

gineers, 60th annual mtg., New York, N.Y. (H. I. Wolff, Shell Chemical Co., 50 W. 50 St., New York 10020)

26-1. **Radiological Soc.** of North America, 53rd annual mtg., Chicago, Ill. (M. D. Frazer, RSNA, 713 East Genesee St., Syracuse, N.Y.)

27-29. **American Astronautical Soc.**, natl. mtg., New York, N.Y. (N. Levin, Guidance and Control, Plant 35, Grumman Engineering Corp., Bethpage, N.Y. 11714)

27-30. **Entomological Soc.** of America, annual mtg., New York, N.Y. (R. H. Nelson, ESA, 4603 Calvert Rd., College Park, Md.)

27-1. **Chemical Industries**, New York, N.Y. (International Exposition Co., 200 Park Ave., New York 10017)

28. **American Soc. of Therapeutic Radiologists**, Chicago, Ill. (J. A. Del Regato, Penrose Cancer Hospital, Colorado Springs, Colo. 80907)

29-30. **Society for Industrial and Applied Mathematics**, fall mtg., Santa Barbara, Calif. (H. B. Hair, 33 S. 17 St., Philadelphia, Pa. 19103)

29-1. **Wire and Cable Symp.**, Atlantic City, N.J. (J. Spergel, USAEC, Fort Monmouth, N.J. 07703, attn: AMSEL-KL-EE)

30-3. **American Anthropological Assoc.**, annual mtg., Washington, D.C. (C. Frantz, 1530 P St., NW, Washington, D.C. 20005)

International and Foreign Meetings

1-3. **Northern Development Conf.**, 4th, Edmonton, Alberta, Canada. (Alberta and Northwest Chamber of Mines and Resources, Edmonton)

5-11. **Allergology**, 6th intern. congr., Montreal, Canada. (S. O. Freedman, 1390 Sherbrooke St., W., Montreal 25)

5-11. **Pharmaceutical Federation**, 4th Central American, San Salvador, El Salvador. (% International Pharmaceutical Federation, 11 Alexanderstraat, The Hague, Netherlands)

6-10. **Microbiological Standards and Testing Methods for Irradiated Food**, Vienna, Austria. (International Agency Liaison Branch, Office of the Director General, Food and Agriculture Organization, Via delle Terme di Caracalla, Rome, Italy)

6-11. **Global Impacts of Applied Microbiology**, 2nd intern. conf., Addis Ababa, Ethiopia. (A. Lemma, Faculty of Science, Haile Sellassie I Univ., Addis Ababa)

6-14. **Dentistry**, intern. symp., Quito, Ecuador. (O. C. Jaramillo, Decano, Facultad de Odontologia, Universidad Central, Quito)

6-24. **Meteorological Instructors**, regional seminar, Santiago, Chile. (World Meteorological Organization, 41, Av. Giuseppe Motta, Geneva, Switzerland)

7-10. **Methods in Soil Ecology**, symp., Paris, France (UNESCO, Pl. de Fontenoy, Paris 7)

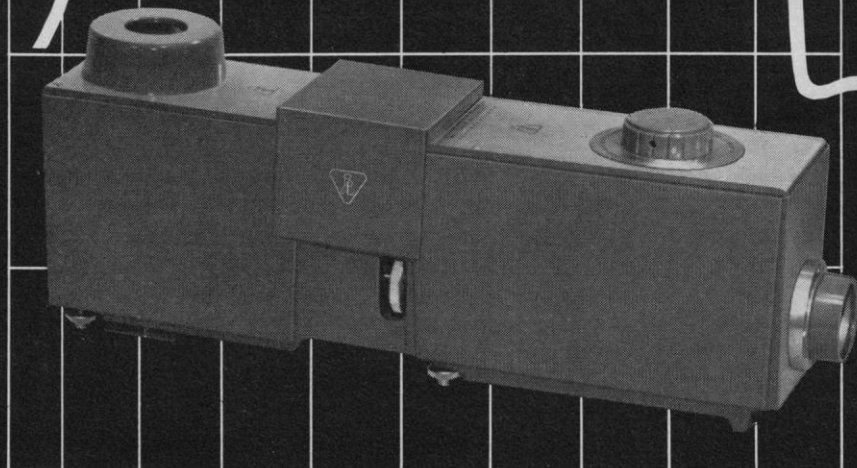
8-10. **Electroplating**, intern. conf., Erfurt, Germany. (Dr. Burkhardt, PV Elektrotechnik, Pa 16, Galvanotechnik, Kammer der Technik, Torgauer Str. 76, 705 Leipzig 5, Germany)

