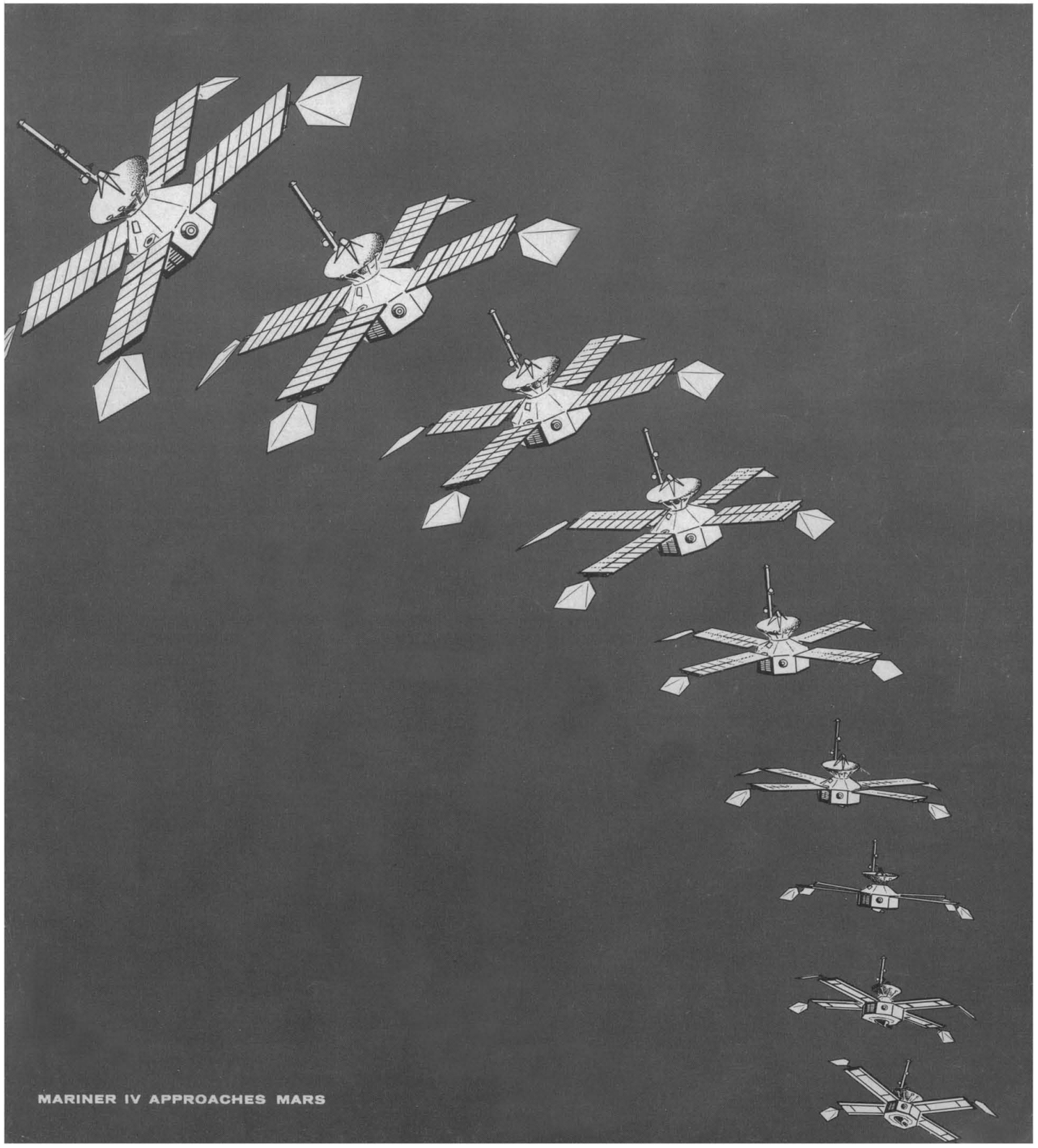
SCIENCE 10 September 1965
Vol. 149, No. 3689
AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE



MARINER IV APPROACHES MARS

Ever wish you could choose a Microtome-Cryostat ideally suited to your needs?

Now you can.

International, makers of the first open-top cryostat, now offers the first *family* of Microtome-Cryostats . . . one for every application, workload, budget.

Model CTD is the world's standard for routine frozen sectioning. Modestly priced, this unit features anti-fog control, ±1°C temperature control, internal quick-freezing.

Model CTI is a new, advanced unit, ideal for both routine and research work. Compact, economical, it offers many features of its research counterpart, the Model CTR.

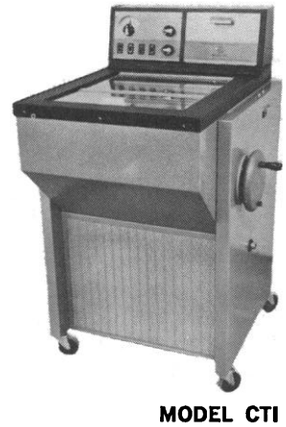
Model CTR is the complete frozen sectioning workshop. Preparation, cutting, staining and microscopic examination all can be performed from a comfortable seated position. Features include ±1°C control, condensate-free cover, internal quick-freeze system, illuminated cold chamber, vacuum port for freeze drying, work and storage space, quick defrost system.

All are equipped with IEC's famous Minot Custom Microtome . . . the precision instrument for both paraffin and frozen sectioning. Cuts sections from 2 to 16 microns, with 18 to 40 micron sectioning optional. 100% rustproof. Autoclavable. Many other high precision features.

CTD, CTI and CTR include special micrometer adjusted anti-roll plate. A new wire loop type anti-roll and frozen sectioning knife are also available. Other accessories such as razor blade holder and rapid freeze device available.

Send for Bulletin CT for complete description of all three models.

MODEL CTD



MODEL CTI

MODEL CTR

INTERNATIONAL IEC EQUIPMENT CO.

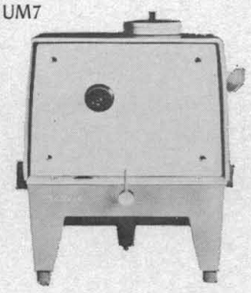
300 SECOND AVENUE, NEEDHAM HEIGHTS, MASS. 02194

There's a Mettler to meet any weighing need!

M5

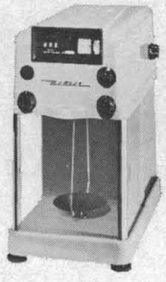
Cap: 20 g Prec: ±0.001 mg

UM7



Cap: 2 mg Prec: ±0.1 mcg

H6



Cap: 160 g Prec: ±0.05 mg

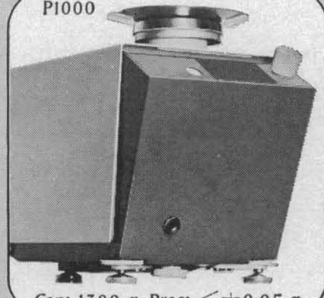
P120

Cap: 130 g Prec: <±0.5 mg

H15

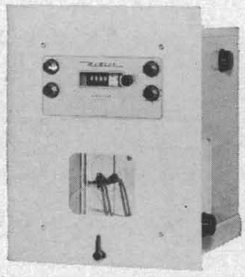
Cap: 160 g Prec: ±0.03 mg

P1000



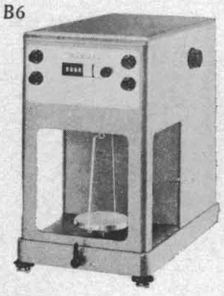
Cap: 1300 g Prec: <±0.05 g

M5 S/A



Cap: 20 g Prec: ±0.001 mg

B6

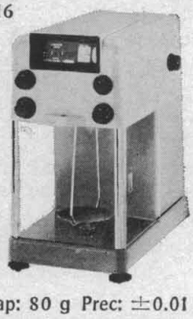


Cap: 100 g Prec: ±0.01 mg

P10

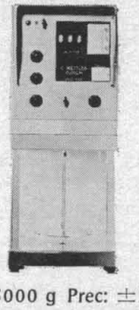
Cap: 13 kg Prec: <±0.5 g

H16



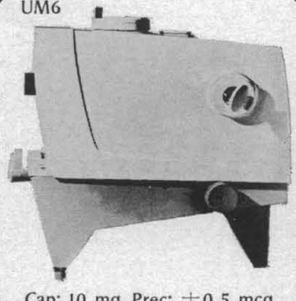
Cap: 80 g Prec: ±0.01 mg

W5



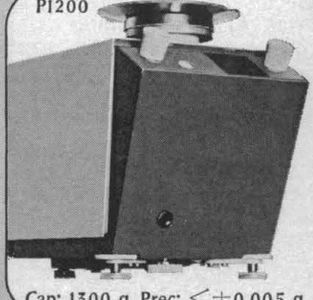
Cap: 5000 g Prec: ±1 mg

UM6



Cap: 10 mg Prec: ±0.5 mcg

P1200

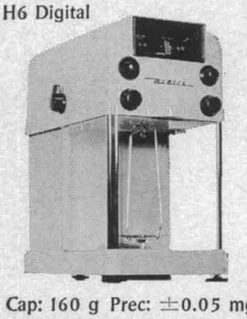


Cap: 1300 g Prec: <±0.005 g

S5

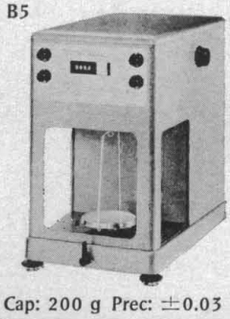
Cap: 160 g Prec: ±0.05 mg

H6 Digital



Cap: 160 g Prec: ±0.05 mg

B5



Cap: 200 g Prec: ±0.03 mg

There are more than 100 Mettler models to choose from. They range from .1 mcg. precision to 13 kg. capacity, all with single-pan convenience and speed. Whatever your weighing need, it can be met by a Mettler. If you'd like to know more about Mettler Balances, write: Mettler Instrument Corp., 20 Nassau St., Princeton, N. J.

Mettler®

10 September 1965
Vol. 149, No. 3689

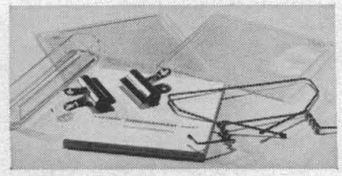
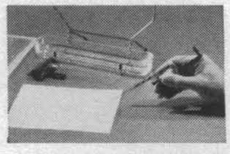
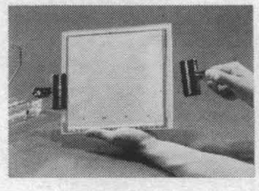
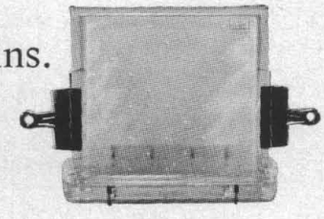
SCIENCE

SCIENCE is published weekly on Friday and on the fourth Tuesday in November by the American Association for the Advancement of Science, 1515 Massachusetts Ave., Washington, D.C. 20005. Now combined with **The Scientific Monthly®**. Second-class postage paid at Washington, D.C. Annual subscriptions $8.50; foreign postage, $1.50; Canadian postage, 75¢; single copies, 35¢. School year subscriptions: 9 months, $7; 10 months, $7.50. Provide 4 weeks' notice for change of address, giving new and old address and zip numbers. Send a recent address label. SCIENCE is indexed in the **Readers' Guide to Periodical Literature.**

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

COVER

Mariner IV left Earth 28 November 1964 on a cruise to the neighborhood of Mars. Data transmitted by instruments aboard the spacecraft during encounter, 14 to 15 July 1965, are presented and interpreted in the reports on the nature of the magnetic fields and particle fluxes near Mars (pages 1226–1248). [Drawing by Federal Graphics]

The EASTMAN CHROMAGRAM System for thin-layer chromatography consists of EASTMAN CHROMAGRAM Sheet and EASTMAN CHROMAGRAM Developing Apparatus.  It makes TLC—once messy and cumbersome—fast, neat, and uncomplicated. Gone are the bulk and expense of coating equipment and the problems of breakage and siliceous dust. You take EASTMAN CHROMAGRAM Sheet out of a box, spot it,  place it in the EASTMAN CHROMAGRAM Developing Apparatus,  and separation begins. 

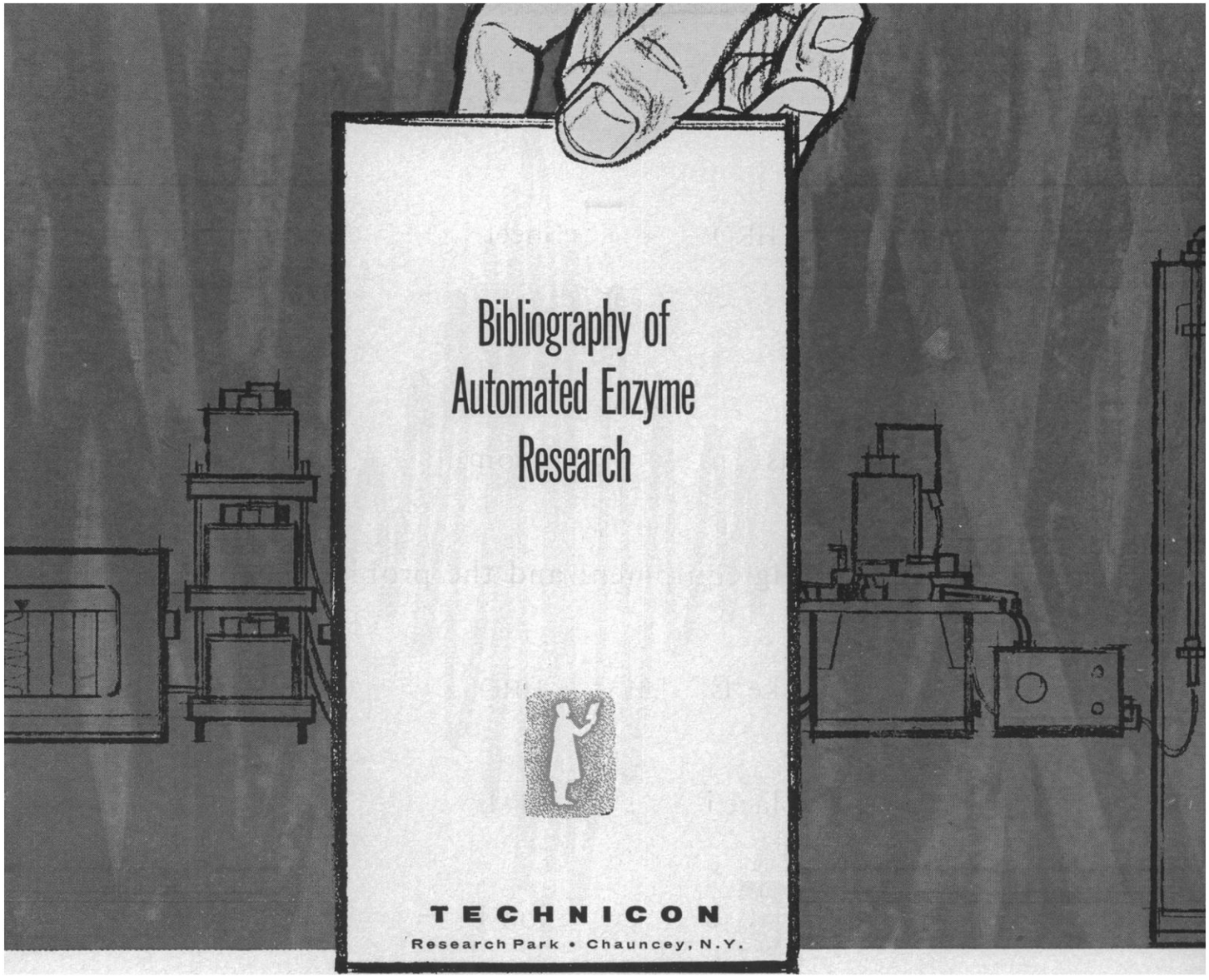
EASTMAN CHROMAGRAM Sheet comes in two types: Type K301R with fluorescent indicator and Type K301R2 without fluorescent indicator. Both types are inert poly(ethylene terephthalate) with an adsorbent layer of polyvinyl-alcohol-bound silica gel 100 microns thick; over-all thickness is 0.3mm. The 20cm x 20cm sheets are packed 20 to the box. They are easily cut to desired sizes and shapes—you need stock only the one size.

EASTMAN CHROMAGRAM Developing Apparatus comprises two identical 23cm-square plates made with bosses, ridges, and flats that work together; a solvent trough, an easel, and a pair of spring clips. The apparatus involves no presaturation or lining with solvent-soaked filter paper. It takes little bench space, and that only when in actual use.

You can obtain EASTMAN CHROMAGRAM Sheet and Apparatus from your regular supplier of EASTMAN Organic Chemicals. Also available directly from *Distillation Products Industries,* Rochester, N.Y. 14603, at $35.50 for the apparatus and $23.20 per box of sheet (prices are subject to change without notice and do not include transportation).

"CHROMAGRAM" is a trademark.
Patents applied for.

Distillation Products Industries is a division of Eastman Kodak Company



A reference you'll be glad to discover is this 73-paper bibliography of investigations involving automatic enzyme determinations. It can be your guide to a widely useful array of experience ranging from the automatic assay of almost any number of enzymes through chemical determinations using enzymatic reagent systems to studies of the complete course of an enzyme reaction to establish its kinetics.

May we mail a copy to you?
It's bibliografree . . . from Technicon.

For the scientist studying enzymes it's invaluable ...and free

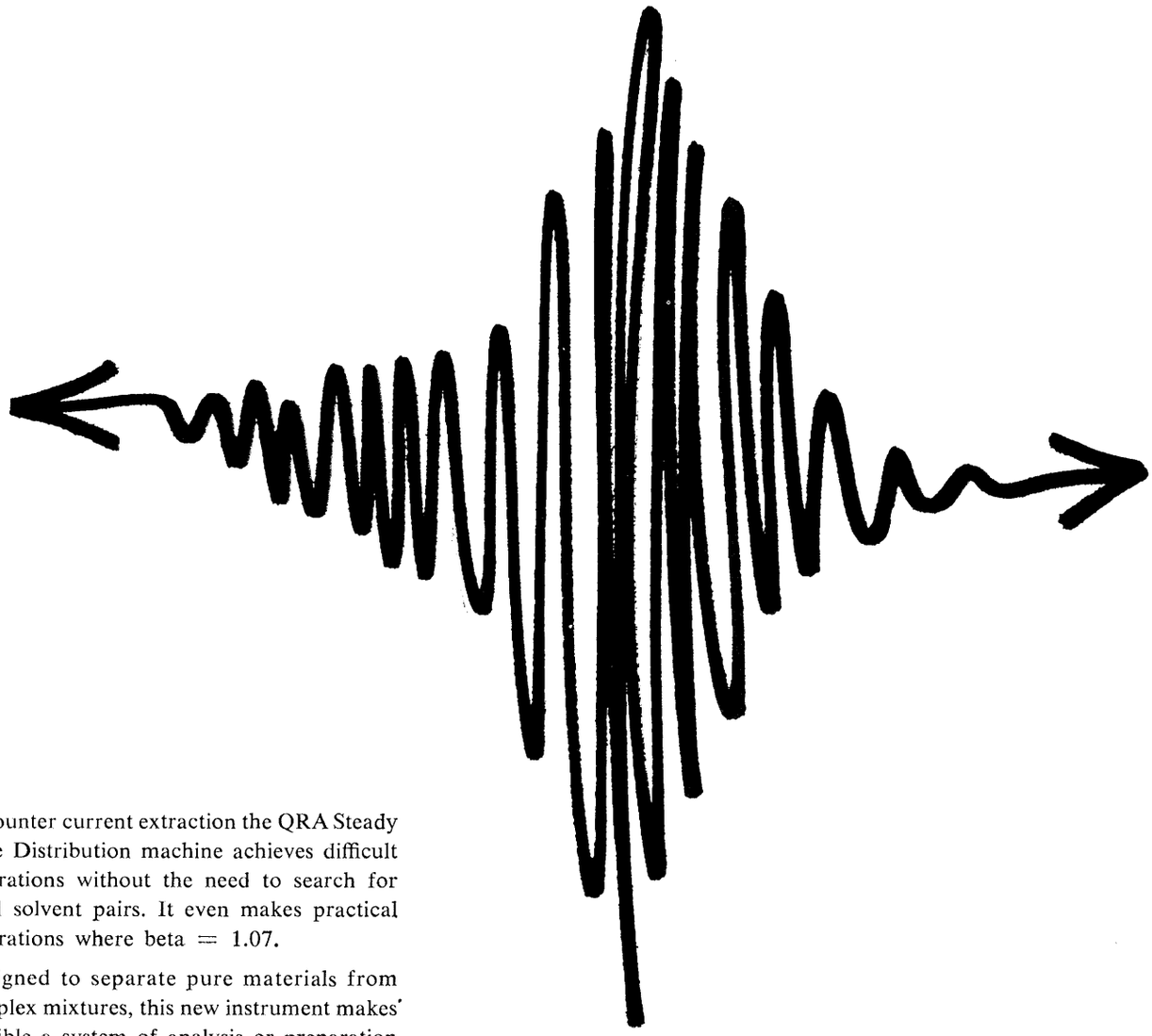
An Automatic Suggestion

If you are assaying large numbers of enzyme samples involving repetitive testing, consider the automated AutoAnalyzer® way. It's rapid (up to 60 samples/hr.), reliable, highly specific and accurate. May be just what you need.

TECHNICON
INSTRUMENTS CORPORATION
Research Park • Chauncey, N.Y.

Technicon International of Canada, Ltd., Montreal • Technicon Instruments Company, Ltd., London • Compagnie Technicon, Paris • Technicon GmbH, Frankfurt/M. • Technicon AB, Stockholm • Technicon, Basle • Technicon Italiana S.r.L., Rome • Technicon Equipment Pty., Ltd., Sydney • Compagnie Belge Technicon, Brussels • Conitech A/S, Copenhagen

Where $\beta = 1.2$...



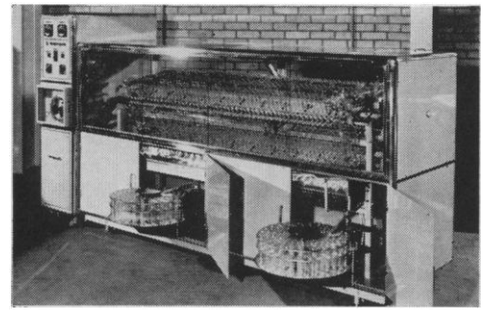
In counter current extraction the QRA Steady State Distribution machine achieves difficult separations without the need to search for ideal solvent pairs. It even makes practical separations where beta = 1.07.

Designed to separate pure materials from complex mixtures, this new instrument makes possible a system of analysis or preparation predicted in theory several decades ago.

Unlike single phase systems, the QRA SSDM moves both solvents in opposite directions, enabling you to separate complex mixtures using relatively few tubes. The key to the flexibility, speed and simplicity of operation of the machine is its program controller. This carries out any sequence of upper to lower transfers. The easy alteration of the ratio of upper to lower phase transfers minimizes the preliminary conditions required to achieve separation. Large numbers of different consecutive separations can be made without changing the solvent system phase volume.

QUICKFIT REEVE ANGEL STEADY STATE DISTRIBUTION MACHINE

for analysis/concentration and isolation of a minor constituent/continuous preparation



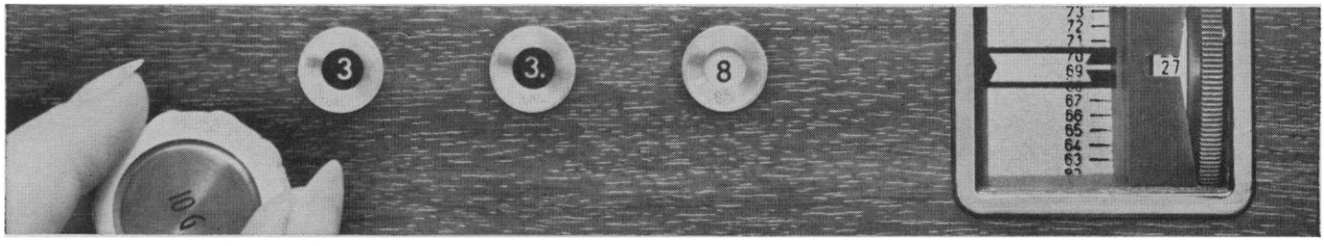
Features:

- Every instrument wet tested with over 1000 transfers.
- Handblown precision glassware.
- Automatic filling and emptying.
- Leak free.
- Precision ball and socket joint.
- No gear train or clutch.
- Available with fraction collectors.

For further information about the Steady State Distribution system and the SSD machine, call or write for our free SSDM booklet.

QUICKFIT REEVE ANGEL
1 BRIDEWELL PLACE, CLIFTON, NEW JERSEY 07014.
PHONE 201-667-6767

NEW LINE OF AINSWORTH BALANCES



GIVES FAST, EASY ALL-DIGITAL READOUT

This new line of substitution type Ainsworth Balances has been designed feature-by-feature to speed accurate weighing. Read-out has been made particularly simple and quick–a straight line of seven digits gives the answer.

Weights are quickly dialed as directed by easy-to-follow "add weight" and "remove weight" signals. Little experience is required to obtain fast, accurate results. Mail coupon today for free, full-color folder giving complete information.

NEW, COMPLETE LINE—a type and price for every need!

Type	SCN	24N	10N	21N	23N
Total Capacity	200 g	120 g	220 g	160 g	160 g
Sensitivity 1 digit in last place	0.1 mg	0.01 mg	0.1 mg	0.1 mg	1.0 mg
color	Brown Hammer-tone	Brown Wood Grain	Blue	Green	Red
Price	$895	$875	$670	$550	$530

A BALANCE FOR EVERY NEED

MEMBER ... NATIONAL CONFERENCE OF STANDARDS LABORATORIES ... Traceability of WEIGHTS to the National Bureau of Standards CERTIFIED By AINSWORTH STANDARDS LABORATORY

MAIL COUPON FOR BULLETIN 665

WM. AINSWORTH & SONS, INC., 2151 LAWRENCE ST., DENVER, COLORADO 80205.

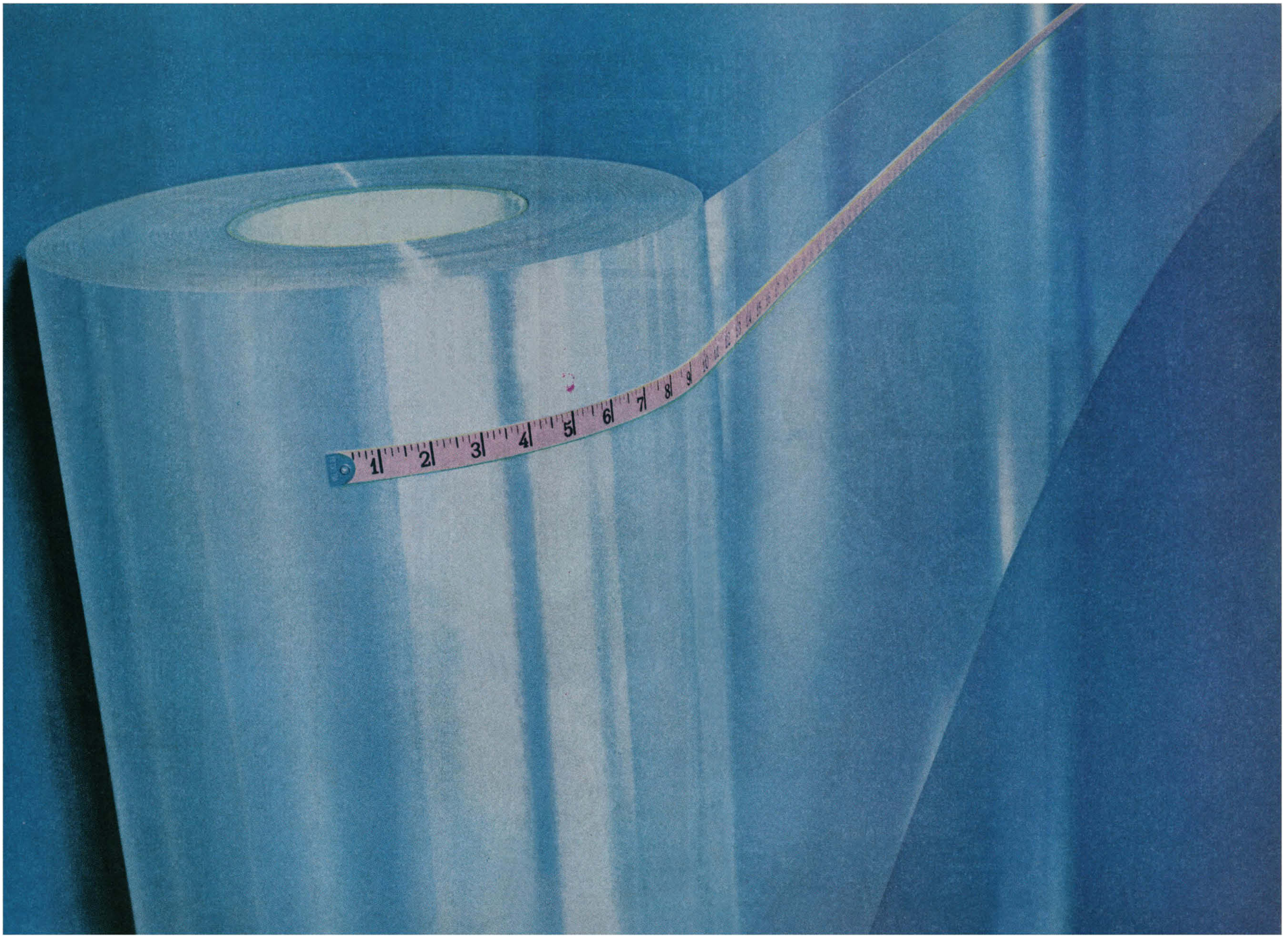
My name_____

Firm name_____

Address_____

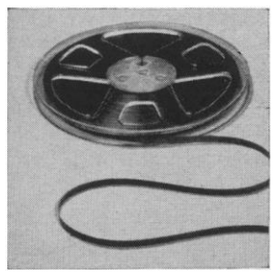
City_____ State_____ Zip_____

WM. AINSWORTH & SONS, INC.

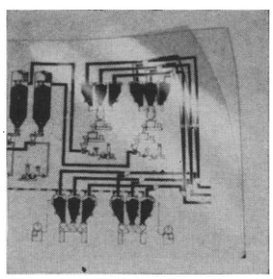


We'll go to any length to make Celanar Polyester Film your best buy!

We mean that literally! Case in point: Customers pointed out that a splice-free roll, tailored to *their* specifications (rather than to the suppliers), would give them a considerable processing advantage. So, unlike the other supplier, we tailor Celanar roll lengths to our customer's specifications. *Your* specifications.

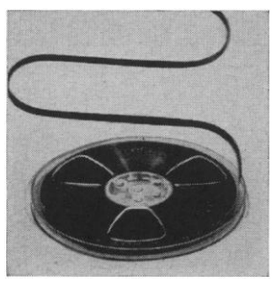


This is just one of the meaningful service advantages causing so many manufacturers to switch to new Celanar polyester film. For magnetic tape. Packaging. Engineering reproduction. Metalizing. Stationery and office supplies. And electrical applications.



Other good reasons include *cleanliness*. New Celanar film is produced in a sealed-off "White Room" clean enough for surgery—the most modern in the industry. For the cleaner the polyester film, the better it processes.

Then there's the fact that Celanar film is *protected against dust contamination* by use of non-fibrous cores. That it may be *shipped with Impact Recorders* to protect you against accepting film jolted and damaged during shipment. And with *temperature recording flags* to alert you to the possibility of undetected harmful environmental changes suffered in transit.



This is the kind of meaningful service you would expect from Celanese Plastics—whose operating philosophy is that the customer, not the supplier, is always right. Celanese Plastics Company, 744 Broad Street, Newark 2, N. J.

Celanese® Celanar®

Celanar® Polyester Film

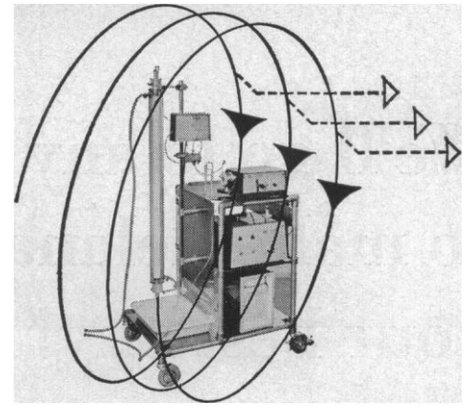
Roll lengths tailored to your specifications, is just one of *six* meaningful service advantages you get when you switch to new Celanar polyester film.

