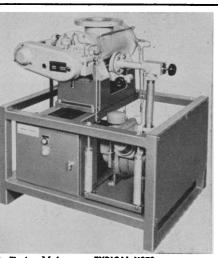
WELCH

New, Compact **ULTRA-HIGH** VACUUM Pumping System with Constant Speed Over Wide Pressure Range.



This new Welch 3101A Turbo Molecular Pumping System has a BLANK OFF PRESSURE LOWER THAN 1 × 10-9 Torr and a CONSTANT SPEED (AIR) of 140 LITERS PER MINUTE OVER A RANGE OF 10-2 to 10-9 TORR. It combines a Welch No. 3101 Turbo-Molecular Pump (manufactured under exclusive license from Arthur Pfeiffer GmbH, Wetzlar, Germany) with the well-known Welch "Duo-Seal" No. 1307, two-stage mechanical pump in a completely assembled and tested pack-age, ready for use. The clean, vapor-free No. 3101 Turbo-Molecular Pump embodies a major ad-vance in the design of molecular pumps, permitting the use of running clearance as the times that of previous the WELCH SCIENTIF

TYPICAL USES:

TYPICAL USES: Evacuation of power tubes and X-ray tubes Solid State Research Semi-conductor production Thin film metallizing Purification of metals such as silicon and germanium Optics Coating Separation of materials or isotopes with different molecular weights, as in particle accelerator work Space simulation chambers Mass spectrometers Roughing ion pump systems. Roughing ion pump systems.

SEND FOR BULLETIN 3101A!

### THE WELCH SCIENTIFIC COMPANY ESTABLISHED 1880 Home Office: 1515 Sedgwick Street, Dept. E. New York Office: 331 East 38th Street Chicago, III. 60610 New York, N.Y. 10016 Manufacturers of Scientific Instruments and Laboratory Apparatus

Personnel Placement

Replies to blind ads should be addressed as follows: Box (give number) SCIENCE

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

## POSITIONS WANTED

Bacteriology, Bachelor of Science degree; experience in medical bacteriology and pharma-ceutical research; relocation desired. Box 353, SCIENCE. 4/3, 10

Chemistry Study, PSSC Physics Teacher, 30 years' experience, wants suburban high school, 1964-65. J. A. House, Box 2424, Williams-burg, Virginia.

Clinical Chemist, Ph.D.; 7 years' experience, university hospital. Desires larger laboratory with automation and special chemistry needs. Current salary, middle teens. Box 350, SCIENCE Current salary, middle teens. Box 350, SCIENCE. (a) Ph.D. Organic Chemist, 1964 graduate; pre-fers teaching with research in institution with graduate program. (b) Ph.D. Zoologist (em-bryologist), biochemistry minor; teaching, re-search experience; wishes teaching/research. (c) Ph.D. Marine Microbiologist (1964 graduate); some teaching, research experience; prefers teaching with research. (Please write for in-formation regarding these and other scientists, senior and junior, in all fields.) Science Division, The Medical Bureau, Inc., Burneice Larson, Chairman, 900 North Michigan Avenue, Chicago 11, Illinois.

Science and Public Affairs Writer seeks position industry, trade association, or specialized publi-cation. Information-editorial services relating to science, technology, government, liaison in Wash-ington. Strong experience science news, PR, publications. Box 344, SCIENCE. X

3 APRIL 1964

**Klett Summerson Photoelectric Colorimeter** 



No. 800-3

Test Tube Model

**KLETT COLONY MARKER and TALLY** 

This instrument takes the drudgery and error out of the counting of bacterial colonies.



Klett MANUFACTURING CO., INC., 179 East 87th Street, New York, 28, N.Y.

POSITIONS WANTED Endocrinologist, M.D.: extensive background in laboratory research with many publications; ex-perienced clinician and teacher. Desires opportu-nity with emphasis on research in medical school or research institute Box 372, SCIENCE. 4/3

Geologist; 6 years in gas liquid systems, radio-carbon dating. Research experience and publi-cations. Desires research position in dating laboratory at college-university, preferably in southern or southwestern U.S. Box 347, SCI-ENCE. X

M.S. Microbiology desires teaching or research position, Box 362, SCIENCE. 4/3

Pharmacologist, Ph.D. Biochemistry and physiol-ogy background, several years' experience in re-search and screening for CNS drugs, publications. Interests in industrial or academic position. De-sires interview at Chicago Federation Meeting. Box 373, SCIENCE. X

Plant Physiology-Biochemistry, Ph.D. 1957. Experienced, publications. Seek academic or gov-ernmental research or research/teaching appoint ment. Box 374, SCIENCE. X



PLaza 2-0600

COMMITTEE ON MANPOWER **OPPORTUNITIES IN ISRAEL** 

515 Park Ave., N.Y. 22, N.Y.

**MEDICAL COMMUNI-**CATIONS

Warner-Chilcott Laboratories, a leading growth firm in the ethical phar-maceutical field has an opportunity in medical writing for a writer with some well related experience, to prepare comprehensive product booklets, investigational use brochures, prod-uct labeling and to assist in the editing of clinical reports.