9-10. **American Anthropological Assoc.**, annual mtg., Toronto, Ontario, Canada. (Executive Secretary, 1530 P St., NW, Washington, D.C. 20005)

27 OCTOBER 1967

MORE OUTPUT

*from any
source*



The Bausch & Lomb HIGH INTENSITY GRATING MONOCHROMATOR gives more useable light with *any* source. Its unique optical system has only two internal reflecting surfaces instead of the conventional four.

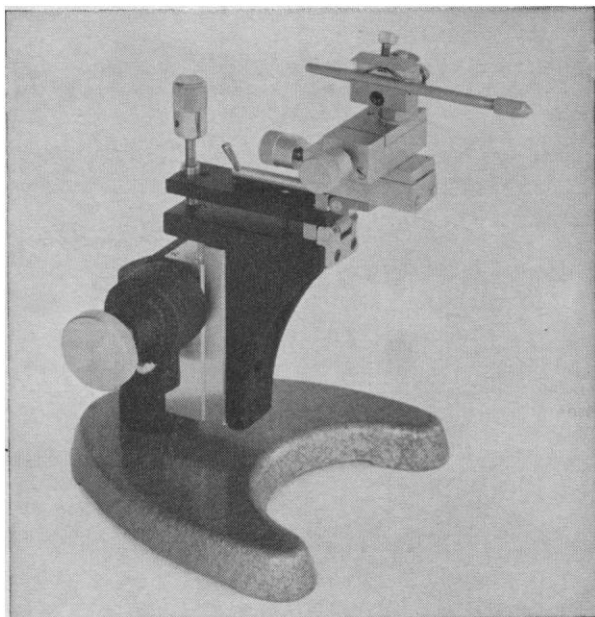
You can get exactly what you want in a monochromator now. And, you can be confident the modular "building-block" design will let you interchange gratings, slits and light sources for future needs. There are five grating assemblies. Each covers a section of the total range from 200m μ to 3.2 μ . You dial the desired wavelength and you're sure of reproducibility. Choose the appropriate light source: Deuterium Arc, Tungsten Quartz-Iodine, high pressure or super pressure Mercury or a highly stable Xenon. Each one is precisely aligned, prefocused and centered.

Bausch & Lomb offers a complete line of standard and custom built monochromators with the widest range of Certified-Precision Gratings from the world's largest source. Write for Catalog 33-2098, Bausch & Lomb, 20746 Bausch St., Rochester, N. Y. 14602.

BAUSCH & LOMB 
ANALYTICAL SYSTEMS DIVISION

ADVANCING ELECTRONIC/OPTICAL
INSTRUMENTATION

micro manipulators



We offer the widest choice of calibrated mechanical drives in various sensitivities, plus numerous accessories, including optional tilting and rotating devices, dual assemblies on common baseplates, magnetic chucks, and instrument holders.

Brinkmann Micro Manipulators are available in over 40 basic models. All are in stock for immediate delivery.

**BRINKMANN
INSTRUMENTS**
CANTIAGUE ROAD, WESTBURY, N. Y. 11590/ED 4-7500

LABELED NUCLEOSIDES

Adenosine-8-C¹⁴

Cytidine-5-H³

Deoxycytidine-5-H³

Guanosine-8-C¹⁴

Guanosine-8-H³

Write for data sheets.



HAncock 6-7311

NEW ENGLAND NUCLEAR CORP.
575 ALBANY STREET, BOSTON 18, MASSACHUSETTS

Colorado Opportunities!

