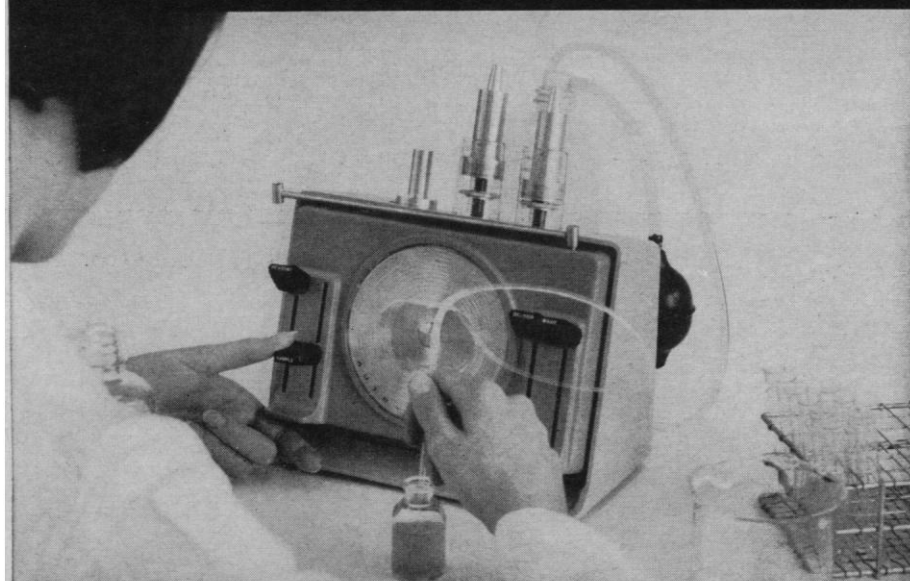


**NOW... pipette, dilute, dispense**  
— in less than 15 seconds!



**WCLID Auto-Spenser™**

This new precision instrument, designed for repetitive pipetting, will quickly pay for itself—thanks to all the time it saves. It's reliable, foolproof, safe . . . far simpler to use than manual methods.

With the *Auto-Spenser*, you can pipette, add a reagent or diluent, and dispense—in 15 seconds or less! All you have to do is press levers. For reagent pickup, depress the first lever. For sample pickup, depress the second lever. For reagent/sample delivery, depress the third lever. And to rinse the system, depress the fourth lever. (This self-wash feature lets you change reagents in seconds.)

Other important features include easy-to-read micrometer-controlled pumps, a damage-proof liquid-handling system, plus automatic reagent buffer. The instrument is compact, rugged . . . requires no electrical power. *Please ask us for details.*

Sample Volume Range \_\_\_\_\_ 0 to 250  $\mu$ l  
Reagent Volume Range \_\_\_\_\_ 0 to 5.0 ml  
Sampling Reproducibility \_\_\_\_\_  $\pm 0.5$   $\mu$ l  
Reagent Delivery Reproducibility \_\_\_\_\_  $\pm 0.005$  ml

P-6796X Auto-Spenser, 9"x9"x6" deep .....\$195.00

<p><b>SCIENTIFIC GLASS APPARATUS CO. INC.</b> BLOOMFIELD, NEW JERSEY</p>	<p><b>LABORATORY...</b></p> <p>♦ APPARATUS</p> <p>♦ INSTRUMENTS</p> <p>♦ CHEMICALS</p> <p>♦ GLASSWARE</p>	

Branches: Boston 16 Mass. Danbury Conn. Elk Grove Village Ill. Fullerton Calif. Philadelphia 2 Penna. Silver Spring Md. Syracuse 2 N.Y.