Celanese

Introducing the LKB ReCyChrom for

RECYCLING CHROMATOGRAPHY

NEW INSTRUMENTATION FOR A NEW TECHNIQUE* IN CHROMATOGRAPHIC SEPARATION



The ReCyChrom is equally applicable for preparative and analytical separation of mixtures of large-sized or of small-sized molecules. These molecules do not have to be electrolytes and restrictions on the type of buffer used are less than with other types of chromatography. Components within a narrow range of molecular sizes, usually not resolved on simple gel filtration columns, are separated in the ReCyChrom by allowing the sample to pass repeatedly through the bed, thereby multiplying its effective height many times. Separated fractions and uninteresting or disturbing parts of the effluent may be bled out of the stream after any cycle without interrupting the separation of the remaining components.

The apparatus is especially suitable for grading homologous series of polymers, e.g., dextrans; for routine control of the purity of biochemical preparations such as serum proteins, enzymes and hormones; and for separation of heat labile substances.

One unique advantage of recycling chromatography is the need for columns of only moderate length. Columns in two standard lengths, 60 cm and 100 cm, both with 32 mm bore are available at present. The range of sample volumes accommodated by these columns depends greatly on the nature of the sample. For simple desalting operations or for separation of peptides and amino acids from proteins, a sample of up to *150 ml* is not unusual, whereas for purity controls of radioactively tagged concentrated preparations, quantities down to 1/100 of this volume are feasible. Sample application by pipette is eliminated. The pump sucks sample through a selector valve with a holdup of 150 µl—a reproducible and non-critical method.

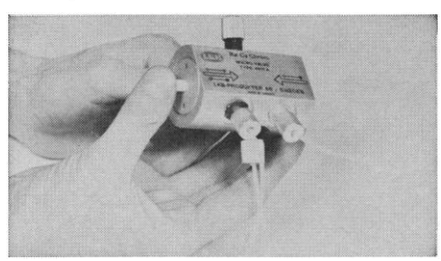
The four main components of the ReCyChrom, namely, a separation column, a peristaltic pump, a selector valve and a flow analyzer are available separately for incorporation into other instrument setups. The specially constructed columns with adjustable plungers at both ends can be sealed completely to eliminate the pressure of water head and permit liquid flow in either direction. Closed system operation and ascending flow maintains even packing and prevents the flow rate from falling off with use, even when beds of material with low mechanical strength (gels) are used.

LKB's specially designed peristaltic pump has a very high flow constancy—0.5% over a period of a week—and a continuously variable pumping rate from 0-390 ml/hr.

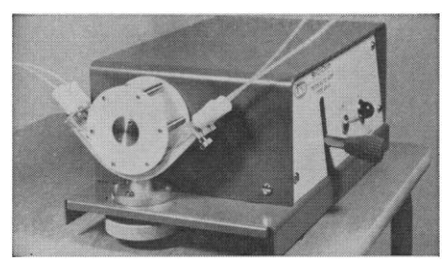
A choice of three flow analyzers, cooling jackets, terminal box, connections and a cart comprise the remainder of the assembly.

*According to J. Porath and H. Bennich

Request literature file 4900S-9 for details



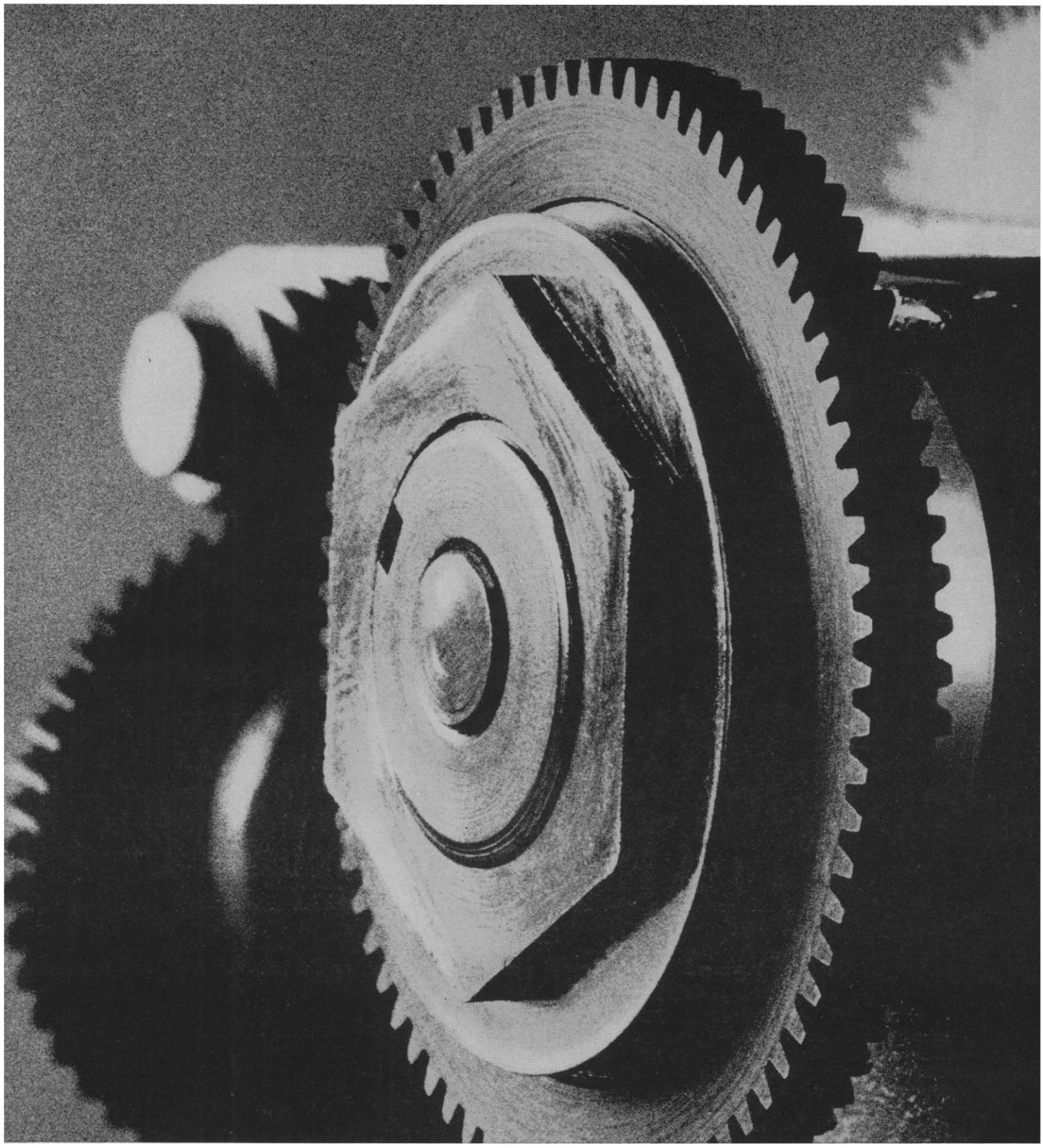
The simple push of a button on the Selector Valve alters the flow circuit from injection or bleeding to recycling.



The Peristaltic Pump has many other uses when not in service for the ReCyChrom.

LKB INSTRUMENTS, INC., 4840 Rugby Ave., Washington, D.C. 20014

LKB PRODUKTER AB, P.O. Box 12220, Stockholm 12, Sweden



We take extra care with our recorder's teeth. Cheap ones are false economy.

Just another cog in the machine.

But stamp it cheaply out of sheet metal. It'll be a little less durable, a little less accurate—a little more prone to play and backlash. You risk trouble.

So our gear-teeth are machine-cut.

Like many other details of construction it makes our recorders a little more expensive. Makes us lose a little business on price-buying. But our customers don't lose. They don't lose control of costly processes, either. No false economies.

They're satisfied. So are we.

You see, we cut our teeth on process control. In steel, steam generation, ceramics and cement—to name a few.

Learned it the hard way. From the back of the plant all the way up to computer control. Learned to be fussy about transducers, recorders, controls. Computers, too.

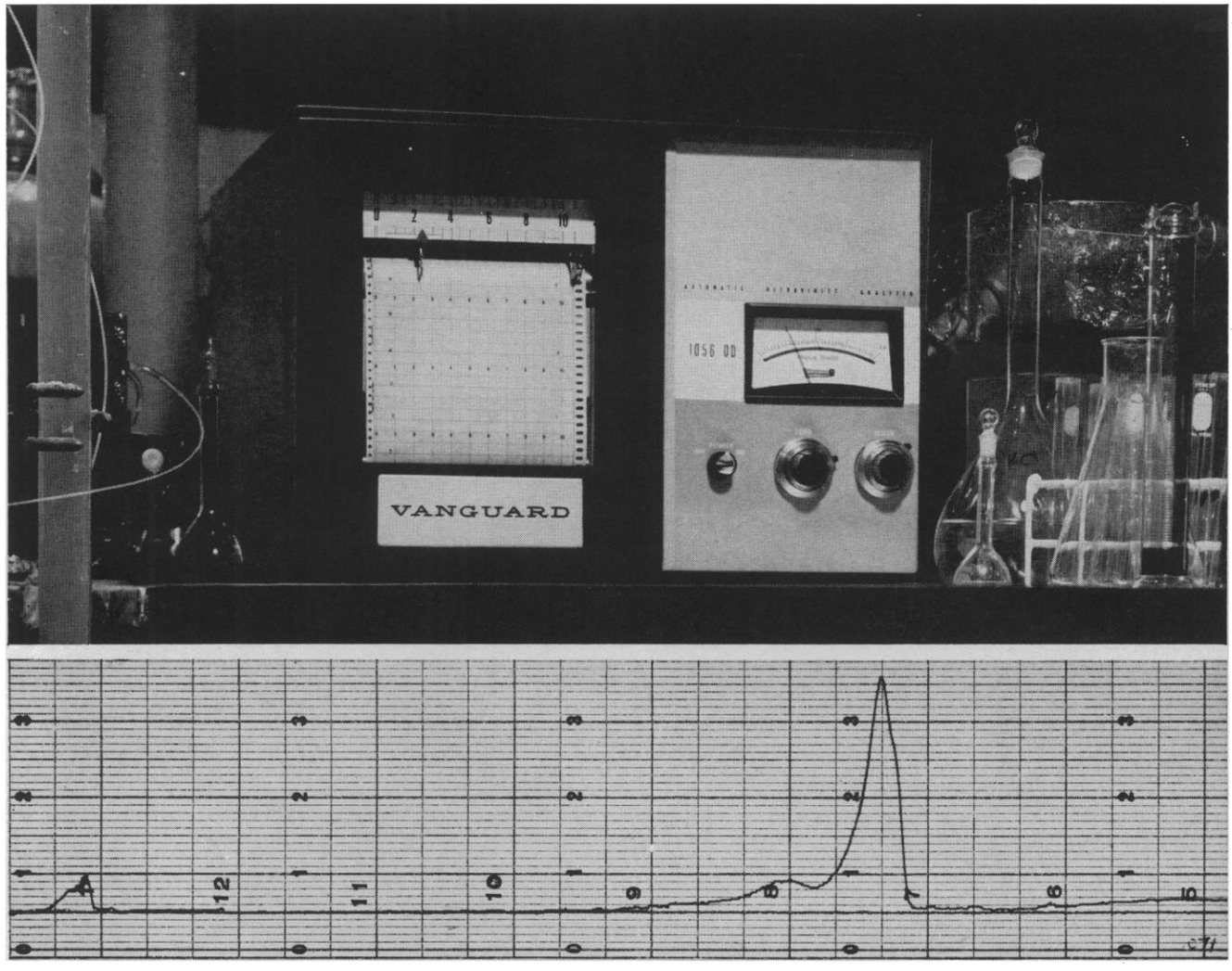
No cog in the machine fouls up a system of ours. And no system gets fouled up by a cog that came from L&N.

If precise control is important to you—remember our slogan. Pioneers in Precision. We're advancing a few frontiers right now.

Ask us about them.

LEEDS & NORTHRUP

Philadelphia 44 • Pioneers in Precision



Typical chromatogram of a mixture of unknown proteins from a DEAE cellulose column. O.D. vs. Volume. Full scale is 2 O.D. units.

Reliable way to run UV analysis automatically at any absorption band you select

The TMC-Vanguard Model 1056-OD is an automatic ultra-violet analyzer, designed for extreme versatility and reliability. It has two independent logarithmic converters which provide a chart recording of the optical density of effluent from a chromatographic column, the ordinate of which is linear with optical density. A plane diffraction grating monochromator makes a continuous energy range available from 200 millimicrons well into the visible spectrum. Wave length settings can be made to an accuracy of 1 mu by means of a simple dial control. This makes it possible to run each experiment at a wave length setting providing best chart resolution for the sample of interest.

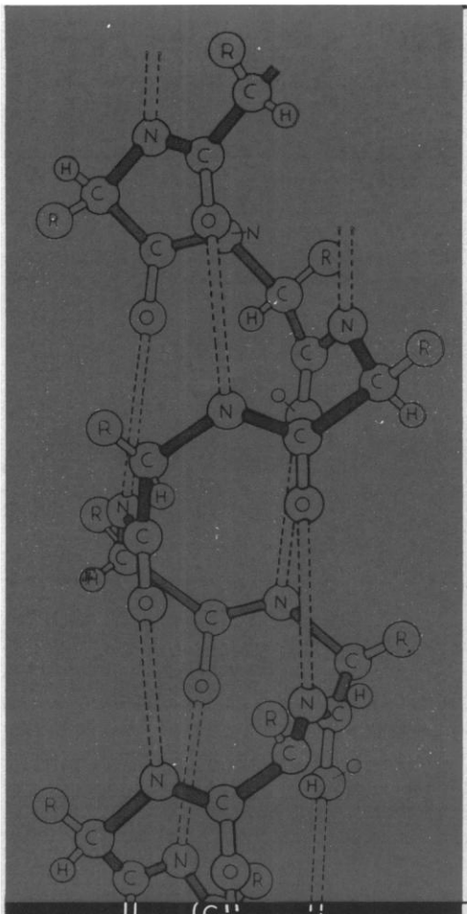
Split-beam operation of the 1056-OD, utilizing sample and reference cuvettes, provides continuous base line compensation for gradient elutions or other applications where the optical density of the eluent may change.

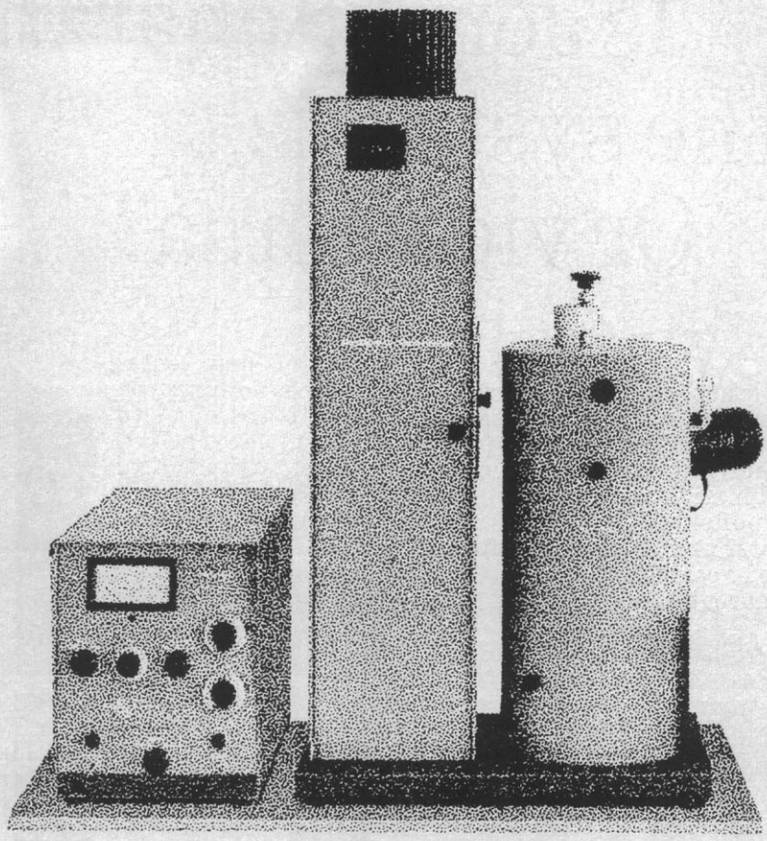
The location and identification of test tubes containing ultra-violet absorbing fractions is speeded by an automatic chart-marking system. Of course, the detection system is completely self-contained and light-shielded. Solid-state electronics are used throughout. Application assistance and field service are assured by TMC's world-wide facilities.

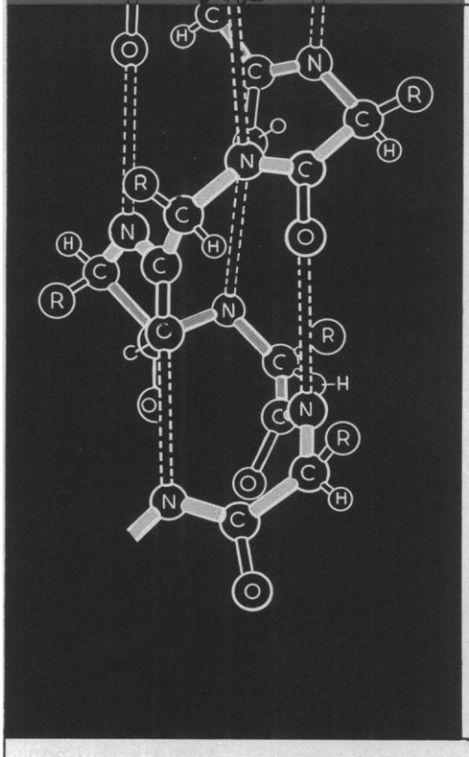
For complete specifications on the Model 1056-OD, contact nearest office or write: Vanguard Instrument Corporation, 441 Washington Ave., North Haven, Conn.

TMC VANGUARD INSTRUMENT CORPORATION

A SUBSIDIARY OF TECHNICAL MEASUREMENT CORPORATION







BY REQUEST: *A LOW-TEMPERATURE OSMOMETER FOR BIOCHEMISTS*

A number of researchers have asked for a low temperature version of the Mechrolab High Speed Membrane Osmometer. And here it is. Equipped with thermoelectric cooling, the Model 503 allows operation down to 5° C. Overall temperature range is 5° to 65° C, making it a very versatile instrument indeed.

Best news of all, aside from the fact that you're assured of the stability of your materials, is that the 503 requires *less than 1 ml.* of sample solution.

RAPID AND PRECISE

The 503 delivers the same rapid and precise performance as other Mechrolab 500 Series instruments, now widely used in chemical and biochemical laboratories. Osmotic and oncontic pressures are automatically read in 3-10 minutes, thereby allowing complete determinations of number-average molecular weights in one hour or less (20,000 to 1,000,000). Price $5,550.

Your technically-qualfied Mechrolab field man has more details; or write us at 1062 Linda Vista Ave., Mountain View 16, Calif.

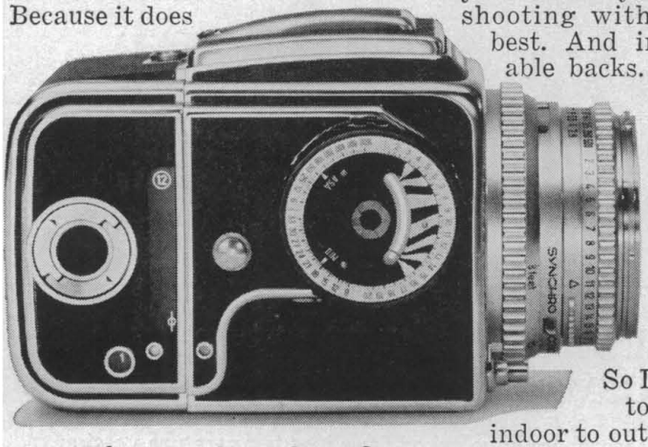
HEWLETT PACKARD hp MECHROLAB DIVISION

"Advanced Instrumentation for Increasing Laboratory Productivity"

Is Jerry Schatzberg part of "the system"? Or vice versa?

Clockwise: Hasselblad 500C with 80mm lens and light meter knob, 150mm lens, sunshade, filter, eye-level prism finder, 250mm lens, magnifying hood and film magazine.

We don't really know. But let us explain. "The system" we refer to is the Hasselblad system. And it offers the photographer a unique and complete combination of interchangeable components that allows for greater versatility than anything called "camera." Because it does



more, photographers depend on it more. To the exclusion of "cameras." And after a while we wonder whether they become part of it, or it of them? We asked Jerry Schatzberg.

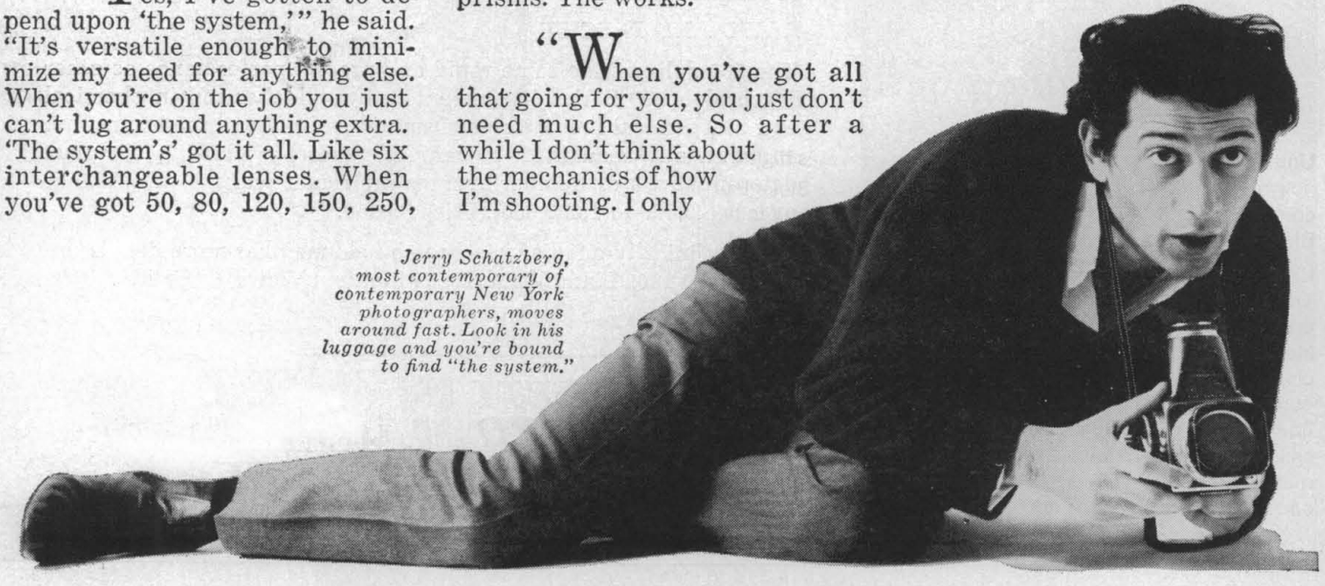
"Yes, I've gotten to depend upon 'the system,'" he said. "It's versatile enough to minimize my need for anything else. When you're on the job you just can't lug around anything extra. 'The system's' got it all. Like six interchangeable lenses. When you've got 50, 80, 120, 150, 250, and 500mm lenses, there's nothing you can't take. And when they're all Zeiss, with manual and automatic diaphragm, and coupled EVS system, you know you're shooting with the best. And interchangeable backs. If I didn't have 'the system,' I'd have, say, three or four cameras loaded with different film. Not for me. 'The system' has 4 interchangeable magazines, 3 for roll film, one for cut film. So I can go from color to black and white, indoor to outdoor film, mid-roll.

"Viewfinders, too. 'The system' lets me see the shot the way I want to see it. (Not any one set way like with 'cameras.') It gives me a choice of eye-level prisms, magnifying hoods, reflex prisms. The works.

"When you've got all that going for you, you just don't need much else. So after a while I don't think about the mechanics of how I'm shooting. I only think about shooting. You might say 'the system' becomes an extension of myself."

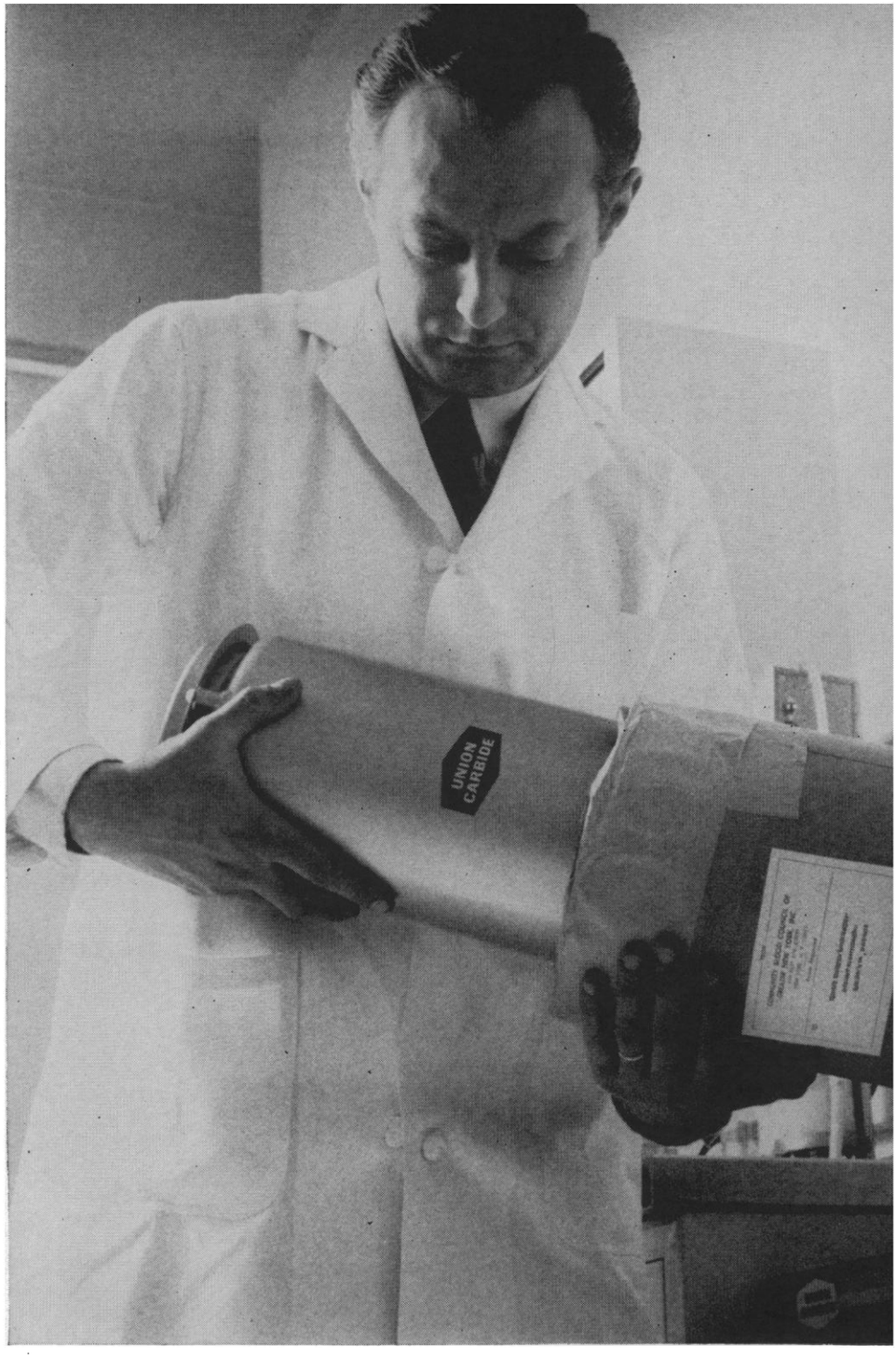
There's our answer: "The system" *does* become part of Jerry Schatzberg. It never gets in the way of the picture. It leaves the photographer free to see, to feel, to shoot. Take 5 cameras out with you. See how much or how little they get in your way. You'll let "the system" become part of you. For literature write: Paillard Incorporated, 1900 Lower Road, Linden, New Jersey.

HASSELBLAD



Jerry Schatzberg, most contemporary of contemporary New York photographers, moves around fast. Look in his luggage and you're bound to find "the system."

Inside: biological specimens –completely frozen –shipped 3 days ago from 5,000 miles away.



Unusual? Not today! Such shipments are now routine for a number of research and commercial laboratories—thanks to LINDE Biological Transports.

It's easy to see why. A LINDE Biological Transport holds specimens below –130°C up to a week. Rugged, lightweight, the Model BT-3 shown weighs only 11 lb. fully charged with liquid nitrogen. Special porous specimen holder block absorbs liquid nitrogen completely, eliminating spillage during shipment—which can be made via postal service or common carrier. Patented LINDE Super Insulation assures high thermal efficiency.

LINDE Biological Transports were developed to the exacting requirements of the National Cancer Institute. They were field-proved in tropical New Guinea where, in a search for the cause of the rare neurological disease, Guru, brain specimens had to be shipped frozen to a central location for study.

Want to learn more about these unique Biological Transports—or any of the large family of LINDE brand cryogenic products? Fill out the coupon, attach to your letterhead, and mail to us.

CHECK COUPON—CLIP—ATTACH TO BUSINESS LETTERHEAD

Dept. SC-92, Linde Division
Union Carbide Corporation
270 Park Avenue, New York, N. Y. 10017

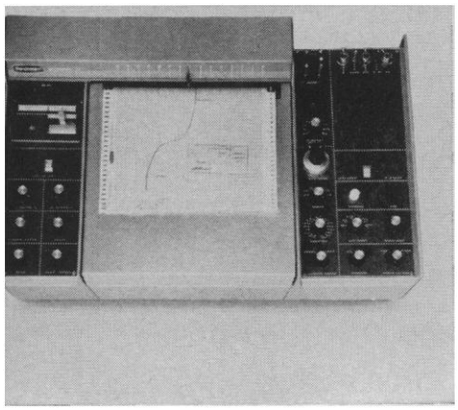
Please send me information on:

☐ LINDE Biological Transports, (F-2243).

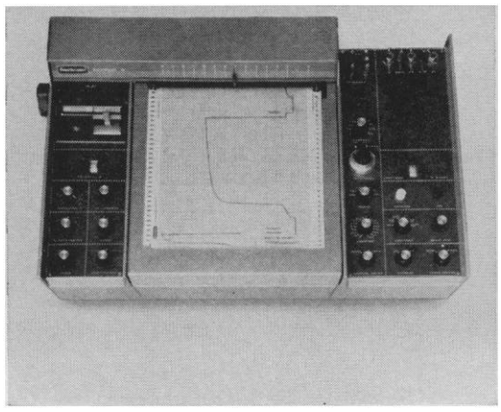
Other cryogenic equipment: _____

☐ PLEASE ADD MY NAME TO YOUR MAILING LIST.