SENIOR STAFF SCIENTIST

To pursue long range technical applications of experiments, sensors and control systems for satellite missions. Requires experience in the design of large optical systems, control systems, engineering management, proposal and customer presentations, system design and hardware development. B.S. in Engineering or Physics.

OPTICAL ALIGNMENT AND TEST ENGINEERS Optical Systems—

Conduct design review and customer demonstration of airborne optical instruments to assure design integrity. Responsible for origination of test specifications for instruments such as spectrometers and spectrographs.

Optical Test—

Develop test procedures and specify test equipment for the assembly, checkout, alignment and environmental test of airborne optical instruments measuring ultra violet light.

DEVELOPMENT ENGINEERS—MATERIALS & PROCESSES

Requires experience in tribophysics and space materials. Will be responsible for materials interface with engineering design and test groups. Requires B.S. or M.S. in Physics and several years materials experience. Publication desirable.

If you possess qualifications in one of the above categories, call Mr. Wild or Mr. Elmore in our personnel department (collect) AC303-444-5300 or submit your resume in confidence:

**BALL BROTHERS
RESEARCH CORP.**

BOULDER INDUSTRIAL PARK
BOULDER, COLORADO 80302

An Equal Opportunity Employer



Personnel Placement

POSITIONS WANTED

Grant and Contracts Administrator, several years of responsible experience with government grant-ing agency. Particularly knowledgeable with technical and fiscal aspects. B.A., M.B.A., 35, Washington area. Box 575, SCIENCE. 10/27

Technician, B.S. degree in biology. Experienced preparing animal tissues for electron and light microscopy and in light microscope histochemistry including protein, nucleic acid, and polysaccharide techniques. Box 587, SCIENCE. X

Vertebrate Zoologist, Ph.D. Eight years' teaching experience. Publications. Wishes to relocate. Available September 1968. Box 578, SCIENCE. X

Veterinarian Endocrinologist, B. Vet. Sc. (India); Ph.D. January 1968 seeks position related to thyroid physiology, mammary gland growth, reproductive physiology and or veterinary medicine. Please contact K. N. Sinha. 602B University Village, Columbia, Mo. 65201. X

Zoologist-Geneticist, Ph.D., University of Chicago; 5 years' research and teaching; genetics, vertebrate zoology, general biology, embryology. Grant. Publications. Seeks teaching, research, or administrative position. Box 579, SCIENCE. X

MEDICAL MICROBIOLOGIST Ph.D.; supervisor hospital section, university medical school teacher; seeks clinical or Public Health appointment. Write WOODWARD PERSONNEL BUREAU, 185 North Wabash, Chicago 60601. X

Immunologist Ph.D.; teaching, postdoctoral, and scientific writing experience, publications. Desires academic appointment offering teaching or research. Box 585, SCIENCE. X

Ph.D., Biochemist; several years' teaching and research experience; publications. Desires full-time teaching position in college; biochemistry-chemistry. Box 577, SCIENCE. 11/17

POSITIONS OPEN

Applications are invited for the position of Assistant Professor of Microbiology. Duties include teaching at undergraduate and graduate levels. Qualifications Ph.D. Microbiology, major interest in Bacterial Physiology. Salary range \$8,700-\$11,700. For further details write **Dr. G. Dempster, Head of Bacteriology, Medical College, University of Saskatchewan.**

Director, Sub-Department of Immunology, Department of Bacteriology and Immunology, University of Western Ontario. Rank of Associate or Full Professor. To direct research and teaching in Immunology within the Department. Address inquiries to, **Chairman, Interim Advisory Committee on Immunology, Department of Bacteriology and Immunology, Medical School, University of Western Ontario, London, Ontario, Canada.**

SALES PROMOTION MANAGER

NEW SCIENTIFIC INSTRUMENT DIVISION

Thoroughly experienced with absolutely proven success record. Excellent permanent growth opportunity. Must spearhead complete operation.

