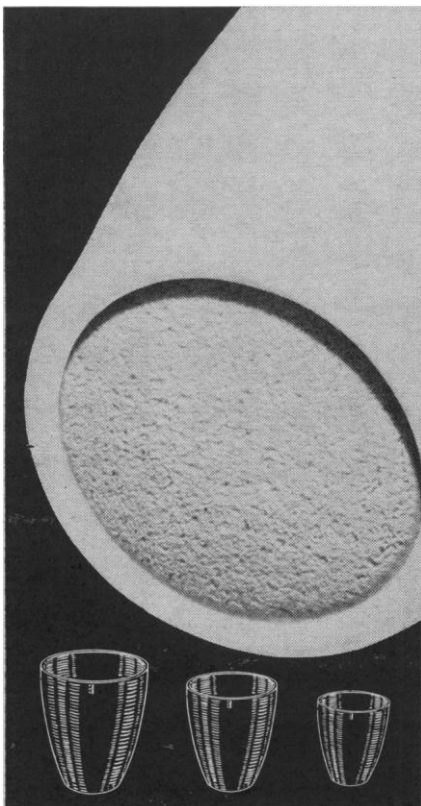


Porous BOTTOM Crucibles



Coors Porous Bottom crucibles give the chemist sturdy, dependable filtering crucibles for unlimited service under the most exacting conditions. An exclusive process developed by Coors provides a porous disc, formed into the crucible wall, that will not crack or drop out during use at room or elevated temperatures. The disc will not disintegrate when subjected to acids (except HF) or moderate alkali solutions. When these Coors crucibles are ignited even to extremely high temperatures, the porous disc will not crack, nor will the pore size be altered. Carefully controlled pore sizes are available in three ranges: (1) for bacterial separation and (2) fine filtering and (3) coarse precipitates. The crucibles are easily cleaned and readied for re-use. The same filtering disc may be ordered in the Coors Emich micro-filter stick for immersion filtration. Write for Bulletin No. 548. Coors Porous Bottom crucibles are immediately available through your nearest laboratory supply dealer.

INSIST THAT YOUR LABORATORY PORCELAIN WARE CARRY THIS MARK OF DEPENDABILITY

COORS U.S.A.

COORS PORCELAIN COMPANY, GOLDEN, COLORADO

Index to Advertisers 8 January 1965

Ace Glass Inc.	92
Alconox, Inc.	194
American Ceramic Society, Inc.	208
Baker & Adamson	87
Baker, J. T., Chemical Co.	111
Bausch & Lomb Inc.	98
Beckman Instruments, Inc.	86, 110, 209
Blickman, S., Inc.	196
Buchler Instruments, Inc.	211
Central Scientific Co.	95
C & H Sales Co.	192
Chemical Rubber Co.	196
Coors Porcelain Co.	216
Difco Laboratories	193
Durrum Instrument Corp.	195
E-C Apparatus Corp.	190
Edmund Scientific Co.	188
Elgeet Optical Co., Inc.	187
Farrand Optical Co., Inc.	206
Fisher Scientific Co.	203
Gilson Medical Electronics	112
Hacker, William J., & Co., Inc.	208
Harvard Apparatus Co., Inc.	187
Honeywell Research Center	99
Hotpack Corp.	214
Institute for Scientific Information	212
International Business Machines	219
International Equipment Co.	106, 191
JEOLCO (U.S.A.), Inc.	100
Klett Manufacturing Co., Inc.	193
Knopf, Alfred A., Publisher	206
Kontes Glass	94
Lea & Febiger	196
Leeds & Northrup Co.	212
London Co.	107
Millipore Filter Corp.	192, 206
Nalge Co., Inc.	213
New Brunswick Scientific Co., Inc.	102
New England Nuclear Corp.	207
Nikon Instrument Div., Ehrenreich	108
Photo-Optical Industries, Inc.	195
Nuclear-Chicago Corp.	195
Owens-Illinois	187, 189, 191, 193
Packard Instrument Co., Inc.	114
Pennsylvania Fluorocarbon Co., Inc.	200
Perkin-Elmer Corp.	185
Phipps & Bird, Inc.	207
Photovolt Corp.	186
Professional Tape Co., Inc.	192
Radiation Instrument Development	
Laboratory, Div. of Nuclear-	
Chicago Corp.	101
Royson Engineering Co.	191
Sage Instruments, Inc.	215
Sandia Corp.	205
Sargent, E. H., & Co.	105
Schwarz BioResearch, Inc.	198
Scientific Industries Inc.	204
Sigma Chemical Co.	210
Sorvall, Ivan, Inc.	97
Technical Measurement Corp.	210
Technicon Chromatography Corp.	93
Tektronix, Inc.	197
Texas Instruments Inc.	90
Thermolyne Corp.	200
Thermovac Industries Corp.	204
Thomas, Arthur H., Co.	220
Tracerlab	188
Varian Associates	96
Welch Scientific Co.	207
Yellow Springs Instrument Co.	214
Zeiss, Carl, Inc.	91