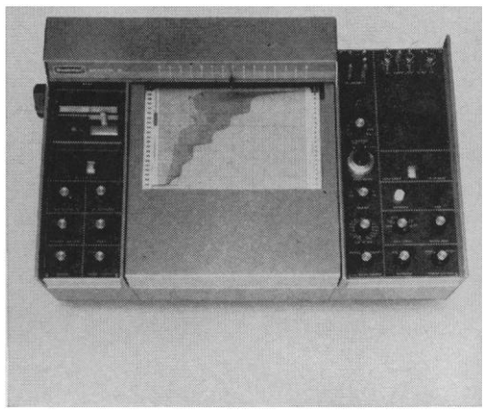
UNION CARBIDE **CRYOGENIC PRODUCTS**



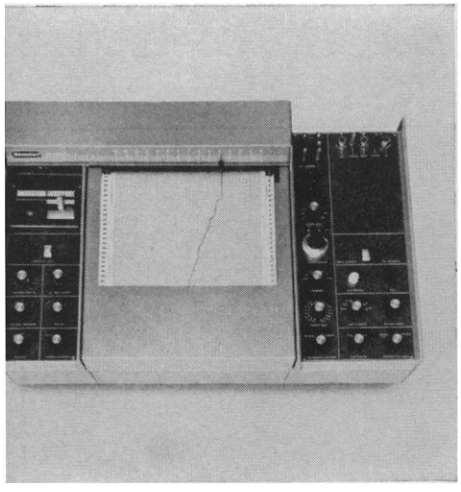
Coulometer,



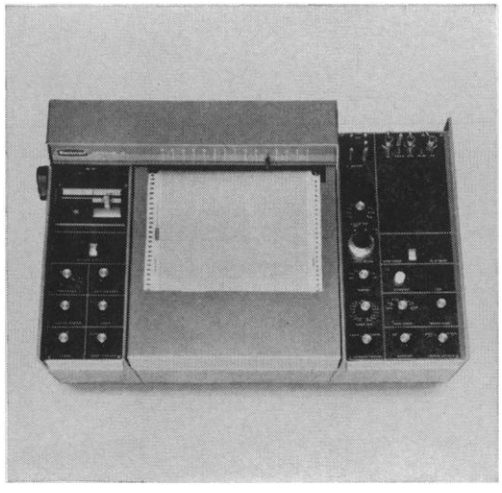
Chronopotentiometer,



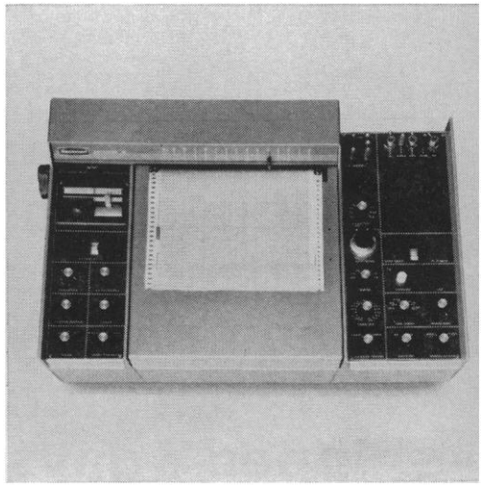
Polarographic Analyzer,



pH Recorder,



etc.,



etc.,

etc....

the new Electroscan* 30

The etceteras are up to you. We found a dozen names for the new Electroscan 30, but we're sure there are more. In fact, we think the Electroscan 30 is a complete electrochemical laboratory.

It's been evaluated for coulometric titrations, chronopotentiometry, three-electrode polarography, cyclic voltammetry, rapid scan voltammetry, electrodeposition, chronoamperometry, stripping analysis, pH and ORP measurements. What else it will do is up to you, your problems, and your imagination.

The standard Electroscan 30 features a controlled DC current power supply, a high-speed, high-impedance, 10-inch recorder, and a wide variety of electrodes and sensors. It is also available with a built-in potentiostat accessory which converts the controlled current supply into a controlled voltage supply. And it's backed by Beckman's 30 years experience as the leader in electrochemical measurement.

If you've had to build your own electrochemical instruments, or if you've never taken advantage of the techniques of electroanalysis, find out what the Electroscan 30 can do for you. For details and specifications, and a copy of the informative new electrochemical primer, contact your Beckman Sales Engineer or write for Data File LES-165.

Then tell us about your etceteras.

*TM

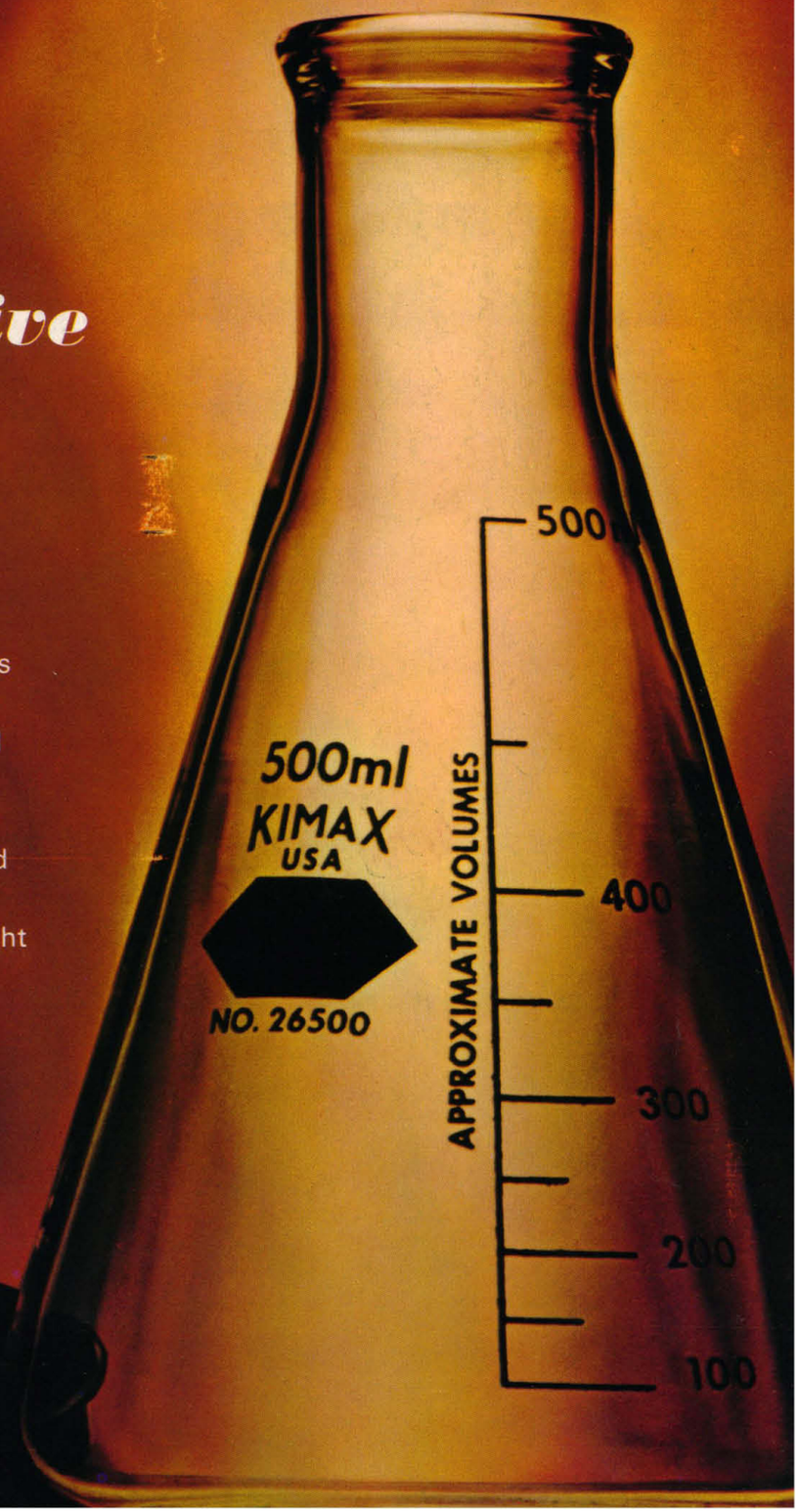
Beckman INSTRUMENTS, INC.

SCIENTIFIC AND PROCESS INSTRUMENTS DIVISION

FULLERTON, CALIFORNIA • 92634

INTERNATIONAL SUBSIDIARIES: GENEVA, SWITZERLAND; MUNICH, GERMANY; GLENROTHES, SCOTLAND; PARIS, FRANCE; TOKYO, JAPAN; CAPETOWN, SOUTH AFRICA

Our Erlenmeyers are becoming pretty exclusive

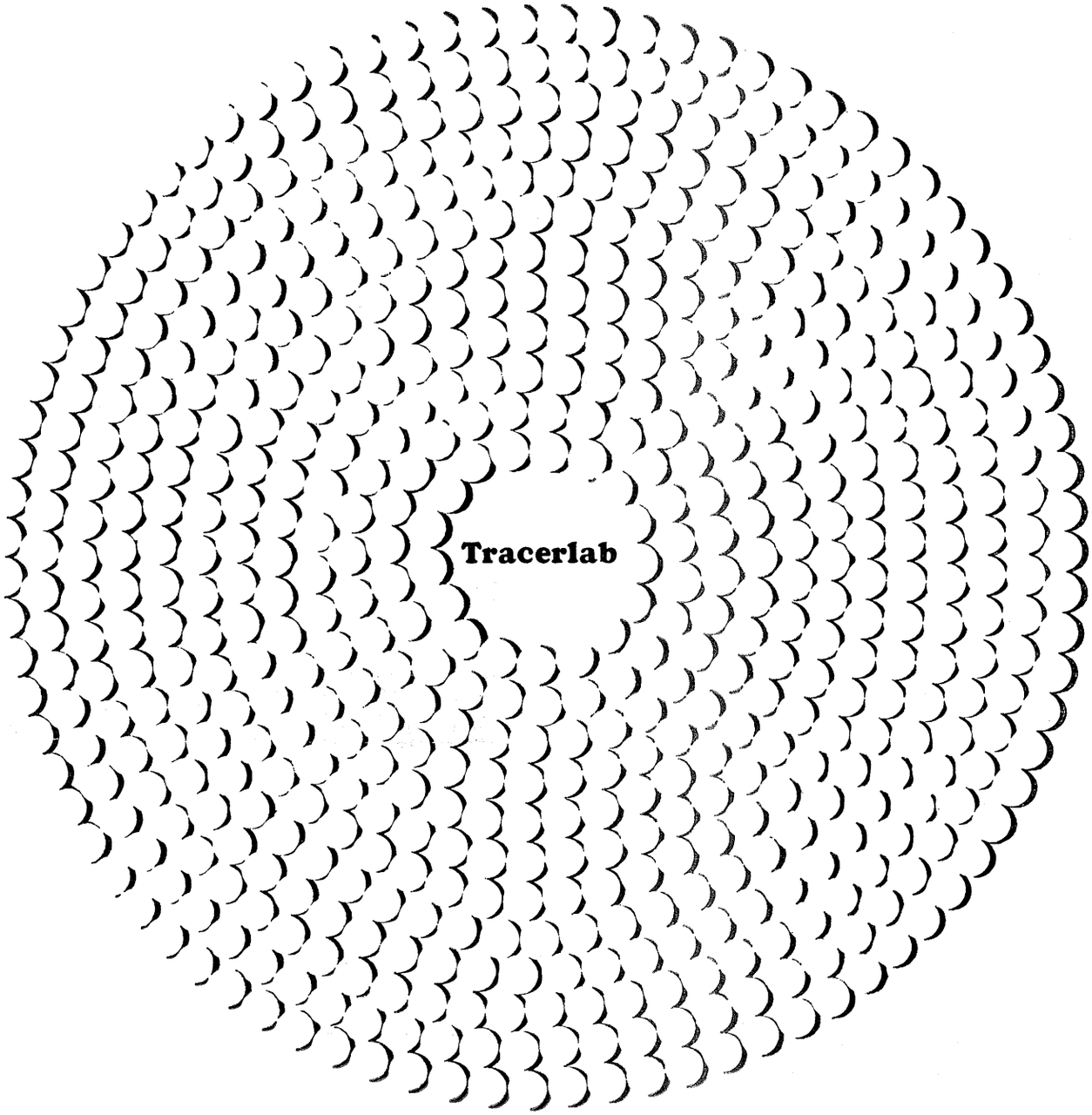


In fact, a growing number of leading laboratories are using nothing else. That's fine with us. Probably they buy only KIMAX® because of the features we build into our Erlenmeyers. Like the tooled heavy-duty neck finish that makes them last longer. Or the full line with graduated scales, in standard or screw cap, narrow and wide mouth designs. Or our liquid tight surgical rubber cap that's autoclavable.

Want to be exclusive? Costs nothing extra. Just say "KIMAX Erlenmeyers" to your dealer.

OWENS-ILLINOIS

maker of Kimble Products
Toledo, Ohio



...your single source for so many radiochemicals each one guaranteed for purity

Same-day personal service . . . overnight delivery by fastest carrier • low prices throughout . . . dependable technical team always available. For catalog and custom-synthesized compounds, call Dr. John Leak COLLECT: TW 4-6600, area code 617.

LFE | *TRACERLAB*

A Division of Laboratory For Electronics, Inc.

WALTHAM, MASSACHUSETTS 02154

Film Badge Service • Health Physics • Bioassays • Sources • Nuclear Instrumentation • Radiochemicals
Radioactive Waste Disposal • Radiation Monitoring Instrumentation • Isotope Applications

INTRODUCING THE EAI 680

an economical, high-performance hybrid computer

Resulting from an extensive study of the scientific computational needs of over 1,000 EAI customers, the EAI 680 sets a new standard for economical analog/hybrid simulation. The compact solid-state EAI 680 combines for the first time outstanding dynamic performance with the high accuracy formerly available only in slower, more expensive large-scale computers.

The EAI 680 is truly a computer to grow with... start with a basic analog computer ... add up to 156 amplifiers and an extensive complement of non-linear and digital logic modules ... then expand with a fast, stored-program digital computer. Thus the EAI 680 keeps pace with the user's ability and requirement to develop more sophisticated models for simulation.

The EAI 680 makes the benefits of hybrid computation available for a wide variety of applications: simulation and control in the process industry; data reduction and physiological model building in the life sciences laboratory; the teaching of computational techniques and advanced problem-solving in the university; and advanced system simulation in the aerospace industry.

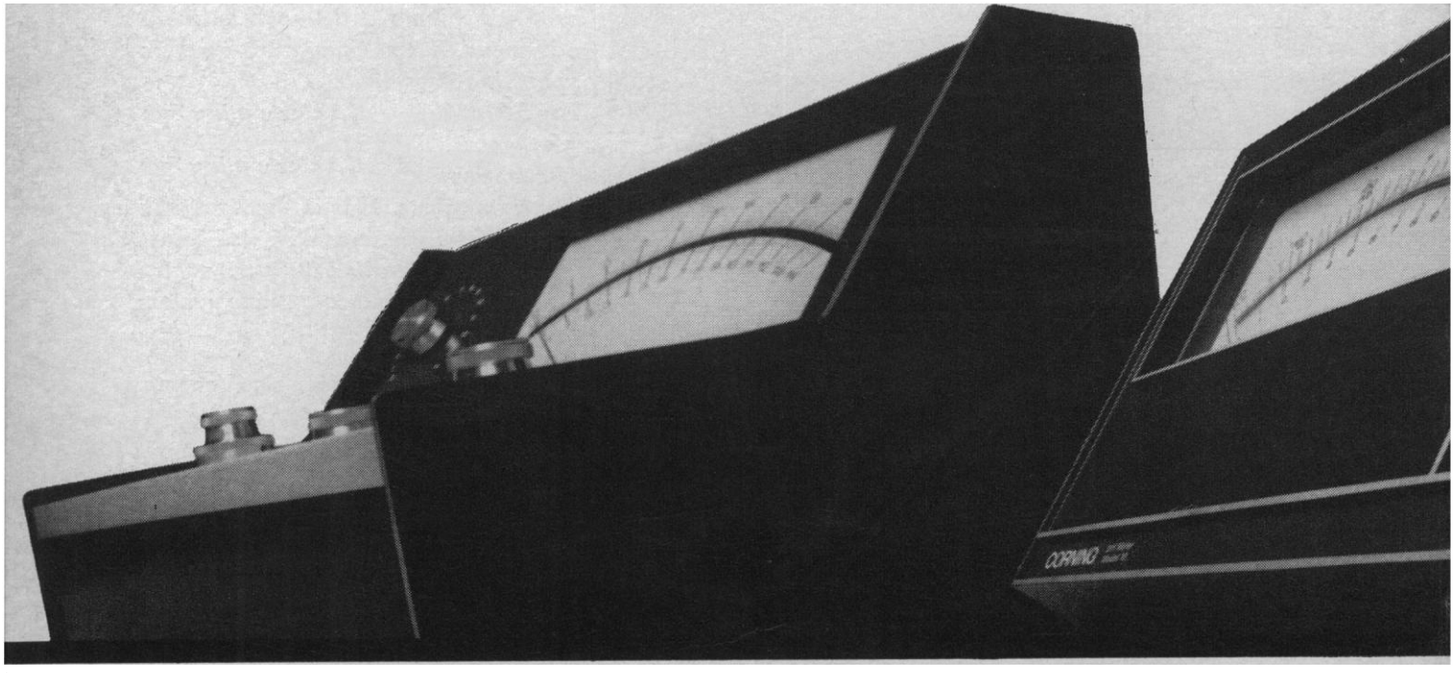
The EAI 680 Scientific Computing System is supported by the full line of EAI customer services including software, customer training, world-wide service facilities, and an extensive applications library. Write for full details on this new, attractively priced hybrid computing system, the EAI 680.

Some performance data and features:

- ***Amplifiers can be used at full amplitude within their 500 kc bandwidth.***
- ***Linear component static accuracy is .01%, and typical multiplier static accuracy is .015%.***
- ***Self-contained digital control and uncommitted general purpose logic.***
- ***Microsecond, low-drift electronic mode control.***
- ***Simplified patching and control organization allows effective use of EAI 680 by newly-trained programmers.***
- ***Display wing expansion for display of both high-speed and real-time information.***

EAI ELECTRONIC ASSOCIATES, INC., *West Long Branch, New Jersey*

Borrow a CORNING®



Are you demanding too little from your pH instruments? Find out.

Evaluate for yourself—in your lab, at your leisure—the new performance standards designed into CORNING meters . . . the stability that only solid-state circuitry gives to performance, the reproducibility that only taut-band suspension meters give to readings, the lab-environment durability that you get only with die-cast aluminum and protective epoxy coating.

Read the following descriptions, then choose the CORNING meter that best suits the work you do. Borrow it . . . and see if you've been demanding too little from your instruments.

CORNING Model 12 Research pH Meter, left—This precision instrument allows you to standardize on any 1-pH-unit expanded range, then switch to and read on others without restandardizing. Reproducibility on expanded scale is better than ±0.002 pH. Price is **$595** complete with accessory kit.

pH Meter

☐ *Check here for an evaluation loan,* and check the meter below that you want to borrow. We will have your CORNING Scientific Instruments dealer contact you to arrange a loan of the meter you specify. No obligation.

☐ *Check here for descriptive bulletin only.* Please check the meter below on which you want literature.

For evaluation loan or literature, send this coupon to: Dept. **SC-9,** Corning Glass Works, 11 Blackstone St., Cambridge, Mass. 02139.

☐ CORNING Model 12 Research pH Meter ☐ CORNING Model 10 Expanded-Scale pH Meter ☐ CORNING Model 7 General-Purpose pH Meter

Name_____

Title_____

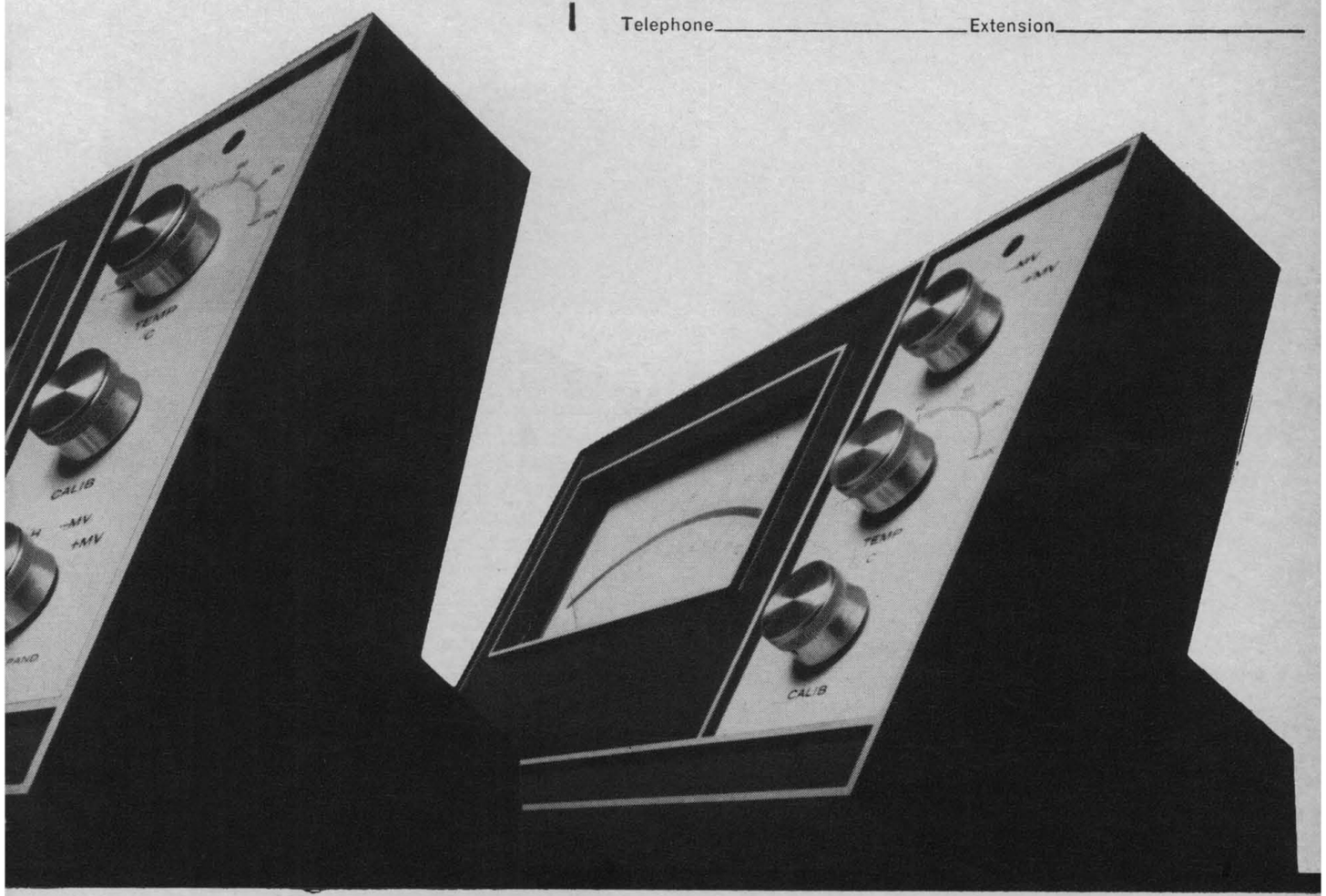
Organization_____

Department_____

Address_____

City_____ State_____ ZIP_____

Telephone_____ Extension_____

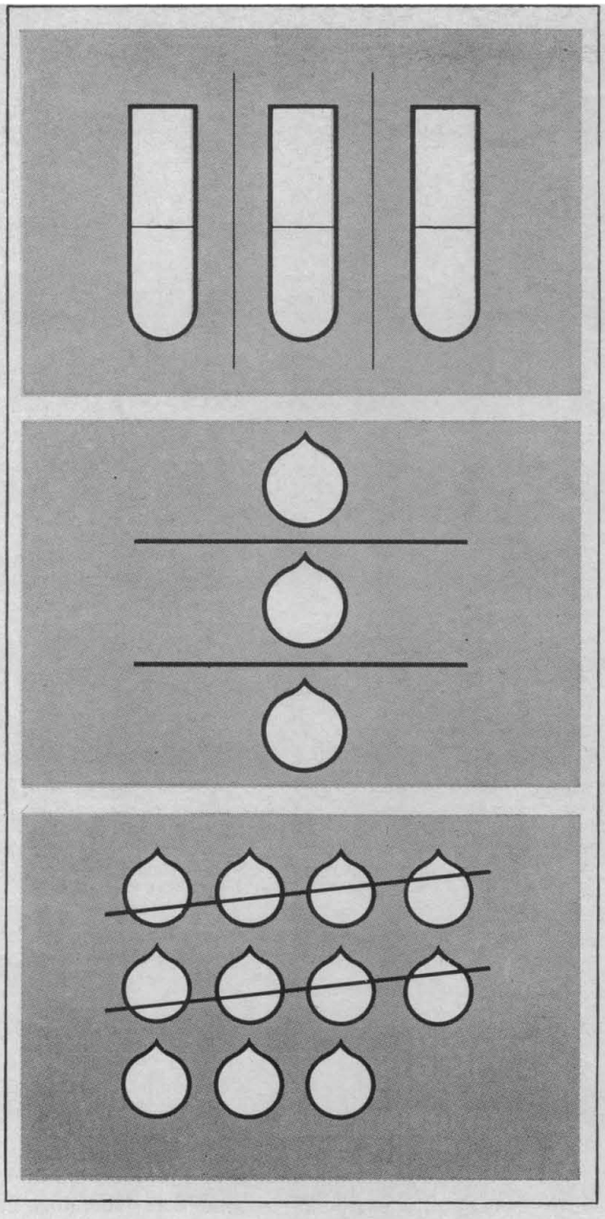


CORNING Model 10 Expanded-Scale pH Meter, center—The longest—10 inches—meter scale on any lab pH instrument lets us put more scale divisions on it, lets you read easily to 0.01 pH on full-scale expansion of any 3 pH units, and to 0.05 pH on the 0-14 range. Reproducibility is better than ±0.005 pH. $485 with accessory kit.

CORNING Model 7 General-Purpose pH Meter, right—Speed up routine work without risking accuracy. Drift of less than 0.01 pH/day means stability that provides dependable measurements all day without restandardization. Reproducibility is better than ±0.02 pH. $330 with accessory kit.

Borrow any one of these meters and you will get the unique CORNING pH Electrode with Triple-Purpose Glass Membrane in its accessory kit. This is the *one* remarkably stable electrode that does the general-purpose, high-alkaline region, and high-temperature work that used to require *three* electrodes.

CORNING
SCIENTIFIC INSTRUMENTS



collect fractions
separated by
column chromatography

collect fractions
separated by
distillation

fill culture tubes—
automatically

by

VOLUMETRIC SIPHONING

•

TIMED FLOW

•

DROP COUNTING

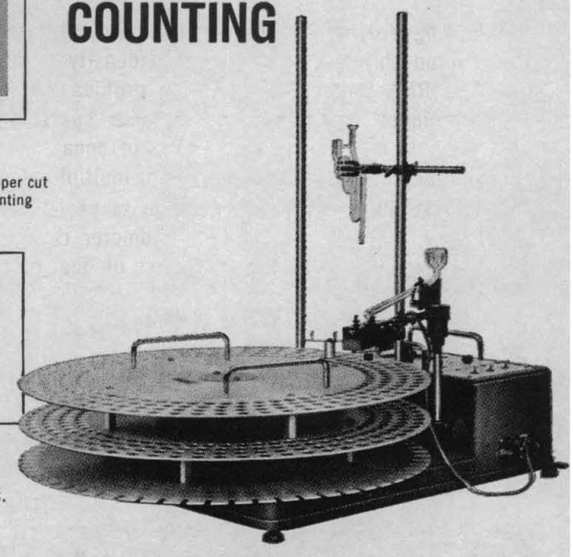
Select the system to fit your needs:

3 ml. to 20 ml. siphons for volumetric cuts | 18 second to 2 hour intervals for time-based cuts | 1 to 400 drops per cut for drop counting

operates on 115 volts 60 cycle or 230 volts 50 cycle

	Turntables				
WCLID Model #	Diameter	Tube Size (mm.)	Vol. Range (ml.)	Pattern Holes	Rows
1205-E2 (Item #12062)	15"	13 x 100	1 to 5	150	3
1205-D3 (Item #12063)	24"	18 x 150	3 to 20	240	4

- dependability—in laboratory or cold room
- versatility—change methods quickly, simply
- capacity—holds up to 240 test tubes, culture tubes, centrifuge tubes.



WITH THE RELIABLE* WCLID **automatic fraction collector**

*Reliability guaranteed—the only Fraction Collector with a 2-year warranty

WARNER-CHILCOTT LABORATORIES
INSTRUMENTS DIVISION
RICHMOND, CALIFORNIA ■ MORRIS PLAINS, NEW JERSEY

available from your WCLID • General Diagnostics distributor

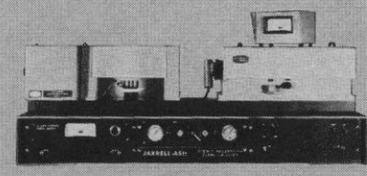
Three Different Atomic Absorption Instruments

FOR MULTI-ELEMENT ANALYSIS

The first direct reading polychromator in the atomic absorption field. A precision analytical instrument for high speed quantitative analysis of very low concentrations of metallic elements in agricultural, biomedical or industrial samples.

- **performs up up to 600 analyses per hour**
- **combines both atomic absorption and flame emission spectrometry**
- **sound-muffled HETCO* Burner**
- **choice of readout systems**
- **all solid state electronics**
- **determines up to 12 elements simultaneously**

Model 82-600

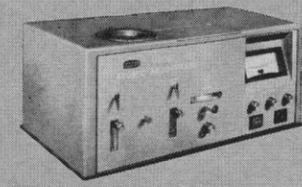


FOR MAXIMUM VERSATILITY

Designed to handle difficult trace metal analysis problems, this Jarrell-Ash unit is the most versatile atomic absorption spectrometer available today. Based on the famous Model 82-000 Ebert Spectrometer, the system contains a unique multi-pass optical system and provides facilities for altering system components and adding new developments. Easy spectrum scanning with electrical wavelength drive!

- **performs up to 120 analyses per hour**
- **combines both atomic absorption and flame emission spectrometry**
- **sound-muffled HETCO* Burner (pre-mix burner also available)**
- **standard meter readout or optional direct plug-in recorder readout**
- **lowest possible detection limits**
- **choice of interchangeable burners, gratings, photomultiplier and hollow cathode tubes**
- **six-lamp Hollow Cathode Turret**

82-500 Series



FOR ROUTINE ANALYSIS

This Atomic Absorption/Flame Spectrometer has been designed specifically for routine analysis where dependability, simplicity of operation, compactness and price are of prime importance. Many desirable features of the more costly instrument have been incorporated into this budget price atomic absorption spectrometer.

- **performs up to 120 analyses per hour**
- **combines both atomic absorption and flame emission spectrometry**
- **sound-muffled HETCO* Burner**
- **standard meter readout or optional plug-in recorder readout**
- **pre-aligned optics**
- **reliable all solid state electronics**
- **requires less than 3 sq. feet of bench space**
- **simple to operate — minimum number of controls**

Model 82-700

Need more convincing? Write for complete technical information about the instrument that interests you. Copies of new 16mm color sound movie "Atomic Absorption Spectrometry" now available. Write: Jarrell-Ash, Film Library.

*HETCO is the name of a new High Efficiency Total Consumption Burner by Jarrell-Ash

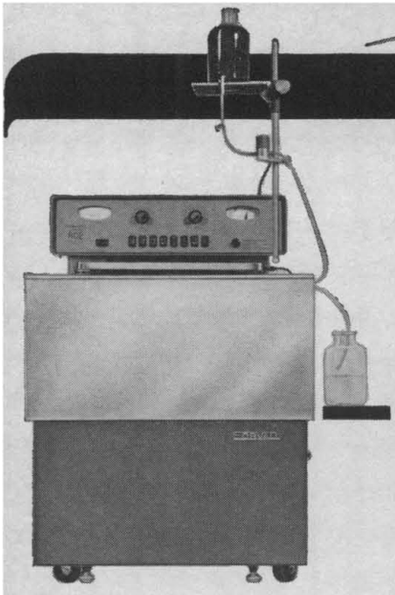
Jarrell Ash

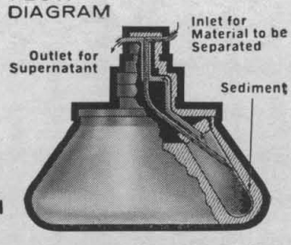
ANALYTICAL INSTRUMENTATION • SPECTROSCOPY • GAS CHROMATOGRAPHY • X-RAY DIFFRACTION • MASS SPECTROMETRY

JARRELL-ASH COMPANY • 530 Lincoln Street, Waltham, Massachusetts 02154

JARRELL-ASH (Europe) S. A., Rue de la Jaluse 6, Le Locle, Switzerland
NIPPON JARRELL-ASH CO., LTD., Kyoto, Japan

SORVALL GUIDE

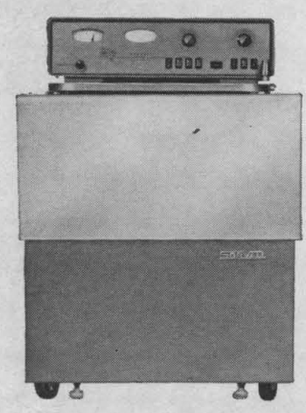




"Szent-Gyorgyi & Blum" KSB TUBE-TYPE CONTINUOUS FLOW SYSTEMS (as shown on RC-2)— Available for SS-1, SS-1A, SS-3, SS-4, RC-1 & RC-2. Separation achieved in 8, 4, or 2 Tubes speedily and conveniently.