Write full details confidential to
Mr. Seymour Berman, Treasurer

THE EDNALITE CORPORATION
OCVI* INSTRUMENT DIVISION

Peekskill, N.Y. 10566

TECHNICAL MARKETING REPRESENTATIVE

Diagnostic Reagents

The rapid expansion of the General Diagnostics Division of Warner-Lambert has created an unusual and challenging opportunity for a scientist with experience in the clinical laboratory, who is interested in applying his technical background to marketing oriented problems. We require an M.S. or Ph.D. in one of the biological sciences, such as biochemistry, microbiology, or hematology.

In this position the representative is responsible for establishing and maintaining contacts with scientists who are investigating experimental diagnostic products. Through these contacts he will investigate the diagnostic value of our products, gather information for sales or development use, assist experimenters with publications, and recommend product improvements or new products. The position is headquartered in Morris Plains, New Jersey, and will require travel covering most of the southeastern U.S.

THIS IS AN OUTSTANDING OPPORTUNITY FOR PROFESSIONAL GROWTH AND ADVANCEMENT.

To apply, please send resume to:

Mr. R. L. Bowley, Technical Employment

WARNER-LAMBERT PHARMACEUTICAL COMPANY

201 Tabor Road, Morris Plains, N.J. 07950

An Equal Opportunity Employer (M/F)

PhD. CNS PHARMACOLOGIST

We are presently working with commercial and federal clients on fundamental and applied research involving drugs of abuse, CNS stimulants and depressants, narcotics and analgesics. Mechanisms of action are of particular interest.

We need an additional staff member with approximately 5 years post-doctoral experience to become involved in this research effort working along with medicinal and bio-organic chemists and clinical pharmacologists.

Opportunity will also include liaison relationships with clients.

Respond to Scott Carson
(617) 864-5770, Ext. 2225



Arthur D. Little, Inc.
RESEARCH • ENGINEERING • MANAGEMENT CONSULTING

20 Acorn Park
Cambridge, Massachusetts 02140

SR. RESEARCH ASSOCIATE in NUTRITIONAL RESEARCH

To plan, direct and conduct research in a laboratory devoted to basic and applied nutritional studies relating to human nutritional needs.

Requires Ph.D. in nutrition and/or biochemistry and approximately 5-10 years' related research experience.

Offers opportunity to head section of an expanding department and to collaborate with clinical research, product development and marketing groups.

Please send resume to:

Dr. Herbert P. Sarett

Director of Nutritional Research

MEAD JOHNSON RESEARCH CENTER

Evansville Indiana 47721
An Equal Opportunity Employer

POSITIONS OPEN

BACTERIOLOGIST

Ph.D. or M.S. with experience

Research position is now open in our Department of Bacteriology. Recent Ph.D. or qualified M.S. for basic and applied research pertaining to topical antimicrobial agents.

RESEARCH ASSISTANT

A position has become available for a B.S. with a major in microbiology to assist in our Department of Bacteriology in a research program in molecular biology.

The Sterling-Winthrop Research Institute is the research division of Sterling Drug Inc., one of the world's largest producers of medicinal agents. Sterling Drug manufactures professional, consumer and industrial products identified by more than a thousand brand names. The Institute employs over 600 people and is engaged in a very active pharmaceutical research program. It is near Albany, on a plateau overlooking the Hudson River Valley.

Salaries open. Excellent employee benefits include educational assistance at local colleges. Travel and moving expenses paid.

Send complete resume to C. E. Alford, Director of Personnel

STERLING-WINTHROP RESEARCH INSTITUTE

RENSSELAER, NEW YORK

An Equal Opportunity Employer

FUNDAMENTAL RESEARCH

MOLECULAR BIOLOGY

A challenging opportunity to implement a basic research program in biochemical mechanisms of viral infections, interferon stimulation and production, and heterogeneous resistance.

Applicants should possess a Ph.D. (or M.S. with equivalent applicable experience) and have a strong background in biochemistry, biophysics and virology. Experience in modern techniques of protein nucleic acid metabolism is essential.