Suburban location between New York and Philadelphia. Complete benefit program, relocation expenses paid.

Send resume to Employment Depart-



201 Tabor Road, Morris Plains, N.J.

An Equal Opportunity Employer

POSITIONS OPEN

Education Director for Natural History Museum Long-established Philadelphia museum seeks Di-rector to take full charge of varied education program, now including 100,000 elementary stu-dents per year in classes, popular and scientific lecture series, live animal shows, summer work-shops, field trips. Must have M.A. in education or equivalent, including training in biology; 5 years of classroom or related teaching, prefer-ably in nature study or science; competence to command respect of experienced teachers and maintain highest professional standards. Will plan and direct department program, promote school use of museum, supervise four teachers, work closely with related school authorities and interested foundations. Salary to \$10,000 depend-ing on qualifications. Non-contributory retire-ment benefits. Start 1 September 1964 or before. Box 375, SCIENCE.

WANTED-Electronics Engineer with B.S. or advanced degree to develop and oversee maintenance of instrumentation in research laboratories of Dept. of Anesthesia at University of Pennsylvania. Liberal benefits. Write stating age, education, experience and salary requirement to Personnel Office, 3025 Walnut Street, Philadelphia, Penna. 19104. An equal opportunity employer.

Full-time Researchers in the fields of internal medicine, biochemistry and physiology desired for research-teaching proin continuing education, Salary gram \$25,000 to \$30,000 per annum.

Box 367, SCIENCE

Histochemist, Experimental Morphologist. Ph.D. or equivalent. Active research program in enzyme and electron histochemistry. Hospital-affiliated research institute. New York. Box 376, SCIENCE, 4/10, 17, 24; 5/1, 8

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 biophysics, cellular physiology, endocrinology, muscle, water metabolism, cardiovascular, gastrointestinal and environmental physiology. Write for details to Head, Department of Physiology, University of Illinois at the Medical Center, Chicago, Illinois.

SENIOR EPIDEMIOLOGIST. Faculty position in a department with strong on-going programs in graduate level training and in research. Prin-cipal duties include development and teaching certain graduate level courses in epidemiology and the direction of graduate students in an Epidemiology-Biometry training program. Appli-cants with backgrounds in medicine, veterinary medicine, or microbiology will be considered. Interview at ASM meeting or write John R. Collier, D.V.M., Ph.D., Head, Department of Pathology and Microbiology, Colo. State Univer-sity, Ft. Collins, Colorado.

### POSITIONS OPEN

CLIMATOLOGIST. Assistant Professor responsi-ble general supervision instrumental programmes arctic, subarctic, tropical stations, undergraduate instruction intermediate level. Excellent coopera-tion with Meteorology Department. Qualifica-tions in pedology and microclimatology an asset. Salary \$7,000-\$9,000 depending on qualifications and experience. Write Chairman, Department of Geography, McGill University, Montreal, Canada.

## BIOCHEMIST

To participate in development of instrumentation for biochemical separations. Experience in liquid — liquid extractions, chromatographic and electrophoretic methods, dialysis, etc. M.S. required, Ph. D. preferred, with experience in theory and use of instruments.

Please submit resume in confidence to:

Manager, Product Development Laboratory Glassware Dept. **Technical Products Division** 

CORNING GLASS WORKS Corning, New York

# CORNING GLASS WORKS

An equal opportunity employer

**POSITION OPEN, TUSKEGEE INSTITUTE** Applications are invited for academic positions in physiology and pharmacology. Appointee will devote approximately half-time to teaching and half-time to pursuing own research interests; D. V.M. or Ph.D. preferred with some teaching and/ or research experience. Address all correspondence to: Dean, School of Veterinary Medicine, Tuske-gee Institute, Alabama.

#### RESEARCH VIROLOGISTS FOR EXPANDED PROGRAM

Ph.D. or M.D., recent graduates or with ex-perience. Background and interests in viral diseases, cancer, immunology, viral interference, and cell biology. General microbiologists can qualify. Graduate students expecting degrees in near future will be considered. Interested persons write to Mr. Robert O'Connor, Research Per-sonnel, Merck & Co. Inc., West Point, Pa. An equal opportunity employer.