## INDEX TO ADVERTISERS

24 June 1966

Bausch & Lomb	1773
Beckman Instruments Inc.	1656, 1670, 1687
Blickman, S., Inc.	1779
BRS Electronics	1797
Buchler Instruments, Inc.	1678
Cary Instruments, Applied Physics Corp.	1679
Chemical Rubber Co.	1793
Coleman Instruments Corp.	1780
Consolidated Electrodynamics	1786
Control Data Corp.	1774
Corning Glass Works	1662, 1663
Daedalus	1796
Difco Laboratories	1799
Digital Equipment Corp.	1672
E & M Instrument Co., Inc.	1790
Electro-Mechanical Development Co.	1788
Electronic Associates, Inc.	1780
Easterline Angus Instrument Co., Inc.	1657
Fischer & Porter Co.	1781, 1784
Fisher Scientific Co.	1684
Friden, Inc.	1787
Gilford Instrument Laboratories Inc.	1688
Glison Medical Electronics	1698
Hamilton Co.	1789
Harford Metal Products, Inc.	1792
Harvard Apparatus Co., Inc.	1792
Hewlett-Packard Co., Sanborn Div.	1666
Honeywell Apparatus, Controls Div.	1785
Institute for Scientific Information	1668
Instrumentation Associates, Inc.	1775
Instrumentation Specialties Co., Inc.	1771
International Equipment Co.	1690, 1797
Isotopes, Inc.	1660
Kahlenberg-Globe Equipment Co.	1794
Klett Manufacturing Co., Inc.	1771
Lab Cages, Inc.	1661
Laboratory Construction Co.	1771
Leeds & Northrup	1684
LKB Instruments, Inc.	1665
London Co.	1682
Lourdes	1686
Mallinckrodt Chemical Works	1680, 1681
Matheson	1689
McDonnell	1801
Mettler Instrument Corp.	1790
Midwestern Instruments	1692
Millipore Filter Corp.	1794
Nalge Co., Inc.	1772
Nega File Co.	1792
New Brunswick Scientific Co., Inc.	1667
Nuclear-Chicago Corp.	1793
Orion Research Corp.	1791
Pace Engineering Co.	1795
Packard Instrument Co., Inc.	1700
Pallard Inc.	1799
Perkin-Elmer	1691
Pharmacia Fine Chemicals Inc.	1789
Philbrick Researches	1695
Phipps & Bird, Inc.	1785
Phoenix Precision Instrument Co.	1795
Photovolt Corp.	1794
Precision Scientific Co.	1778
Professional Tape Co., Inc.	1788
Radiochemical Centre	1786
RCA Scientific Instruments	1697
Revco Inc.	1790
Schleicher, Carl, & Schuell Co.	1772
Scientific Glass Apparatus Co., Inc.	1798
Shimadzu Selsakusho Ltd.	1795
Siemens America Inc.	1777
Sigma Chemical Co.	1775
Technicon Chromatography Corp.	1671
Thermolyne Corp.	1789
Thomas, Arthur H., Co.	1802
Thomas, Charles C., Publisher	1676
Torsion Balance Co.	1664
Tracerlab	1675
Unitron Instrument Co.	1677
Victoreen Instrument Co.	1669
Whittaker Corp.	1784
Wilkins-Anderson Co.	1776
Williams & Wilkins Co.	1776
Wilmot Castle Co.	1683
Worthington Biochemical Corp.	1799

## BACTO-LATEX

0.81 MICRON

¶ Bacto-Latex 0.81 micron is characterized by uniform particle size, batch reproducibility and biological inertness.

¶ An inert carrier for use in clinical and investigational tests including

### RHEUMATOID ARTHRITIS

### INFLAMMATORY DISEASES

### TRICHINOSIS

### LEPTOSPIROSIS

¶ Recommended for Rheumatoid Arthritis Tests of Singer and Plotz and modifications.