Modern, well-equipped research laboratories are located in the Valley Forge area close to suburban living, yet with easy access to Philadelphia's academic and cultural centers. Publications and attendance at scientific meetings are encouraged. Benefit and salary programs are liberal.

Please submit your resume in confidence to: R. W. Kinney, Ph.D., Director of Scientific Employment

SMITH KLINE & FRENCH LABORATORIES



1552 Spring Garden Street
Philadelphia, Pa. 19101

An Equal Opportunity Employer

FIELD SALES AND SERVICE PERSONNEL

A rapidly growing manufacturer of electro-optical instruments used by research, clinical and industrial laboratories has openings in several major U.S. and Canadian cities for experienced sales and service personnel. Full range of employee benefits.

Please send detailed resume, in confidence, to N. Jaworowski, Vice-President—Sales, Gilford Instrument Laboratories, Inc., Oberlin, Ohio 44074.

gilford

An equal opportunity employer

HISTOLOGY TISSUE TECHNICIAN with experience using celloidin and sliding microtome, preferably on bone or cochlear specimens. Opportunity for some patient and non-laboratory responsibility. Salary, \$6,800. Write **F. B. Simmons, M.D., Division of Otolaryngology, 300 Pasteur Drive, Stanford, California 94304.**

POSITIONS OPEN

STUDY TRAINEESHIP

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, energy metabolism and bioengineering. Write for details, to, **Head, Department of Physiology, University of Illinois at the Medical Center, P.O. Box 6998, Chicago, Illinois 60680.**

Postdoctoral Traineeships in Journal Editing. Full- or part-time positions as salaried executive and assistant editors of biomedical journals are beginning to be available as the volume of scientific publications increases, and few qualified persons are available to fill them. A new 9-month program will begin October 1968 to train scientists, who have a doctorate (M.D. or Ph.D.) in science plus 3 or more years' research experience, in all aspects of journal editing. Trainees will receive a stipend commensurate with their qualifications and experience. Please write now if at all interested to **Dr. F. Peter Woodford, The Rockefeller University, New York, N.Y. 10021.**

Postdoctoral traineeship in research pathology, biochemistry or biomedical sciences sponsored by NIH. Excellent laboratory facilities and research supervision. Remuneration according to previous training up to \$8,000 per annum of which \$3,600 is tax free. U.S. citizenship or permanent residency required. Apply **Dr. Henry P. Schwarz, Philadelphia General Hospital, 34th Street and Civic Center Blvd., Philadelphia, Pa. 19104.**

FELLOWSHIPS

NATIONAL RESEARCH COUNCIL OF CANADA

POSTDOCTORATE FELLOWSHIPS 1968-69

Approximately 150 Fellowships will be awarded for 1968-69 by the National Research Council. They will be tenable in the laboratories of the National Research Council, Department of Agriculture, Department of Forestry and Rural Development, Department of Energy, Mines and Resources, Department of National Health and Welfare, Fisheries Research Board of Canada, Meteorological Service of the Department of Transport, National Museum of Canada, and Atomic Energy of Canada Limited.

Applicants should not be more than 35 years of age and should possess a Ph.D. degree from a recognized university or expect to obtain such a degree before taking up an award. (Candidates having equivalent research experience may be considered.) There are no restrictions regarding nationality of applicants, but successful applicants must meet all Canadian immigration requirements. The competition closes on 15 January, 1968.

The annual stipend, which is free of income tax, is \$6000 for both single and married Fellows and \$7200 for a married Fellow (male) with a child or children. A grant is provided towards the cost of travel.

Inquiries should be addressed to: **Awards Officer, National Research Council of Canada, Ottawa 7, Canada.**

Academic Vacancy Advertisement

The Department of Physiology and Pharmacology, Ontario Veterinary College, University of Guelph, Guelph, Ontario, Canada, requires four faculty members to meet growing teaching and research needs. Persons interested in the following positions are invited to send curriculum vita, grade transcripts, list of publications, and special qualifications and interests to Dr. H. G. Downie, Professor and Head of the Department.