AAAS Symposium Volumes

AGING . . . SOME SOCIAL AND BIOLOGICAL ASPECTS

Edited by Nathan W. Shock. 436 pages. 65 illustrations. References. Index. 1960. \$8.50 (\$7.50 prepaid, for AAAS members).

"This monograph should be of immense interest to scientists wishing to gain a general understanding of the subject. In fact it could be profitably read by a large number of well informed nonscientific people who are desirous of recognizing the aging process and its consequences. The publishers have done excellently as to printing and binding. It is easy to read, and the illustrations are of top quality. The indexing of authors and subjects is quite adequate."

Food Technology, May 1962

ALCOHOLISM—BASIC ASPECTS AND TREATMENT

Edited by Harold E. Himwich. 220 pages. 33 illustrations. References. Index. 1957. \$5.75 (\$5.00 prepaid, for AAAS members).

"This collection is a fine factual, and healthily undigested, presentation of research on alcohol . . . arranged, edited, and summarized . . . with concision and clarity."

Contemporary Psychology, Jan. 1959

LOW-LEVEL IRRADIATION

Edited by Austin M. Bruce. 158 pages. 18 illustrations. References. Index. 1959. \$3.75 (\$3.25 prepaid, for AAAS members).

" . . . reveal the authors' skill in summarizing for the informed layman the status of extremely complex and only partially understood information . . . these articles . . . discuss the crux of the problem. . . ."

American Journal of Roentgenology, Radium Therapy and Nuclear Medicine, Feb. 1961

CONGENITAL HEART DISEASE

Edited by A. D. Bass and G. K. Moe. 372 pages. 147 illustrations. References. Index. 1960. \$7.50 (\$6.50 prepaid, for AAAS members).

" . . . precise editing . . . maximum amount of information . . . distinguished panel of authors . . . constantly high and informative level in its presentation . . . a valuable and concise summation of the more important aspects of congenital heart disease."

American Journal of Cardiology, Aug. 1961

Order Today from
**AMERICAN ASSOCIATION
FOR THE
ADVANCEMENT
OF SCIENCE**

1515 Massachusetts Ave., NW,
Washington, D.C. 20005

Personnel Placement

CLASSIFIED: Positions Wanted. 25c per word, minimum charge \$4. Use of Box Number counts as 10 additional words. Payment in advance is required.

COPY for ads must reach SCIENCE 2 weeks before issue date (Friday of every week).

DISPLAY: Positions Open. Rates listed below—no charge for Box Number. Rates net. No agency commission allowed for ads under 4 inches. No cash discount. Minimum ad: 1 inch. Ads over 1 inch will be billed to the nearest quarter inch. Frequency rate will apply only to repeat of same ad. No copy changes. Payment in advance is required except where satisfactory credit has been established. Send copy for display advertising to SCIENCE, Room 1740, 11 West 42 St., New York 36.

