insulated spools, these being of metal to insure dissipation of heat. Coils adjusted to within .005% after thorough aging and long observation for constancy. They will remain constant to .02% or better.<sup>1</sup>

SWITCHES are of very low and constant resistance, tests having shown their variation to be less than .00003 ohm per switch. Remarkably smooth in operation. Each switch segment accommodates a tapered plug for checking of each resistance.

BINDING POSTS are of copper to minimize thermal electromotive forces.

OIL IMMERSED with motor driven stirrer, and electrically operated temperature control device.

<sup>1</sup> Rosa and Babcock—Bur. Stan. Bull. 4, 121 (1907). Thomas—Research Paper No. 201, Bureau of Standards.

Note: Can be supplied without temperature control and oil immersion at considerable reduction in cost.



THE EPPLEY LABORATORY, INC.

SCIENTIFIC INSTRUMENTS

NEWPORT, R.I.

# IT COST BILLIONS OF DOLLARS TO BUILD

## YET YOU CAN USE IT FOR A FEW CENTS A DAY



EVERY TIME you telephone you share the benefits of a nation-wide communication system using eighty million miles of wire and employing four hundred thousand people. It represents a plant investment of more than four thousand million dollars, yet you can use a part of it for as little as five cents... for considerably less on a monthly service basis.

The organization that makes efficient telephone service possible is called the Bell System, yet it is as truly yours as if it were built specially for you. For every telephone message is a direct contact between you and the person you are calling.

At any hour of the day or night, the telephone stands ready and waiting to carry your voice to any one of twenty million other telephone users in this country. It knows no rest or sleep, or class or creed. All people—everywhere—may use it equally. Its very presence gives a feeling of security and confidence and of nearness to everything.

Many times during the day or week or month, in the ordinary affairs of life and in emergencies, you see the value of the telephone and realize the indispensable part it plays in every business and social activity.

The growth of the Bell System through the past fifty-five years and the constant improvement in service may well be called one of the great achievements of this country. Greater even than that are the policies, improvements and economies that make this service possible at such low cost.

Of all the things you buy, probably none gives so much for so little as the telephone.

\* AMERICAN TELEPHONE AND TELEGRAPH COMPANY \*



7

# A Low Priced High Frequency Oscillator THE CENCO MIDGET TESLA COIL



No. F4057

THE CENCO MIDGET TESLA COIL is of the quenched gap type, having a primary transformer tuned and loosely coupled to a secondary high frequency circuit consisting of a single layer high frequency transformer, mica condensers and an adjustable spark gap assembly. The arrangement of parts and the design is such as to eliminate faradic surges, to give long life to the unit and to insure safe and easy handling. It was designed for the greatest utility in both the laboratory and lecture room. By separating the primary transformer from the secondary transformer and oscillating circuit it has been possible to produce a high frequency oscillator of small size that can be handled safely while in operation and therefore can be quickly applied to demonstration devices or the parts of a vacuum system. The frequency of the output current is so high that it can be taken through the body without the slightest noticeable effect.

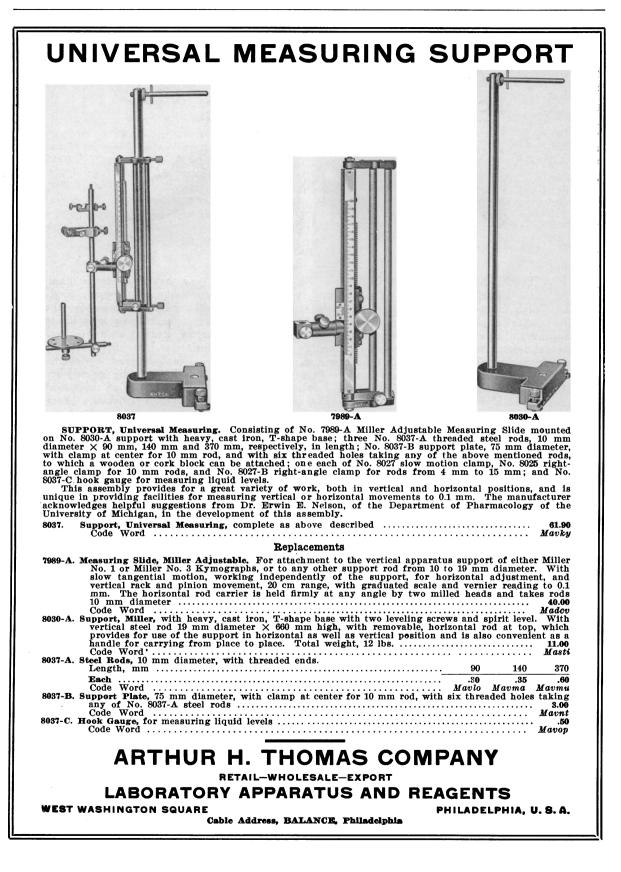
With this device many high frequency demonstrations such as the lighting of Geisler tubes, fluorescent and cathode ray tubes, demonstrations of standing waves on our No. F4012M standing wave tube, lighting of a 10 watt 110 volt lamp by current passing through one's body, etc., can be performed. It is a very superior device for use in the detection of leaks in a vacuum system as current at this high frequency does not puncture the glass but unerringly finds the source of the leak by concentrating at that point.