†RC-2 AUTOMATIC SUPERSPEED REFRIGERATED CENTRIFUGE — 20,000 rpm — 48,200 x G. — Capacity to 1,890 ml. Six Angle and Horizontal Rotors available. Shown set up for unique SORVALL Continuous Flow centrifugation.

†THE RC-2, RC-3 AND SS-3 are now equipped with a new exclusive SORVALL Speed Selector (patent applied for) featuring rapid automatic acceleration to all speeds from 500 rpm to maximum, and capable of accurately maintaining preset speed with all rotors regardless of fluctuation in line voltage.

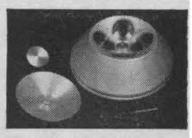


†RC-3 GENERAL PURPOSE AUTOMATIC REFRIGERATED CENTRIFUGE—5,000 rpm — 6,975 x G (with HG-4). 11 Angle and horizontal rotors — accepts wide selection of tubes and bottles from 1 ml to 650 ml. Rapid acceleration and deceleration.

BR-4, BR-4T, & HG-4 Rotors for use only with RC-3

The following catalogs plus individual product literature available on request: for SC-9-GP

- **PRODUCT GUIDE** for SORVALL Centrifuges & Laboratory Instruments
- **PRICE LIST & ORDERING SPECIFICATIONS**
- **CATALOG of TUBES, ADAPTERS and ACCESSORIES**



BR-4 Two-Liter General-Purpose Rotor (with stainless steel cups & screw covers) Up to 5,000 rpm — 5,140 x G

BR-4T Blood Bag Rotor (with Teflon-lined cups) Up to 5,000 rpm — 5,140 x G

HG-4 Swinging Bucket 4 x 650 ml Compartments Up to 5,000 rpm 6,975 x G

Types M & SP/X Rotors also for use with RC-3

ROTORS FOR SORVALL SS-3, SS-4, RC-2 AND RC-3

SS-34 — 8 x 50 ml Superspeed. Adapts to Continuous Flow. To 20,000 rpm 48,200 x G

GSA — Large-Capacity. 1,890 ml (operating). 6 Compartments. To 10,000 rpm 16,300 x G

SM-24 — 24 x 15 ml Superspeed. To 16,000 rpm 31,550 x G

HB-4 — Swinging Bucket 4 x 50 ml — Wide range of Tubes and Accessories. Also for density gradient work. To 10,000 rpm — 16,300 x G

SE-12 — 12 x 15 ml, 40° Angle. To 20,000 rpm 41,545 x G

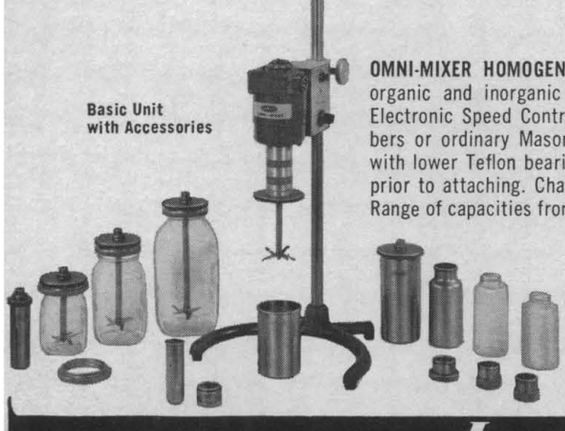
SU — SORVALL-Sharp for virus, particle counting. 8 cells. To 20,000 rpm — 31,500 x G (not recommended for RC-3)

SS-1 SUPERSPEED ANGLE CENTRIFUGE — 16,000 rpm — 31,000 x G. The original concept in Superspeed Angle Centrifuges. Also, the SS-1A, same as above but watercooled for extra-heavy duty.

†SS-3 AUTOMATIC SUPERSPEED CENTRIFUGE — 17,000 rpm — 34,800 x G. Easily the most advanced table-top centrifuge available today.

SS-4 MANUAL SUPERSPEED CENTRIFUGE — 17,000 rpm — 34,800 x G. The modern manually-controlled centrifuge. Complete control panel snaps out for remote control.

ONE BASIC MOTOR ASSEMBLY can be used for any one of five different rotors in this range of Small and Medium Centrifuges. Exceptional versatility in the number and types of tubes and adapters accommodated permits hundreds of combinations.



Basic Unit with Accessories

OMNI-MIXER HOMOGENIZER For rapid, high-speed safe homogenizing of many organic and inorganic materials. Simple yet efficient. Direct overhead drive. Electronic Speed Control maximizes torque at all speeds. Stainless steel chambers or ordinary Mason jars accommodated. Autoclavable rotor knife assembly with lower Teflon bearing available. Chambers and jars may be filled and sealed prior to attaching. Chambers may be lowered into temperature regulating bath. Range of capacities from 5 ml to two quarts for macro work.

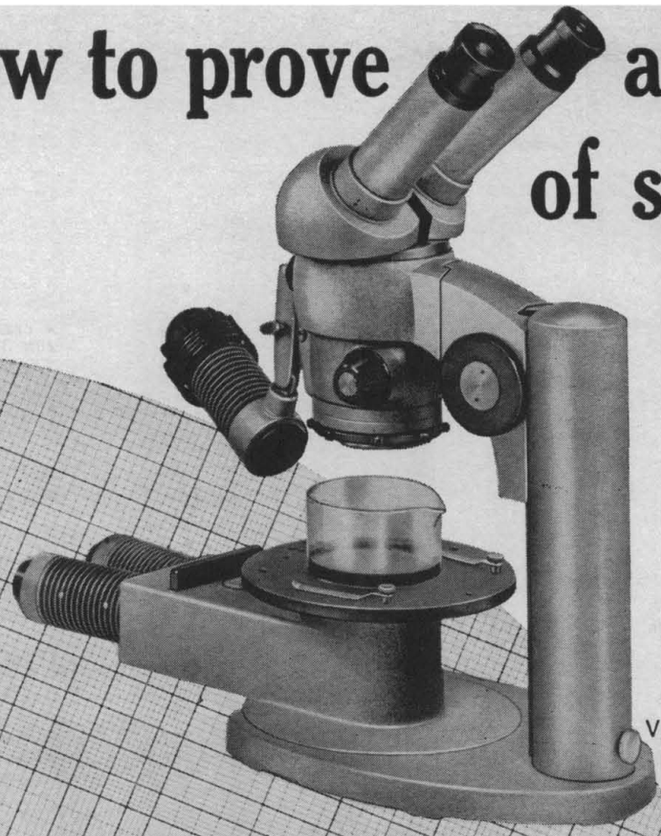
- **Electronic Speed Control**
- **Sealed Stainless Steel Chamber**
- **Easy to assemble, clean and autoclave**
- **Rugged construction throughout**
- **Designed for high torque throughout speed range**
- **Choice of optional Chambers and Accessories**

Basic Unit with Micro Attachment 0.5 ml to 5.0 ml capacity — speeds up to 50,000 rpm

Optional Storage Box

Ivan Sorvall, Inc.
NORWALK, CONNECTICUT 06852, U.S.A.

How to prove absolute flatness of stereo field



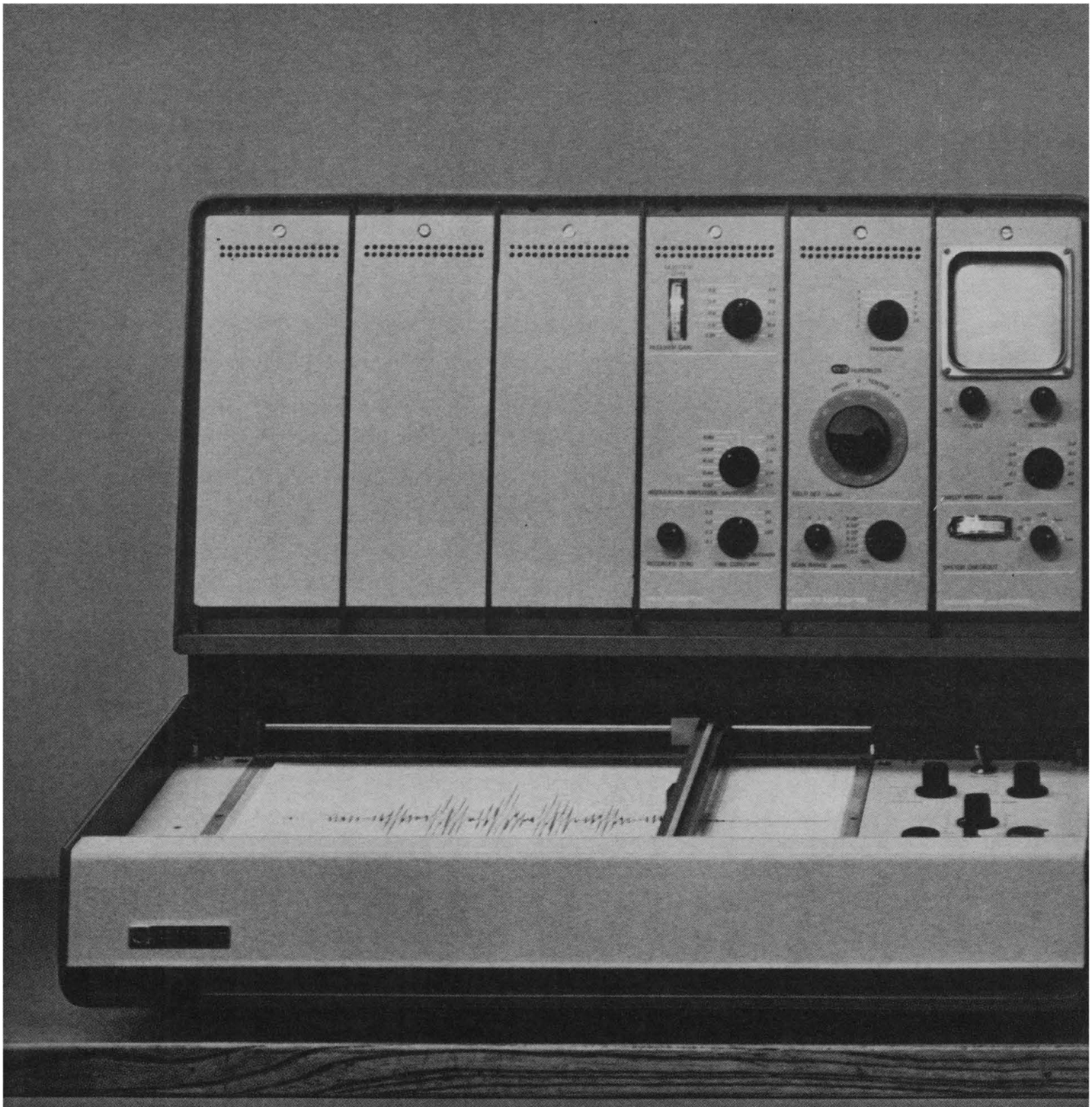
View a piece of graph paper through the new Carl Zeiss Stereomicroscope III. You can't help but note the remarkably brilliant definition; the absolute sharpness throughout all zooming ranges from 2x to 200x; the absolute flatness across the entire field. When you change eyepieces, there is no need to refocus. □ Three paired eyepieces (4x, 10x, 25x) give respective continuous ranges from 4x to 16x, 10x to 40x, 25x to 100x—at the turn of a dial. With the special 2x and 0.5x Attachment Objectives, you can cover a zooming range from 2x up to 200x. □ Simple to operate, Stereo III is an exceptionally versatile performer in lab, Quality Control, or on the micro-assembly line. Use it with transmitted light, incident light, or both simultaneously. (A polarizing attachment is also available.) Rotate the instrument's binocular body to any position by simply loosening a clamp screw on its annular carrier. Extend the normal working distance of 3 inches up to 5 inches with the 0.5x Attachment Lens; down to 1 inch with the 2x Attachment Lens. □ Measure these new dimensions in excellence for yourself. Contact us for a demonstration of the new Stereomicroscope III. (We'll bring the graph paper.) Or write for complete information. Dept. **SC.** Carl Zeiss, Inc., 444 Fifth Ave., N. Y., N. Y. 10018. In Canada: 14 Overlea Blvd., Toronto. COMPLETE SERVICE FACILITIES AVAILABLE.

ZEISS

CARL ZEISS
WEST GERMANY

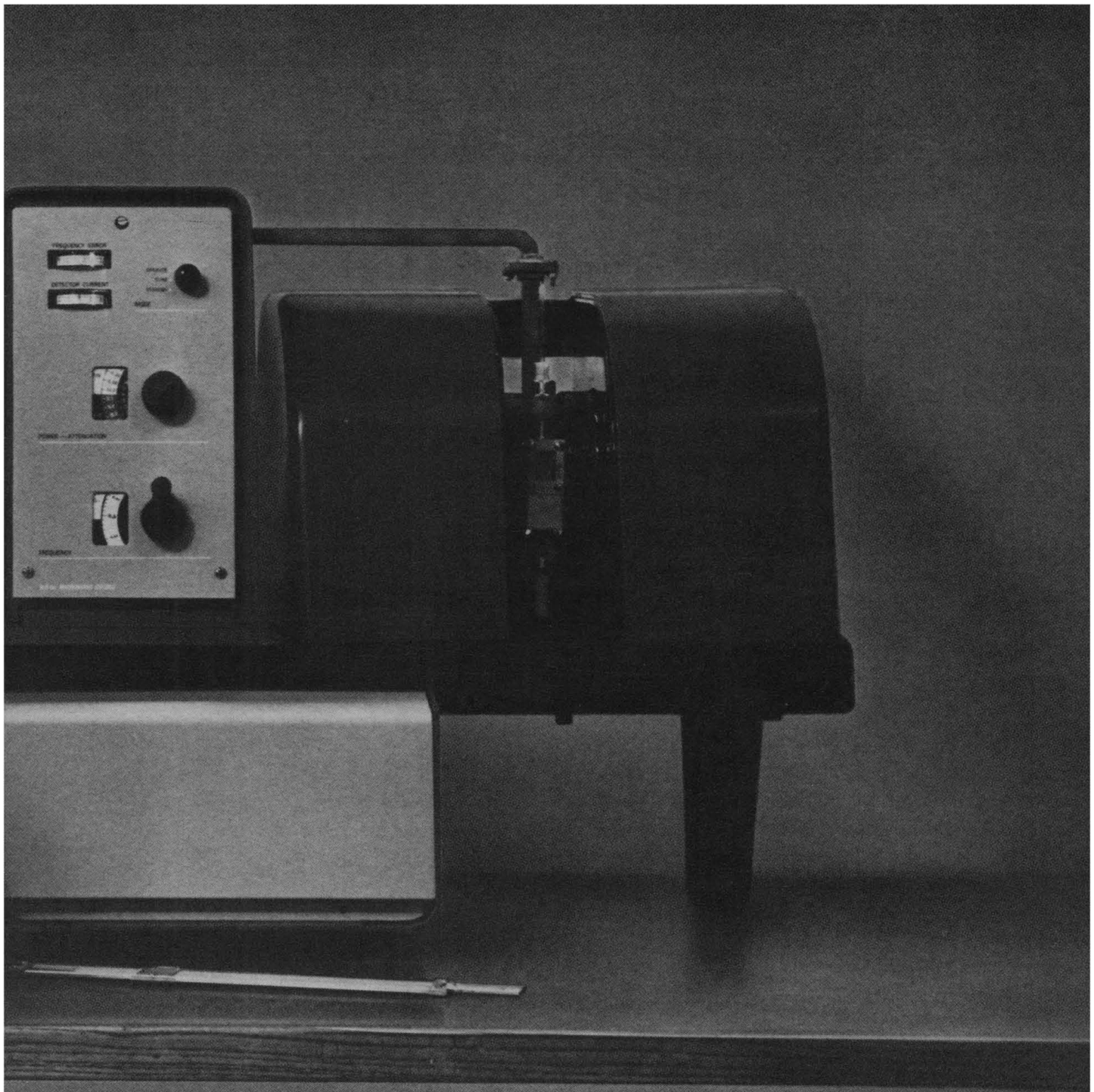
THE GREAT NAME IN OPTICS

ATLANTA, CHICAGO, LOS ANGELES, SAN FRANCISCO, SEATTLE, WASHINGTON D. C., BOSTON
IN CANADA: TORONTO, MONTREAL, WINNIPEG, VANCOUVER



ANOTHER FIRST FROM VARIAN

NEW TABLE-TOP LOW-PRICED EPR



The E-3 is the first of its kind—an easy to operate, sensitive, reliable, low-priced spectrometer. It was specially designed to bring Electron Paramagnetic Resonance spectroscopy within the reach of *all* biologists, chemists, biochemists, and biophysicists.

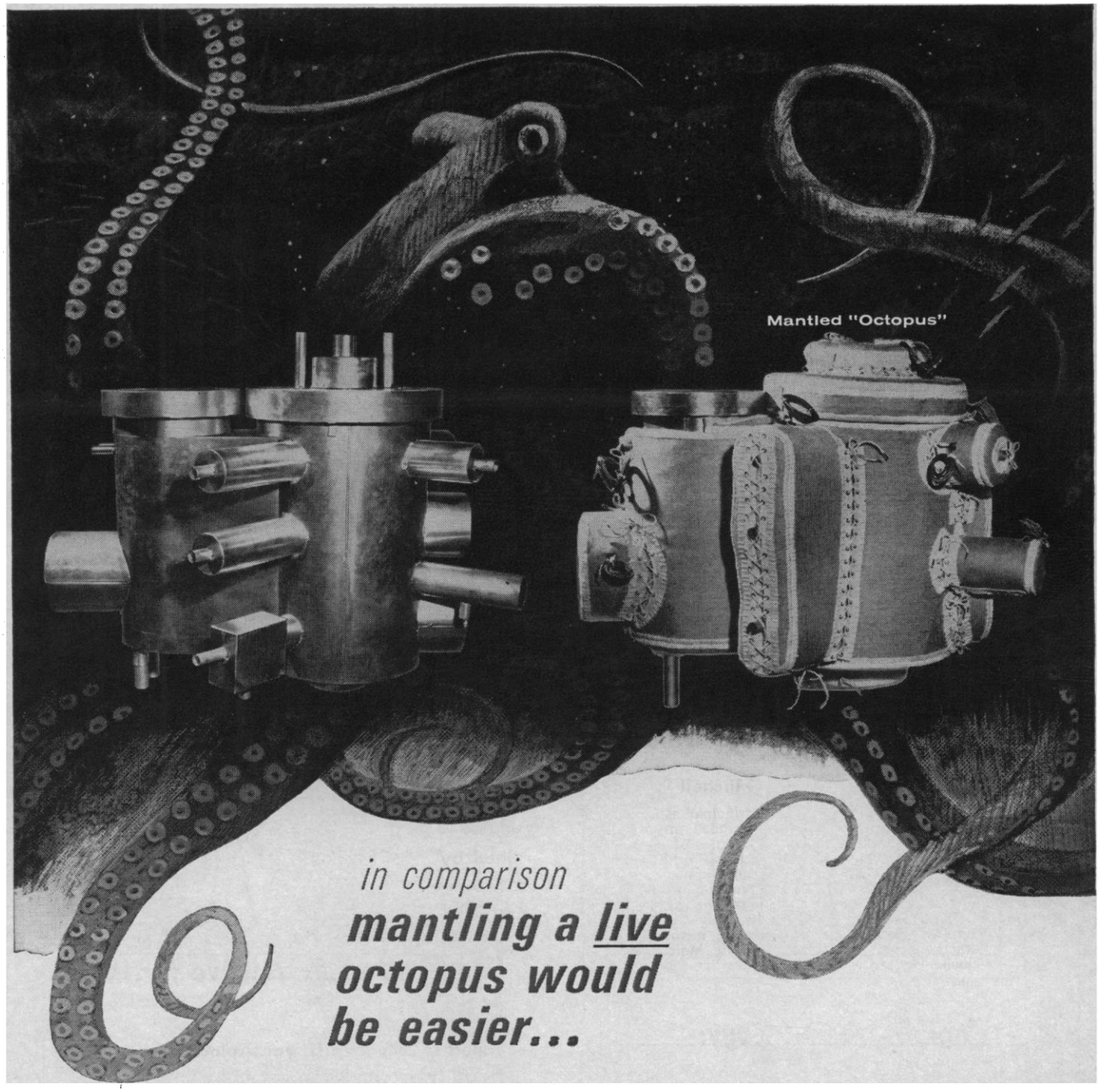
Solid state construction makes the E-3 a compact, table-top spectrometer. And it's also surprisingly low-priced *(just check with us and see).* And because it has a wide range of accessories, you can use the E-3 in many kinds of experiments. It's highly reliable and accurate, and has a sensitivity of $1\times10^{11}\triangle$H spin/gauss.

If we sound proud of the E-3, it's because we are! To hear more about this compact little EPR system, just contact your nearest Varian Field Sales Office.

VARIAN ASSOCIATES

ANALYTICAL INSTRUMENT DIVISION

PALO ALTO, CALIF. • ZUG, SWITZERLAND



This environmental chamber "octopus" ranks with our all-time toughest heating mantle assignments. Note its complexity. It was absolutely essential that every square inch of surface be heated uniformly.

This was accomplished—and more. End result: a Glas-Col heating mantle delivering even heat over the entire complex surface of the chamber, and controlled by only one thermocouple.

No hot spots, no cold areas. Power needs are far less than those of other heating methods. And the mantle is easy to apply and remove, like all Glas-Col electric heating equipment.

Meanwhile, in other environmental chamber applications, Glas-Col mantles are performing with complete reliability—as planned. There isn't a more efficient or economical way to heat such equipment—or any equipment requiring safe, uniform heat.

Unusual heating problems rate the best solutions—by the heating mantle developer, pioneer and leader... Glas-Col. Write—tell us your problems.

Specialists in solving unusual heating problems

GLAS-COL®
HEATING MANTLES
Glas-Col Apparatus Company
Dept. SC, 711 Hulman Street, Terre Haute, Indiana

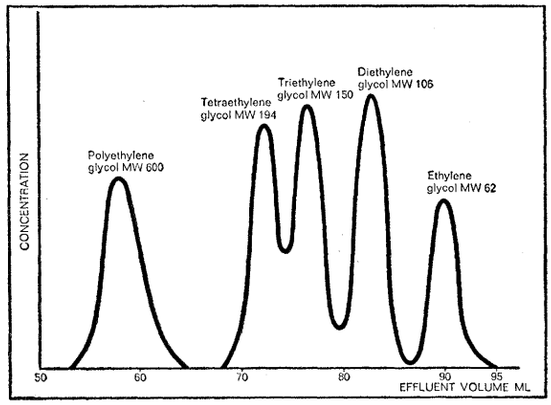
NOW...SEPHADEX® G-10 and SEPHADEX® G-15 for fractionation of low molecular weight solutes

Pharmacia Fine Chemicals is continuously expanding its range of separation products—gel filtration media and ion exchangers. The newest additions to the line are Sephadex G-10 and Sephadex G-15. Two distinctive new products help open a whole new area of fractionation of low molecular weight substances by gel filtration.

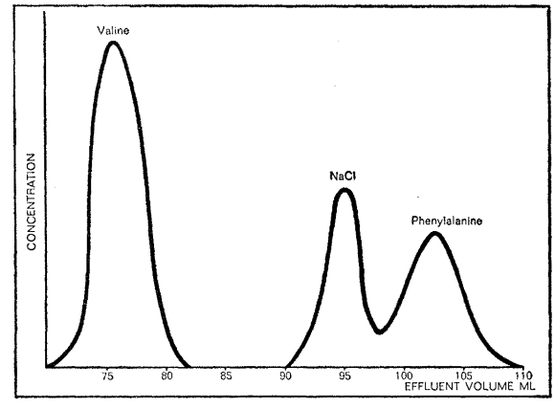
TECHNICAL DATA:

Type	Fractionation range (molecular weight)	Water regain (g H_2O/g dry gel)	Particle size (microns)
Sephadex G-10	up to 700	1.0 ± 0.1	40-120 (beads)
Sephadex G-15	up to 1,500	1.5 ± 0.2	40-120 (beads)

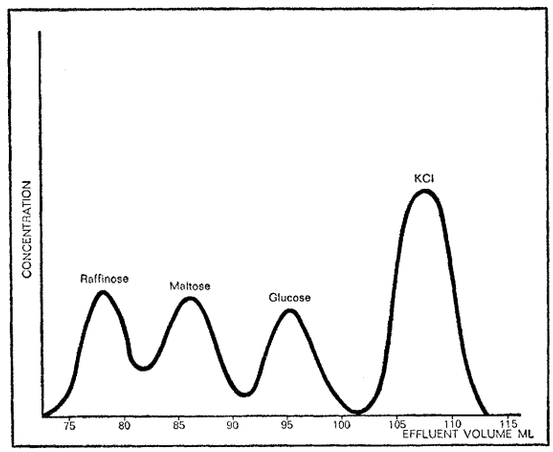
The figures give some examples on the excellent separation properties of these new Sephadex types.



Fractionation of oligomers of ethylene glycols on Sephadex G-10.



Separation of valine, NaCl and phenylalanine on Sephadex G-10.



Desalting of raffinose, maltose and glucose on Sephadex G-15.

Sephadex Laboratory Columns: Columns especially designed for gel filtration with Sephadex are available in four convenient sizes: 1.5 cm x 30 cm and 90 cm. Only the 2.5 cm x 45 cm and 100 cm are available with upward flow adaptors and cooling jackets.

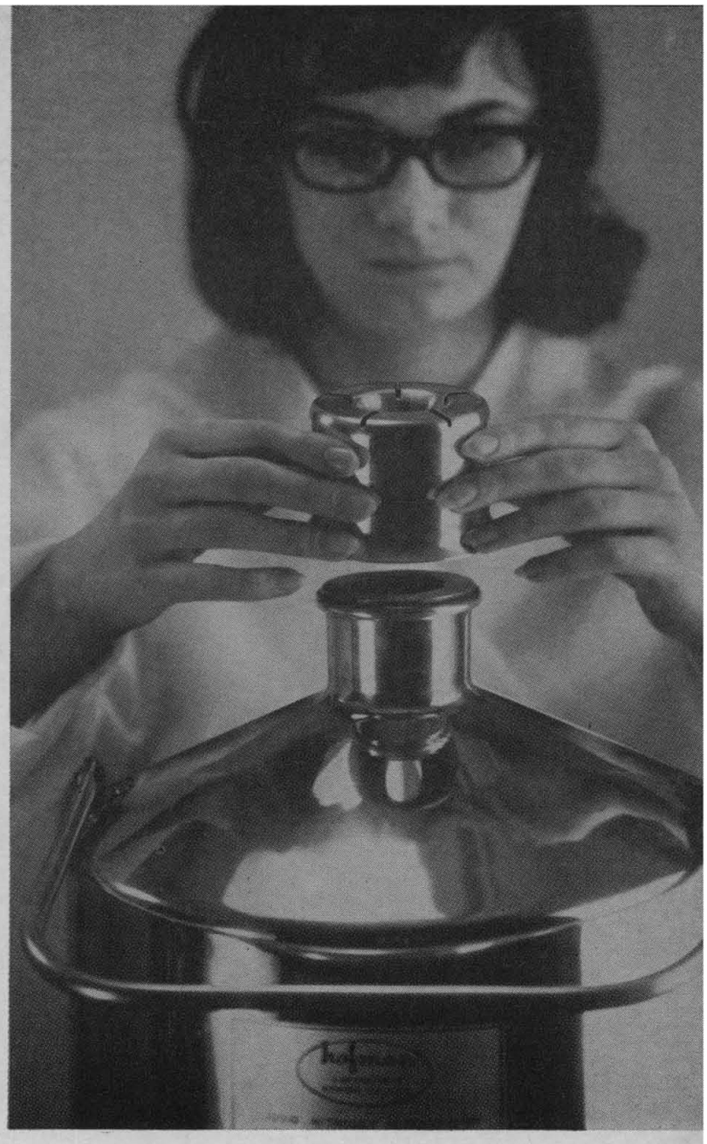
Sephadex Ion Exchange in Bead Form: Sephadex Ion Exchangers are now available in bead form — DEAE —, CM —, and SE — Sephadex. These have high capacities, low nonspecific adsorption and can be repeatedly regenerated. The new spherical shape gives increased mechanical strength for easier column packing. More uniform particles result in improved hydrodynamic properties.

Information Service

Sephadex G-10 and G-15 literature or information is available on request. *Address all inquiries to:*

PHARMACIA FINE CHEMICALS INC.
800 Centennial Avenue
Piscataway, New Market, New Jersey 08854

(Inquiries outside North America should be directed to AB PHARMACIA, Uppsala, Sweden.)



New lightweight aluminum nitrogen storage container costs less, increases holding time...

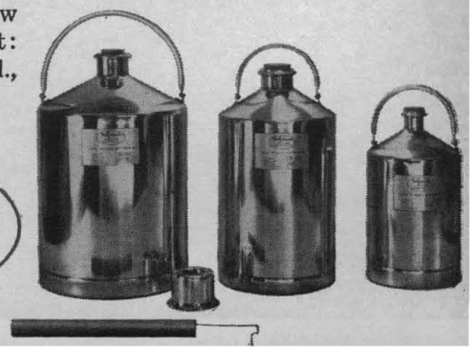
and doubles as a nitrogen refrigerator. It's revolutionary!

Now greater flexibility and economy with Hofman's new 10 liter *aluminum* nitrogen storage container. Thermal-conductivity is reduced considerably with new plastic inner neck design, allowing increased liquid retention. Through use of a separate neck connection the 10 liter container converts to a refrigerator with room for five sample storage canisters.

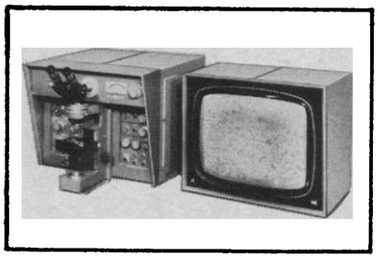
Also available in 2½ liter and 5 liter sizes for storage and transfer (these units not interchangeable). All three models are lighter and smaller in overall size than the standard steel units cutting storage space and handling effort to an absolute minimum.

For complete specs and prices, write or call today. Hofman Laboratories, 225 Parkhurst Street, Newark, New Jersey. West Coast: 6750 Caballero Blvd., Buena Park, Calif.

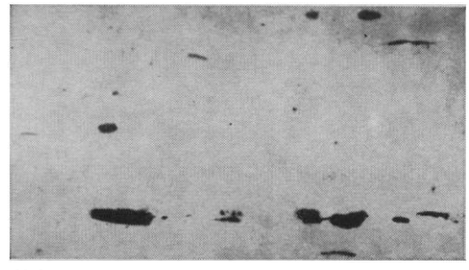
hofman
LABORATORIES
Division Air Reduction Co., Inc.



Now... instant, electronic measurement of microscopic features

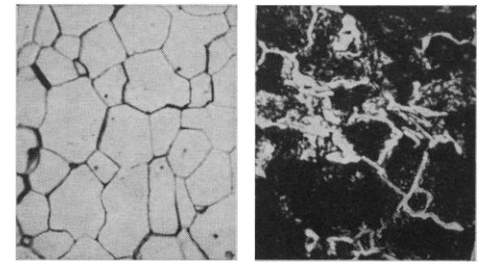


The Quantitative Micro-Image Analyzer has a microscope fitted with beam splitting prism which projects the image simultaneously into a conventional binocular eyepiece for direct viewing and to a television camera which displays it for easy focusing and field selection. The output from the camera is also fed directly into an electronic detector which responds to the changes in output voltage as the scanning spot in the camera tube passes over features in the field, such as grain boundaries, inclusion pores, cells, bacteria, or powder particles. The signals obtained from such areas are also fed immediately into the computer which then presents the desired information on the meter. The screen provides the operator with an instantaneous visual check of setting and instrument operation. Below are examples of this versatile instrument in action. To get more complete details, write for our bulletin QTM-1.



INCLUSIONS IN METAL

For this field of sulphide and silicate inclusions in steel, the Quantitative Micro-Image Analyzer will provide the following information: the number of inclusions present, counting the silicate stringers either as one inclusion or as number of fragments; the number of inclusions in any size range; the area or volume fraction; the average form factor; the average size.