Single insertion \$65.00 per inch
4 times in 1 year 60.00 per inch

For PROOFS on display ads, copy must reach SCIENCE 4 weeks before date of issue (Friday of every week).

Replies to blind ads should be addressed as follows:

Box (give number)
SCIENCE
1515 Massachusetts Ave., NW
Washington, D.C. 20005

POSITIONS WANTED

Biochemist Ph.D.; 4 years' experience in teaching and research. Prefers research institute or medium size college. Box 11, SCIENCE. X

Biochemistry/Nutrition Ph.D.; good physiology, some pathology background. Sixty publications. Long teaching/research experience. Glycoproteins, capillary resistance, mucopolysaccharides, vitamins, mineral metabolism, tissue permeability. Associate professor level: university, institute. Box 15, SCIENCE. 1/15, 22

Chief Chemist, Ph.D. Seeks position in academic or hospital setting. Oriented toward the life sciences with experience in clinical chemistry, calcification, nutrition, vitamins, and sterols. Numerous publications, several awards. Demonstrated ability to maintain collateral staff on grants. Box 14, SCIENCE. 1/15

Clinical Chemist, Ph.D., with considerable experience in diagnostic analysis, research, and teaching. Seeks challenge in building up laboratory of clinical chemistry. Box 539, SCIENCE. X

General Physiologist. General education. Teaching and/or research. Southwest. H.H., Ph.D., 4548 Nineteenth NW, Oklahoma City. X

Information Scientist and Librarian. Literature searching, abstracting. Broad background in biological and medical sciences. Experience in medical library. Publications. Currently available. Box 541, SCIENCE. X

Laboratory Director, Ch.E., Ph.D. Seeks position where leadership, dynamic initiative, organizing ability, and creative versatile grasp of problems is an asset. Training in chemistry. Experience in clinical chemistry, calcification, nutrition, vitamins, and hormones. Successful consultant to pharmaceutical industry. Several scientific awards. Over 200 scientific publications and patents. Experienced lecturer to scientific and lay groups. Box 9, SCIENCE. X

Ph.D. Genetics. Completing summer 1965. Statistics minor, teaching and research experience. Desires teaching/research. Box 8, SCIENCE. X

Psychologist, Ph.D., completing postdoctoral; seeks teaching/research appointment. Publications in psychophysics and perception. Box 7, SCIENCE. X

POSITIONS OPEN

BACTERIOLOGIST

Recent B.S.; Bacteriology work in Research Laboratory at

The Lovelace Foundation
5200 Gibson, SE,
Albuquerque, New Mexico 87108
(Attn: Personnel)

BIOCHEMIST

with Ph.D. Active medical laboratory, 1011-bed hospital. Starting salary \$10,250. Excellent fringe benefits and laboratory facilities. Contact

Hospital Director
VA Hospital
Topeka, Kansas 66622

Interested in **Biochemistry and Behavior?** Need person with extensive experience in pharmacology and/or biochemistry for technical work. Long-term, interesting projects at prominent San Francisco area university.

Box 10, SCIENCE

BIOLOGIST

to teach general biology, genetics in liberal arts college. Central Appalachia. Start 1 February as instructor or assistant professor, \$6000 to \$7200 for 9 months. Opportunity for permanent position in rapidly developing department. Write **Chairman, Biology Department, Concord College, Athens, West Virginia.**

CLINICAL CHEMIST, Ph.D.

for 450-bed general hospital medical center to supervise clinical chemistry laboratory and participate in teaching of technologists and clinical pathology residents. Opportunities for research. Salary open. Write

Box 16, SCIENCE

PHARMACOLOGIST

SANDOZ'S EXPANSION PROGRAM

requires the addition of a Ph.D. to head a research unit in the general area of CNS pharmacology. It is preferable that candidate have knowledge or experience in neuroanatomy and neuro pharmacology and/or behavioral science.

THE SANDOZ RESEARCH CENTER

has modern and well-equipped facilities located in a most desirable suburban area only 35 miles from New York City.

