Does someone in your lab have to read an electrical measuring instrument every few minutes? And enter the reading in a data book? And plot curves from the data?

The chances are that an L&N Recorder can take over all three jobs. It can show almost any quantity convertible into voltage or resistance. It can have any one of a wide variety of operating speeds—can be either a galvanometer type Micromax or a vacuum-tube type Speedomax. Its automatically-drawn records are adding extra hours to the week in hundreds of laboratories.

Mechanically and electrically, Micromax and Speedomax equipments are easy to work with. Measuring circuits are easily alterable—ranges easily changed. Signalling or controlling may be added or removed at will. Structurally, these instruments are rigid, tough, beautifully fitted and adjusted; built like machine tools as well as like the sensitive instruments they are.

An L&N Field Engineer will be glad to explain the use of an L&N Recorder, or will send a catalog if you prefer. Write to Leeds & Northrup Co., 4926 Stenton Ave., Philadelphia 44, Pa.
Larife

Large Capacity Centrifuges

Designed for large capacity centrifuging in the Chemical, Biological and Pharmaceutical industries, or wherever a batch type Centrifuge is required to handle large volumes of material in bottles or sealed containers. Several Models are available according to capacity requirements.

**Model 13L** - Spins 10 one liter bottles at 2300 r.p.m. (2280xg.) — or 10 1.3 liter spun aluminum containers at the same speed. A water-cooled enclosing guard and windshielded head minimize heating of contents during centrifuging.

**Model FS** - Spins 4 one liter bottles or six half-liter bottles at 2500 r.p.m. (2000xg.). Adapters are available for smaller tubes and bottles. Perforated basket style heads are also available 14" in diameter x 6½" deep in manganese bronze and stainless steel, speed 2500 r.p.m. (1250xg.). This Centrifuge can be furnished with explosion-proof motor and mechanical speed controller for hazardous locations.

**Model SR-3** - Identical in speed and capacity to Model FS listed above, but refrigerated, so that controlled temperatures to 0°C or lower may be maintained within the Centrifuge guard during the centrifuging process.

**Note:** A smaller capacity, higher speed Refrigerated Centrifuge, Model PR-1, is also available.

Prompt delivery on all Models. Write today for descriptive Bulletins 13L, FS and RC, containing complete details and current prices.

*Makers of Fine Centrifuges for Fifty Years*

**INTERNATIONAL EQUIPMENT COMPANY**

1284 SOLDIERS FIELD ROAD, BOSTON 35, MASS.

August 11, 1950
Instruments which operated from a battery were dependable and stable only when the battery was at an optimum charge. These instruments needed constant adjustment to compensate for the state of charge. Now, this problem has been solved.

With the Fisher Power Supply Unit, designed especially for use with the Beckman DU Spectrophotometer, the battery is constantly replenished at a rate equal to the drain. Your battery is never called on to provide a net current in excess of 0.5 amperes. Eliminate “drift” and its attendant calibration problems, put an end to battery changing and charging, minimize need for adding water, add greatly to the life of the battery.

Write today for further information.

Operates on 115 volt, 60 cycle A.C. Complete with 120 ampere hour storage battery, $161.45. Without battery, $135.00.

The Fisher Power Supply Unit is the result of research and development carried out in the Fisher Development Laboratories. The instrument is manufactured exclusively in the shops of the Fisher Scientific Company.
### Table of Contents

**Cellular Opacity and the Activity of Chloroplast Pigments in Photosynthesis:**
Harold H. Strain ........................................... 161

**Concerning the Measurement of pH, Ion Activities, and Membrane Potentials in Colloidal Systems:** Hans Jenny et al. ......................... 164

**Technical Papers**

Chemical Composition of the Vitelline Membrane of *Ascaris lumbricoides var. suis*:
Richard W. Timm .......................................... 167

Effect of Trace Minerals on Growth and Fattening of Swine:
Earle W. Klosterman et al. ................................. 168

Evidence of a Homing Instinct in the Bermuda Spiny Lobster:
Edwin P. Creaser and Dorothy Travis ...................... 169

Acetaldehyde Accumulation in Excised Wheat Roots Induced by Plant Growth Substances:
James F. Nance and Leon W. Cunningham 170

Antimyein A, an Antibiotic with Insecticidal and Miticidal Properties:
George S. Kido and E. Spyhalski ........................... 172

The Solubility of Fibrin Clots Produced by Thrombin and by Snake Venom: B. Jónszky 173

Effect of Evisceration on Renal Glycogen:
Clarence Cohn, Bertram Katz, and Pauline Cohn .......... 174

The Effect of Exercise upon the Lethality of Roentgen Rays for Rats: D. J. Kimeldorf, D. C. Jones, and M. C. Fishler ....................... 175