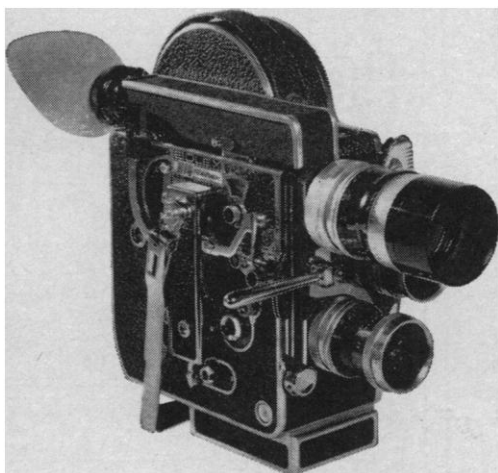
*Literature available on request*

**DIFCO LABORATORIES**  
**DETROIT 1 MICHIGAN USA**  
**LABORATORY PRODUCTS**

BIOLOGICS

CULTURE MEDIA

REAGENTS



**When we introduced  
this camera, it was  
nearly perfect. Now read  
what we've done in  
the 30 years since.**

The first Bolex H-16 16mm camera appeared in 1936. It was the most advanced camera of its day. It had such professional features as automatic threading, film rewind, variable speeds, single-frame exposure and a three-lens turret. Although it was extremely popular, we decided the Bolex had an even greater potential. So in the early forties, we added a super-accurate frame counter. Later we included the Registrator Claw to make Bolex films the steadiest in the world. And full reflex focusing and viewing. A variable shutter so you could fade, dissolve, and have greater control over exposure. And a filter slot so you could use one filter to accommodate every lens on your turret.

Today's Rex-4 has an improved reflex viewfinder, giving a full 10X magnified image. And a single-frame shaft for synchronization with audio equipment. The Rex-4 accepts a number of electric motors for shooting long sequences. And a complete range of lenses from 10mm wide angle through extreme telephoto, including macro and zoom lenses. Add the Vario-Switar 86EE zoom and the Rex-4 becomes the world's only professional camera with fully automatic exposure control—with today's Rex-4 system, you can do virtually anything!

Most of those original 1936 Bolex cameras are still in use. That's how rugged our cameras are. Try our "improved" model—it may have taken us 30 years to do it, but we think we've got the perfect camera at last. A copy of the Rex catalog will tell you all. Write Paillard Incorporated, 1900 Lower Road, Linden, New Jersey 07036.

**BOLEX**



## FOR RESEARCH FROM WORTHINGTON - - NEW HIGHLY PURIFIED PREPARATIONS

**CARBOXYPEPTIDASE B**  
chromatographically prepared (Folk, et al.: J. Biol. Chem., 235, 2272, 1960), essentially free of carboxypeptidase A, trypsin and chymotrypsin activities.

**CHYMOTRYPSIN**  
freed from autolysis products and low molecular weight contaminants by dextran gel filtration. (Yapel, Han, Rosenberg and Lumry: J. Am. Chem. Soc., In press).

**ALKALINE PHOSPHATASE**  
Free of Ribonuclease, prepared by free flow electrophoresis.



For more information  
write for  
Bulletin 66-4A.

**Worthington Biochemical Corporation**  
FREEHOLD, NEW JERSEY 07728

# Personnel Placement

## POSITIONS WANTED

**Business Administrator**, university, hospital, medical institute background. Creative and effective. Box 137, SCIENCE.

(a) **Pharmacology Ph.D.**, 1965; M.S. Biochemistry major, Physiology minor; psychotropic research interest; seeks academic appointment. (b) **Bacteriology Ph.D.**, infectious disease, virology, tissue culture experience; desires teaching or research opportunity; write **WOODWARD MEDICAL PERSONNEL BUREAU**, 185 NORTH WABASH, CHICAGO 60601.

## POSITIONS OPEN

# MICROBIOLOGIST

We have attractive opening for  
**MICROBIOLOGIST BS/MS**  
with tissue culture training and experience.

Excellent salary and benefits. Please send résumé to S. R. Sawczuk, Employment Supervisor.



**MERCK & CO., INC.**

Rahway, New Jersey

An Equal Opportunity Employer

## BACTERIOLOGIST

We are currently seeking a PhD who can accept the challenge of combining technical knowledge with managerial ability. Individual selected will assume highly responsible position in quality control. This position requires a PhD in a biological science and 3-5 years' of tissue culture experience obtained in a commercial laboratory or research institute. Course work or experience in virology also helpful. In addition to excellent growth opportunity, we offer an attractive salary and an exceptionally liberal benefits program including stock purchase and educational assistance. To explore the areas of your interest in confidence, please send résumé to:

**MR. GORDON L. GERHARD**  
Employment Supervisor

**MERCK SHARP & DOHME**

Division of Merck & Co., Inc.