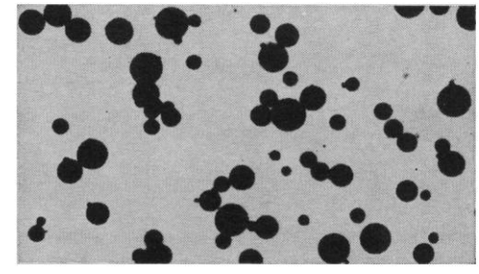


GRAIN SIZE AND FORM FACTOR

The Quantitative Micro-Image Analyzer provides a figure for Mean Linear intercept which is readily converted to A.S.T.M. standards. Shown above is a conventionally prepared mild steel sample etched in 2% nital and a McQuaid-Ehn Test sample. By taking readings along and across the direction of elongation, an average form factor for grains is readily and accurately determined.

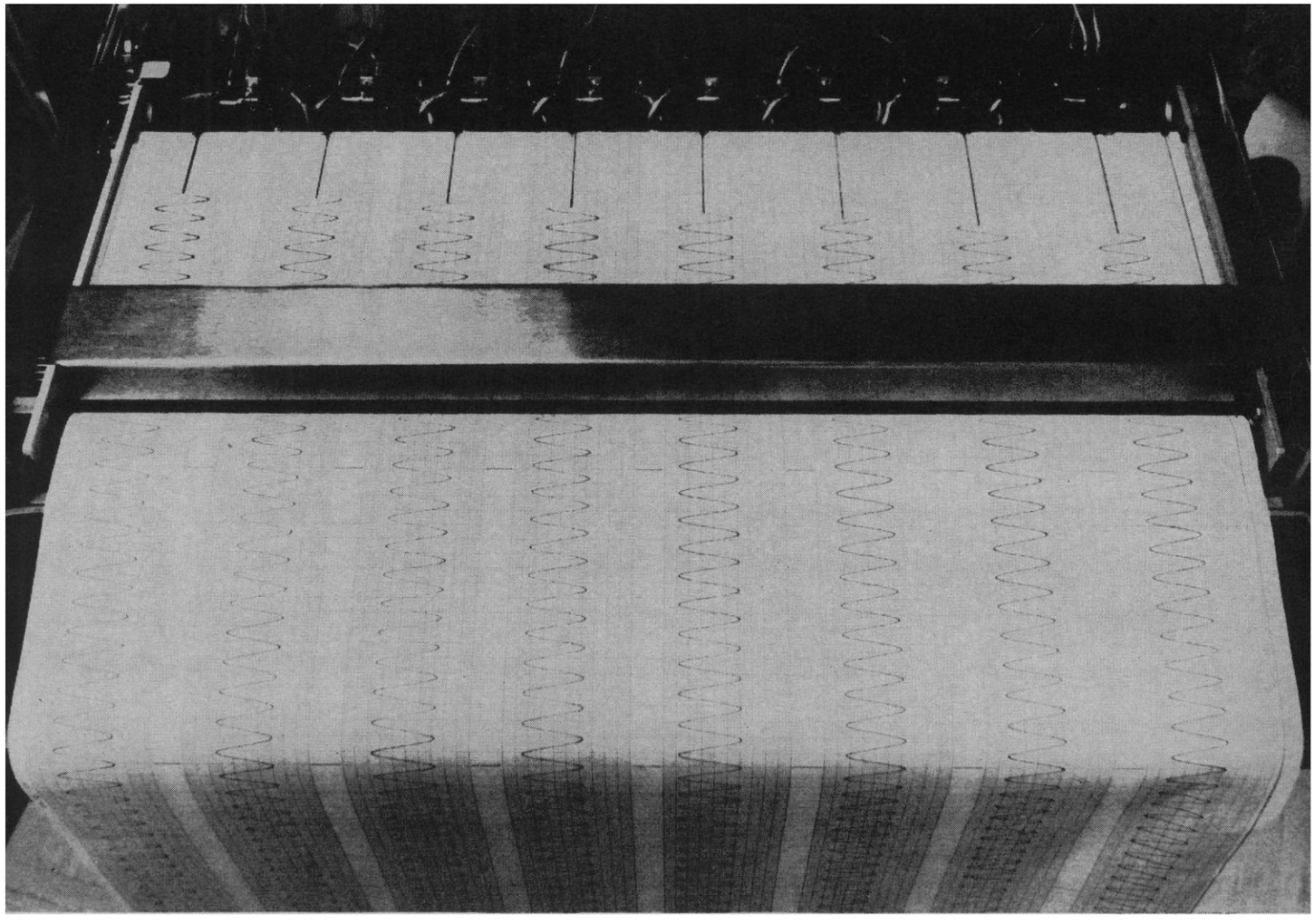
VOLUME FRACTION

In just two minutes, the Quantitative Micro-Image Analyzer was able to make readings for 10 different parts of this specimen, measuring the pearlite fraction in this conventionally prepared plain carbon steel sample.



PARTICLE SIZE DISTRIBUTION

The Quantitative Micro-Image Analyzer provided the following information on the acrylic granules shown. There are 9 particles 0-5 microns in size; 21 in the 5-10 range; 37 between 10-20; 20 between 20-40; 3 between 40-80; none above 80 microns.

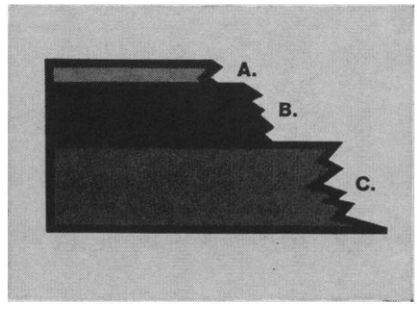


A few lines worth repeating...

Graphic Controls' thermal recording oscillograph charts produce distinct, black, clearly legible trace lines everytime.

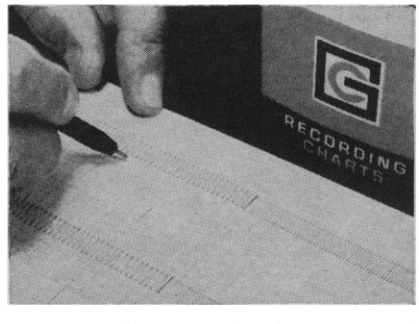
The reason is the unique construction of our paper. We start with a specially processed, high-density undercoating that provides the blackest possible trace. To this we add an unusually sensitive, completely compatible surface coating that lets the stylus glide evenly and smoothly. Many critical areas that are blurred or indistinct on other papers become clear and precise with GC's oscillograph charts. Even the most complex functions and inputs are recorded easily.

Because the surface coating is applied by a new process, there's no variance in thickness from edge-to-edge. The caliper of the paper is constant. Creep is eliminated and uniform paper flow is assured. And at the same cost as the paper you are now using.



A. Thermal-reactant coating
B. Contrast undercoat
C. Substrate

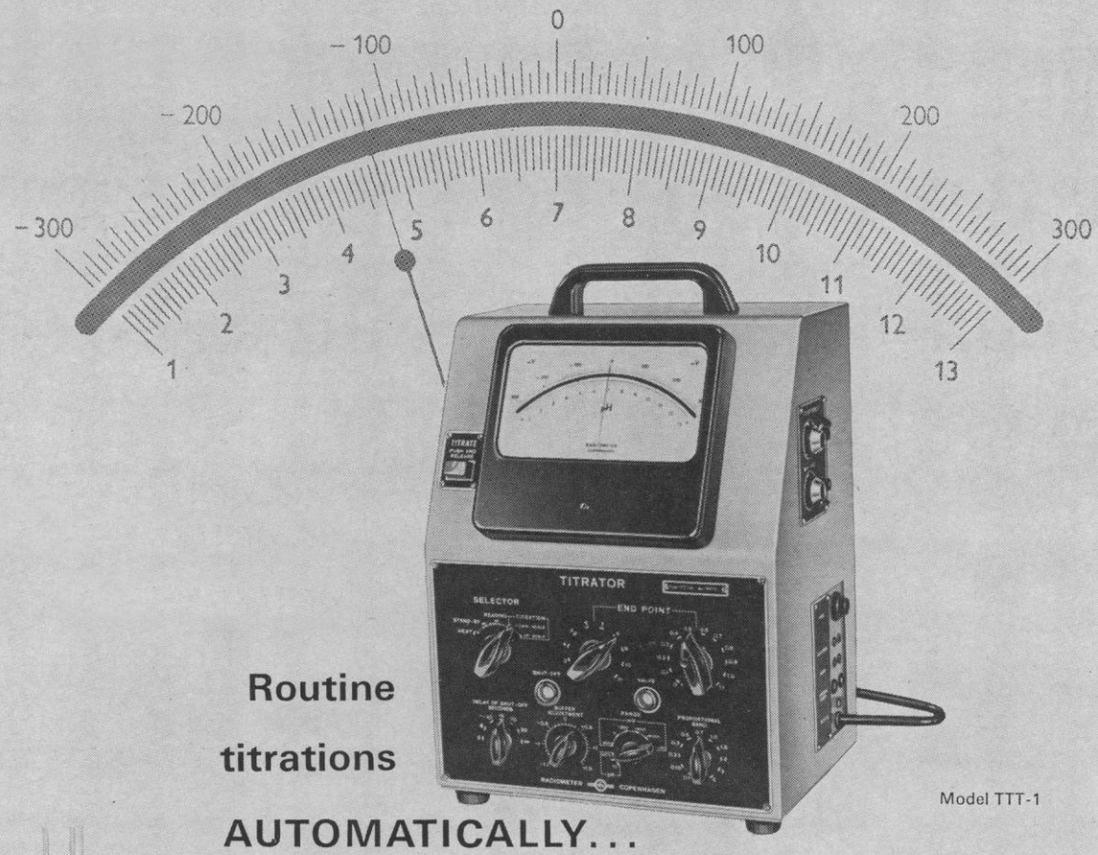
In addition, GC's thermal recording charts are water resistant, durable, yet extremely lightweight. Their consistent performance has been proved in major aerospace, industrial, and scientific research applications.



Check the performance of GC's charts for yourself... and compare them with your present papers. For complete information, contact:

RECORDING CHART DIVISION
GRAPHIC CONTROLS CORPORATION
189 VAN RENSSELAER STREET, BUFFALO, NEW YORK 14210

RADIOMETER TTT-1



Model TTT-1

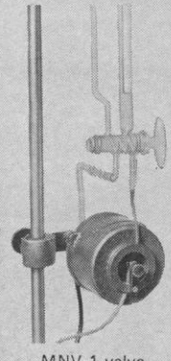
Routine titrations AUTOMATICALLY...

with speed, accuracy and complete versatility

—for the hospital, research, industrial or process control laboratory. Performs all types of titrations—acid-base, dead stop end point, redox and constant pH—with completely controlled end point approach, and adjustable delay of shut off. It's a quality laboratory pH meter too, with a 160 mm. hand calibrated mirror scale, recording facilities, and a remarkable absence of drift.

The TTT-1 Auto Titrator operates either a simple and versatile valve MNV-1 to control flow from gravity feed burettes—or the new digital readout syringe type Auto Burette ABU-1. Other accessories add to the versatility of this unusual instrument—titration assemblies to meet every application, electrodes of all types, scale expanders, and volume recorders for pH stat work and the automatic tracing of titration curves. The TTT-1 is indeed the heart of complete instrumentation for all automatic titration and titrigraphic applications.

Its many other features are well described in descriptive literature available on request.



MNV-1 valve

ABU-1 Auto Burette
Volume Control Accessories

THE LONDON COMPANY

811 SHARON DRIVE, WESTLAKE, OHIO

RADIOMETER COPENHAGEN

In Canada: Bach-Simpson Limited, Box 2484, London

How to avoid going through 10,000 case histories to find the files of the 8 patients who were treated for 3 kinds of respiratory diseases during the past 10 years:

Use Keydex®

—McBee's low-cost information retrieval and object identification system. It pinpoints the information in minutes.

How it works: Key Cards are prepared for each characteristic or key word you want access to. Then, each document or item in your files is referenced to the pertinent Key Cards by a simple coding operation perfected by McBee. (Up to 10,000 items can be referenced on a single Key Card.)

To find all the documents pertinent to your specifications—and only these documents—you merely select the Key Cards for each desired characteristic and superimpose them on the viewing screen. And immediately, the location of all the documents you need is spotlighted.

The whole operation takes place in a matter of minutes—and *anyone* can use Keydex after very brief instruction.

For details, fill in this coupon and return it to us. **McBEE**

To retrieve information, operator merely selects Keydex Key Cards with desired key words and superimposes them on the viewing screen. Location of wanted items is spotlighted through illuminated code holes.

McBEE SYSTEMS, Dept. 95-IU
A Division of Litton Industries
80 Greenwich Avenue, Greenwich, Conn.
Gentlemen:
Please send me full details on Keydex.

Name_____
Company_____
Street_____
City_____ State_____

COLEMAN

AUTOMATED NITROGEN ANALYZERS
for micro samples; for larger samples

For Micro Samples

Now in use in hundreds of laboratories, the automated Coleman Model 29 Nitrogen Analyzer is providing rapid, exact results for an almost unlimited range of materials.

From foods to fertilizers, from plastics to petroleum derivatives, from biological materials to organic intermediates, the instrument is supplementing or replacing both the manual Dumas and the Kjeldahl methods.

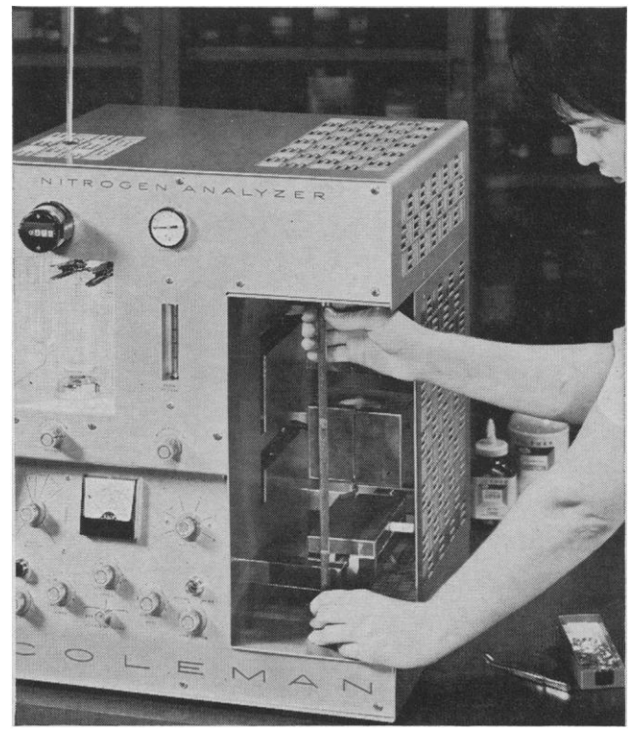
A special extraction technique, announced in a recent issue of ANALYTICAL CHEMISTRY, permits the instrument to be used for trace analysis with materials containing as little as 20 ppm nitrogen.

Operation of the instrument is simple. The operator is required merely to weigh and install the sample, to actuate the instrument, and 8 minutes later, to read and record nitrogen volume from a digital counter.

Thus, an analyst without extensive training in microchemistry can produce excellent results in both routine investigations and in research.

Condensed Specifications:
Sample . . . any material that pyrolyzes at temperatures up to 1000° C.
Sample size . . . from 5 to 50 milligrams, generally.
Operating cycle . . . 8 minutes.
Accuracy . . . results correspond to theory ±0.2% nitrogen.
Readout . . . digital counter in microliters.

Ask for Bulletin SB-291



For Larger Samples

Specially designed to meet requirements of materials that require extensive sample preparation before a representative sample can be obtained, the Coleman Model 29A accepts samples up to 500 milligrams. Even larger samples of inorganic materials are analyzed without difficulty.

The instrument is finding wide application in laboratories working with such diverse materials as foods, feeds, grains, soils, fertilizers, milk products, and biological materials.

To accept the larger samples, the instrument incorporates an expanded combustion system, extended combustion cycle, and a larger, modified nitrometer for measurement of the greater volumes of nitrogen. The measurement operation is speeded by a reversible electric motor in the precision syringe-and-micrometer screw adjustment.

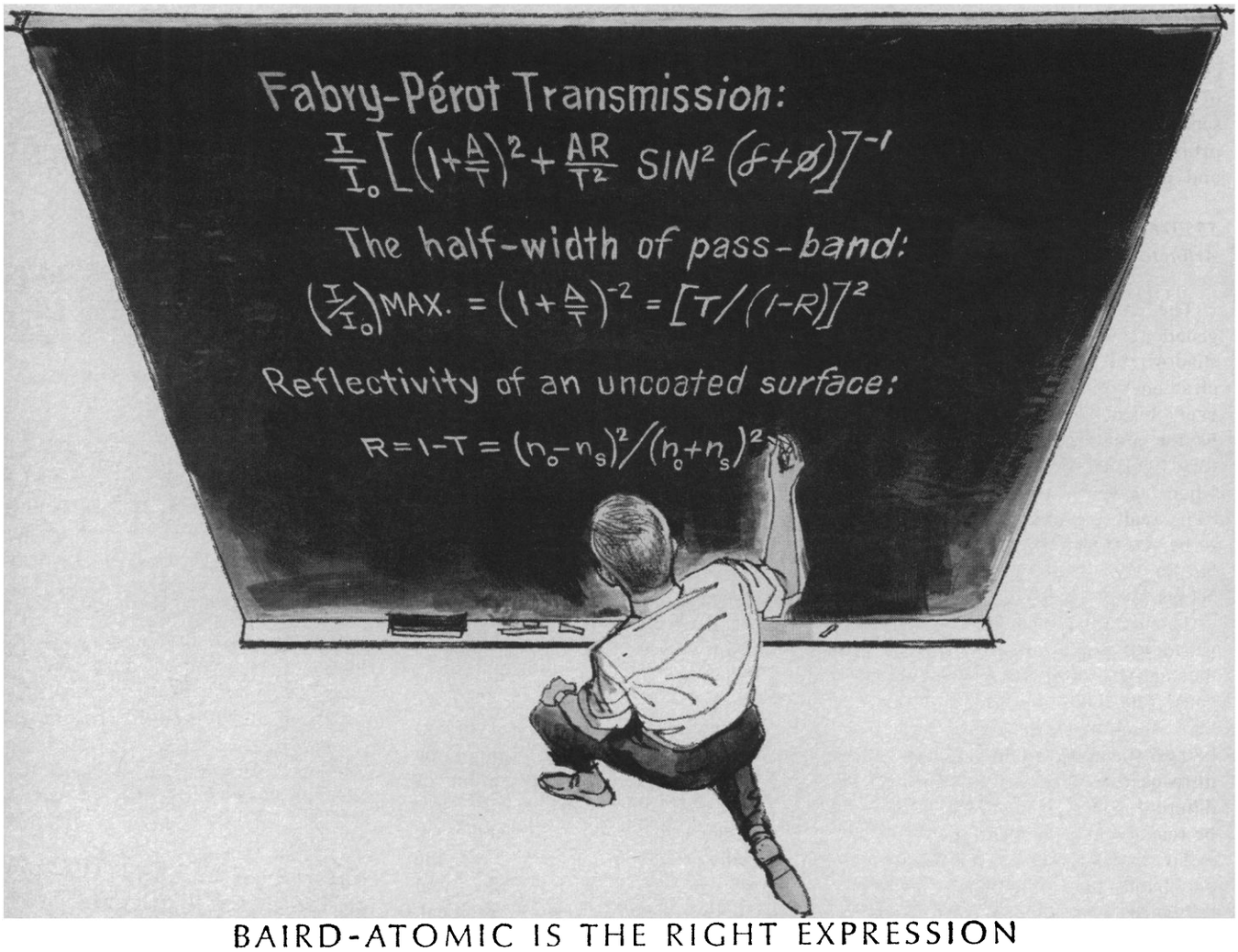
The Model 29A minimizes the work formerly required in preparing samples of non-homogeneous materials for microanalysis.

Condensed Specifications:
Sample . . . any material that pyrolyzes at temperatures up to 1000° C.
Sample size . . . 50 up to 500 milligrams; up to one gram or more for inorganic materials.
Operating cycle . . . 12 minutes.
Accuracy . . . results correspond to theory ±0.2% nitrogen.
Readout . . . motor-driven digital counter.

Ask for Bulletin SB-291

COLEMAN INSTRUMENTS CORPORATION • MAYWOOD, ILLINOIS 60154

For Reliability in Optical Interference Filters, Use the Right Expression!



BAIRD-ATOMIC IS THE RIGHT EXPRESSION FOR RELIABLE FILTERS IN THE UV, VISIBLE, AND IR REGIONS!

You can rely on Baird-Atomic filters to give maximum transmission at the specified peak wavelength. You can rely on Baird-Atomic for steep bandpass walls and the lowest possible transmission of unwanted wavelengths. You can rely on Baird-Atomic for prompt, off-the-shelf delivery of standard filters. Immediate response to telephone orders is routine. Special filters are usually delivered within three weeks after receipt of order!

Baird-Atomic all-dielectric Optical Interference Filters are available in the ultraviolet region from 2100 to 3999 Å, in the visible region from 4000 to 7500 Å, and in the near infrared region from 7501 to 11,500 Å and from 1.6 to 3.5 microns. Bandwidths available from 9 Å to 1600 Å.

Standard sizes include 1" x 1", 1" diameter, 2" x 2", and 2" diameter. Other sizes and shapes are available.

And now, you can also rely on Baird-Atomic for substantial savings! New, highly efficient production facilities utilizing our most recent technical developments have permitted a complete revision of our price list.

Contact the Filter Department at Baird-Atomic for our new XK series of technical data sheets. They describe our complete line of standard Optical Interference Filters.

Scientists: Investigate challenging opportunities with Baird-Atomic. An Equal Opportunity Employer.

BAIRD-ATOMIC, INC. B A 33 University Road, Cambridge, Mass. 02138

Telephone: (617) UN4-7420

with which this knowledge, if attained, can be entrusted to human nature in its present state of moral development. Otherwise we put ourselves in the position of the small boy who blows himself up by playing with explosives. . . . If scientists as human beings are concerned with the dangerous possibilities of "scientific progress," they can best serve mankind by doing their part in promoting the restoration of a healthy and proper sense of moral values.

BENJAMIN GINZBURG
5550 Columbia Pike,
Arlington, Virginia 22204

The control of human evolution by genetic treatment will probably overshadow the impact of the use of nuclear energy upon man's destiny. However, this achievement does not seem to be the great revolution in human history which Aldous Huxley foresaw when he wrote, as quoted by Abelson, "The really revolutionary revolution is to be achieved not in the external world but in the souls and flesh of human beings."

The external world is the objective world we are aware of by computing the signals collected by the sense organs. The internal world, the world of "the souls and the flesh of human beings" investigated by Huxley, is the introspective one revealed through the different states of awareness that can be reached in deep meditation.

To the internal world belong, on one hand, the "phantoms" built by a religiously indoctrinated imagination and the fantastic impressions generated by psychedelic drugs and, on the other hand, the inspired flashes of the scientists and the poets and the incommunicable states of awareness reached by the true mystics.

The discovery of the internal world is a strange experience. This discovery may drastically change the way of living of an individual by giving him the knowledge of the existence of a reality which transcends the reality of the physical world. If this knowledge were largely shared, the human race would probably enter a new phase of its evolution. Unfortunately, this knowledge is solely the result of a personal experience and apparently cannot be taught.

Contemporary scientists, objectively trained, are not inclined to accept the possibility of a *spiritual* mutation of the human race. But for those who accept the possibility of such a mutation, as suggested with persuasive arguments by Teilhard de Chardin in *The Phenomenon of Man* (Harper, New York, 1961), this mutation, and not the control of human evolution by genetic treatment, will be the revolutionary revolution prophesied by Aldous Huxley.

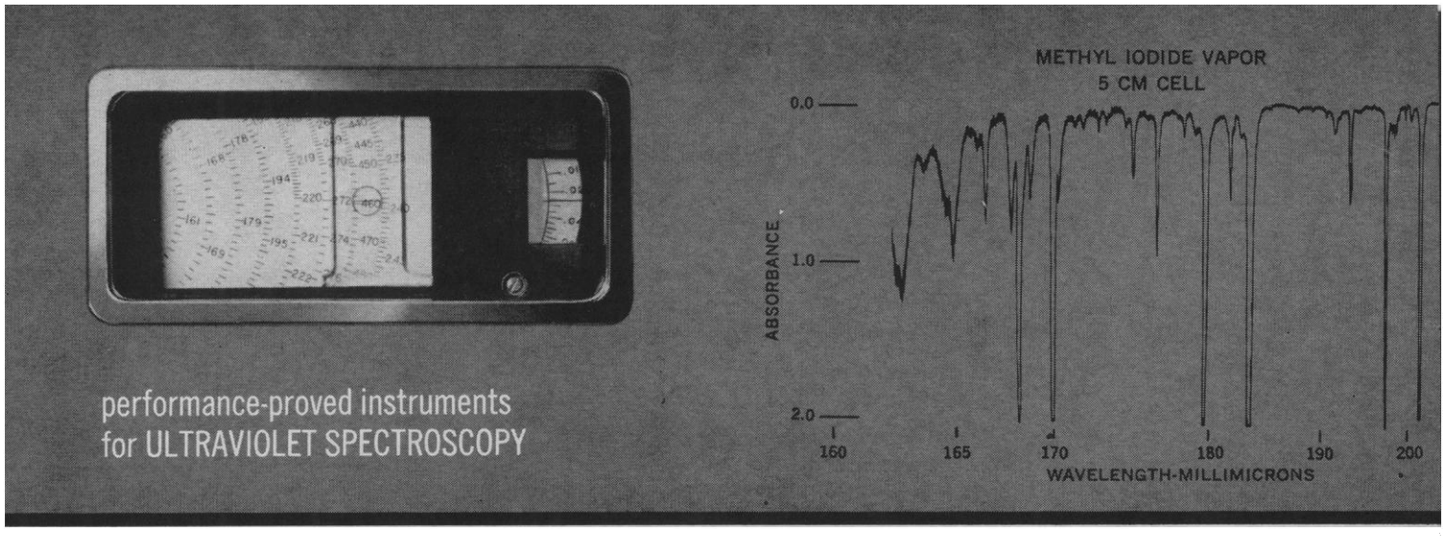
ANDRE L. JULIARD
Green Acres, Bryn Mawr, Pennsylvania

"Disjointed Incrementalism"

In his article "National planning for medical research" (25 June, p. 1688), Handler discusses the dynamics of planning in the face of unknowns and uncertainties which are characteristic of biomedical research. He states that research gains are achieved through a process of "disjointed incrementalism" rather than through balanced, overall planning. To make progress, a critical mass effort must be applied against a target. A resulting payout may cause an imbalance in knowledge to occur, says Handler, but the imbalances are self-correcting through a variety of mechanisms. He adds that such an irregular pattern of advance is more in conformity with reality than planners would have the rest of us—and themselves—believe. His arguments are directed toward the planning of breakthroughs, which he says cannot be planned although the exploitation of actual breakthroughs can be.

Handler's arguments are persuasive, especially within the context of the pursuit of knowledge. In the real worlds of social, economic, political, and military action, disjointed incrementalism has often furthered the public good but it has also been followed by disaster and grief which could or should not have been left to self-correction.

The emerging dangers in the real world of biomedical affairs lie in the ensuing phases of exploitation after breakthrough. There we have not really had the planning which Handler says is feasible. Rather, political considerations associated with the funding of medical affairs have led people into premature exploitation of laboratory findings and statistical inferences. Some of the perturbations in the area of chemotherapy are due to premature application of such findings in spite of ignorance of drug effects; that is, the side-effects problem. Assumptions in mental-health planning must now be revised because psychopharmacology has not paid off as first hoped and promoted. Public-relations gains were



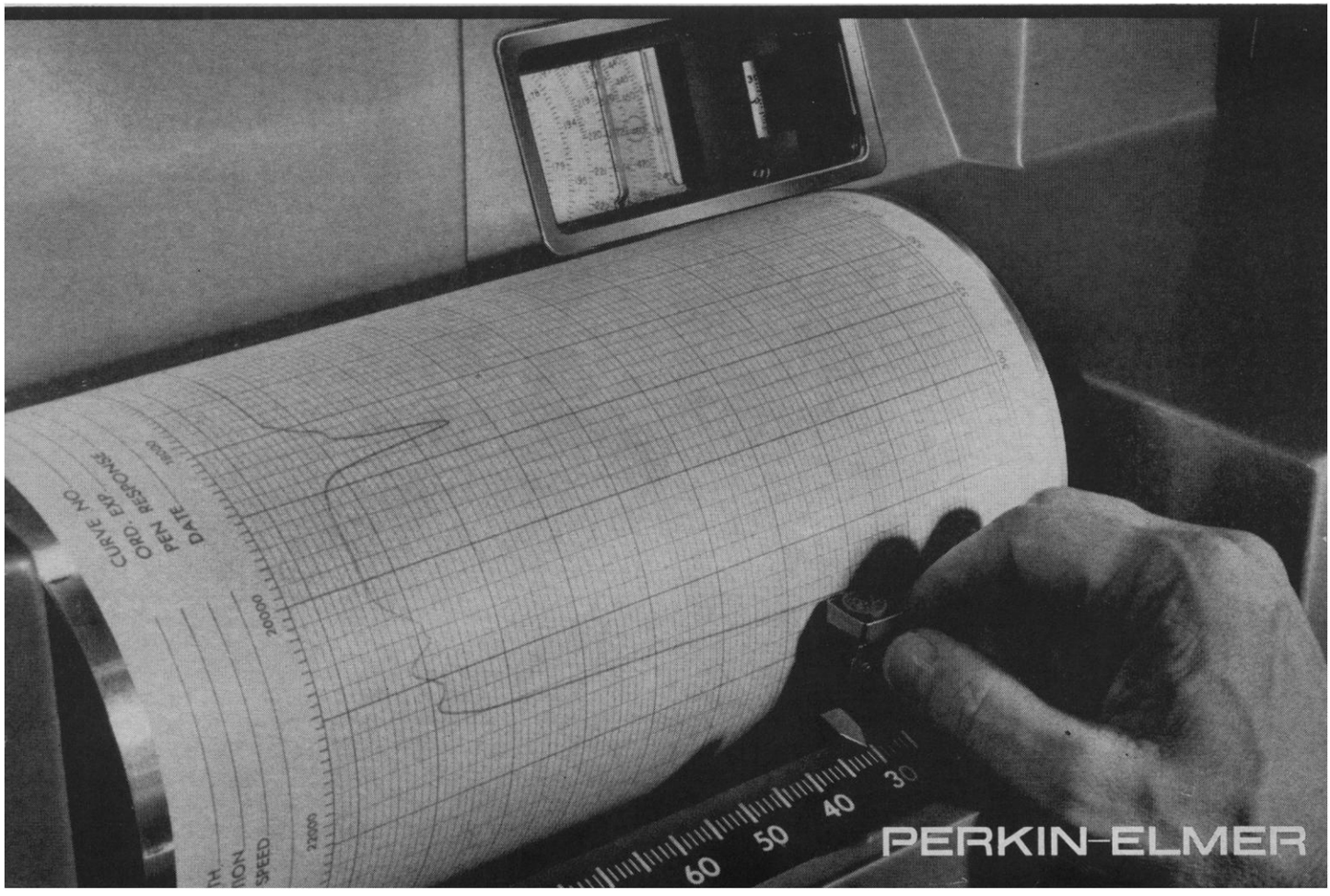
NOW...THE WIDEST RANGE HIGH PERFORMANCE UV INSTRUMENT AVAILABLE

A highly versatile analytical instrument, the Model 450 Spectrophotometer has a new extended range—from 165 to 2700 millimicrons. Its uniquely high energy system allows workable analyses in the far UV with comparatively little purging and no vacuum requirements—while offering the lowest stray light (.0002% at 210 mμ) over the widest range. Model 450 — because of its double monochromator — *presents no problems due to stray* even in energy-limited spectral regions.

From the far ultraviolet spectrum to the near infrared, the Model 450 offers superb resolution—separates bands less than 0.3 Angstrom apart at 175 mμ. The *integral* ordinate scale expansion feature lets any weak or recessive band—on any portion of the ordinate—no matter how dense or dilute, to be expanded by factors of 5, 10, 20 or 50 X, with the turn of a dial.

A wide choice of accessories broadens the Model 450's applications. With these attachments you can perform, for example, kinetic studies — fluorescence analyses — diffuse reflectance and colorimetric work —temperature sensitive determinations — flame spectra studies of most elements — analyses of micro-samples—optical rotatory dispersion—and many more.

