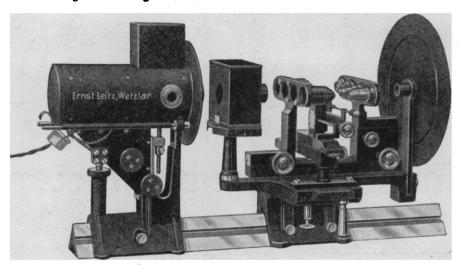
# LEITZ Precision Micro-Projector "XI"

with Synchronic Quick-Changing Device for Objectives and Condensers



Model "XI" represents the most ideal apparatus for micro-projection of utmost efficiency. It is available for the complete range of micro objectives including oil immersions of highest magnification. Model "XI" involves an entirely new construction affording a quick change from one objective to another and similarly a quick shift from one condenser to another for use of the objective employed.

The Projector "XI" consists of a strong wooden base plate mounted upon a triangular optical bench. The illuminant is supported on a rider with clamping screw and attaches to the optical track. The well-known Leitz Automatic-feed Arclamp (carbons being manipulated by clockwork mechanism) is made use of.

The microscope rider supports on a bracket with rack and pinion motion a slider for a combination of four different condensers, an especially devised mechanical stage and on a separate bracket equipped with rack and pinion coarse focus and micrometer screw for a fine adjustment, a slider for four different microscope objectives. A sleeve attached to a swinging arm, serves as a receptacle for the projection ocular.

The slider holding four different condenser units permits an immediate change from one condenser to another and by rack and pinion to focus these condensers precisely. The microscope proper being provided with a slider for four different objectives, affords an immediate change from one objective to another; dependent upon synchronic shift of condensers and objectives a microscopic preparation may be instantly projected under a variance of different magnifications and this without the least loss of time.

Objectives and condensers are so par-focalized to each other that when applying them under the change of different magnifications, the focus once obtained will remain in adjustment irrespective of the change made. The screen image at a distance of 13 ft. (using ocular 4x) or at 27 ft. (using ocular 2x) measures  $5\frac{1}{2}$  ft. in diameter.

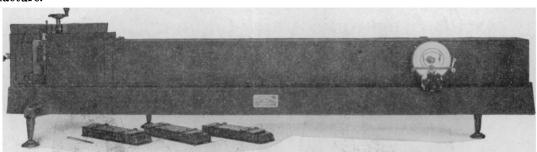
WRITE FOR PAMPHLET NO. 1155 (0)

60 East Tenth St. E. LEITZ, INC. New York, N. Y.

## L253 QUARTZ SPECTROGRAPH

#### LITTROW AUTO-COLLIMATING TYPE

The illustration shows one of the types of the various Spectrographs which we manufacture.



The instrument is of extremely compact and substantial construction and gives excellent definition throughout the entire spectrum. It is designed for photographing spectra in three sections from 210 Mu Mu to 800 Mu Mu on 10" x 2\frac{1}{2}" photographic plates.

Full particulars regarding this Spectrograph, together with sample spectrographs, sent on request.

#### THE GAERTNER SCIENTIFIC CORP.

1201 Wrightwood Avenue.

Chicago, U.S.A.



## New AMINCO Stop Watch Holder

This convenient device fills a long felt need. It holds the stop watch in an easily read position and prevents expensive accidents. No dirt or oil can find its way into the delicate mechanism from hands of operator. Sturdily built and well padded at base. Price, \$4.50 each. Bulletin sent on request.

# New AMINCO ELECTRIC STIRRER

Controlled by a stepless rheostat which permits propeller to be driven at any desired speed from 100 to 1200 r.p.m. Equipped with a Universal Motor and built-in speed reducer; (can also be supplied with induction motor of same dimensions.) Shaft has universal chuck so other stirrers can be inserted easily. Support rod is of stainless steel.

Angle of shaft can be adjusted to 12 positions. Motor shaft is equipped with a three-step cone pulley for use in driving other apparatus. Low speed shaft also has pulley for driving slow speed equipment. All bright parts nickel plated.

Price, \$32.50 complete with stand and either glass or brass propeller.

AMERICAN INSTRUMENT COMPANY, Inc.
774 GIRARD STREET, N. W. WASHINGTON, D. C.