West Point, Pa. (A Suburb of Philadelphia)

An Equal Opportunity Employer

## FELLOWSHIPS

Postdoctoral Fellowship in protein structure studies available Sept. 1, 1966. Excellent facilities. Write to: Dr. B. Jirgensons, Univ. of Texas M. D. Anderson Hospital and Tumor Institute Houston, Texas 77025

## POSITIONS OPEN

**Clinical Chemist**, to direct chemistry department in 308 bed community hospital. Laboratory has 3 pathologists, good technical staff, and approved school. Income commensurate with education and experience. Apply to: J. U. Gunter, M.D., Watts Hospital, Durham, N. C.

## Predoctoral Assistantships and Traineeships in Physiology

Excellent opportunities for graduate students leading to the Ph.D. Ample stipends and free tuition. Training and research in endocrinology, gastrointestinal, water and electrolyte metabolism, cardiovascular, sensory physiology, biophysics and bioengineering. Write for details to:

**Head, Department of Physiology**  
University of Illinois at the Medical Center  
P. O. Box 6998  
Chicago, Illinois 60680

## WANTED

Associate Dean for Eastern College of Pharmacy—Administrative Talent Necessary—PhD Pharmacy Preferred But Not Essential—Starting Salary \$15,000 Plus Unusual Fringe Benefits. Box 138, SCIENCE.

## EXPANDING RESEARCH RESPIRATORY AREA



### PhD PHARMACOLOGIST—

Basic and applied research in field of respiration, including design and development in the methodology required. Background in physiology-pharmacology with 0-1 year experience.

### BS PHARMACOLOGIST —

Be a learning and working part of this basic research team, a stimulating opportunity for professional growth in research. Background in pharmacy or biology with 1-2 years' experience.

National offers a fine salary and benefits program with desirable working conditions. Please Direct Your Résumé In Confidence To:

Director of Personnel,

**National Drug Co.**

Div. of Richardson-Merrell Inc.

4663 Stenton Ave.,

Philadelphia, Pa. 19144.

An Equal Opportunity Employer.

## POSITIONS OPEN

## BIOCHEMICAL TOXICOLOGIST

Challenging opportunity for Scientist to manage the Biochemical Toxicology Laboratory in the Dept. of Biological Sciences. Responsibilities include the direction on on-going programs, development of new research projects, planning of new and expanded Laboratories. Opportunity to do basic and applied work on grant or contract basis with support from other scientists in a broad range of disciplines. Areas of interest include agricultural chemicals, food additives, drugs, and environmental toxicology. PhD req'd in Biochemistry, Toxicology, Pharmacology or Veterinarian Science.

Experience in Industrial Research desirable. Applicants are invited to send résumés to: H. D. Snider . . .

## STANFORD RESEARCH INSTITUTE

333 Ravenswood

Menlo Park, Calif.

—an equal opportunity employer—

## MYCOLOGIST

National Research Council, Canada  
Prairie Regional Laboratory  
Saskatoon, Sask.

The Physiology and Biochemistry of Fungi Section requires a MYCOLOGIST—Ph.D., preferably with some biochemical training for full time research in a well-equipped laboratory—to select, plan, organize and carry out individual studies and take part in team projects, generally in the fields of physiology, biochemistry and/or enzymology of fungi. Candidates with competence in other fields of mycology may also be considered. Several years research preferred. Starting salary \$9,450 - 11,400 depending on qualifications and experience. Hospitalization and Medicare schemes, good superannuation plan, etc.