Adaptive Production of Amylase and Lipase by Three Species of Fungi: J. J. Goodman ......................... 176

Determination of Circulating Red Cell Volume by Radioactive Chromium:
Seymour J. Gray and Kenneth Sterling ......................... 179

**Comments and Communications**

Failure of Vitamin B₁₂ to Promote Growth of Premature Infants:
Daniel F. Downing .............................................. 181

Effect of Tricaine Methanesulfonate on the Determination of Sulfonamides:
S. B. Friddle and S. F. Snieszko .............................. 181

**Book Reviews**

Einführung in die Kernphysik:
Wolfgang Riezler. Reviewed by E. Bleuler 182

Kleine Raketenkunde: Hans K. Kaiser.
Reviewed by Willy Ley ........................................ 182

**News and Notes**

Upper Atmosphere Symposium and Conference:
Warren N. Aronquist ......................................... 183

---


All correspondence should be sent to *Science*, 1515 Massachusetts Ave., N.W., Washington 5, D.C. The AAAS assumes no responsibility for the safety of manuscripts or for the opinions expressed by contributors. Four weeks' notice is required for change of address, and an address stencil label from a recent issue must be furnished. Claims for a missing number will be allowed only if received within 60 days from date of issue.

Annual subscriptions, $7.50; single copies, $2.25; foreign postage, outside the Pan-American Union, $1.00; Canadian postage, $5.00.

The AAAS also publishes *The Scientific Monthly*. Subscription rates on request.
Announcing Publication of MEAKINS' New Fifth Edition

The Practice of Medicine

By JONATHAN CAMPBELL MEAKINS, C.B.E., M.D., LL. D., D.Sc., Formerly Professor of Medicine and Director of the Department of Medicine, McGill University; Physician-in-Chief, Royal Victoria Hospital, Montreal, etc.

A FULLY INTEGRATED AND COMPLETE DIAGNOSTIC AND THERAPEUTIC GUIDE FOR THE SPECIALIST AND GENERAL PRACTITIONER IN MEDICINE

1558 Pages ~ 518 Illustrations, 50 In Color ~ PRICE, $13.50

From its inception, Dr. Meakins' work has been based on symptomatology with a physiological approach—never stopping with dry signs and symptoms alone. Always their significance is clearly explained and logical treatment indicated. As was true of all previous editions, the many and notable illustrations make the book a standout among the "practice" books in print today.

Specifically the changes and additions to this New 1950 Edition are:

The entire book has been reviewed and brought completely up-to-date.

Special attention has been given to: Mycotic diseases of the lungs...Electrolyte imbalance of cardiac function...Gastro-intestinal infections...Hepatic diagnosis...Diseases of the Mediastinum...Hepatitis...Diseases of nutrition—with particular attention to the effect of injuries and diseases on nutrition.

The so-called collagen diseases have been given considerably more attention, particularly in regard to periarteritis nodosa, lupus erythematosis, scleroderma, etc.

The chapters on metabolism and on the ductless glands have been considerably enlarged.

Published by
THE C. V. MOSBY COMPANY
Saint Louis 3, Missouri
San Francisco 9, California

There is no other book in which the material has been better integrated, considering the enormous amount of information that has been covered. It is actually more than a dozen "books" in one large, well illustrated volume. For example:

It contains 63 pages on the Larynx and Bronchial System...92 pages on the Nasopharynx and Mouth...145 pages on Diseases of the Lungs...167 pages on the Circulatory System...139 pages on the Gastro-intestinal Tract...65 pages on Diseases of the Liver and Bile Passage...79 pages on Diseases of Metabolism...86 pages on Diseases of the Ductless Glands...187 pages on Diseases of the Nervous System...44 pages on Psychosomatic Medicine...44 pages on the Urinary System...120 pages on Infectious Diseases.
FOR LIFETIME ACCURACY AND PRECISION

Choose a NEW

Leitz Medical Microscope

Model GO 48/77

Model BS 48/77

IMPORTANT NEW FEATURES

Smooth working and most accurate coarse and fine adjustments yet devised.

New, built-in mechanical stage with low-set drives on a common axis...more convenience, smoother operation.

New substage condenser with swing-out upper element permits the use of lenses from lowest to highest powers.

Larger yet lighter stands with longer bearing surface for the focusing motion...easier to carry, easier to focus.

Oil immersion lens is anti-reflection coated for maximum definition and better color rendition.

When it's time to decide which microscope you want to own, be sure to take a look at the new Leitz Medical Microscopes. Here is precision and quality that will stand the test of time and long-run performance; the kind of instrument that will meet your student needs today, your professional requirements tomorrow.

Made to the uncompromising standards of quality that have earned world-wide recognition for the name Leitz, these improved Medical Microscopes embody the latest advancements, optical science can provide. They're easier to operate, more accurate than ever.