# WARD'S NATURAL SCIENCE ESTABLISHMENT, INC.

### Renders an Unique Service to American Science

For over sixty-five years Ward's has been the world emporium for natural science material. Nowhere else in the whole world will be found such a large or varied stock. The following is a partial list of the items which can be supplied:

### FOR THE GEOLOGICAL SCIENCES

An unrivalled stock of minerals
A large assortment of rocks
Hundreds of meteorites
An immense stock of fossils
Geological models
Relief maps and models
Mineralogical supplies
Mineral and Rock collections
Krantz crystal models

#### FOR THE BIOLOGICAL SCIENCES

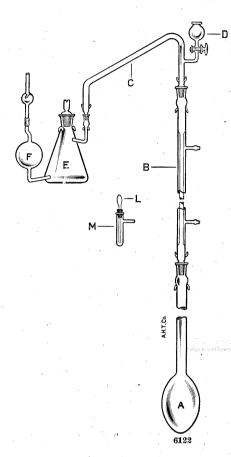
High quality zoological specimens
Complete line of vertebrate skeletons
Thousands of bird and mammal skins
Entomological equipment
North American and Exotic Lepidoptera & Coleoptera
Rich collections of Sponges, Corals,
Echinoderms, Mollusca
Microscopic slides

Write for our two hundred and ten page General Catalog listing thousands of items. This should be in the files of every scientist. Also send for your copy of our new booklet, "Ward's Natural Science Establishment. Its History, Reorganization and Plans for the Future." Both are sent free upon request.

WARD'S NATURAL SCIENCE ESTABLISHMENT, INC.
P. O. Box 24, Beechwood Station,
ROCHESTER, N. Y.

The Frank A. Ward Foundation of Natural Science of the University of Rochester

## THOMPSON-OAKDALE HALOGEN DETERMINATION APPARATUS



## HALOGEN DETERMINATION APPARATUS, Thompson-Oakdale,

of Pyrex glass, with interchangeable ground joints. For the determination of chlorine, bromine and iodine in organic compounds; consisting of a digestion flask, condenser, dropping funnel, connecting tube, receiver, etc., all of special design.

This apparatus offers advantages of accuracy, safety, time, convenience and simplicity over standard methods now in use. It also leaves the residue after digestion in a condition to permit the convenient and accurate determination of bismuth, antimony, and arsenic therein.

See J. J. Thompson and U. O. Oakdale, "A General Method for the Determination of Halogens in Organic Compounds," The Journal of the American Chemical Society, Vol. 52, No. 3 (March, 1930), p. 1195.

6122. Halogen Determination Apparatus, Thompson-Oakdale, of Pyrex glass with interchangeable ground joints. Complete as above described, consisting of digestion flask A, condenser B, connecting tube C with attached dropping funnel D, receiving flask E with attached safety bulb F, thin-walled glass bulb L, glass tube with side arm M and No. 7501 Kjeldahl Connecting Bulb, 52 mm. 36.40

Code Word

Igers

|                  | · · · · · · · · · · · · · · · · · · ·                     |      |       |
|------------------|---|------|-------|
| 6122-A.          | Digestion Flask A, 300 ml capacity                        | 7.50 | Igesq |
|                  | Condenser B, 685 mm long                                  |      | Igeto |
|                  | Connecting Tube C, with attached dropping funnel D        |      | Igeum |
| 6122- <b>E</b> . | Receiving Flask E, with attached safety bulb F            | 7.00 | Igevk |
| 6122-L.          | Glass Bulb L, thin walled; for use with liquid material   | .35  | Igewi |
|                  | Glass Tube M, with side arm; for use with liquid material |      | Igexg |

#### ARTHUR H. THOMAS COMPANY

RETAIL-WHOLESALE-EXPORT

#### LABORATORY APPARATUS AND REAGENTS

WEST WASHINGTON SQUARE

PHILADELPHIA, U. S. A.