Applicants may obtain application forms from the Employment Office, National Research Council, Ottawa 7, Ontario or the Canadian Scientific Liaison Officer, Africa House, Kingsway, London W.C.2, England. If further information is required write to:

Dr. R. H. Haskins,  
National Research Council,  
Prairie Regional Laboratory,  
Saskatoon, Saskatchewan,  
Canada.

# The Market Place

## SUPPLIES AND EQUIPMENT

### SPRAGUE-DAWLEY, INC.

Pioneers in the development of the  
**STANDARD LABORATORY RAT.**

P.O. Box 4220

Madison, Wisconsin

CE 3-5318

## PROFESSIONAL SERVICES

### CONTRACT STERILIZATION AVAILABLE.

Wilmot Castle Company offers a wide variety of methods and equipment for sterilizing and certified sterility testing on production line basis. Many years experience with a wide range of products. Our R & D facilities are staffed with skilled researchers specializing in sterilization and ready to undertake solution of your sterilization problems. Call, write or wire, Research Lab, Wilmot Castle Company, Rochester, New York.

## HISTOLOGY SERVICE

**RAPID SERVICE Large Orders Quickly Processed! Quickly Shipped!** Professional supervision of every order. Free estimates on special problems. Distant points serviced swiftly. Special stains and techniques available. Fully protected shipments. **HISTOLOGY SERVICE, INC.** 4801 N. Broad St., Philadelphia, Pa. Zipcode 19141, (215) Davenport 4-5800

# The Future Is At MCDONNELL

## MCDONNELL AIRCRAFT CORPORATION ST. LOUIS, MISSOURI 63166

PERSONAL: Ms. Donnell  
Name St. Louis, Missouri  
Address 27 years  
Age Billion Dollar Aerospace Backlog  
Health Complete, Modern Aerospace  
Physical Appearance Engineering, Research Laboratories and  
Production Facilities  
Size Over 35,000

MILITARY SERVICE: Contracts with U.S. Navy, U.S. Air Force,  
U.S. Army and the NASA.

ACHIEVEMENTS:  
FH-1 Phantom First Navy jet to take off and  
land on a carrier.  
F2H Banshee Saw extensive combat in Korea.  
F-101 Voodoo Set 10 world records.  
F3H Demon Served with the Navy in the Lebanon Crisis.  
Aeroballistic Lifting body research craft.  
Quail GAM-72 U.S. A.F. Betsy Missile.  
Mercury America's First Manned Orbital Spacecraft.  
ASSET Lifting Reentry Research Spacecraft.  
Talos Airframes and Engines.

CURRENT ASSIGNMENTS:  
Phantom II Fighter, Attack, and Reconnaissance aircraft  
for U.S. Navy, Marines and Air Force.  
British Royal Navy and Royal Air Force.  
Gemini Two-man Spacecraft for Extended  
Missions and Orbital Rendezvous.  
F-111 Crew Module.  
TORS Systems utilizing Precise Time Reference.  
Automation Data Services for Business, Govern-  
ment and Industry.  
Model 204 Data Retrieval and Access Systems.  
BGRV Boost Glide Reentry Vehicle.  
MAW Medium Anti-tank Weapon for the Army.  
MOL Gemini B for the Air Force MOL.

IN DESIGN FOR THE FUTURE: Jet Fighters, Manned and Unmanned  
Spacecraft, Data Retrieval Systems, Collision  
Avoidance Systems, Advanced Missile Systems,  
both Tactical and Long Range, and a host of  
related basic system application studies.

Where Exploring Engineers  
Are Converging on  
Space Beyond the Moon  
and Fighter Aircraft  
to Win the Seventies

LET'S  
SWAP  
RESUMES

These vital programs in the national interest, now underway at McDonnell, have created exceptional opportunities for engineers, scientists, physicists, mathematicians, and other specialists in aerospace design, human factors, electronics, and data handling. For more information, complete the resume form below. For a comprehensive, immediate review of your qualifications, include your complete resume.