1. D.V.M. (or equivalent) with Ph.D. in Pharmacology. Duties include participation in the team approach to teaching undergraduate and graduate Pharmacology, and research in areas of own interest. Rank: Associate Professor.
2. D.V.M. (or equivalent) with Ph.D. in Pharmacology, Toxicology, or Biochemistry. Duties include participation in the team approach to teaching undergraduate and graduate Toxicology and Pharmacology, administrative supervision of a veterinary toxicology testing laboratory, and research and development in forensic analysis. Rank: Associate Professor.
3. D.V.M. (or equivalent) with Master's degree in any related science. Duties include participation in the team approach to teaching undergraduate Pharmacology. The candidate would be expected to pursue graduate work at the Ph.D. level in Pharmacology. Rank: Lecturer.
4. PHYSIOLOGIST with Ph.D. qualification. Duties include instruction in Physiology to Physical Education undergraduates and participation in a laboratory course on Human Physiology. Consideration will be given to those individuals having a special research interest in respiratory or cardiovascular physiology. Rank: Assistant Professor.

Moving expenses up to \$1,000 will be provided for each position. All salaries are competitive with industry.

The Market Place

BOOKS • SERVICES • SUPPLIES • EQUIPMENT

BOOKS AND MAGAZINES

AUTHORS WANTED BY NEW YORK PUBLISHER

Your book can be published, promoted, distributed by a reliable company on a subsidized basis. Fiction, non-fiction, poetry, scholarly, scientific and even controversial manuscripts welcomed. For Free Booklet write Vantage Press, Dept. SC, 120 W. 31 St., New York 10001.

FREE

Monograph entitled "Dynamic Synthesis: New Tool for Stock Price Forecasting" plus a sample of our weekly *Stock Market Forecast*. Institute of Dynamic Synthesis, 4405G North Ravenswood, Chicago, Illinois 60640.

SUPPLIES AND EQUIPMENT

SPRAGUE-DAWLEY, INC.

Pioneers in the development of the
STANDARD LABORATORY RAT.