INTRODUCTION TO GENERAL PATHOLOGY for graduate students and investigators who do not have a medical background

## June 22-July 11, 1964 HARVARD MEDICAL SCHOOL, Boston, Mass.

The course will be geared to graduate students and Ph.D.'s. It is intended to present the most important areas of General Pathology to investigators in the biological field who do not have a medical background, and wish to become acquainted with the basic mechanisms of disease at the level of cells and tissues.

Experimental methods will be emphasized. The course will consist of lectures, laboratories, and demonstrations. The following areas will be covered:

DISEASE AT THE LEVEL OF CELLS – INFLAMMATION – CIRCULATORY DISTURBANCES – TUMORS – INFECTION – ALLERGY

No Tuition. A limited number of fellowships will be available. Information: Dr. G. Majno, Department of Pathology, Harvard Medical School, 25 Shattuck Street, Boston, Mass. 02115

### POSITIONS OPEN

(a) Administrator, new research institution under university auspices; West. (b) Bacteriology Tech-nician, tissue culture experience; production and control laboratory; eastern biological firm. (c) Clinical Chemist, B.S./M.S.; 200-bed mideastern nospital. (d) B.S./M.S.; Immunchematologist, blood bank experience; degrees in chemistry, biology, studies of unusual bloods, some teach-ing; eastern pharmaceutical house; to \$10,500. (e) Medical Technologist, isotope tracer expe-rience; large Central teaching hospital. Faculty Appointments: (f) Mathematician, Ph.D. or near; some administrative responsibilities; Central col-lege to \$10,000. (g) Radiobiologist, Ph.D., teach elementary radiobiology, application of tracer techniques; Central liberal arts college. (h) Ph.D. Cytologist/Cytogeneticist, teaching, research; southern university. (i) Ph.D. Physiologist (verte-brate anatomist), experienced; familiar with new teachers college; from \$9250. (j) Zoologist, Ph.D. or near; teach general zoology and speciality; southeres morphologist; develop own re-search program and graduate courses in endo-crinology/cellular physiology; midwestern university. Many other opportunities available for both junior and senior scientists. Please write to Science Division, The Medical Bureau, Inc., Burneice Larson, Chairman, 900 North Michigan Avenue, Chicago 11, Illinois. X

GENERAL MICROBIOLOGIST. Faculty posi-tion in an established, growing, and well-equipped department. Applicant to have Ph.D. Research and teaching experience desired. Initial duties teaching. Opportunity to participate in on-going research and/or develop own program. Interview at ASM meeting or write directly to John R. Collier, D.V.M., Ph.D., Head, Department of Pathology and Microbiology, Colo. State Univer-sity, Ft. Collins, Colorado.



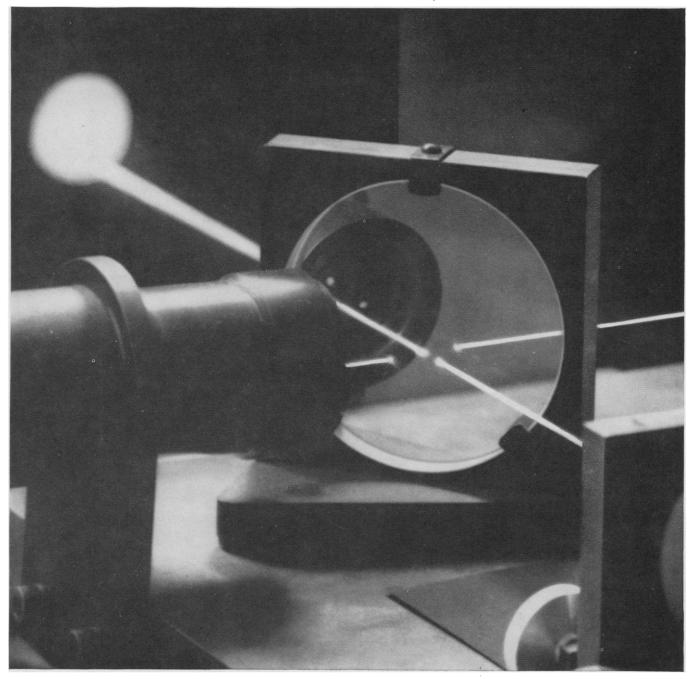
Trainceships for Graduate Work in Pharmacology. A 4-year program of course work and research training leading to the Ph.D. degree is offered. Research opportunities include the action of drugs on kidney, circulation, autonomic ganglia, connec-tive tissue, behavior, metabolism, and ion trans-port. Annual stipend (U.S. citizens) of \$2400 plus tuition, plus \$500 for each dependent. Early application strongly advised for entrance Septem-ber 1964. Detailed information on request. Write Department of Pharmacology, School of Medicine, State University of New York at Buffalo, 15 The Circle, Buffalo, N.Y. 14214.