For additional information concerning this position send your resume to MR. ROLAND WILLIAMS, Director of Personnel



SANDOZ PHARMACEUTICALS

ROUTE 10 HANOVER, N.J.

An Equal Opportunity Employer

VETERINARY PATHOLOGIST

HAZLETON LABORATORIES, a leading independent company specializing in the Life Sciences, needs a Veterinary Pathologist (D.V.M.—M.Sc. or Ph.D.) with 0 to 3 years' experience. Position involves examination and evaluation of histology slides from a variety of research animals. Opportunity for inexperienced individual to qualify for Boards. Some research coordination including experiment design and evaluation. Opportunity for scientific meetings attendance and publications. Liberal employee benefit program including profit sharing. Salary commensurate with experience and education. Please send résumé to

Hall A. Acuff
Assistant Personnel Manager
Hazleton Laboratories, Inc.
P.O. Box 30
Falls Church, Virginia
(Suburban Washington, D.C.)
An Equal Opportunity Employer

POSITIONS OPEN

(a) **Director of Biological Research;** Ph.D. preferred, experienced; Midwest. (b) **M.S. Biochemist;** clinical research; Central hospital; to \$8400. (c) **Food Technologist;** physical, organic chemistry background; East; to \$14,000. (d) **M.S./B.S. Analytical Chemist;** experienced; small, growing pharmaceutical firm; Midwest; \$10,000. (e) **Histology Technicians,** histopathology/histochemistry training; East; \$5200 up.

Faculty Appointment: (f) **Biology,** associate professor, genetics, physiology background; small eastern college. (g) **Chemistry,** associate professor, some physics background, East Coast. (h) **Ph.D. Microbiologist;** teaching; research; eastern university. (i) **Physiologist,** cellular, general; Southeast. (j) **Ph.D. Biologist;** botany training; eastern university. (k) **Biologist;** general, plant physiology; teaching stressed; research encouraged; southeastern college; to \$8800. Please write **Science Service, The Medical Bureau, Inc., 900 North Michigan Avenue, Chicago, Illinois 60611.** X

GRADUATE ASSISTANTSHIPS IN ANATOMY. One-half time assistantships on a 10- or 12-month basis at \$270.00 per month plus tuition, are available for study toward Ph.D. degree in the anatomical sciences. Minimum requirements: B average last two undergraduate years and GRE score 500. Research training available in embryology, teratology, electron microscopy, histochemistry, endocrinology, experimental neurology, anthropology, and cytology. Write to: **Chairman, Department of Anatomy, University of Florida, Gainesville, Fla.**

SENIOR VETERINARY ENTOMOLOGIST. Capable of directing a program for evaluation and commercial development of experimental insecticides for veterinary application. A M.S. or Ph.D. degree in entomology is required (chemical or biochemical minor). Experience in conducting animal systemic test procedures desirable. Position offers good future in expanding research program. An equal opportunity employer. All replies confidential. Send complete résumé to: **Dr. Gerald Brody, Stauffer Chemical Company, 1200 South 47th Street, Richmond, California.**

ZOOLOGISTS—Ph.D. Areas of interest include Endocrinology, Herpetology, Cellular Physiology, and Invertebrate Zoology. Expanding graduate program, new research and teaching facilities.

MICROBIOLOGIST—Ph.D. Teaching and research experience desired. Areas of interest include Physiology, Genetics, Electron Microscopy. Rank and salary for all positions according to qualifications.

Write to: **Dean, College of Arts and Sciences, University of Arkansas, Fayetteville.**

PHYSIOLOGIST- BIOCHEMIST

Unique opportunity for a Ph.D. with training in Biochemistry and Physiology and interests in drug research and development. To provide essential liaison between laboratory and clinical scientists, aid in evaluating scientific data and help plan R&D activities. Occasional travel and attendance at scientific meetings is an integral part of this position. Prior industrial experience is not required.

MICROBIOLOGIST-Ph.D.