Mail This Form To: W. R. Wardle, McDonnell Employment, Dept. ZZ-624 Box 516, St. Louis, Mo. 63166

Name \_\_\_\_\_ Phone \_\_\_\_\_ Age \_\_\_\_\_

Home Address \_\_\_\_\_ City & State \_\_\_\_\_ Zip \_\_\_\_\_

Education: BS \_\_\_\_\_ MS \_\_\_\_\_ PhD \_\_\_\_\_ Major Field: \_\_\_\_\_  
Date Date Date

Primary Experience Area: \_\_\_\_\_

Present Position: \_\_\_\_\_

\_\_\_\_\_ Number of Years \_\_\_\_\_ I would like to receive application form ☐

### Openings now exist in the following areas:

Aerodynamics, Automation, Control and Structural Dynamics, Design,  
Electronics, Engineering Planning, Ground Support Equipment, Liaison, Materials,  
Mathematics, Metallurgy, Operations Analysis, Propulsion, Reliability, Research,  
Space Medicine, Structures, Systems Management, Thermodynamics.

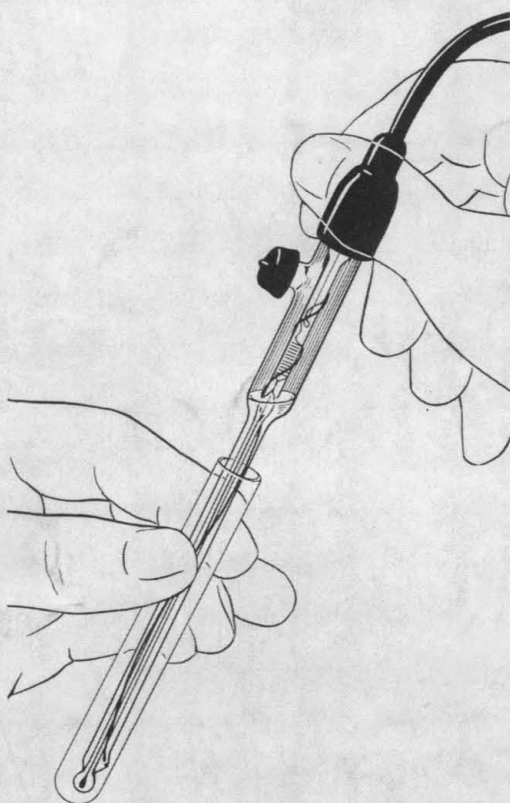
An Equal Opportunity Employer

**MCDONNELL**

*Thomas* **fast response, low resistance . . .**

## COMBINATION pH ELECTRODES

- For samples from 0.2 ml to a tankful
- Stem 1/4-inch diameter
- Ideal for titrations\*—fast response—compact size



Consisting of a glass electrode and a silver-silver chloride reference electrode sealed into a single body. Bulb wall thickness and strength provide a sturdier electrode than heretofore available. Electrodes are 6 inches long. Upper section is 1/2-inch diameter for use in standard electrode holders. Stem is 1/4-inch diameter over the lower 4-inch length.

The single 1/4-inch stem can be used with samples of small volume as well as with larger quantities, and is more convenient for transfer by hand from sample to sample than bringing the sample to electrodes in a fixed position.

The stable, fast response of this low resistance glass electrode and the short fixed distance between it and the reference electrode junction make it particularly valuable in avoiding endpoint overshooting in electrometric titrations.\* Permits use of small vessels and leaves more room for stirrers and buret tips. Can be used with samples as small as 0.2 ml in narrow tubes.

Connector plug of the glass electrode fits into the jacks of most existing pH Meters, either directly or through available adapters.

**4858-L15. Combination Electrode, Thomas, as above, range pH 0 to 11, 0 to 70°C, with 30-inch shielded lead . . . 29.50**  
**4858-L60. Ditto, pH 0 to 14 . . . 38.00**

\*See H. V. Malmstadt and E. H. Piepmeier, *Analytical Chemistry*, Vol. 37, No. 1 (January, 1965), p. 34

**Detailed descriptive bulletin, consisting of pp 464-468  
of our 1965 catalog, 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.