For a fully illustrated brochure and specifications on the Model 450, including sample spectra, write to Instrument Division, Perkin-Elmer Corporation, 723 Main Avenue, Norwalk, Conn.



words the scientific community has adopted a benignant posture toward the escalation of neologisms with concomitant minimization of sophistication in their utilization.

ARTHUR L. COHEN
Electron Microscope Laboratory
and *Department of Botany,*
Washington State University, Pullman

Working Hypotheses in Psychotherapy

I agree with N. H. Eisen in his letter concerning Chamberlin's method of "multiple working hypotheses" as applied to psychotherapy (16 July, p. 246) that many psychotherapists are coming to frown on rigid adherence to any single "school of thought," that is, working hypothesis. However, what psychotherapists do in practicing the eclectic methods is not identical with applying on a tentative basis, with the same patient, now this and then another hypothetical viewpoint. Rather, they use a single hypothesis based on a combination and fusion into one unified working hypothesis of whatever they find correct in the approaches of the various schools. Such a hypothesis bears the marks of the personality of the therapist and makes it possible to emphasize once this, and another time another, element of this unified eclectic hypothesis according to the individual case. In this again I agree with Eisen.

However, one of the main elements of successful treatment is to give the *patient* a unified working hypothesis for dealing with external and internal reality. It is the patient who presents us, unfortunately, with multiple working hypotheses which interfere with his efficiency and happiness. The patient uses simultaneously the magic and the rational hypotheses, the system of projection and the system of reality testing, the infantile and the grown-up code of morals, and so on. It is the task of the therapist to use all methods at his disposal to replace this confusion by a unified working hypothesis. One of the necessary methods involves giving the patient a living example of an unconfused mind. This is not all theory; I have actually seen bad results from introducing, for example, the physiological hypotheses in the case of a psychologically oriented patient, and sometimes also from combining behavior therapy with psychoanalytically oriented therapy.

Eisen suggests the application of the method of multiple working hypotheses to psychodiagnosis. In contrast to therapy, I see no objection to this and have seen advantages from the application of neurologic viewpoints simultaneously with psychological.

JOSEPH WILDER
1199 Park Avenue, New York 10028

Occurrence of Cilia

Kilburn and Salzano (18 June, p. 1618), in reporting a conference on cilia, began with the words: "Cilia are found in all animal groups except Nematoda. . . ." If this is correct, I have been teaching an error in introductory zoology courses for many years. I recognize the Onychophora as a distinct phylum rather than as a class of Arthropoda and teach that cilia do not occur in the Arthropoda, which, in terms of number of species, constitute some four-fifths of the animal kingdom. If I am wrong, I would appreciate references to the occurrence of cilia in insects, crustaceans, arachnids, chilopods, or diplopods.

LAMONT C. COLE
Department of Zoology,
Cornell University, Ithaca, New York

The statement "Cilia are found in all animal groups except Nematoda . . . ." was a summary of Table 1 in M. A. Sleigh, *The Biology of Cilia and Flagella* (Macmillan, New York, 1962). The references for this table were L. H. Hyman, *The Invertebrates* (McGraw-Hill, New York, 1959), and P. P. Grasse, *Traité de Zoologie* (Masson, Paris, 1948–1961). Specifically, to answer Cole's questions: in Onychophora, nephridia and reproductive systems have cilia, while in Insecta, cilia are found in sensory organs and gametes.

A substantial correction to the same statement was suggested to us by Donald E. Giles. He calls attention to a study by H. G. Browne and A. B. Chowdbury [*J. Parasitol.* **45**, 241 (1959)] which showed cilia in the intestine of the nematode dog roundworm, *Ancylostoma caninum.*

Thus, the opening statement should be amended to "Cilia are found in all animal phyla." We stand corrected and informed.

KAYE H. KILBURN
Department of Medicine,
Duke University Medical Center,
Durham, North Carolina

10 September 1965, Volume 149, Number 3689 **SCIENCE**

EDITORIAL CORRESPONDENCE: 1515 Massachusetts Ave., NW, Washington, D.C. 20005. Phone: 202-387-7171. Cable: Advancesci, Washington. Copies of "Instructions for Contributors" can be obtained from the editorial office. ADVERTISING CORRESPONDENCE: Rm. 1740, 11 W. 42 St., New York, N.Y. 10036. Phone: 212-PE 6-1858.

Mariner IV Mission

Scientifically, the results of the Mariner IV mission constitute the most important advance in space research since the discovery of the Van Allen radiation belts. Contributing to the value of the mission is the fact that the results of the various experiments are complementary; they also build on and extend previous findings of ground-based astronomy.

Useful data on particles, fields, and micrometeorites were collected during the voyage to Mars. Additional information was gathered after the fly-by, and more may be forthcoming when the spacecraft is once again fairly close to Earth. The major contributions, however, are the observations in the vicinity of Mars. Among the most important are the photographs (*Science*, 6 August). These show that, unlike Earth, Mars resembles the moon in topography. There are many craters, but there is no evidence of mountain chains.

Experiments on particles and fields reported in this issue show other major differences between the two planets. The magnetic field of Mars is not more than 1/1000 that of Earth, and the Red Planet has no radiation belt. An occultation experiment gives independent evidence that the atmosphere of Mars is tenuous and unlike that of Earth. A micrometeorite study shows that interplanetary dust is more abundant in the vicinity of Mars than near Earth.

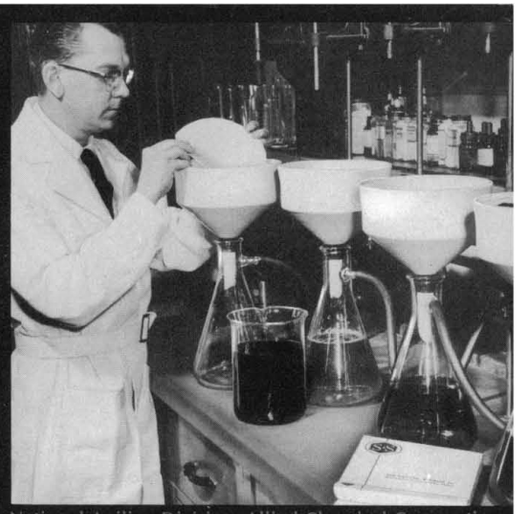
The evidence from the photographs, the absence of a sizable magnetic field, and the character of the atmosphere all support the view that the history of Mars has been unlike that of Earth.

An example of a close relation between Earth-based findings and findings from Mariner is the estimate of the composition and density of the Martian atmosphere. Astronomers have known for some time that the atmosphere of Mars is thin and that it contains CO_2. Recently the estimates have been sharpened. Measures of infrared radiation indicate that the total pressure at the Martian surface is 11 millibars, of which about half is CO_2 (0.28 mole per square centimeter). The Mariner IV occultation experiment determined changes in radio signals from the spacecraft caused by passage through the atmosphere and the ionosphere of Mars. Preliminary interpretation of the data provides an estimate of the scale height of the atmosphere ($\sim$9 km) and its density. The pressure at the surface of Mars as estimated from the data (about 5 or 6 mb) is lower than estimates obtained in ground-based studies. This disagreement is not serious, and the discrepancy will probably diminish on further analysis. The important fact is that two very different kinds of measurements give essentially the same result. Half or more of the atmosphere of Mars is CO_2, and the total number of molecules per unit area is about 1/100 the number in the Earth's atmosphere.

The contrast between Earth and Mars can be stated in another way by listing the amounts per unit area of three volatile substances that have appeared at the surface of the planets in the past or are now present. For Earth the values are: H_2O, 3.2×10^5 g; CO_2, 1.8×10^4 g; N_2, 8×10^2 g. The corresponding values for Mars are: H_2O, $\sim$0.01 g; CO_2, $\sim$12 g; N_2, $<$10 g. The numbers are not strictly comparable, for most of the CO_2 that has reached the surface of the Earth is now incorporated in sedimentary rocks. Probably most of the H_2O that has appeared on Mars has been lost, the hydrogen having escaped and the oxygen having been consumed or lost. Nitrogen has not been detected on the planet, and the value given is probably an upper limit, derived from the pressure effect it exerts on CO_2.

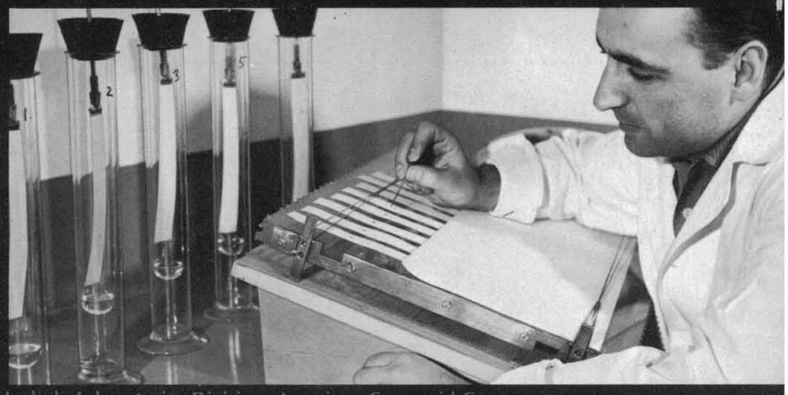
The success of Mariner IV represents a superb engineering achievement by the Jet Propulsion Laboratory. The accomplishment required the proper functioning of 134,000 parts after 7 months in space. The magnitude of the success is highlighted by the failure of others to attain the goal. The Russians, who have some first-class engineering talent, have not succeeded in their dozen or so attempts at attaining close-in data from Mars or Venus.—PHILIP H. ABELSON

Union Carbide Corporation



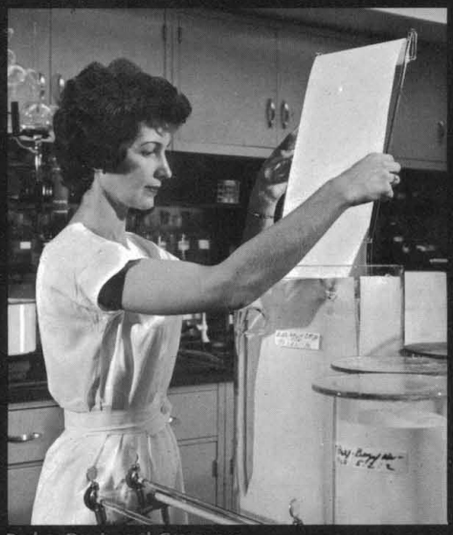
National Aniline Division, Allied Chemical Corporation

erck Institute

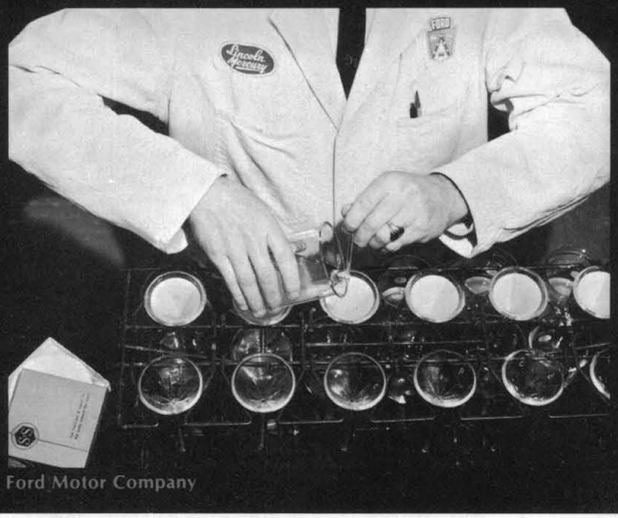


Lederle Laboratories Division, American Cyanamid Company

Chas. Pfizer & Co., Inc.



Parke, Davis and Company

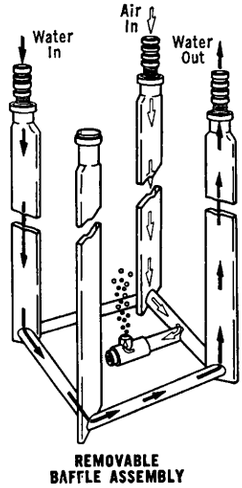


Ford Motor Company

S&S Analytical Filter Papers and Filtration Specialties are available from your favorite laboratory supply house.

New Bench-Top Fermentor

Is Small, Compact, Convenient to Use



REMOVABLE BAFFLE ASSEMBLY

A wide range of microbial investigations can now be made with bench-top convenience in the MicroFerm, a compact research fermentor. In the quiet of your own laboratory, you can conduct realistic pilot studies while temperature, agitation, and aeration are carefully controlled.

±0.25°C TEMPERATURE CONTROL

To conserve space and achieve more efficient temperature regulation, the conventional water bath has been eliminated. A new design permits tempered water to flow through hollow baffles* in the fermentor from an integral recirculating system. Temperature is adjustable from 5°C above water-supply temperature to 60°C, by means of a Thermistor controller.

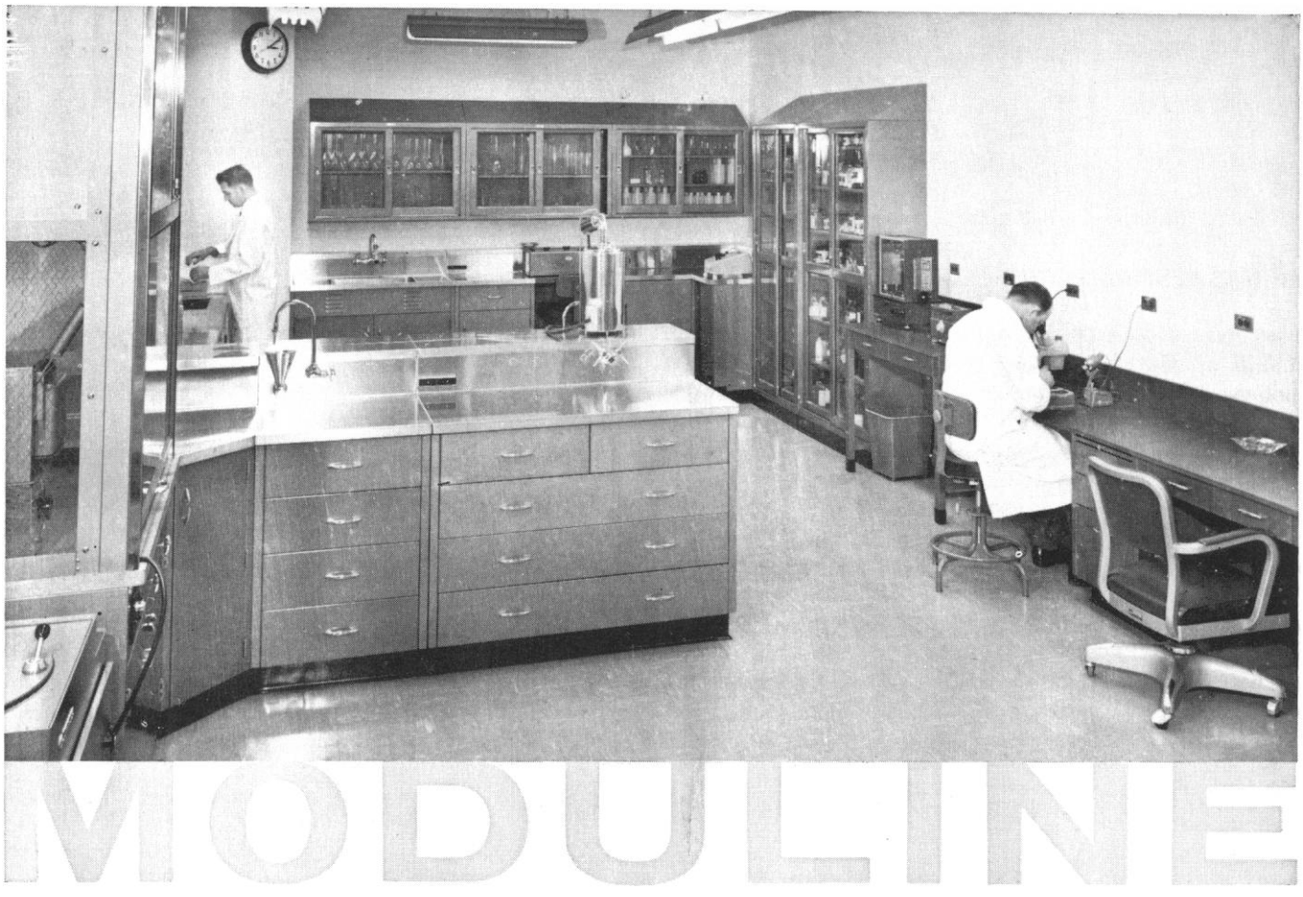
Cultures can be irradiated with fluorescent or neon illumination from a Photosynthetic Light Manifold.

Accommodates 4 interchangeable fermentors: 2, 5, 7½ or 14 liters. Easy to remove. Designed for repeated sterilization in a 20″ autoclave.

*Patent Pending

Send for Catalog MFS/9105

NBS New Brunswick Scientific Co., Inc.
1130 Somerset Street, New Brunswick, New Jersey 08903



Casework With A Future

Casework quality cannot be measured solely on the gauge of steel used to construct the cabinets. Structural strength is determined by the form, not gauge of the sheet steel. Quality is also workmanship, skill in welding, proper grinding, painting — and in general the manner in which the equipment is crafted — to give it a future.

Coved inside front corner posts for added strength, hat section stiffeners along shelves for heavy loads, welded inverted pan stiffeners on floor and wall cases for rigidity, full height internal channel stiffeners in doors, ½" shelf adjustment on applied pilasters in lieu of perforated louvers in the corner post, nylon drawer rollers with ball bearings rather than just nylon rollers — these are some of the quality features that make Moduline laboratory furniture structurally superior and new looking year after year under constant heavy usage.

The list can go on and on — modular design provides for future modification and arrangement and simplifies installation. Walk-in fume hoods, illuminated titration tables, distillation racks, lazy susans — formerly custom built pieces — are now part of the standard line.

Look to Moduline for advanced ideas in laboratory furniture — better built to give it a future.

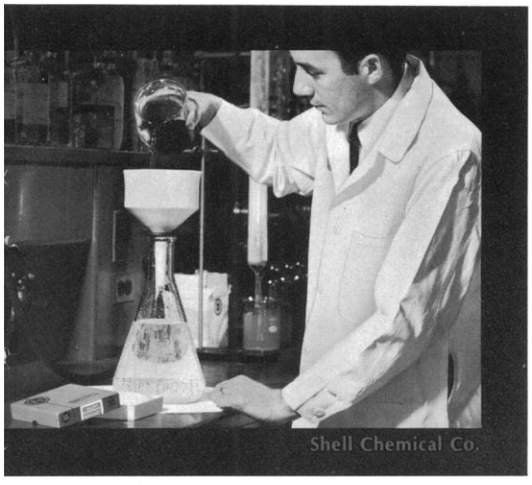
For details see your Aloe Scientific representative or write Aloe Scientific, 1831 Olive Street, St. Louis 3, Mo.

Serving the Sciences that Serve Mankind

HEALTH AND SCIENCE DIVISION [B] BRUNSWICK CORPORATION

ALOE SCIENTIFIC

Known by the company they keep and the companies they serve..



Photographs courtesy of the companies named below each picture

Specify S&S Analytical Filter Papers

All of the companies who contributed the pictures on these pages have one thing in common. Whether theirs is the business of pharmaceuticals, industrial chemicals, or finished industrial products, you will find S&S Analytical Filter Paper in their laboratory.

S&S has consistently set the highest standards in the industry as to purity—less than 0.007% ash per circle or sheet for quantitative grades. But more than that, S&S maintains its rigid physical and chemical standards lot after lot, box after box. If after actual analysis in our quality control laboratories any batch does not measure up, it is rejected.

2 NEW S&S GRADES

In response to widespread demand for economical papers, of pure cotton fibers having the characteristics described below, S&S announces 2 new qualitative filter paper grades.

- **591 A** Basic paper for general filtration. Circles, sheets.
- **591 C** Specially selected for chromatography. Medium absorption. Sheets and strips.
- **593 A** Thick. Medium filtration—increased retention. Circles, sheets.
- **593 C** Thick. Specially selected for chromatography. Sheets and strips.

OTHER S&S FILTRATION SPECIALTIES

S&S Membrane Filters First membrane filters sold in the United States. Pure cellulose or cellulose derivatives, extremely uniform micropore structure, very smooth surface. Pore sizes of the different types range from 5 millimicrons to 10 microns. S&S offers the bacteriologist and microbiologist a wider range of pore sizes from which to choose than any competing line.

Selectacel* TLC Ion Exchange Celluloses for Thin Layer Chromatography Offers two outstanding advantages—(1) savings in time because of extremely uniform particle size for outstandingly smooth TLC layers, (2) Better adherence to the plate—superior, extremely sharp separations, even of closely related substances.

S&S No. 2500 Cellulose Acetate Membrane Makes possible a great advance in chromatographic separations through electrophoresis. (1) Increased speed—extremely rapid separations possible. (2) Separations of outstanding clarity and sharpness not obtainable through previously standard techniques.

S&S Collodion Bags For concentration and enrichment of protein solutions—a preliminary step to electrophoretic separation. Simple, time-saving method—an exclusive S&S Specialty Product.

S&S Micro-Filter Apparatus For vacuum filtration of small volumes and collection of cells, etc., on small surface areas. Makes possible a new, faster more quantitative method for detection of RNA-DNA complexes using S&S Membrane Filter B-6. Durable, easy to use, more convenient than other designs.

*Selectacel is produced by Brown Company and exclusively packaged and distributed for laboratory use by Carl Schleicher & Schuell Co.

MAIL COUPON FOR DATA AND SAMPLES.

Without obligation please send the following:

Carl Schleicher & Schuell Co.
Keene, New Hampshire Dept. INS

- ☐ S&S Analytical Filter Paper Sampler
- ☐ S&S Membrane Filter Brochure
- ☐ Selectacel TLC Bulletin
- ☐ S&S Collodion Bag Bulletin
- ☐ S&S No. 2500 Cellulose Acetate Membrane Bulletin
- ☐ S&S Micro-Filter Apparatus Bulletin

Samples and data on New S&S Grades:

- ☐ S&S 591 A and 593 A (analytical use)
- ☐ S&S 591 C and 593 C (chromatographic use)

Name_____

Company_____

Address_____

are therefore vital to obtaining significant calculations. It was evident at the meeting that a considerable amount of effort has gone into the collection and organization of good nuclear data. More than a dozen systems have been developed to process evaluated nuclear data. Perhaps the most advanced nuclear data system, the Evaluated Nuclear Data File, is being worked on at the Sigma Center at Brookhaven National Laboratory. Most nuclear data will be primarily available through inquiry to some computer system.

The time behavior of reactors is receiving increased emphasis. W. K. Ergen (ORNL) pointed out a number of mathematical problems in nuclear safety analysis which would require additional computations. However, because large reactors can lead to spatial instability in the flux, it is becoming necessary to consider spatial kinetics problems. Judging by papers presented from the United Kingdom and France it appears that this is an area of reactor computation in which the United States does not lead.

Depletion codes continue to be based on a series of steady-state diffusion codes. The new interest appears to be centered about allowing the user to specify the depletion chains of interest to him. Depletion or burn-up codes are tending to become systems or linked calculations and, for example, the KARE and NOVA systems, allow depletion calculations to be selected.

The usual competition was present between advocates of probabilistic methods (Monte Carlo) and deterministic methods. On the deterministic side, some results were shown for supposedly complex problems for the transport equation which gave good comparative results with Monte Carlo codes. The deterministic methods used only a fraction of the machine time required by the Monte Carlo codes. Two papers dealing with Monte Carlo codes, however, indicated that, by astute techniques, it was possible to reduce the computer time and still get satisfactory results. L. H. Underhill (United Kingdom) commented that a Monte Carlo program had the advantage of eliminating unnecessary human thinking and allowed the computer to do the real brute-force work. After comparing some deterministic and probabilistic results, the comment was attributed to Bengt Carlson that his faith was restored in the Monte Carlo method because it agreed so well with the deterministic methods.

This conference was very valuable to those present and will also be valuable to those who will receive the conference proceedings. Two of the "facetious" remarks made by J. J. Syrett (United Kingdom) point out the concern of man and computers. He commented, in reference to the new faster and bigger computers that are appearing, that "a sort of Parkinson's Law applies to computing in that the computing requirements always expand to fill the machine available." His second comment was that "the really important question was not the cost per operation on the computer but the cost per useful piece of output that one gets off the computer."

The meeting was jointly sponsored by Argonne National Laboratory, European Nuclear Energy Agency, and the Mathematics and Computations Division of the American Nuclear Society.

WARD SANGREN
Computer Applications Incorporated, San Diego, California

Forthcoming Events

September

19–22. **Power**, natl. conf., Albany, N.Y. (Inst. of Electrical and Electronics Engineers, Box A, Lenox Hill Station, New York 10021)

19–25. World **Medical** Assoc., 19th general assembly, London, England. (H. S. Gear, 10 Columbus Circle, New York 10019)

20. **Organic Solid State**, 3rd annual symp., Franklin Inst., Philadelphia, Pa. (M. M. Labes, Franklin Inst. Research Laboratories, Philadelphia 19103)

20. **Photo-Electronic Image Devices** as Aids to Scientific Observation, symp., London, England. (G. V. McGee, Dept. of Physics, Imperial College of Science and Technology, South Kensington, London S.W.7)

20–22. **Glacier Mapping**, symp., Ottawa, Ont., Canada. (Intern. Assoc. of Scientific Hydrology, 61 rue des Ronces, Gentbrugge, Belgium)

20–24. **Biochemistry**, 8th Latin meeting, Lisbon, Portugal. (S. F. Gomes da Costa, Laboratorio de Quimica Fisiologica, Faculdade de Medicina, Hospital de Santa Maria, Lisbon)

20–24. **Burn Research**, intern. congr., Edinburgh, Scotland. (A. Sutherland, Royal Hospital for Sick Children, Sciennes Rd., Edinburgh 9)

20–24. **Fundamental Research**, 3rd intern. symp., Cambridge, England. (H. W. Emerton, Reed Paper Group Ltd., Research and Development Centre, Aylesford, Maidstone, Kent, England)

20–24. International Council of Societies of **Industrial Design**, 4th general assembly and congr., Vienna, Austria. (Mrs. D. des

Cressonieres, 70 Coudenberg, Brussels, Belgium)

20–24. **Thermionic Electrical Power Generation**, intern. conf., London, England. (Inst. of Electrical Engineers, Savoy Pl., London W.C.2)

20–27. Comparative and Cellular **Pathology of Epilepsy**, symp., Liblice, Czechoslovakia. (F. Hrabal, Foreign Relations Dept., Czechoslovak Academy of Sciences, Narodni tr. 3, Prague 1)

21–23. **Chemurgic** conf., Columbus, Ohio. (J. Ticknor, Chemurgic Council, 350 Fifth Ave., New York, N.Y.)

21–23. **Fiber** Soc., 25th mtg., Boston, Mass. (Box 625, Princeton, N.J.)

21–23. **Magnetism**, European conf., Vienna, Austria. (Verein Deutscher Eisenhüttenleute, Breit Str. 27, Düsseldorf, Germany)

21–23. **Plasma Electromagnetics of Hypersonic Flight**, 3rd symp., Boston and Bedford, Mass. (A. Cahill, Air Force Cambridge Research Laboratories, L. G. Hanscom Field, Bedford, Mass. 01731)

21–23. **Touch, Heat, and Pain**, CIBA symp., London, England. (CIBA, 41 Portland Pl., London W.1)

21–25. Propagation Factors in **Space Communications**, symp., Rome, Italy. (Lt. Col. E. F. Dukes, Advisory Group for Aeronautical Research and Development, 64 rue de Varenne, Paris 7, France)

22–24. Practice of **Gas Chromatography**, 4th annual mtg., St. Louis, Mo. (N. Brenner, Perkin-Elmer Corp., Main Ave., Norwalk, Conn.)

22–24. Canadian **High Polymer Forum**, 13th, Ottawa, Ont. (D. M. Wiles, Div. of Applied Chemistry, National Research Council, Ottawa)

22–24. **Military Electronics**, conf. (MIL-E-CON 9), Washington, D.C. (L. H. King, Atlantic Research Corp., Shirley Hwy. at Edsall Rd., Alexandria, Va.)

22–24. American Soc. of **Photogrammetry**, 30th semiannual conv., Wright-Patterson AFB, Ohio. (A. J. Cannon, Research and Technology Div., Wright-Patterson AFB)

22–25. Committee of European **Acarologists**, symp., Milan, Italy. (G. Mathys, Stations Federales d'Essais Agricoles, Lausanne, Switzerland)

22–25. **Amblyopia Exanopsia**, intern. symp., Liége, Belgium. (R. Weekers, Clinique Ophtalmologique, Universite de Liége, 66 blvd. de la Constitution, Liege)

22–25. British Assoc. for **Cancer Research**, annual, Dublin, Ireland. (J. G. Bennerre, Courtauld Inst., Middlesex Hospital, London W.1, England)

22–26. **Paläontologische Gesellschaft**, mtg., Zurich, Switzerland. (E. Kuhn-Schnyder, Paläontologisches Institut d. Univ. Zurich, Künstlergasse 16, 8006, Zurich)

22–28. **Radiology**, 11th intern. congr., Rome, Italy. (Secretariat, Via Reno 21, Rome)

23–25. French **Medical** Congr., Paris, France. (M. Bricaire, 40 rue Scheffer, Paris 16)

23–25. Society of the **Plastics** Industry, New England sect., 21st annual, Groton, Conn. (The Society, 250 Park Ave., New York 10017)

23–26. **Mycology**, tripartite conf., Germany, Austria, Switzerland; Klagenfurt, Austria. (Ostrian Mycology Soc., Postfach 200, Vienna 1)

23–28. **Electronics and Vacuum Physics**, 3rd Czechoslovak conf., Prague, Czechoslovakia. (Organizing Committee, Ke Karlovu 5, Dept. of Electronics and Vacuum Physics, Prague 2)

24–25. **Communications**, 13th conf., Cedar Rapids, Iowa. (Inst. of Electrical and Electronics Engineers, Box A, Lenox Hill Station, New York 21)

25–30. International Soc. of **Nephrology**, 3rd intern. congr., Washington, D.C. (Secretariat, 9650 Wisconsin Ave., Washington, D.C. 20014)

26–29. American Inst. of **Chemical Engineers**, 57th natl., Minneapolis, Minn. (AIChE, 345 E. 47 St., New York 10017)

27. Society for **Pediatric Radiology**, Washington, D.C. (J. L. Gwinn, Children's Hospital, 4614 Sunset Blvd., Los Angeles, Calif.)

27–29. Chemistry of the **Solvent Extraction of Metals**, intern. conf., Atomic Energy Research Establishment, Harwell, England. (F. K. Pyne, B. 329, Harwell)

27–1. **Community Oral Health**, hemispheric conf., San Juan, P.R. (N. O. Harris, School of Dentistry, Univ. of Puerto Rico, San Juan 00905)

27–1. **Urology**, French congr., Paris, France. (J. Michon, French Assoc. of

Urology, 47, boul. des Invalides, Paris 7)

28. Society of Austrian **Chemists**, general assembly, Graz, Austria. (The Society, Eschenbachgasse 9, Vienna 1)

28–29. **Electric Heating**, 7th biennial conf., Cleveland, Ohio. (A. F. Leatherman, Battelle Memorial Inst., 505 King Ave., Columbus, Ohio 43201)

28–30. German Soc. for **Documentation**, 17th annual, Constance, Germany. (The Society, Schubertstr. 1, Frankfurt am Main, Germany)

28–30. Physics and **Nondestructive Testing**, symp., Dayton, Ohio. (D. W. J. McGonnagle, IIT Research Inst., 10 W. 35 St., Chicago, Ill. 60616)

28–30. Industrial and Commercial **Power Systems**, conf., Buffalo, N.Y. (J. A. Hart, Allison Div., General Motors Corp., Box 894, Indianapolis 6, Ind.)

28–1. **Experimental Mechanics**, 2nd intern. congr., Washington, D.C. (J. L. Jones, Soc. for Experimental Stress Analysis, 21 Bridge Sq., Westport, Conn. 06880)

28–1. Society for **Experimental Stress Analysis**, Washington, D.C. (B. E. Rossi, 21 Bridge Sq., Westport, Conn.)