The current input required is about the same as a 40 watt lamp, being .35 amperes of 110 volt 60 cycle current. The output is a 60 milliampere current of approximately 30,000 volts at 2500 kilocycles. The output is easily controlled from 10% to full value by means of an adjusting lever on the spark gaps.

The complete unit consists of two parts, the primary transformer and the secondary high frequency unit, together with the necessary connecting cords and plug. The primary transformer case measures but  $3\frac{3}{4} \times 5\frac{1}{4} \times 2\frac{1}{2}$  inches. A toggle switch is mounted on the side for control of the input current. The high frequency unit is connected to the primary transformer by 4 feet of connecting cords. This unit is designed for easy grasping by the hand. Its hard rubber case measures  $2\frac{1}{4}$  inches in diameter and is 8 inches long including the metal housing for the spark gaps and regulating lever. The case of the high frequency unit tapers to the output receptacle into which objects to  $\frac{1}{2}$  inch diameter may be inserted. A copper brush of fine wire in a bundle  $\frac{1}{2}$  inch diameter by 2 inches long is provided with the coil for use about a vacuum system.

No. F4057 . . . . . . . . . . . . . . . . \$20.00

CENTRAL SCIENTIFIC COMPANY LABORATORY WW SUPPLIES Apparatus Chemicals New York-Boston-CHICAGO-TORONTO-LOSANGELES



# SCIENCE

### Vol. 74

## FRIDAY, AUGUST 14, 1931

No. 1911

The Internal Secretions and Human Well-being: PROFESSOR M. F. GUYER ...... 159 Scientific Events: Drought in the Nesting Areas of Waterfowl in the United States and Canada; The International Passamaquoddy Fisheries Commission; The Faraday Celebration; The Joseph Henry Lectureship . 166 of the Philosophical Society of Washington ..... Scientific Notes and News ..... 168 Discussion: The Uncertainty Principle and Free Will: PRO-FESSOR ARTHUR H. COMPTON. Geomorphic Nomenclature: DR. F. BASCOM. Lord Kelvin's "Mortal Spring'': PROFESSOR EVAN THOMAS. On "The New Cytology": PROFESSOR JEAN OLIVER. Chro-Societies and Academies: The Second International Congress of the History of Science and Technology: DR. DAVID EUGENE ..... 175 SMITH . Scientific Apparatus and Laboratory Methods: A Triple-spectrum Discharge Tube: R. WILLIAM

#### Special Articles:

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

New York City: Grand Central Terminal

Lancaster, Pa.	Garrison, N. Y.
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 INTERNAL SECRETIONS AND HUMAN WELL-BEING<sup>1</sup>

### By Professor M. F. GUYER

UNIVERSITY OF WISCONSIN

PERHAPS there is no field of biological investigation to-day that is attracting more attention on the part of both biologists and the public than that concerned with the glands of internal secretion—secretions which do not pass out from their place of origin through ducts as do ordinary glandular products, but which are absorbed directly into the blood or lymph and circulated through the body. The interest of the public has been aroused in this new knowledge through its rather wild exploitation in the press under such captions as "The Chemistry of the Soul,"

<sup>1</sup>Address given at the forty-fifth annual meeting of the Iowa Academy of Science, May 1, 1931; in substance, a section from the author's forthcoming textbook, ''Animal Biology,'' published by Harper and Brothers. "The Glands of Destiny," "Rejuvenation through Monkey Glands" and other equally sensational titles, together with the occasional truths that filter through from time to time regarding the really remarkable part played by the internal secretions—or hormones as they are technically called—in our physical and mental well-being.