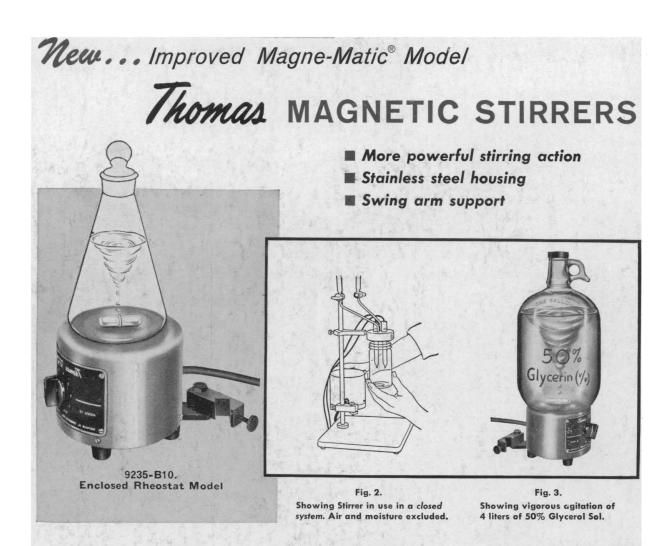
## The Market Place **BOOKS • SERVICES • SUPPLIES • EQUIPMENT**



SCIENCE, VOL. 144

**CRYSTAL-GAZING LASER.** Advances in communications often produce new manufacturing and testing problems. Example: Western Electric research engineers at Princeton, New Jersey, are using lasers themselves as tools for the development of even better ones. Solid state lasers are being studied for the precise welding and machining operations required to make components for tomorrow's communications systems. The gas laser probes the optical qualities of solid state laser rods far better than can today's instruments. A helium-neon gas laser produces a beam for a Twyman-Greene interferometer. A transparent crystal placed in one arm of the interferometer distorts the pattern in a way peculiar to its own structure. The powerful, monochromatic, collimated laser beam produces the clear, intense, straight-line fringes needed. Another example of how Western Electric research helps assure a continuous supply of quality communications products for the Bell Telephone System. **WESTERN ELECTRIC** 





A new stainless steel and more powerful, extremely efficient model of the Magnetic Stirrer introduced by us in 1944. Drive unit totally enclosed in compact housing of corrosion-resistant stainless steel, stronger than aluminum. Rotating magnetic field spins a magnetized stirring bar, encapsulated in inert plastic, to stir liquids in open or closed vessels. Speed is rheostat-controlled; operation is quiet and vibration-free.

Wide Power Range. These new model stirrers produce vigorous agitation of 4 liters of 50% glycerol solution (see fig. 3). Positive control of stirring rate, from full speed down to a few revolutions per second, allows use also for very small volumes or for gentle mixing. Magnetic coupling flux is adequate to stir effectively even in vessels elevated 1 inch above drive unit.

**Drive Unit.** Continuous duty motor and driving magnet are encased in housing of heavy gauge stainless steel, 5 inches diameter  $\times 3\frac{1}{2}$  inches high, with no seams above base. The larger motor of these improved stirrers is of the shaded pole type. Bearings are lubricated for long service life. Alnico V driving magnet,  $\frac{3}{4}$ -inch square  $\times 2$  inches long, is dynamically balanced on motor shaft. Rubber feet permit use on bench. Freestanding height is 4 inches.

Swing Arm Support. Exclusive feature of Thomas Magne-Matic® Stirrers is the attached swivel clamp.

When mounted on support, stirrer can be raised or lowered on the rod, or swung aside for easy removal of vessels from assemblies (see fig. 2). Clamp also permits adjustment of stirrer center in a horizontal plane from 3 to  $4\frac{1}{2}$  inches from rod. Particularly convenient in both the mounting and use of the closed system assemblies.

Stirring Bars. Stirrers supplied are Alnico V magnets encapsulated in Teflon, with central pivot ridge to minimize friction.

9235-B40. Magnetic Stirrer, Thomas Remote Control Model, with separate rheostat attached to control unit by 30-inch connecting cord. With stirring bars as listed above. For 115 volts, 60 cycles, a.c.; 10 watts. 44.40

9235-B50. Ditto, but without stirring bars.... 40.00

10% discount in lots of 12 or more.