An opening has recently developed in our Infectious Disease Department for which we are seeking a Bacteriologist with biochemical training. Duties will involve the investigation of various infectious disease processes in animals and their biochemical manifestations. Following the establishment of sound basic information, the program will be expanded to include the study of the effects of new pharmacological agents on these processes.

Please send curriculum vitae as well as salary requirements to: **Cyrus M. Greenberg, Ph.D., Director of Scientific Employment, SMITH KLINE & FRENCH LABORATORIES, 1566 Spring Garden Street, Philadelphia, Pa. 19101.** An Equal Opportunity Employer.



POSITIONS OPEN

BIOCHEMIST

Ph.D. with 1 to 5 years' experience in tracer analysis. Interdisciplinary work in expanding research department. Direct résumé, in confidence, to: **Dr. William White, Nuclear-Chicago Corporation, 333 East Howard Avenue, Des Plaines, Illinois 60018. An Equal Opportunity Employer.**

Clinical Laboratory Supervisor with special interest in biochemistry. Excellent salary for person combining technical knowledge and managerial ability. B.S. or M.S. degree.

Physicians Clinical Laboratory
425 East Washington Street
Ann Arbor, Michigan

Ph.D. Biochemist for fundamental research in lipid metabolism involving also enzymology and isotope work sponsored by A.E.C. and N.I.H. Salary about \$13,000. Apply to **Dr. H. P. Schwarz, Philadelphia General Hospital, 34th and Curie Avenue, Philadelphia.**

FISHERIES RESEARCH ASSISTANT

Minimum B.Sc., preferably with training in biochemistry, especially electrophoretic techniques. Salary commensurate with qualifications. Position available 15 January. Submit written application with transcript to:

Dr. D. R. Idler, Director
Fisheries Research Board of Canada
Technological Research Laboratory
P.O. Box 429
Halifax, Nova Scotia
Canada

ZOOLOGIST

Applications are invited to fill faculty position in the Department of Biology, University of San Diego, College for Men, San Diego, Calif. Salary and rank commensurate with background and experience. Address to **Chairman, Department of Biology, University of San Diego, College for Men, San Diego, Calif. 92110.**

STUDY INSTITUTE

NATO ADVANCED STUDY INSTITUTE "PLANETARY AND STELLAR MAGNETISM"

Departments of Physics and Mathematics,
University of Newcastle Upon Tyne,
Newcastle Upon Tyne, 1, England

It is announced that between 26th April and 1st May, 1965, a NATO Advanced Study Institute will be conducted jointly by the Departments of Physics and Mathematics in the Physics Building of the University of Newcastle Upon Tyne, England.

The Institute will consist of a series of lectures by distinguished authorities on geomagnetism, planetary magnetism and stellar magnetism. The programme will be arranged to provide accounts of the basis of observation in each field, the analysis of data, and the theoretical interpretation.

A limited number of travel grants will be available to intending participants, and applications for these should be made before 1st February, 1965.

Further details and registration forms are obtainable on application from:

The Administrative Assistant,
Physics Department,
The University,
Newcastle Upon Tyne, 1,
England

The Market Place

BOOKS • SERVICES • SUPPLIES • EQUIPMENT

DISPLAY: Insertions must be at least 1 inch in depth. Weekly invoices will be sent on a charge account basis—provided that satisfactory credit is established.

Single insertion	\$65 per inch
4 times in 1 year	60 per inch
13 times in 1 year	50 per inch
26 times in 1 year	50 per inch

PROOFS: If copy is to be set, and proofs submitted for approval, complete copy and cuts must be received 4 weeks in advance of issue date (Friday of each week); complete plates no later than 3 weeks in advance of issue date.

BOOKS AND MAGAZINES

AAAS Symposium Volume Fundamentals of Keratinization

Edited by Earl O. Butcher and Reidar F. Sognnaes. 202 pages. 136 illustrations. References. Index. Published May, 1962.

Co-sponsored by the AAAS Section on Medical Sciences, the American College of Dentists, American Dental Association, and the International Association for Dental Research, North American Division.