The ductless or endocrine glands which produce these various internal secretions occur in, all backboned animals from fishes to man. The secretions themselves are second in importance only to the nervous system in keeping the parts of the body in harmonious operation. They are also necessary for normal development and growth. They can stimulate or inhibit the activity of some organ or tissue in a part



# SCHOOL AND SOCIETY

EDITED BY J. MCKEEN CATTELL

#### June 11, 1931

The Contribution of Rescarch to the Mental Hygiene Program for Schools: PERCIVAL M. SYMONDS. Educational Events: Anti-Semitic Disorders at the University of Vienna; Decrease in Illiteracy as Shown by the Census; Endowment Funds of the American Library Association; Award of the Garvan Scholarships; The Chautauqua Institution; The International House of the University of Chicago; The Alumni University of the University of Michigan; Masters of Colleges at Yale Uni-versity.

versity. Educational Notes and News:

Discussion: Instruction in Our Graduate Schools—A Protest: GEORGE MORLAN.

Limit and Reorganization in CAMPBELL and LEO P. Ківву.

Quotations: State Appropriations for the University of North Carolina.

Reports: The State University as the Developmental Arm of the State: M. M. CHAMBERS.
Societies and Meetings: Conference on University Training for the Na-tional Service.
Educational Research and Statistics: Absences, Lateness and Drop-Outs in the North-east High School, Philadelphia: CHAS. W. PAI.MER

PALMER.

#### July 18, 1931

Intellectual Freedom and Integrity: ADAM STROHM. Adventures in Evolution: EDWIN LINTON.

Adventures in Evolution: EDWIN LINTON. Educational Events: Report of the International Educational Cine-matographic Institute; Physically Handicapped Children in Illinois; New York City Budget for Recreation; The Increase of High-school Stu-dents in New York City; The Growth of College and University Education in the United States; "University City" of the University of Wiscon-sin; The Atlanta University Library; The First International Recreation Conference; The In-stitute of Politics of Williams College. Educational Notes and News: Discussion:

Discussion:

The Discussion Technique: Allen O. HANSEN. The Contract Plan in Retrospect: Allson COMISH. Quotations:

Requests for Free Copies of Text-books.

Reports Educational Problems of Pennsylvania.

Societies and Meetings: Detroit Meeting of the American Home Eco-nomics Association.

Educational Research and Statistics: The Influence of Practice on Individual Differ-ences: H. B. REED.

July 25, 1931

The Los Angeles Meeting of the National Education Association: Some Problems in Education: WILLIS A. SUTTON. The Profession of Teaching: WILLIAM C. BAGLEY. The Sixty-ninth Annual Meeting of the National Education Association: WILLIAM DOW BOUTWELL. Educational Events: Physical and Psychological Examination of School Children; Educational Broadcasting; Public Education in Arkansas; Courses in Mental Health at Teacher Training Institutions; In-vestigation of Sites and Supplies of the New York City Schools; Chicago's New Experimental School; The Tent Colony of the University of Wisconsin; Library of the University of Ken-tucky. tucky.

Educational Notes and News: Discussion

ussion: Vocational Guidance and Mental Hygiene: JOSEPH MILLER, A New Mode of Attack on the Colleges: G. WAKEHAM.

Quotations Child Labor in India.

Reports:

Massachusetts State College.

Educational Research and Statistics: Preliminary Report on Medical Aptitude Tests for 1931-32: F. A. Moss.

#### August 1, 1931

- National Education Association: The Superintendent as the Chief Inspiration and Executive in making the White House Conference Effective: EDWIN CORNELIUS BROOME.
  Educational Events: English Teaching in Japan; The Decline in Ap-propriations for Ohio State Colleges and Uni-versities; The Linguistic Atlas of the United States; The Influence of the Economic Depression on Vocational Education; Prison Education in New York City; The Financial Situation of the Chicago Schools; The World Federation of Education Associations.
  Educational Notes and News:

Educational Notes and News:

Discussion.

- The Wisconsin Experiment: OLE MAN RIBBER.
- Quotations Chile's Students; The High-school Curriculum.
- Reports: The National Council of Education: AdelAIDE S. BAYLOR.
- Educational Research and Statistics: Experiment in Remedial Reading: WILLIAM H. THOMPSON.

## EDUCATIONAL REVIEW

Edited by WILLIAM MCANDREW

Editorial Comment: Memories of the Meeting at Los Angeles. Book Reviews:

\$5.00 A YEAR

PUBLISHED WEEKLY

15 CENTS A COPY

THE SCIENCE PRESS GRAND CENTRAL TERMINAL, NEW YORK CITY