28–1. **Inhaled Particles and Vapors**, Cambridge, England. (J. S. McLintock, Medical Service, Natl. Coal Board, Hobart House, Grosvenor Pl., London S.W.1)

28–1. **Medical Electronics**, European symp., Brighton, England. (J. Pearce, 4 Mill St., London W.1)

28–2. **Hyperpure Materials** in Science and Technology, Inst. for Applied Physics of Hyperpure Materials, Dresden, Germany. (The Institute, Dresden A 20, Winterbergstr. 28, East Germany)

29–1. German Soc. for **Aviation and Space Medicine**, intern. congr., Munich, Germany. (H. von Diringshofen, German Soc. for Aviation and Space Medicine, Silcherstr. 6, Munich 13)

29–1. **Analytical Chemistry**, symp., Graz, Austria. (Prof. Gutmann, Austrian Assoc. for Microchemistry and Analytical Chemistry, Eschenbachgasse 9, Vienna 1)

29–1. European **Atomic Forum**, 2nd congr., Frankfurt am Main, Germany. (European Atomic Energy Forum, 26, rue de Clichy, Paris 9)

29–1. American **Vacuum** Soc., 12th annual symp., New York, N.Y. (R. L. Jepsen, Varian Associates, 611 Hansen Way, Palo Alto, Calif.)

October

1–3. French-Language Assoc. of **Scientific Psychology**, 10th study sessions, Marseilles, France. (P. Fraisse, The Association, Inst. de Psychologie, 28, rue Serpente, Paris 6°)

1–11. International **Scientific Film** Assoc., 19th annual congr., Bucharest, Rumania. (ISFA, 38, avenue des Termes, Paris 17°, France)

2. Association of **Clinical Biochemists**, annual, London, England. (D. W. Moss, Postgraduate Medical School, Ducane Rd., London, W.12)

3–5. **Refractory Metals**, 4th symp., French Lick, Ind. (J. Maltz, Materials Research Div., NASA, 600 Independence Ave., SW, Washington, D.C. 20546)

3–7. American **Phytopathological** Soc., Miami Beach, Fla. (J. R. Shay, Dept. of Botany and Plant Pathology, Purdue Univ., Lafayette, Ind.)

3–8. **Clinical Pathology**, 6th intern. congr., Rome, Italy. (B. L. Della Vida, Via de'Penitenzieri 13, Rome)

3–9. **Water Desalination**, 1st intern. symp., Washington, D.C. (Atomic Industrial Forum, 850 Third Ave., New York 10022)

4–5. **Enzyme Regulation**, 4th intern. symp., Indiana Univ., Indianapolis. (G. Weber, Indiana Univ. School of Medicine, Indianapolis 46207)

4–5. **Physical Metallurgy of Refractory Metals**, conf., American Inst. of Mining, Metallurgical, and Petroleum Engineers, French Lick, Ind. (AIME, 345 E. 47 St., New York 10017)

4–6. **Electronics**, Canadian conf., Toronto, Ont. (W. M. Lower, 1819 Yonge St., Toronto)

4–6. **Industrial Organic Analysis**, Analytical Chemistry Div., Chemical Inst. of Canada, Sarnia, Ont. (R. M. Small, Research Dept., Polymer Corp, Sarnia)

4–6. International **Scientific Radio Union**/Inst. of **Electrical and Electronics Engineers**, fall meeting, Dartmouth College, Hanover, N.H. (IEEE, Box A, Lenox Hill Station, New York, N.Y.)

4–7. **Instrument-Automation** Conf., Los Angeles, Calif. (E. M. Grabbe, Instrument Soc. of America, 530 William Penn Pl., Pittsburgh, Pa. 15219)

4–7. **Otorhinolaryngology**, 62nd French congr., Paris, France. (H. Guillon, 6, avenue Mac-Mahon, Paris 16°)

4–7. **Research Equipment**, exhibit and instrument symp., 15th annual, Bethesda, Md. (J. B. Davis, Natl. Institutes of Health, Bethesda, Md. 20014)

4–7. International Committee for **Social Sciences Documentation**, annual plenary assembly, Budapest, Hungary. (J. Meyriat, 27, rue St. Guillaume, Paris 7)

4–8. **Aeronautic and Space Engineering**, Soc. of Automotive Engineers, Los Angeles, Calif. (C. C. King, SAE Western Branch, 999 North Sepulveda Blvd., El Segundo, Calif. 90245)

4–8. Ciba Foundation **Clinical Research** Guest Conf., London, England. (Ciba, 41 Portland Pl., London W.1)

4–10. **Physicists**, conf., Frankfurt am Main, Germany. (G. Schubert, Inst. für Theoretische Physik, Universität, Mainz, Germany)

4–13. International Council for the **Exploration of the Sea**, 53rd annual meeting, Rome, Italy. (The Council, Charlottenlund Slot, Charlottenlund, Denmark)

4–13. **Commonwealth Medical** Conf., Edinburgh, Scotland. (Mrs. J. Hotchkiss, Ministry of Overseas Development, Stag Place, London, S.W.1, England)

5–7. Industrial and Commercial **Power Systems**, conf., Buffalo, N.Y. (T. O. Zittel, Bethlehem Steel Co., 3555 Lake Shore Rd., Buffalo 14219)

5–8. International Committee of **Weights and Measures**, session, Sèvres, France. (Intern. Bureau of Weights and Measures, Pavillon de Breteuil, Sèvres, Sein-et-Oise, France)

5–9. **Infectious Pathology**, 4th intern. congr., Freiburg im Breisgau, Germany. (G. Mossner, Hugerterstr. 55, Freiburg im Breisgau)

5–9. **Tuberculosis**, 18th intern. conf., Munich, Germany. (Intern. Union Against Tuberculosis, 15, rue Pomereu, Paris 16°, France)

6–8. **Dynamics of Fluids and Plasmas**, symp., Univ. of Maryland, College Park. (S. I. Pai, Inst. for Fluid Dynamics and Applied Mathematics, Univ. of Maryland, College Park 20742)

6–8. **Optical** Soc. of America, annual meeting, Philadelphia, Pa. (M. E. Warga, OSA, 1155 16th St., NW, Washington, D.C. 20036)

6–8. Royal Inst. of **Public Health and Hygiene**, annual conf., Weymouth, England. (Secretary, RIPHH, 28 Portland Place, London, W.1, England)

6–10. **Wood and Organisms**, intern. symp., Berlin, Germany. (German Soc. for Wood Research, Danneckerstr. 37, Stuttgart S, Germany)

7–9. **Seismological** Soc. of America, eastern sec. 37th annual, Lamont Geological Observatory, Palisades, N.Y. (J. Dorman, Lamont Geological Observatory, Palisades 10964)

8–9. **Atlantic Coastal Plain Geological** Assoc., field trip, South Carolina. (D. J. Colquhoun, Dept. of Geology, Univ. of South Carolina, Columbia)

8–9. Association of Midwestern **College Biology Teachers**, 9th annual conf., Northern Illinois Univ., DeKalb)

8–9. **Indiana** Acad. of Science, fall meeting, Notre Dame. (C. F. Dineen, St. Mary's College, Notre Dame)

9. **Paleontological Research** Inst., Ithaca, N.Y. (K. V. W. Palmer, Paleontological Research Inst., 109 Dearborn Pl., Ithaca)

9–10. **Gastroenterology**, French conf., Paris, France. (R. Biguie, 79, Boulevard Malesherbes, Paris 8°)

9–13. American Soc. of **Clinical Hypnosis**, Chicago, Ill. (F. D. Nowlin, ASCH, 800 Washington Ave., SE, Minneapolis, Minn. 55414)

9–17. Electrical, Electronics, and Mechanical **Engineering**, first Pan American congr., Mexico, D.F. (Inst. of Electrical and Electronics Engineers, Box A, Lenox Hill Station, New York 10021)

10–14. **Water Pollution Control** Fed., 38th annual, Atlantic City, N.J. (R. E. Fuhrman, 4435 Wisconsin Ave., NW, Washington, D.C. 20016)

10–15. International Federation for **Documentation**, congr., Washington, D.C. (Secretariat, FID, 9650 Wisconsin Ave., Washington 20014)

10–15. **Electrochemical** Soc., meeting, Buffalo, N.Y. (Executive Secretary, ES, 30 E. 42 St., New York 10017)

10–15. **Endocrinology**, 6th Pan American conf., Mexico, D.F. (G. Gual, Inst. Nacional de la Nutrición, Dr. Jimenez No. 261, Mexico 7)

10–16. American **Documentation** Inst., Washington, D.C. (J. E. Bryan, 2000 P St., NW, Washington, D.C. 20036)

10–17. **Bronchoesophagology**, 1st Latin American congr., Rio de Janeiro, Brazil. (F. Aprigliano, Rua Alcindo Guanabara, 24, Sob-Loja 206, Rio de Janeiro)

10–17. **Otorhinolaryngology**, 14th Brazilian congr., Rio de Janeiro, Brazil. (W. Benevides, Rua Alcindo Guanabara, 24, Sob-Loja 206, Rio de Janeiro)

10–17. **Plastic Surgery**, 10th Latin American congr., Buenos Aires, Argentina. (J. Norberto Spera, Riglos 624, Buenos Aires)

11–13. **Color Centers in Alkali Halides**,

symp., Univ. of Illinois, Urbana. (D. W. Compton, Dept. of Physics, Univ. of Illinois, Urbana)

11–13. **Communications**, 11th natl. symp., Utica, N.Y. (G. E. Brunette, Communications Div. (EMCT) Rome Air Development Center, Griffiss AFB, New York 13442)

11–13. Metabolic Roles of **Lipids**, symp., Cincinnati, Ohio. (C. H. Hauber, American Oil Chemists' Soc., 35 East Wacker Dr., Chicago 1, Ill.)

11–13. **Manned Spaceflight**, 4th meeting, St. Louis, Mo. (J. F. Yardley, McDonnell Aircraft Corp., P.O. Box 516, St. Louis)

11–13. **National Acad. of Sciences**, fall meeting, Univ. of Washington, Seattle. (H. Neurath, Dept. of Biochemistry, Univ. of Washington, Seattle 98105)

11–13. American **Record Management** Assoc., 10th annual conf., Minneapolis, Minn. (L. Loveless, Office Services, Honeywell, Inc., 2701 Fourth Ave., S, Minneapolis 55408)

11–14. Association of **Official Agricultural Chemists**, 79th annual, Washington, D.C. (L. G. Ensminger, AOAC, Box 540, Benjamin Franklin Station, Washington 20044)

11–14. American **Oil Chemists'** Soc., fall meeting, Cincinnati, Ohio. (AOCS, 35 E. Wacker Dr., Chicago, Ill. 60600)

11–15. Fall **Metallurgy** Days, Paris, France. (Soc. Française de Metallurgie, 25 rue de Clichy, Paris 9e)

11–16. **Stomatology**, 19th French congr., Paris. (R. Cayron, 99, rue de Courcelles, Paris 17e)

11–23. International Organization for **Standardization**, Milan, Italy. (Soc. of Motion Picture and Television Engineers, 9 E. 41 St., New York 10017)

12–13. **Cardio-Renal Consequences of Sustained Hypertension**, seminar, Philadelphia, Pa. (Miss S. Rosen, Symposium Office, Hahnemann Medical College and Hospital, 230 N. Broad St., Philadelphia 19102)

12–14. **Analytical Chemistry in Nuclear Technology**, 9th conf., Gatlinburg, Tenn. (C. D. Susano, Oak Ridge Natl. Laboratory, P.O. Box X, Oak Ridge, Tenn. 37831)

12–16. **Communications**, 13th intern. congr., Genoa, Italy. (Inst. for Intern. Communications, Viale Brigate Partigiane, 18, Genoa)

13. **Medical Physics**, seminar, New York, N.Y. (American Inst. of Physics, 335 E. 45 St., New York 10017)

13. **Animal Nutrition Research** Council, 26th annual, Washington, D.C. (J. C. Fritz, 12314 Madeley Lane, Bowie, Md. 20715)

13–15. **Detonation**, 4th symp., White Oak, Silver Spring, Md. (S. J. Jacobs, U.S. Naval Ordnance Laboratory, White Oak, Silver Spring 20910)

13–15. American Assoc. of **Petroleum Geologists**, mid-continent regional meeting, Tulsa, Okla. (E. W. Ellsworth, AAPG, Box 979, Tulsa 74101)

13–16. **Tau Beta Pi** Assoc., Inc., Univ. of Maryland, College Park. (R. H. Nagel, 508 Dougherty Engineering Bldg., Univ. of Tennessee, Knoxville)

13–17. **Soil Biology**, first Latin American colloquium, Bahia Blanca, Argentina.

(Organizing Committee, Inst. de Edafologia e Hidrologia, Alem 925, Bahia Blanca, Argentina)

13–19. **Instrumentation and Automation**, 3rd intern. congr., Düsseldorf, Germany. (Nordwestdeutsche Ausstellungs- und-Messe-Gesellschaft, Ehrenhof 4, 4000 Düsseldorf 10)

14. Association of **Vitamin Chemists**, Chicago, Ill. (D. Olson, Dawe's Laboratories, 4800 S. Richmond St., Chicago)

14–15. International Federation of **Surgical Colleges**, 8th annual, Philadelphia, Pa.; *17*, Atlantic City, N.J. (K. Cassels, Royal College of Surgeons, Lincoln's Inn Fields, London W.C.2, England)

14–16. British **Orthopaedic** Assoc., fall meeting, London, England. (Joint Secretariat, 47 Lincoln's Inn Fields, London, W.C.2)

15. **Southern California Acad.** of Science, Los Angeles. (C. Rozaire, Los Angeles County Museum, 900 Exposition Blvd., Los Angeles 90007)

15–16. Contributions of Cytogenetics to the **Determination of Phylogenies**, 12th symp., Missouri Botanical Garden, St. Louis. (H. C. Cutler, Missouri Botanical Garden, St. Louis 63110)

15–16. National Soc. of **Professional Engineers**, 3rd annual conf., Oklahoma City, Okla. (NSPE, 2029 K St., NW, Washington 20006)

15–17. American **Heart** Assoc., Scientific sessions, Bal Harbour, Fla. (AHA, 44 E. 23 St., New York 10010)

16–17. **Infectious Diseases** Soc. of America, Washington, D.C. (E. H. Kass, IDS, Boston City Hospital, Boston, Mass. 02118)

17–21. **Antimicrobial Agents and Chemotherapy**, 5th interscience conf./4th intern. congr. of chemotherapy, Washington, D.C. (R. W. Sarber, American Soc. for Microbiology, 115 Huron View Blvd., Ann Arbor, Mich.)

17–21. **Metallurgical** Soc. of American Inst. of Mining, Metallurgical, and Petroleum Engineers, Detroit, Mich. (AIME, 345 E. 47 St., New York 10017)

18. **Industrial Pharmacy** sect., American Pharmaceutical Assoc., 4th annual midwest regional meeting, Chicago, Ill. (C. Schroeter, Abbott Laboratories, North Chicago, Ill.)

18–19. American Inst. of **Aeronautics and Astronautics**/Canadian Aeronautics and Space Inst., Toronto, Ont., Canada. (D. L. Raymond, 1290 Sixth Ave., New York 10019)

18–19. **Systems Science**, conf., Case Inst. of Technology, Cleveland, Ohio. (Inst. of Electrical and Electronics Engineers, Box A, Lenox Hill Station, New York 10021)

18–20. **Dynamic Stability of Structures**, intern. conf., Evanston, Ill. (G. Herrmann, Technological Inst., Northwestern Univ., Evanston 60201)

18–20. **Electromagnetic Radiation in Agriculture**, intern. conf., Roanoke, Va. (D. P. Brown, Niagara Mohawk Power Corp., 300 Erie Blvd. W., Syracuse, N.Y. 13202)

18–20. American Soc. of **Lubrication Engineers**, San Francisco, Calif. (D. B. Sanberg, 5 North Wabash Ave., Chicago, Ill.)

18–20. Canadian Inst. of **Mining and**

Metallurgy, annual western meeting, Winnipeg, Canada. (CIMM, 906 Drummond Bldg., 1117 St. Catherine St. W., Montreal 2, P.Q., Canada)

18–20. **Nuclear Science**, 12th symp., San Francisco, Calif. (Inst. of Electrical and Electronics Engineers, Box A, Lenox Hill Station, New York 10021)

18–20. Applied **Spectroscopy**, 12th symp., Ottawa, Ont., Canada. (R. V. Baker, Aluminum Co. of Canada, Arvida, P.Q., Canada)

18–21. Advances in **Gas Chromatography**, 3rd intern. symp., Houston, Tex. (A. Zlatkis, Dept. of Chemistry, Univ. of Houston, Houston)

18–21. **Management Information** and Data Transfer Systems, American Univ., Washington, D.C. (R. I. Cole, Center for Technology and Administration, American Univ., 2000 G St., NW, Washington, D.C. 20006)

18–22. American Soc. of **Civil Engineers**, Kansas City, Mo. (W. H. Wisely, ASCE, 345 E. 47 St., New York 10017)

18–22. Society for **Nondestructive Testing**, 25th natl. conv., Detroit, Mich. (N. H. Cale, Anaconda American Brass Co., Research and Technical Center, P.O. Box 747, Waterbury, Conn.)

18–22. American **Public Health** Assoc., 93rd annual, Chicago, Ill. (APHA, 1790 Broadway, New York, N.Y.)

18–22. **Radioisotope Instruments** in Industry and Geophysics, Warsaw, Poland. (J. H. Kane, Div. of Special Projects, U.S. Atomic Energy Commission, Washington, D.C.)

18–22. American Soc. for **Metals**, natl. congr., Detroit, Mich. (A. R. Putnam, ASM, Metals Park, Ohio)

18–22. Application of **Radioisotopes in Gastroenterology**, symp., Lausanne, Switzerland. (A. Vannotti, Clinique Médicale Universitaire, Hôpital Cantonal, Lausanne)

18–22. American College of **Surgeons**, annual clinical congr., Atlantic City, N.J. (American College of Surgeons, 55 East Erie St., Chicago, Ill. 60611)

19–20. International **Rhinologic** Soc., 1st congr., Kyoto, Japan. (H. A. E. van Dishoeck, Academisch Ziekenhuis, Leiden, Netherlands)

19–21. Association of **Analytical Chemists**, 13th conf., Detroit, Mich. (G. Schenk, Dept. of Chemistry, Wayne State Univ., Detroit 48202)

19–21. **Cloud Physics and Severe Storms**, conf., American Meteorological Soc., Reno, Nev. (K. C. Spengler, 45 Beacon St., Boston 8, Mass.)

19–21. Radio Astronomical and Satellite **Studies of the Atmosphere**, 2nd symp., Boston, Mass. (G. A. Cushman, Wentworth Inst., 550 Huntington Ave., Boston)

19–22. Economics of **Automatic Data Processing**, symp., Rome, Italy. (Intern. Computation Center, Viale della Civilia del Lavoro, 23, P.O.B. 10053, Rome)

20–21. **Airborne Infection**, 2nd intern. symp., Johns Hopkins School of Medicine, Baltimore, Md. (E. K. Wolfe, Fort Detrick, Frederick, Md. 21701)

20–21. International Soc. of **Audiology**, 2nd congr., Kyoto, Japan. (M. Goto, Dept. of Otolaryngology, Kyoto Univ., Shogoin, Sakyo-ku, Kyoto)

20–22. **Circuit and System Theory**, Allerton Conf., Univ. of Illinois, Monticello. (M. E. Van Valkenburg, Dept. of Elec-

trical Engineering, Univ. of Illinois, Urbana 61803)

20–22. **Design of Experiments**, 11th conf., Hoboken, N.J. (F. G. Dressel, Army Research Office-Durham, Box CM, Duke Station, Durham, N.C. 27706)

20–22. **Parenteral Drug** Assoc., annual conv., New York, N.Y. (PDA, Western Saving Fund Bldg., Broad and Chestnut St., Philadelphia, Pa. 19107)

21. **New Mexico** Acad. of Science, Albuquerque. (K. S. Bergstresser, 739 42nd St., Los Alamos, N.M.)

21–22. **Copolymer** conf., Ludwigshafen, Germany. (Deutsche Bunsen-Gesellschaft für Physikalische Chemie, Varrentrappstr. 40-42, 6 Frankfurt am Main, Germany)

21–22. **Electrochemical Current Sources**, symp., Frankfurt am Main, Germany. (Gesellschaft Deutscher Chemiker, Postfach 9075, 6 Frankfurt am Main)

21–23. **Microminiaturization in Automatic Control**, symp., Munich, Germany. (G. Müller, Siemens & Halske AG, Wernerwerk für Messtechnik, Postfach 834, Karlsruhe, Germany)

21–23. Society of **Photographic Scientists** and Engineers, symp., Washington, D.C. (W. S. Dempsey, Houston Fearless Corp., 1413 K St., NW, Washington 20005)

22–23. **Data Processing** in Public Libraries, conf., Drexel Inst. of Technology, Philadelphia, Pa. (M. D. Warrington, Graduate School of Library Science, Drexel Inst. of Technology, Philadelphia 19104)

23–28. American Acad. of **Pediatrics**, annual, Chicago, Ill. (R. G. Frazier, AAP, 1801 Hinman Ave., Evanston, Ill. 60204)

24–27. Society of American **Foresters**, annual, Detroit, Mich. (Society of American Foresters, 1010 16th St., NW, Washington 20036)

24–29. **Stable Isotopes**, 4th symp., Leipzig, East Germany. (Inst. für Stabile Isotope, Deutsche Akademie der Wissenschaften, Permoserstr. 15, 705 Leipzig)

24–30. American College of **Gastroenterology**, Bal Harbour, Fla. (D. Weiss, 33 W. 60 St., New York 10023)

25–27. **Chemical Engineering**, 15th conf., Quebec, Que., Canada. (Chemical Inst. of Canada, 48 Rideau St., Ottawa 2, Ont.)

25–27. Functional Organization of the **Compound Eye**, symp., Karolinska Inst., Stockholm, Sweden. (W. E. Savely, Air Force Office of Scientific Research, Washington, D.C. 20333)

25–27. **Electrical Insulation**, Natl. Acad. of Sciences–Nat. Research Council conf., Buck Hill Falls, Pa. (D. W. Thornhill, NAS, 2101 Constitution Ave., NW, Washington, D.C.)

25–27. **Electronics**, natl. conf., Chicago, Ill. (R. G. Brown, Dept. of Electrical Engineering, Iowa State Univ., Ames 50010)

25–27. **Nuclear and Engineering Ceramics**, conf., Harwell, England. (G. H. Stewart, British Ceramic Soc., Shelton House, Shelton, Stoke-on-Trent, England)

25–27. Society of **Rheology**, Case Inst. of Technology, Cleveland, Ohio. (J. C. Miller, Union Carbide Plastics Co., Bound Brook, N.J.)

25–29. **Hypotensive Polypeptides**, intern. symp., Florence, Italy. (E. G. Erdös, Dept. of Pharmacology, Univ. of Oklahoma

Medical Center, Oklahoma City 73104)

26. American Soc. of **Safety Engineers**, annual, Chicago, Ill. (A. C. Blackman, ASSE, 5 N. Wabash, Chicago, Ill.)

26–28. **Fluid Amplification**, symp., Washington, D.C. (J. M. Kirschner, Fluid Systems Branch, Harry Diamond Laboratories, Washington 20438)

26–28. **Shock and Vibration**, 25th symp., New Orleans, La. (Shock and Vibration Information Center, Code 4021, U.S. Naval Research Laboratory, Washington, D.C. 20390)

26–28. **Spacecraft Sterilization Technology**, natl. conf., NASA, California Inst. of Technology, Pasadena. (L. B. Hall, Code SB, NASA, Washington, D.C. 20546)

26–29. National Soc. for **Clean Air**, 32nd annual conf., Eastbourne, England. (R. Sharp, The Society, Field House, Breams Bldg., London, E.C.4)

26–30. **Immunohistochemistry**, symp., Nijmegen, Netherlands. (H. von Mayersbach, Faculteit der Geneeskunde, Laboratorium voor Cytologie en Histologie, Universiteit Van Nijmegen, Nijmegen)

27–29. **Aerospace and Navigational Electronics**, 12th East Coast conf., Baltimore, Md. (B. W. Moss, Mail #383, Martin Co., Box 988, Baltimore 21203)

27–29. American **Ceramic** Soc., Electronics Div., fall meeting, Los Angeles, Calif. (R. S. Shelden, 4055 N. High St., Columbus 4, Ohio)

27–29. **Electronic Data Processing Systems** for State and Local Governments, 2nd natl. conf., New York Univ., New York, N.Y. (H. G. Berkman, Graduate School of Public Administration, 4 Washington Sq. N, New York 10003)

27–30. **Neurological Surgeons**, 15th annual congr., Chicago, Ill. (J. R. Russell, 1815 N. Capitol Ave., Indianapolis, Ind. 46202)

28–29. **Educational Records** Bureau, 13th annual conf., New York. (A. E. Traxler, Educational Records Bureau, 21 Audubon Ave., New York 10032)

28–29. **Microwave Acoustics**, symp., Hanscom Field, Bedford, Mass. (T. G. Burnhagen, Air Force Cambridge Research Laboratories, Cambridge, Mass.)

28–30. American Soc. for **Aesthetics**, Washington, D.C. (J. R. Johnson, Cleveland Museum of Art, Cleveland, Ohio 44106)

28–4. **Psychology** as a Theoretical and Applied Discipline, seminar, Gujarat Univ., Ahmedabad, India. (P. H. Prabhu, School of Psychology, Education, and Philosophy, Gujarat Univ., Ahmedabad 9)

29–30. Society for the **Scientific Study of Religion**, annual, New York, N.Y. (SSSR, 1200 17th St., NW, Washington, D.C. 20036)

30–31. **Bronchoesophagology**, 11th intern. congr., Hakone, Japan. (C. M. Norris, 3401 N. Broad St., Philadelphia, Pa. 19140)

30–2. American **Speech and Hearing** Assoc., Chicago, Ill. (K. O. Johnson, 1001 Connecticut Ave., NW, Washington, D.C.)

31–4. American Soc. of **Agronomy**, 57th annual, Columbus, Ohio. (ASA, 677 South Segoe Rd., Madison, Wis. 53711)

31–5. Society of **Motion Picture and Television Engineers**, 98th technical conf., Montreal, P.Q., Canada. (SMPTE, 9 E. 41 St., New York 10017)

NEW BOOKS

(Continued from page 1225)

Atomic and Ionic Impact Phenomena on Metal Surfaces. Manfred Kaminsky. Academic Press, New York; Springer, Berlin, 1965. 414 pp. Illus. $14.50.

Boron-Nitrogen Compounds. Kurt Niedenzu and John W. Dawson. Springer, Berlin; Academic Press, New York, 1965. 184 pp. Illus. $6.75. Anorganische und Allgemeine Chemie in Einzeldarstellungen, vol. 6, edited by Margot Becke-Goehring.

Chemical Energy. Laurence E. Strong and Wilmer J. Stratton. Reinhold, New York; Chapman and Hall, London, 1965. 125 pp. Illus. Paper, $1.95. A volume in the Selected Topics in Modern Chemistry Series, edited by Harry H. Sisler and Calvin A. VanderWerf.

The Collected Papers of Emil Artin. Serge Lang and John T. Tate, Eds. Addison-Wesley, Reading, Mass., 1965. 566 pp. Illus. $13.50.

Cooling Electronic Equipment. Allan D. Kraus. Prentice-Hall, Englewood Cliffs, N.J., 1965. 406 pp. Illus. $16.

Cosmic Rays. Proceedings of the P. N. Lebedev Physics Institute. vol. 26. D. V. Skobel'tsyn, Ed. Translated from the Russian (Moscow, 1964). Consultants Bureau, New York, 1965. 260 pp. Illus. Paper, $27.50.

Development of Concepts of Physics: From the Rationalization of Mechanics to the First Theory of Atomic Structure. A. B. Arons. Addison-Wesley, Reading, Mass., 1965. 992 pp. Illus. $14.75.

Developments in Applied Spectroscopy. vol. 4. Proceedings, 15th Annual Mid-America Spectroscopy Symposium (Chicago, Ill.), June 1964. Elwin N. Davis, Ed. Plenum Press, New York, 1965. 558 pp. Illus. $18.50. Forty-five papers on the following topics: X-ray spectroscopy (9 papers); Infrared and raman spectroscopy (8 papers); Ultraviolet and visible spectroscopy (4 papers); Gas chromatography (11 papers); NMR spectroscopy (1 paper); and Emission, flame, and atomic absorption spectroscopy (12 papers).

Diffusion in Body-Centered Cubic Metals. Proceedings of a conference (Gatlinburg, Tenn.), September 1964. J. A. Wheeler, Jr., and F. R. Winslow, Eds. American Soc. for Metals, Metals Park, Ohio, 1965. 440 pp. Illus. $18. Twenty-seven papers.

The Dynamics of Conduction Electrons. A. B. Pippard. Gordon and Breach, New York, 1965. 156 pp. Illus. Paper, $1.95; cloth, $4.95. Documents on Modern Physics Series, edited by Elliott W. Montroll and George H. Vineyard.

Electronic Computers. S. H. Hollingdale and G. C. Tootill. Penguin Books, Baltimore, 1965. 336 pp. Illus. Paper, $1.65.

Elementary Structural Analysis and Design: Steel, Timber, and Reinforced Concrete. Linton E. Grinter. Macmillan, New York, ed. 2, 1965. 485 pp. Illus. $9.75.

Elements of Modern Algebra. Sze-Tsen Hu. Holden-Day, San Francisco, 1965. 21 pp. Illus. $9.85. Holden-Day Series in Mathematics, edited by Earl A. Coddington and Andrew M. Gleason.

Energetics in Metallurgical Phenomena.

vol. 1. William M. Mueller, Ed. Gordon and Breach, New York, 1965. 439 pp. Illus. Paper, $9.50; cloth, $19.50. Eight papers: "Intermetallic diffusion" by David Lazarus; "Solid solutions" by Rudolph Speiser; "Nucleation processes" by Michael B. Bever; "Transformations" by Earl C. Roberts; "Metastable phases obtained by rapid solidification" by Pol Duwez; "Annealing mechanisms in deformed metals" by Paul Gordon; "Energetics in dislocation mechanics" by John E. Dorn; and "Oxidation of metals" by Kenneth R. Lawless.

Engineering Magnetohydrodynamics. George W. Sutton and Arthur Sherman. McGraw-Hill, New York, 1965. 568 pp. Illus. $19.75. A volume in the McGraw-Hill Series in Mechanical Engineering.

Finite Graphs and Networks: An Introduction with Applications. Robert G. Busacker and Thomas L. Saaty. McGraw-Hill, New York, 1965. 308 pp. Illus. $11.50. A volume in the International Series in Pure and Applied Mathematics.

Fundamentals of Carbanion Chemistry. Donald J. Cram. Academic Press, New York, 1965. 297 pp. Illus. $9.50. Organic Chemistry, vol. 4, a series of monographs edited by Alfred T. Blomquist.

Die Genese der metamorphen Gesteine. Helmut G. F. Winkler. Springer, Berlin, 1965. 226 pp. Illus. Paper, DM. 19.80.

Geological Problems in Lunar Research (*Ann. N.Y. Acad Sci.* **123**). Harold E. Whipple, Ed. New York Acad. of Sciences, New York, 1965. 891 pp. Illus. Paper. Fifty-four papers presented at a conference held in May 1964. The topics considered were: Volcanic and impact mechanisms and origins (14 papers); Lunar tectonics (3 papers); Surface properties and radiation effects (5 papers); Lunar surface features and changes (6 papers); Lunar and terrestrial analogs (10 papers); Shatter coning (3 papers); Tektite origin (3 papers); Possible lunar technologies (5 papers); and Geophysical programs (5 papers).

High-Strength Materials. Proceedings, 2nd Berkeley International Materials Conference, June 1964. Victor F. Zackay, Ed. Wiley, New York, 1965. 895 pp. Illus. $22. Twenty-two papers.

Industrial Isotope Techniques. Lars G. Erwall, Hans G. Forsberg, and Knut Ljunggren. Wiley, New York, 1965. 342 pp. Illus. $19.50.

Interpretation Theory in Applied Geophysics. F. S. Grant and G. F. West. McGraw-Hill, New York, 1965. 603 pp. Illus. $17.50. A volume in the International Series in the Earth Sciences.

An Introduction to Abstract Mathematical Systems. David M. Burton. Addison-Wesley, Reading, Mass., 1965. 128 pp. Illus. $3.95. Addison-Wesley Series in Introductory Mathematics.

Introduction to Linear Algebra. Marvin Marcus and Henryk Minc. Macmillan, New York, 1965. 271 pp. Illus. $7.95. A series of Advanced Mathematics Texts, edited by Carl B. Allendoerfer.