The fields of anatomy, dentistry, dermatology, medicine, pathology, and zoology are all represented in this volume. It presents information on those processes of growth and differentiation through which epithelial cells are transformed into important keratinized structures—information developed through the use of newer techniques in histology, histochemistry, electron microscopy, tissue culture, chemistry, and physics. The effect of environmental and physical factors, ultraviolet radiation, and vitamin A are stressed, and particular attention is given to the keratinization of the mucosa and cysts in the oral cavity. Ultrastructure and chemistry of dental enamel provides intriguing new information.

Price: \$6.50 (\$5.75 prepaid
for AAAS members).

Order today from

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

1515 Massachusetts Ave., NW
Washington, D.C. 20005

SUPPLIES AND EQUIPMENT

1919 - 1965

LaMotte Chemical

Chestertown, Maryland, U.S.A.
Specialists in

Colorimetric Techniques

Reagents-Standards-Comparators

Send for illustrated Controls Handbook
Dept. H

SPRAGUE-DAWLEY, INC.

Pioneers in the development of the
STANDARD LABORATORY RAT.

P.O. Box 4220

Madison, Wisconsin

CE 3-5318

SYMPOSIUM ON BASIC RESEARCH

Editor: Dael Wolfe 1959

AAAS Symposium Volume No. 56

328 pages, cloth \$3.00

AAAS members' cash order, price \$2.50

Sponsored by the National Academy of Sciences, the American Association for the Advancement of Science, and the Alfred P. Sloan Foundation.

CONTENTS

J. Robert Oppenheimer, The Need for New Knowledge

Alan T. Waterman, Basic Research in the United States

W. O. Baker, The Paradox of Choice

Laurence M. Gould, Basic Research and the Liberal Arts College

C. A. Elvehjem, Basic Research and the State University

Lee A. DuBridge, Basic Research and the Private University

James R. Killian, Jr., Capsule Conclusions

Crawford H. Greenewalt, Basic Research: A Technological Savings Account

Dwight D. Eisenhower, Science: Handmaiden of Freedom

Allen V. Astin, Basic Research in Government Laboratories

James B. Fisk, Basic Research in Industrial Laboratories

Merle A. Tuve, Basic Research in Private Research Institutes

Paul E. Klopsteg, Support of Basic Research from Government

Robert E. Wilson, Support of Basic Research by Industry

Robert S. Morison, Support of Basic Research from Private Philanthropy

Dael Wolfe, The Support of Basic Research: Summary of the Symposium

British Agents: Bailey Bros. & Swinfen, Ltd.

Warner House,

48 Upper Thames Street,

London, E.C.4

American Association for the Advancement of Science

1515 Massachusetts Avenue, NW
Washington, D.C. 20005

The shock waves of sudden stops and eddy currents around slow vehicles are elements of traffic flow studied by IBM



There's a variety of mathematical problems at IBM. For example, mathematical models, using concepts from various subjects such as fluid mechanics, are being applied to the study of vehicular traffic flow. The variational calculus is used to study high-frequency vibrations in crystals. Non-linear free boundary problems have been solved for dipping electrical connections into a hot solder bath.

Applied Mathematics at IBM is an intriguing area in which mathematical theory and new applications often develop out of the same problem. The problems may range from structural mechanics to solid state physics and electrocardiogram research.

There are many opportunities for interdisciplinary study in science and engineering, management and operations research, or computing and programming. For a broader scope of problems to solve, write to Manager of Employment, Dept. 716A, IBM Corporate Headquarters, Armonk, New York 10504.