Write today for Catalog Micro 101—SC

E. LEITZ, Inc., 304 Hudson Street, New York 13, N. Y.

LEITZ MICROSCOPES • SCIENTIFIC INSTRUMENTS
LEICA CAMERAS AND ACCESSORIES
2 MINUTES for
pH, Chlorine, Phosphate
DETERMINATIONS with

TAYLOR COMPARATORS
To make a determination, simply place reagent treated sample in middle tube in base, with untreated samples in flanking tubes. Move the Color Standard slide across until the colors match, and . . .

There's the Value!

Consistent Accuracy Guaranteed
No Single Standards To Handle
Taylor sets are recognized standards for colorimetric determinations. They're the natural favorite of those who have used them because all the Taylor Color Standards necessary for any one determination are enclosed in a handy size molded plastic slide. No fragile, single standards to handle. One determination usually takes less than 2 minutes. Accuracy is assured because all Taylor Liquid Color Standards carry an unlimited guarantee against fading.

GET THIS WEALTH OF INFORMATION FREE!

This valuable 96 page book contains authoritative information for 34 basic industries. Discusses Taylor methods and equipment. Write for your copy - see your dealer for equipment.

W. A. TAYLOR AND CO.
416 RODGERS FORGE RD. • BALTIMORE-4, MD.

"FREEZE-DRYING" PRESERVES PRODUCTS

Freeze-Drying preserves labile substances so they retain their original characteristics over great periods of time, without impairing or nullifying their original properties. Freeze-Drying is the simplest method for preserving sera, plasma, antibiotics, antitoxins, viruses, bacteria and other micro-organisms, vaccines, injectable vitamins, hormones, enzymes, and other labile biologicals and pharmaceuticals.

Stokes Freeze-Drying equipment for industrial, research and laboratory applications is complete, self-contained and easy to install. The Stokes Advisory Service can help on all freeze-drying problems.

F. J. STOKES MACHINE CO.
5255 TABOR ROAD
PHILADELPHIA 20, PA.

LaMOTTE BLOCK COMPARATOR

This improved LaMotte Unit greatly facilitates simple, accurate, Hydrogen Ion Control. It is especially recommended for the use of individual operators on any step of a process where a definite pH value must be maintained. Even with highly colored or turbid solutions determinations can easily be made with accuracy.

The new plastic block comparator is non-corrodible, moisture-resistant, and has more sharply defined color fields. Complete with any one set of LaMotte Permanent Color Standards, together with a supply of the corresponding indicator solution, measuring pipette and marked test tubes.

LaMOTTE WATER SOLUBLE pH INDICATORS (Sulfon-phthalein series) pH 0.2-9.6

These products were originally developed in the LaMotte laboratories and are of the same superior quality as the acid form indicators hitherto available for pH work. They have the distinct advantage of being instantly soluble in distilled water, hence are easy to convert to solution form. Use of alkali, as required in the older technique is eliminated, and no heating is necessary.

The clean quick way to prepare indicator solutions for accurate pH work.
LaMotte Chemical Products Company
Dept. "H"
Towson, Md.
LIQUID PREPARATIONS:

GBI

"Vitamin Free" Casein Hydrolysate
An acid hydrolysate of a 10% solution of Vitamin Test Casein GBI. Vitamins are removed by several carbon treatments. When suitably supplemented, it will support excellent growth of organisms employed in microbiological procedures. Offered in sterilized liquid form, ready to use, 100 ml. serum bottles.

GBI

Riboflavin Basal Medium
A complete medium suitable for microbiological riboflavin assay. Offered in sterilized liquid form, ready to use, 100 ml. serum bottles.

GBI

Yeast Supplement Solution
A sterile solution suitable for preparing culture media. Each 10 ml. ampul of Solution with other necessary ingredients is sufficient to prepare 500 ml. of Riboflavin Basal Medium Stock Solution.

GBI

Biotin Solution
Pure crystalline biotin (free acid), uncomplicated by other B-complex factors, is offered in 1 ml. ampules each containing 25 micrograms in water solution.

POWDERED PREPARATIONS:

GBI

Niacin Basal Medium
Lyophilized Powder
A complete medium suitable for microbiological niacin assay. Offered in lyophilized form in serum bottles containing sufficient dry material to make up 500 ml. of medium ready to use.

GBI

"Vitamin Free" Casein Hydrolysate
Enzymatic — Lyophilized Powder
An enzymatic hydrolysate rendered vitamin free by carbon adsorption and dried by lyophilizing. Useful in various microbiological procedures. Bottle contains sufficient dry powder to make 100 ml. of solution which is ready to use in the medium being prepared. Dilution is made right in the bottle in which the hydrolysate is sold.