P.O. Box 4220

Madison, Wisconsin

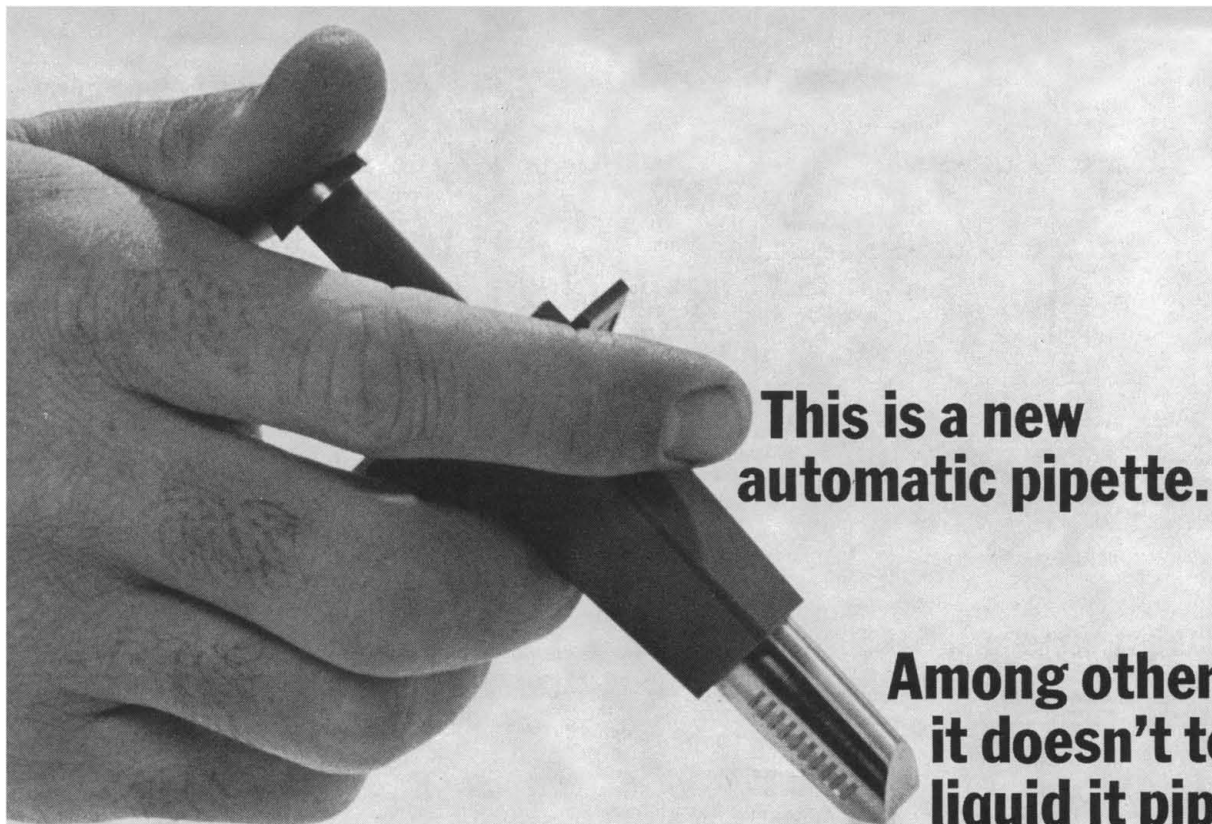
CE 3-5318

PREISER SCIENTIFIC INC.

Complete Stocks Of
SCIENTIFIC EQUIPMENT

All Laboratory Supplies, Chemicals,
and Furniture For Modern
Chemical, Clinical-Metallurgical
and Educational Laboratories

900 MacCorkle Ave., S.W. 343-5515
Charlestown, West Virginia



**This is a new
automatic pipette.**

**Among other things,
it doesn't touch the
liquid it pipettes.**

(How's that again?)

When using the BIOPETTE automatic pipette, all of the measured aliquot is held in the disposable plastic tip. The liquid never has to enter the housing of the BIOPETTE itself. Hence, the BIOPETTE stays clean, can't contaminate anything else, and doesn't need washing. And to switch from one liquid to another: just put in a new disposable tip. Period.

Fast? It takes approximately 2 seconds for *both* filling and discharging. Without sacrificing accuracy.

Safe? Safety is inherent in the design. Liquid does not come in contact with operator.

Reproducible delivery volume? Using the same instrument: $\pm 1\%$.

Easy to use? Yes. With virtually no training. Requires no special "touch" or technique. (Goodbye meniscus.) Weighs less than 2 oz. with tip.

Economical? If time *is* money, yes. Two ways: greatly reduces time for pipetting; totally eliminates time required for the washing ritual. (Special bonuses: no broken or contaminated glass pipettes.)

Useful? Without doubt. Interesting current animal care

applications include, for example, forced feeding, artificial insemination, blood dilutions, and so forth.

Guarantee? A real one, lasting ten years. If a problem develops (unlikely), we will immediately send you a replacement BIOPETTE automatic pipette while we fix yours for you. Or we'll throw yours away and let you keep the replacement.

For further information and prices, please write: Lab Cages Inc., 126 John St., Hackensack, New Jersey 07602. (And why not ask for our new, interesting catalog also?)

Write Dept. A.
lab cages inc.

BIOPETTE is a trademark of Becton, Dickinson and Company.

A SUBSIDIARY OF BECTON, DICKINSON AND COMPANY

WHEN YOU SPECIFY AN EXTERNAL STANDARD FOR LIQUID SCINTILLATION COUNTING, SPECIFY THE BEST—Ba133.