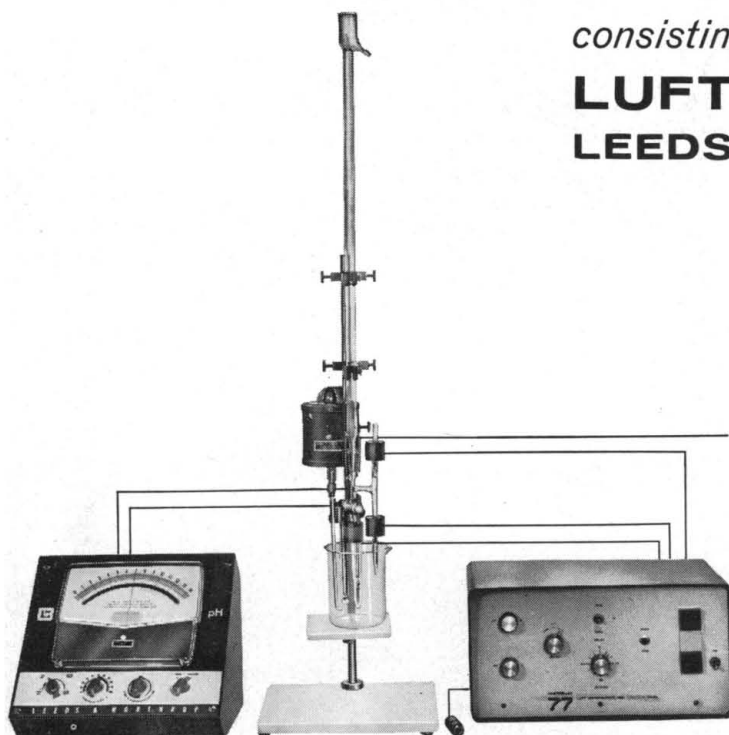
An Equal Opportunity Employer **IBM®**

Thomas announces a new . . .

AUTOMATIC TITRATION ASSEMBLY

consisting of . . .

LUFT CONTROLLER and LEEDS & NORTHRUP pH METER



*For rapid, precise pH titrations,
or oxidation-reduction titrations**

*New type Automatic Buret with push-
button operated solenoid refill valve*

**Titrant is delivered at maximum rate
until a preset pH value, close to end-
point, is reached.**

**Subsequent delivery is automatically
switched to a slower preset rate to
prevent overshooting.**

This assembly increases both speed and precision of serial titrations made to a preselected pH or oxidation-reduction endpoint. Useful also for rapid adjustment to critical pH value of samples or reaction mixtures.

Compensation can be made for mixing lag or for kinetics of non-aqueous reactions by means of a time delay circuit. With the latter control feature in play, completion of titration will not be signaled, and titrant will continue to be added until endpoint persists for a selected time interval. Both titration stages and final endpoint are signaled by colored indicator lamps. Pushbutton switch operates solenoid valve in buret refill line, putting titrator in readiness for next sample.

Operation. Mode switch is set to control rising or falling input value, depending upon the characteristics of the titration. The pH meter is adjusted to indicate desired endpoint. Control knob A is turned until indicating lamp switches from

red to amber, to set endpoint. Anticipation point, at which buret delivery is to be changed from fast to slow, is set by adjusting pH meter to desired value and turning control knob B until lamp changes from amber to green. Termination time delay switch has positions for zero, infinite, or adjustable delay. Timer control sets delay from 0 to 57 seconds, to accommodate reaction lag, etc. Pushbutton switch begins the titration and can be used to interrupt operation at any point. During titration, green lamp indicates fast titrant delivery, amber lamp indicates slow delivery phase. Amber and red lamps together indicate apparent endpoint with time delay in effect. Red lamp signals end of operation. Buret is then read and refilled for next titration.

9679-M. Titration Assembly, Automatic, consisting of Luft Controller, L.&N. Model 7401 pH Meter with glass and calomel electrodes, Automatic Buret, porcelain base titration stand with swinging shelf, Variable Speed Stirrer, clamps, holders, connecting cables and line cords, but without beaker or tubing for buret filling. For 115 volts, 60 cycles, a.c.; 600 watts **1,215.00**

*Requires substitution of metal electrodes for the glass and calomel pair furnished with titrator.

Detailed information sent upon request.



ARTHUR H. THOMAS COMPANY

Scientific Apparatus and Reagents

VINE STREET AT 3RD • P. O. BOX 779 • PHILADELPHIA 5, PA., U. S. A.