OTHER GBI MEDIA INGREDIENTS
Crystalline vitamins, amino acids and other accessory growth factors.

Write for Latest Price List No. 677
CUSTOM MADE

TOOL FOR THE ANALYSIS
OF COMPLEX COLLOID SYSTEMS, AND FOR
THE CONTROL OF PRODUCTION OF
PURIFIED PROTEINS, ENZYMES, HORMONES

KLETT MANUFACTURING CO.
179 EAST 87TH STREET
NEW YORK, N. Y.

because SCIENTISTS demand the most
in
MAXIMUM EFFICIENCY
SIMPlicity of OPERATION
LOW COST

LINDLY
microscope
LAMP

Simply rotate lens for variable light intensity.

Standard projection bulb used.
Daylight filter supplied with lamp.
2 lens condenser.
Slides and pivots to any position.
Color filters and lens available for special purposes.
10% discount in lots of 5 or more.

LINDLY & COMPANY
80 Herricks Rd., Mineola, N. Y.

"VITAMIN FREE"
CASEIN HYDROLYSATE
For Microbiological Procedures
and
Vitamin Assays

- Riboflavin
- Folic Acid
- Biotin
- Pantothentic Acid
- Niacin
- B-12

Uniform—Pre-tested—Dependable
Available as ACID or ENZYMATIC Hydrolysates
Low "Blanks" High "Maximum Acid"

WRITE FOR CATALOGUE #5 850
NUTRITIONAL BIOCHEMICALS CORP.
CLEVELAND 5, OHIO

8

SCIENCE, Vol. 112
AN INTRODUCTION TO THE EMBRYOLOGY OF ANGIOSPERMS

Gives an up-to-date account of the embryology of the angiosperms in the widest sense, covering not only the embryo and endosperm but also the development of the male and female gametophytes and the process of fertilization. The author shows that modern embryology is not a mere narration of facts but a rapidly advancing science having many contacts with other fields of study.

TEXTBOOK OF BIOCHEMISTRY. New 2nd edition
By PHILIP H. MITCHELL, Professor Emeritus of Biology, Brown University. 695 pages, $6.00

A modernized and introductory presentation of the essentials of biochemistry, centering upon metabolism and human nutrition. Emphasis is given to the constitution and activity of enzymes, the intermediary reactions of anabolism and catabolism, and the vital significance of hormones and vitamins. The material is up to date and includes recent advances in the field.

PRINCIPLES AND PRACTICE OF SPECTROCHEMICAL ANALYSIS
By NORMAN NACHTRIEB, University of Chicago. 324 pages, $4.50

Presents the theory which underlies chemical emission spectroscopy, and illustrates these principles by descriptions of practical applications of spectroscopy to various problems of chemical analysis. Concerned entirely with emission spectroscopy in the ultraviolet and visual regions of the spectrum, the book treats such topics as, the diffraction and refraction of light, the photographic process, the origin and excitation of spectra, construction of prism and grating spectrographs, the application of spectroscopy to qualitative analysis, and the quantitative analysis of metals, refractories, and solutions.

FUNCTIONAL ANATOMY OF THE VERTEBRATES
By DANIEL P. QUIRING, Western Reserve University, and Cleveland Clinic Foundation. McGraw-Hill Publications in the Zoological Sciences. In press

Placing particular emphasis upon the function of structures, this new text presents in concise form the various systems of the chordate animal and many of the conclusions arrived at on the basis of a study of these systems. It is written from the viewpoint of levels of being which permits a more advantageous unification of material and a more dynamic treatment of function. Special topics cover: the endocrine system, an anthropological review, treatment of animals as energy-releasing mechanisms, and tabulations on evolutionary changes in organ systems.

Send for copies on approval

McGRAW-HILL BOOK COMPANY, INC.
330 West 42nd Street, New York 18, N. Y.
Yesterday's finest... many still in use!

**BUT TODAY** you need all these performance advantages:

- Exclusive variable focus condenser
- Exclusive nosepiece with roller bearing stop
- Exclusive bronze body tube dove-tail slide
- Exclusive patented lever fine adjustment
- Threadless cell lens mounts
- Coarse adjustment with *matched* rack and pinion
- Substage with full 360° ring mount
- Integral substage illuminator (optional)
- Balcoated optical system (optional) to reduce reflections and flare

See the difference with a demonstration

Yesterday's finest microscopes are not good enough for today's problems. Let your own test prove the smooth-as-silk motion, precise focusing and illumination control, world's finest optical system, and time-and-effort-saving convenience of a new B&L Laboratory Microscope.

**WRITE** for complete information and demonstration to: Bausch & Lomb Optical Co., 642-AA St. Paul St., Rochester 2, N. Y.

Replace your old microscopes now with NEW

Bausch & Lomb Laboratory Microscopes