Here are the facts. When you specify Geometry-Optimized™ barium-133 external standardization, available only in Nuclear-Chicago liquid scintillation systems, you really have two unique benefits going for you: First, an external standard that inherently makes determination of counting efficiency for quenched samples highly accurate. Second, an exclusive positioning technique that ensures reproducibility of sample-to-standard geometry—sample after sample. Here's how this powerful combination works:

THE Ba133 SPECTRUM ITSELF

A low-energy gamma emitter, Ba133 has a Compton spectrum end-point that *closely* compares to the beta emitters most commonly used in liquid scintillation counting. So its spectral shift, as a function of quenching, more closely approximates the shift of a C14 or H3 beta spectrum than would the spectrum of a higher-energy standard (such as Cs137 or Ra226, alone or with another isotope).

Let's look at two multichannel analyzer plots obtained from one channel of one of our liquid scintillation systems. Plot A shows the Ba133 spectrum and an unquenched C14 sample spectrum (system is calibrated for C14 counting). Plot B shows the Ba133 spectrum and the spectrum for a highly quenched C14 sample (system is calibrated for H3 counting). Note that, in *both* plots, the Ba133 spectrum closely follows the sample beta spectrum.

THE BENEFITS OF Ba133

As the multichannel analyzer plots show, the spectral shifts of Ba133 and the sample isotope are similar from unquenched to highly quenched samples. This means that a given set of channels ratio quench correction curves derived from the Ba133 standard will cover a much *wider* range

of sample quenching than curves derived from a higher energy standard.

Further, the close similarity of the Ba133 spectrum to that of the sample beta permits using the sample-counting channels to count the external standard. Any system variables (small gain drifts, etc.) affect the external standard and sample equally. The external standard channels ratio, therefore, will more closely approximate the sample channels ratio than if a higher energy external standard had been used. This also allows *all* system channels to be available for sample counting.

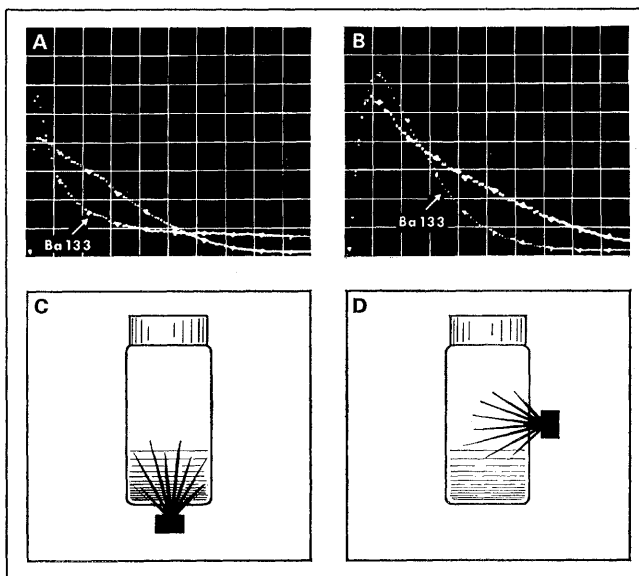
GEOMETRY-OPTIMIZED POSITIONING

Ba133 sounds good so far. But, like any external standard, it has to be placed exactly where it belongs—centered *directly* and *precisely* beneath the sample. That's what our exclusive Geometry-Optimized (G-O) external standard system is designed to do. G-O positioning is shown in Diagram C. When the Ba133 external standard is so placed, the external standard ratio is significantly less affected by sample-volume variations than if the standard were placed at the side of the sample vial or elsewhere.

And note in Diagram D, how side-positioning of the external standard would be more volume-dependent. Not so with G-O positioning. And the G-O system "sees" the same spot—no matter *how* the vial is rotated. Result: inaccuracies caused by variations in vial-wall thickness are minimized.

Remember that Ba133 external standard with G-O positioning is available only in our liquid scintillation systems. For more information about them—and their exclusive "computer with a memory" that makes Ba133 even more useful—call your local Nuclear-Chicago sales engineer. Or write to us.

7-251



NUCLEAR-CHICAGO CORPORATION

A SUBSIDIARY OF G. D. SEARLE & CO.

349 East Howard Avenue, Des Plaines, Illinois 60018 U.S.A.

Donker Curtiusstraat 7, Amsterdam W, The Netherlands