Cable Address, BALANCE, Philadelphia

## SCIENCE

Vol. 74 No. 1921 FRIDAY, OCTOBER 23, 1931 The Next Twenty Years: Professor Hans Zinsser 397 GEO. T. HARGITT. Section E (Geology and Geography): PROFESSOR KIRTLEY F. MATHER ..... Obituary: Thomas Alva Edison ..... Scientific Apparatus and Laboratory Methods: Scientific Events: An Apparatus for Determining the Purity of Lime-Conferences on the Calendar and on Meteorology; stone in the Field: Dr. Paul Emerson. A Sim-Techno-chemical Lectures of the Mellon Institute ple, Quick and Inexpensive Method of Preparing The American College of Surgeons; Gold Medals Lantern Slides: P. E. Reid in Recognition of Work in Yellow Fever; Grants Special Articles: of the American Academy of Arts and Sciences; A Natural Copper Deficiency in Cattle Rations: Appointments of the Carnegie Institution of Wash-Dr. W. M. NEAL, Dr. R. B. BECKER and PROFESSOR A. L. SHEALY. Decrease in Rate of Oxygen Consumption under the Influence of Visible Light on ingtonScientific Notes and News ..... Sarcina lutea: Boris B. Rubenstein ..... Discussion: On a Possible Explanation of the Difference in Science News .... Wave-lengths of the Spectral Lines of a given Ele-SCIENCE: A Weekly Journal devoted to the Advancement produced on the Sun and on the Earth: Pro-FESSOR FERNANDO SANFORD. Bottom Temperatures ment of Science, edited by J. McKeen Cattell and pubin Deep Lakes: Dr. Stillman Wright. Metabolism of Cystine and Methionine: Dr. Richard W. lished every Friday by JACKSON and RICHARD J. BLOCK. The Transformation of Carotene to Vitamin A in Vitro: Dr. THE SCIENCE PRESS New York City: Grand Central Terminal HAROLD S. OLCOTT and DUANE C. McCann. Con-Lancaster, Pa. Garrison, N. Y. ical Snowflakes: WILLIS W. WAGENER ..... Annual Subscription, \$6.00 Single Copies, 15 Cts. The American Association for the Advancement of 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. Science: The Host Institution and Hotel Headquarters for the New Orleans Meeting: Dr. Charles F. Roos. Section F (Zoology) at New Orleans: Professor

#### THE NEXT TWENTY YEARS<sup>1</sup>

By Dr. HANS ZINSSER

PROFESSOR OF BACTERIOLOGY AND IMMUNOLOGY, HARVARD UNIVERSITY

#### Introduction

THANKS to the new understanding which has pervaded American medicine during the last forty years, the dedication of a great hospital becomes at the same time the foundation of a new educational institution. For of all the beneficent changes which have come with the reorganization of medical education, the home-coming of the schools and hospitals to shelter under the wings of the universities is perhaps the most significant and important. By this, medicine has taken its rightful place as the science of human biology in which the laboratories form the bridge over which thought and method of the fundamental sciences find their way to the arts of the clinic and the operating room. Here in these splendid buildings, in the coming years, countless thousands will find comfort and relief from pain, new hope and the postponement of sorrow. And the old traditions of our profession will be upheld, to apply our wisdom and

 $^{\rm n}$  Address given at the dedicatory exercises, the new Lakeside Hospital, Cleveland, Ohio, June 17, 1931.

our best skill to all who may have need of them, regardless of the trivial differences which, under all other circumstances, keep men distrustful and apart. But here, too, the ranks of our profession will be renewed, year after year, with younger men, wiser than we—if wisely you train them; stronger in purposes of kindness and human understanding; learned as we could not be, and more skillful.

In all human affairs there is a curious lag between the acceptance of high principles and the application of such understanding to practical purposes. In politics, to realize this, one need only sit in the gallery of Congress and remember that Plato wrote "The Republic" 2,400 years ago. In religious thought we are nineteen hundred and thirty-one years along, and it is best not to say anything more about it. In medicine, the dependence of progress on the disciplines of chemistry, physics and biology has been impressed upon us since the beginnings of the 19th century; and only now are we finally organized, within great universities, as a technical branch of learning, where

New!

Up-to-Date!

# OUTLINE OF COMPARATIVE EMBRYOLOGY

#### By Aute Richards

Professor of Zoology, and Head of the Department, Director of Biological Survey, University of Oklahoma

# Relates the Different Types of Development Throughout the Entire Animal Kingdom

The aim throughout this book is to set up the general principles of development so that the student may see how his special case is merely one of several types and what its relation to the other types may be. This text-book is intended chiefly for college of Arts courses in embryology as distinguished from medical courses. It will also be valuable as a preparation for medical courses, and professors of medical embryology will be interested in that aspect of it.

In this book the principles of early development are discussed for the

entire animal kingdom and the relation of different types to each other is brought out. No other book in English presents this material so extensively.

presents this material so extensively. Part I deals with General Embryology. Part II, Embryological Problems, discusses topics of embryological interest about which every embryologist and zoologist knows something but most of which has never been brought together in a form available for English speaking students. Tables are included which contain a great deal of information summarized and condensed into consultable form.

444 pages

6 by 9

Price, \$5.00

## JOHN WILEY&SONS, Inc.

440 Fourth Avenue, New York City