Introduction to Mass Spectroscopy and Its Applications. Robert W. Kiser. Prentice-Hall, Englewood Cliffs, N.J., 1965. 368 pp. Illus. $14. Prentice-Hall International Series in Chemistry.

Jordan Algebras of Self-Adjoint Operators. David M. Topping. American Mathematical Soc., Providence, R.I., 1965. 48 pp. Paper, $1.50. Memoir, American Mathematical Society.

Lattice Defects in Quenched Metals. International Conference (Argonne, Ill.), June 1964. R. M. J. Cotterill, M. Doyama, J. J. Jackson, and M. Meshii, Eds. Academic Press, New York, 1965. 829 pp. Illus. $22. Twenty-eight papers.

Lectures in Theoretical Physics. vol. 7A, *Lorentz Group.* Lectures delivered at the Summer Institute for Theoretical Physics (Boulder, Colo.), 1964. Wesley E. Brittin and Asim O. Barut. Univ. of Colorado Press, Boulder, 1965. 394 pp. Illus. Paper, $6.50. Eighteen papers.

Lectures on Particles and Field Theory. vol. 2. Brandeis Summer Institute in Theoretical Physics, 1964. Stanley Deser and Kenneth W. Ford, Eds. Prentice-Hall, Englewood Cliffs, N.J., 1965. 493 pp. Illus. Paper, $5. Five papers: "Quantum electrodynamics" by K. Johnson; "Spectroscopy of the strongly interacting particles" by D. Lichtenberg; "Field theory of particles" by J. Schwinger; "Quasiparticles and perturbation theory" by S. Weinberg; and "The quantum theory of massless particles" by S. Weinberg.

Linear Elastic Theory of Thin Shells. J. E. Gibson. Pergamon, New York, 1965. 192 pp. Illus. Paper, 21s. The Commonwealth and International Library.

Machine-Tool Vibration. S. A. Tobias. Translated from the German edition (1961) by A. H. Burton. Wiley, New York, 1965. 367 pp. Illus. $10.50.

Materials Science Research. vol. 2. Proceedings of a conference (Orlando, Fla.), April 1964. Henry M. Otte and Saul R. Locke, Eds. Plenum Press, New York, 1965. 333 pp. Illus. $6.65. Seventeen papers given at the Southern Metals and Materials Conference on Advances in Aerospace Materials, sponsored by American Society of Metals.

Mathematical Theory of Connecting Networks and Telephone Traffic. V. E. Beneš. Academic Press, New York, 1965. 333 pp. Illus. $12. Mathematics in Science and Engineering Series, edited by Richard Bellman.

Mathematics for Introductory Science Courses: Calculus and Vectors. With a review of algebra, analytic geometry, and trigonometry. Daniel A. Greenberg. Benjamin, New York, 1965. 230 pp. Illus. Paper, $2.45; cloth, $5.

Mechanics of Machines. vol. 1. H. E. Barnacle and G. E. Walker. Pergamon, New York, 1965. 312 pp. Illus. Paper, 25s. A volume in the Commonwealth and International Library Series, Mechanical Engineering Division, edited by N. Hiller and G. E. Walker.

Methods of Matrix Algebra. Marshall C. Pease, III. Academic Press, New York, 1965. 424 pp. Illus. $13.75. Mathematics in Science and Engineering Series, edited by Richard Bellman.

Microwave Tubes. Proceedings, 5th International Congress (Paris), September 1964. Academic Press, New York, 1965. 535 pp. Illus. $55. One hundred and forty-two papers.

Modern Algebra. vol. 1. Seth Warner. Prentice-Hall, Englewood Cliffs, N.J.,

1965. 478 pp. Illus. $16.65. Prentice-Hall Mathematics Series, edited by Albert A. Bennett.

Modern Hydrology. Raphael G. Kazmann. Harper and Row, New York, 1965. 317 pp. Illus. $10.50. Harper's Geoscience Series, edited by Carey Croneis.

Nuclear Interactions of the Hyperons. R. H. Dalitz. Published for the Tata Institute of Fundamental Research, Bombay, by the Oxford Univ. Press, New York, 1965. 112 pp. Illus. Paper, $5.05.

Nuclear Magnetic Resonance in a Flowing Liquid. Aleksandr Ivanovich Zhernovoi and Georgii Dmitrievich Latyshev. Translated from the Russian edition (Moscow, 1965) by C. Nigel Turton and Tatiana I. Turton. Consultants Bureau, New York, 1965. 174 pp. Illus. $22.50.

Numerical Analysis. I. M. Khabaza. Pergamon, New York, 1965. 254 pp. Illus. Paper, $5. A volume in the Commonwealth and International Library of Science.

100 Great Problems of Elementary Mathematics: Their History and Solution. Heinrich Dörrie. Translated from the German edition (Würzburg, ed. 5, 1958) by David Antin. Dover, New York, 1965. 399 pp. Illus. Paper, $2.

Optical Methods of Investigating Solid Bodies. vol. 25. Proceedings, P. N. Lebedev Physics Institute. D. V. Skobel'tsyn, Ed. Translated from the Russian. Consultants Bureau, New York, 1965. 194 pp. Illus. Paper, $22.50. Three papers: "Polarized luminescence of molecular crystals" by N. D. Zhevandrov; "Vibrational spectra and structure of certain oxides in the crystalline and glassy states" by V. P. Cheremisinov; and "Calculation of cross sections for excitation of atoms and ions by electron impact" by L. A. Vainshtein.

Optical Physics. Max Garbuny. Academic Press, New York, 1965. 480 pp. Illus. $14.50.

Organic Chemistry. B. Pavlov and A. Terentyev. Translated from the Russian edition by Boris Belitzky. Gordon and Breach, New York; Noordhoff, Groningen, Netherlands, 1965. 568 pp. Illus. $16. Russian Monographs and Texts on Advanced Mathematics and Physics, vol. 18.

Oxidation and Combustion Reviews. vol. 1. C. F. H. Tipper, Ed. Elsevier, New York, 1965. 350 pp. Illus. $14.50. Six papers: "Application of the theory of branched chain reactions in low-temperature combustion" by R. Ben-Aïm and M. Lucquin; "Oxidation reactions induced by ionising radiation" by G. Hughes; "Gas phase photo-oxidation" by G. R. McMillan and J. G. Calvert; "Oxidation reactions involving nitrogen dioxide" by J. H. Thomas; "Oxidative degradation of high polymers" by W. L. Hawkins; and "The heterogeneous selective oxidation of hydrocarbons" by R. J. Sampson and D. Shooter.

Oxidation-Reduction Polymers (Redox Polymers). Harold G. Cassidy and Kenneth A. Kun. Interscience (Wiley), New York, 1965. 323 pp. Illus. $12.50.

Periodic Correlations. Ronald Rich. Benjamin, New York, 1965. 175 pp. Illus. Paper, $3.95; cloth, $8. A volume in the Physical Inorganic Chemistry Series, edited by Robert A. Plane and Michell J. Sienko.

Physical Networks. Richard S. Sanford. Prentice-Hall, Englewood Cliffs, N.J.,

1965. 590 pp. Illus. $17.25. Prentice-Hall Electrical Engineering Series, edited by William L. Everitt.

Physico-Chemical Constants of Pure Organic Compounds. vol. 2. J. Timmermans. Elsevier, New York, 1965. 490 pp. $28.50.

Physics of High Pressures and the Condensed Phase. A. Van Itterbeek, Ed. North-Holland, Amsterdam; Interscience (Wiley), New York, 1965. 614 pp. Illus. $22.50. Fourteen papers.

Physics of Non-Crystalline Solids. Proceedings, International Conference (Delft, Netherlands), July 1964. J. A. Prins, Ed. North-Holland, Amsterdam; Interscience (Wiley), New York, 1965. 683 pp. Illus. $27.50. Fifty-three papers on the following topics: Structure and devitrification (10 papers); Neutron diffraction, heat conduction, ESR, NMR, mangetism, and ultrasonics (9 papers); Relaxation, mainly in organic materials (12 papers); Relaxation, fracture, and coordination, mainly in inorganic materials (12 papers); and Optical and electric properties (10 papers).

Physics of the Earth's Upper Atmosphere. C. O. Hines, I. Paghis, T. R. Hartz, and J. A. Fejer, Eds. Prentice-Hall, Englewood Cliffs, N.J., 1965. 448 pp. Illus. $17.35. Eighteen papers.

Preparative Inorganic Reactions. vol. 2. William L. Jolly, Ed. Interscience (Wiley), New York, 1965. 387 pp. Illus. $14.50. Nine papers: "Phosphazene compounds" by R. A. Shaw, R. Keat, and C. Hewlett; "Silicon-nitrogen compounds" by B. J. Aylett; "Orthophosphoric acids and orthophosphates" by C. Y. Shen and C. F. Callis; "Metal alkoxides" by D. C. Bradley; "Cyclopentadienyl and arene metal carbonyls" by R. L. Pruett; "Sulfur and phosphorus—Bridged complexes of transition metals" by R. G. Hayter; "Binary fluorides" by E. L. Muetterties and C. W. Tullock; "Flourine compounds of the platinum metals" by N. Bartlett; and "Compounds of xenon" by E. H. Appelman and J. G. Malm.

Probability Tables for Locating Elliptical Underground Masses with a Rectangular Grid. Igor' Dmitrievich Savinskii. Translated from the Russian edition (Moscow, 1964). Consultants Bureau, New York, 1965. 116 pp. Illus. $15.

Programmed Units in Chemistry. *Balancing Chemical Equations* (69 pp., 60¢); *Chemical Formulas and Names* (62 pp., 56¢); *Chemical Symbols* (31 pp., 36¢); *Molecular Weight Calculations* (48 pp., 52¢); and *Weight and Volume Relationships* (38 pp., 48¢). Virginia P. Powell. Prentice-Hall, Englewood Cliffs, N.J., 1965. Paper.

Progress in Dielectrics. vol. 6. J. B. Birks and J. Hart, Eds. Academic Press, New York, 1965. 342 pp. Illus. $14.50. Four papers: "Electrical force effects in dielectric liquids" by W. F. Pickard; "Polymeric semiconductors" by A. Rembaum, J. Moacanin, and H. A. Pohl; "Space charges in dielectrics" by Z. Croitoru; "Energy transfer in polyacene solid solutions, pt. 4: A bibliography for 1963" by F. R. Lipsett; and "The theory of ionic and electronic mobility in liquids" by S. A. Rice and J. Jortner.

Projective Geometry. vols. 1 and 2. Oswald Veblen and John Wesley Young.

Blaisdell (Ginn), New York, 1965. vol. 1, 355 pp., $2.25; vol. 2, 525 pp., $3. Illus. Paper.

Quantum Electronics and Coherent Light. Course 31, International School of Physics "Enrico Fermi." C. H. Townes and P. A. Miles, Eds. Academic Press, New York, 1965. 383 pp. Illus. $16. Twenty-two papers.

Radiation Dosimetry. Course 30. International School of Physics "Enrico Fermi." G. W. Reed and F. W. Spiers, Eds. Academic Press, New York, 1965. 320 pp. Illus. $14. Twenty-five papers.

Radiochemical Survey of the Elements. Principal characteristics and applications of the elements and their isotopes. M. Haissinsky and J. P. Adloff. Translated from the French by Express Translation Service. Elsevier, New York, 1965. 187 pp. Illus. $12.

Radiochemistry of Rhodium [NAS-NS-3008 (rev)]. James C. Armstrong, Jr., and Gregory R. Choppin. Natl. Acad. of Sciences–Natl. Res. Council, Washington, D.C., 1965 (available from Clearinghouse for Federal Scientific and Technical Information, U.S. Department of Commerce, Springfield, Va.). 81 pp. Illus. Paper, $1.

Random Processes in Nonlinear Control Systems. A. A. Pervozvanskii. Translated from the Russian (Moscow, 1962) by Scripta Technica. Ivo Herzer, Translation Editor. Academic Press, New York, 1965. 357 pp. Illus. $14. Mathematics in Science and Engineering Series, vol. 15, edited by R. Bellman.

Recent Researches in the Fields of Hydrosphere, Atmosphere and Nuclear Geochemistry. Yasuo Miyake and Tadashiro Koyama, Eds. Maruzen, Tokyo, 1965. Twenty-five papers; the volume is dedicated to Ken Sugawara.

Research in Molecular Spectroscopy. Proceedings, P. N. Lebedev Physics Institute, vol. 27. D. V. Skobel'tsyn, Ed. Translated from the Russian edition (Moscow, 1964). Consultants Bureau, New York, 1965. 211 pp. Illus. Paper, $22.50.

Reviews of Plasma Physics. vol. 1. M. A. Leontovich, Ed. Translated from the Russian edition (Moscow, 1963) by Herbert Lashinsky. Consultants Bureau, New York, 1965. 338 pp. Illus. $12.50. Four papers: "Motion of charged particles in electromagnetic fields in the drift approximation" by D. V. Sivukhin; "Particle interactions in a fully ionized plasma" by B. A. Trubnikov; "Transport processes in a plasma" by S. I. Braginskii; and "Thermodynamics of a plasma" by A. A. Vedenov.

Rock Magnetism. Takesi Nagata. Maruzen, Tokyo; Plenum Press, New York, ed. 2, 1965. 350 pp. Illus. $9.50.

Second Symposium on Oil Shale. A symposium (Denver, Colo.), April 1965. Colorado School of Mines, Golden, 1965. 206 pp. Illus. Paper, $4. Eleven papers.

Simplified Design of Structural Steel. Harry Parker. Wiley, New York, ed. 3, 1965. 325 pp. Illus. $7.75.

SOCMA Handbook. Commercial organic chemical names. Chemical Abstracts Service, American Chemical Soc., Washington, D.C., 1965. 757 pp. Illus. $25.

The Solid-State Chemistry of Binary Metal Hydrides. George G. Libowitz. Benjamin, New York, 1965. 151 pp. Illus.

$7.50. A volume in the Physical Inorganic Chemistry Series, edited by Robert A. Plane and Michell J. Sienko.

Soviet Research in New Semiconductor Materials. D. N. Nasledov and N. A. Goryunova, Eds. Translated from the Russian edition (Kishinev, 1964) by A. Tybulewicz. Consultants Bureau, New York, 1965. 127 pp. Illus. Paper, $17.50. Seventeen papers.

Spectroscopic Techniques in Organic Chemistry. A. J. Baker and T. Cairns. Heyden, London, 1965. 91 pp. Illus. Paper, $3.50. Spectroscopy in Education Series, vol. 2.

Stellar and Solar Magnetic Fields. A symposium, International Astronomical Union (Rottach-Egern near Munich, Germany), September 1963. R. Lüst, Ed. North-Holland, Amsterdam; Interscience (Wiley), New York, 1965. 466 pp. Illus. $17.50. Fifty-nine papers.

Studies in Mathematics. vol. 3, *Studies in Real and Complex Analysis*. I. I. Hirschman, Jr., Ed. Published by the Mathematical Association of America; available from Prentice-Hall, Englewood Cliffs, N.J., 1965. 221 pp. Illus. $4.

Sulfonation and Related Reactions. Everett E. Gilbert. Interscience (Wiley), New York, 1965. 541 pp. Illus. $16.50. Interscience Monographs on Chemistry, Organic Chemistry Section, edited by George A. Olah.

A Survey of Modern Algebra. Garrett Birkhoff and Saunders MacLane. Macmillan, New York, ed. 3, 1965. 447 pp. Illus. $8.50.

Symmetries in Elementary Particle Physics. A. Zichichi, Ed. Academic Press, New York, 1965. 441 pp. Illus. Paper, $7.95; cloth, $12. Nine lectures, five seminars, and six discussions presented at the 1964 International School of Physics "Ettore Majorana" (1964) Advanced Study Institute, by J. Ashkin, S. M. Berman, G. Bernardini, L. C. Biedenharn, M. M. Block, N. Cabibbo, R. P. Feynman, R. Gatto, P. Kabir, P. Tarjanne, and G. Zweig.

Symmetry Principles at High Energy. Coral Gables Conferences, Second Conference, January 1965. Behram Kursunoğlu, Arnold Perlmutter, and Ismail Sakmar, Eds. Freeman, San Francisco, 1965. 446 pp. Illus. Paper, $8.

Tenth Symposium (International) on Combustion (Cambridge, England), August 1964. Organized by the Combustion Institute. Combustion Inst., Pittsburgh, Pa., 1965. 1516 pp. Illus. $35. One hundred thirty-one papers.

The Theory of Electron-Atom Collisions. G. F. Drukarev. Translated from the Russian edition (1962) by S. Chomet. J. B. Hasted, Translation Ed. Academic Press, New York, 1965. 173 pp. Illus. $6.50.

Theory of Random Functions. vol. 1. A. Blanc-Lapierre and R. Fortet. Translated from the original French edition (1953) by J. Gani. Gordon and Breach, New York, 1965. 454 pp. Illus. $14.50.

Theory of Random Functions: And Its Application to Control Problems. V. S. Pugachev. Revised translation from second Russian edition (Moscow), with amendments incorporated to conform with third Russian edition (1962), by O. M. Blunn. N. L. Johnson, Translation Ed.

Pergamon, London; Addison-Wesley, Reading, Mass., 1965. 851 pp. Illus. $21.

Thermodynamic and Transport Properties of Uranium Dioxide and Related Phases. Report of the panel (Vienna), March 1964. Charles Holley, Ed. International Atomic Energy Agency, Vienna, 1965 (order from Natl. Agency for International Publications, New York). 115 pp. Illus. Paper, $2.50.

Thermodynamics of Multicomponent Systems. Bruce H. Sage. Reinhold, New York, 1965. 378 pp. Illus. $18.50.

Time-Domain Analysis and Design of Control Systems. Richard C. Dorf. Addison-Wesley, Reading, Mass., 1965. 206 pp. Illus. $8.95.

Transactions of the Moscow Mathematical Society for the Year 1963. Prepared jointly by the American Mathematical Society and the London Mathematical Society. American Mathematical Soc., Providence, R.I., 1965. 528 pp. Illus. $5.50. English translation of *Trudy Moskovskogo Matématiceskogo Obscestva*; 12 papers.

La Transmission de la Chaleur au Cours de la Solidification, du Rechauffage et de la Trempe de l'Acier. Yves Dardel. Editions de la Revue de Métallurgie, Paris, 1964. 266 pp. Illus. F. 70.

Treatise on Analytical Chemistry. vol. 6, pt. 1, *Theory and Practice*. Section D-3 (continued), *Optical Methods of Analysis*. I. M. Kolthoff and Philip J. Elving, Eds. Interscience (Wiley), New York, 1965. 923 pp. Illus. $23. The contributors are N. Bauer, George G. Cocks, G. W. Leddicotte, S. Z. Lewin, Lucy B. McCrone, Walter C. McCrone, Marvin Margoshes, Edward C. Olson, John H. Reisner, E. J. Rosenbaum, Bourdon F. Scribner, A. Lee Smith, William A. Struck, Ralph E. Thiers, and Bert L. Vallee.

A Treatise on Analytical Dynamics. L. A. Pars. Wiley, New York, 1965. 663 pp. Illus. $27.50.

Ultrasound in the Production and Inspection of Concrete. pt. 1, *Production Applications* (47 pp.) by Yu. E. Kornilovich and V. I. Belokhvostikova; pt. 2, *Inspection in Hydraulic Construction* (64 pp.) by A. K. Tret'yakov and A. M. Filonidov. Translated from the Russian (1964) by James S. Wood. Consultants Bureau, New York, 1965. Illus. Paper, $7.50 each.

Ultraviolet Radiation. Lewis. R. Koller. Wiley, New York, ed. 2, 1965. 320 pp. Illus. $12. Wiley Series in Pure and Applied Optics; Stanley S. Ballard, Advisory Editor.

Underwater Acoustics Handbook. Vernon M. Albers. Pennsylvania State Univ. Press, University Park, ed. 2, 1965. 372 pp. Illus. $12.50.

University Physics: Experiment and Theory. George D. Freier. Appleton, Century, Crofts (Meredith), New York, 1965. 613 pp. Illus. $10.

Vectors. James A. Hummel. Addison-Wesley, Reading, Mass., 1965. 124 pp. Illus. Paper, $1.95. Addison-Wesley Series in Introductory Mathematics.

World Maps of Climatology: Weltkarten zur Klimakunde. H. E. Landsberg, H. Lippmann, K. H. Paffen, and C. Troll. Springer-Verlag, New York, ed. 2, 1965. 36 pp. Illus. Maps. $7.50.

Advances in Enzymology, and Related Subjects of Biochemistry. vol. 27. F. F. Nord, Ed. Interscience (Wiley), New York, 1965. 640 pp. Illus. $17.50. Ten papers: "Mechanism of enzyme action—An approach through the study of slow reactions" by Kunio Yagi; "Extrinsic cotton effects and the mechanism of enzyme action" by David D. Ulmer and Bert L. Vallee; "Contributions of EPR spectroscopy to our knowledge of oxidative enzymes" by Helmut Beinert and Graham Palmer; "Chemie und biochemie des disulfidaustausches" by Von L. Lumper and H. Zahn; "Enzymology of the nucleus" by Günther Siebert and G. Bennett Humphrey; "The chemical basis of mutation" by L. E. Orgel; "The origin of life and the origin of enzymes" by A. I. Oparin; "Experimental approaches to the origin of life problem" by Howard H. Pattee; "Inhibition of folate biosynthesis and function as a basis for chemotherapy" by George H. Hitchings and James J. Burchall; and "The mechanisms of microbial oxidations of petroleum hydrocarbons" by A. C. van der Linden and G. J. E. Thijsse.

The Amino Sugars: The Chemistry and Biology of Compounds Containing Amino Sugars. vol. 2A, *Distribution and Biological Role.* Endre A. Balazs and Roger W. Jeanloz, Eds. Academic Press, New York, 1965. 620 pp. Illus. $22. Twenty papers.

Analgetics. George deStevens, Ed. Academic Press, New York, 1965. 489 pp. Illus. $17. Medicinal Chemistry Series of Monographs, vol. 5, edited by George deStevens. Seven papers: "The physiology and pharmacology of pain and its relief" by Charles A. Winter; "Clinical measurement of pain" by Raymond W. Houde, Stanley L. Wallenstein, and William T. Beaver; "Morphine and its modifications" by Everette L. May and Lewis J. Sargent; "Synthetic analgetics with morphine-like action" by Robert A. Hardy, Jr. and M. Gertrude Howell; "Isoquinoline analgetics" by A. Brossi, H. Besendorf, L. A. Pirk, and A. Rheiner, Jr.; "Pyrazole derivatives" by Walter Krohs; and "General synthetics" by George deStevens; there is an introduction by Alfred Burger.

Bioenergetics: The Molecular Basis of Biological Energy Transformations. Albert L. Lehninger. Benjamin, New York, 1965. 274 pp. Illus. Paper, $2.95; cloth, $6. Biology Teaching Monograph Series, edited by Cyrus Levinthal.

Biological Effects of Radiation. Daniel S. Grosch. Blaisdell (Ginn), New York, 1965. 307 pp. Illus. Paper, $3.50. A Blaisdell Book in the Pure and Applied Sciences Series.

Biology and Information: Elements of Biological Thermodynamics. Karl Sigmundovich Trincher. Translated from the Russian by Edwin S. Spiegelthal. Consultants Bureau, New York, 1965. 103 pp. Illus. Paper, $17.50.

Biomedical Electronics. Howard M. Yanof. Davis, Philadelphia, 1965. 373 pp. Illus. $12.50.

Biophysical Mechanisms in Vascular Homeostasis and Intravascular Thrombosis. Philip N. Sawyer, Ed. Appleton, Century, Crofts (Meredith), New York,

1965. 397 pp. Illus. $8.95. Thirty papers.

Bound Water in Biological Integrity. S. J. Webb. Thomas, Springfield, Ill., 1965. 199 pp. Illus. $7.75.

Cells and Tissues in Culture: Methods, Biology, and Physiology. vols. 1 and 2. E. N. Willmer, Ed. Academic Press, London, 1965. vol. 1, 802 pp., 17 papers; vol. 2, 825 pp., 17 papers. Illus. $25 each.

Cellular Ultrastructure of Woody Plants. Proceedings, Advanced Science Seminar (Upper Saranac Lake, N.Y.), September 1964. Wilfred A. Côté, Jr., Ed. Syracuse Univ. Press, Syracuse, N.Y., 1965. 617 pp. Illus. $14. Twenty-nine papers.

Circadian Clocks. Proceedings, Feldafing Summer School, September 1964. Jürgen Aschoff, Ed. North-Holland, Amsterdam, 1965. 499 pp. Illus. $15. Forty-four papers.

Comparative Physiology and Pathology of the Skin. Arthur J. Rook and G. S. Walton, Eds. Davis, Philadelphia, 1965. 808 pp. Illus. $31. Fifty-five papers on the following topics: Comparative dermatology (5 papers); Hair (12 papers); Nutritional influences on the skin (3 papers); Porphyria and light sensitization (5 papers); The mast cell (6 papers); Immunology (13 papers); and Tumours of the skin (11 papers).

Comprehensive Biochemistry. vol. 6, *Lipids and Amino Acids and Related Compounds*. Marcel Florkin and Elmer H. Stotz, Eds. Elsevier, New York, 1965. 339 pp. Illus. $17. Nine papers: "Fatty acids, long-chain alcohols, and waxes" by James F. Mead, David R. Howton, and Judd C. Nevenzel; "Neutral fats and oils" by J. A. Lovern; "Phospholipids and glycolipids" by Donald J. Hanahan and Hans Brockerhoff; "General chemistry of the amino acids" by R. J. F. Nivard and G. I. Tesser; "Nitrogeneous bases" by N. van Thoai; "Melanins" by J. Harley-Mason; "Peptides: Synthetic methods and applications" by George W. Anderson; "Capsular polypeptide" by G. Ivánovics; and "Syntheses of bacterial glutamyl polypeptides" by V. Bruckner.

Computers in Biomedical Research. vol. 1. Ralph W. Stacy and Bruce D. Waxman, Eds. Academic Press, New York, 1965. 584 pp. Illus. $20. Twenty-two papers.

Deranged Memory. A psychonomic study of the amnesic syndrome. George A. Talland. Academic Press, New York, 1965. 368 pp. Illus. $9.50.

Evolution of Parasites. Third symposium, British Society for Parasitology (London), November 1964. Angela E. R. Taylor, Ed. Blackwell, Oxford, England; Davis, Philadelphia, 1965. 141 pp. Illus. Paper. $5. Four papers: "The evolution of parasitic protozoa" by J. R. Baker; "The evolution of parasite-arthropod vector systems" by P. F. Mattingly; "The evolution of parasitic platyhelminths" by J. Llewellyn; and "Patterns of evolution in parasitic nematodes" by W. G. Inglis.

The Genus Aspergillus. Kenneth B. Raper and Dorothy I. Fennell. With a chapter by Peter K. C. Austwick. Williams and Wilkins, Baltimore, 1965. 698 pp. Illus. $20.

Grundriss der Ökologie. Mit besonderer Berücksichtigung der Tierwelt. Wilhelm

Kühnelt. Fischer, Jena, East Germany, 1965. 402 pp. Illus.

Handbook of Physiology. A critical, comprehensive presentation of physiological knowledge and concepts. Section 5, *Adipose Tissue*. Albert E. Renold and George F. Cahill, Jr. American Physiological Soc., Washington, D.C., 1965. 832 pp. Illus. $28.

International Conference on Gerontology. A. Balazs, Ed. Akadémiai Kiadó, Budapest, Hungary, 1965. 939 pp. Illus. $19.60. One hundred and thirty-three papers presented at a conference (Budapest), 1962.

Isotopes in Experimental Pharmacology. Lloyd J. Roth, Ed. Univ. of Chicago Press, Chicago, 1965. 502 pp. Illus. $12.50. Thirty-six papers on the following topics: Isotopic labeling of drugs (2 papers); Activation analysis (2 papers); Autoradiography (8 papers); Compartmental analysis and dynamic measurements (10 papers); Drug biotransformation (8 papers); Biochemical pharmacology (4 papers); and Deuterium isotope effect: Elucidation of pharmacological mechanisms (2 papers).

Mechanisms of Hormone Action. P. Karlson, Ed. Academic Press, New York; Thieme, Stuttgart, Germany, 1965. 285 pp. Illus. $14.50. Twenty-two papers presented at a NATO Advanced Study Institute. Most of the papers are in English, the others in German or French.

Metabolism of Steroid Hormones. Ralph I. Dorfman and Frank Ungar. Academic Press, New York, 1965. 726 pp. Illus. $32.

Methods of Animal Experimentation. vol. 1. William I. Gay, Ed. Academic Press, New York, 1965. 398 pp. Illus. $13.50. Nine papers: "Collection and withdrawal of body fluids and infusion techniques" by Alvin F. Moreland; "Anesthesia and sedation" by Albert Schaffer; "Care of animals during surgical experiments" by Norman Bleicher; "Radiography" by William D. Carlson; "Methods of euthanasia and disposal of laboratory animals" by Dietrich C. Smith; "Methods of parasitic infections: Outline of general principles" by Ira Singer; "Methods in germfree animal research" by Walter L. Newton; "Aerosol challenge of animals" by Joseph V. Jemski and G. Briggs Phillips; and "Principles in drug administration" by Geoffrey Woodard.

Nutrition and Caries-Prevention. vol. 3. *Symposia*, Swedish Nutrition Foundation (Falsterbo), August 1964. Gunnar Blix, Ed. Almqvist and Wiksells, Stockholm, 1965. 130 pp. Illus. Kr. 35. Twelve papers.

Physiology of Digestion in the Ruminant. Papers presented at a symposium (Ames, Iowa), August 1964. R. W. Dougherty, Ed. Butterworth, Washington, D.C., 1965. 496 pp. Illus. $14.50. Thirty-three papers.

Primate Behavior: Field Studies of Monkeys and Apes. Irven De Vore, Ed. Holt, Rinehart, and Winston, New York, 1965. 668 pp. Illus. $10.

The Principal Diseases of Lower Vertebrates. H. Reichenbach-Klinke and E. Elkan. Academic Press, London, 1965. 612 pp. Illus. $20.

Proceedings, International Union of Physiological Sciences (Tokyo, Japan),

September 1965. D. Noble, Ed. Excerpta Medica Foundation, Amsterdam, 1965. 652 pp. Illus. Paper. International Congress Series, No. 87.

Progress in Experimental Tumor Research, vol. 6. F. Homburger, Ed. Hafner, New York, 1965. 352 pp. Illus. $22.25. Six papers: "The position of oncogenic viruses in a classification of viruses based on particle morphology" by J. D. Almeida and Arthur W. Ham; "Antigenic behaviour of lymphoma cell populations in mice as revealed by the spleen colony method" by Arthur Axelrad; "Effects of anticancer drugs on biochemical control mechanisms" by J. Frank Henderson; "Some unsolved problems in lung cancer etiology" by Francis J. C. Roe and Margaret A. Walters; "Approaches to the combination chemotherapy of transplantable neoplasms" by Alan C. Sartorelli; and "Transplantation methods as a tool for detection of tumor-specific antigens" by Hans Olof Sjögren.

Recent Progress in Hormone Research. vol. 21. Proceedings, 1964 Laurentian Hormone Conference (Lake George, N.Y.), September 1964. Gregory Pincus, Ed. Academic Press, New York, 1965. 687 pp. Illus. $24. Fourteen papers and discussions on the following topics: Recent advances in thyroid chemistry and physiology (2 papers); Hormones in normal and pathological physiology (2 papers); Pituitary hormones (3 papers); Steroid sex hormones (3 papers); Comparative endocrinology (2 papers); and Neurohumors (2 papers).

Selected Exercises from Microbes in Action: A Laboratory Manual of Microbiology. Harry W. Seeley, Jr. and Paul J. VanDemark. Freeman, San Francisco, 1965. 235 pp. Illus. Paper, $3.25.

Selected Papers on Molecular Genetics. A collection of reprints. J. Herbert Taylor, Ed. Academic Press, New York, 1965. 661 pp. Illus. Paper, $5.95; cloth, $9. Perspectives in Modern Biology Series; 55 papers.

The Strategy of Life. Clifford Grobstein. Freeman, San Franciso, 1965. 128 pp. Illus. Paper, $1.75; cloth, $3.50. A Series of Books in Biology, edited by Douglas M. Whitaker, Ralph Emerson, Donald Kennedy, and George W. Beadle.

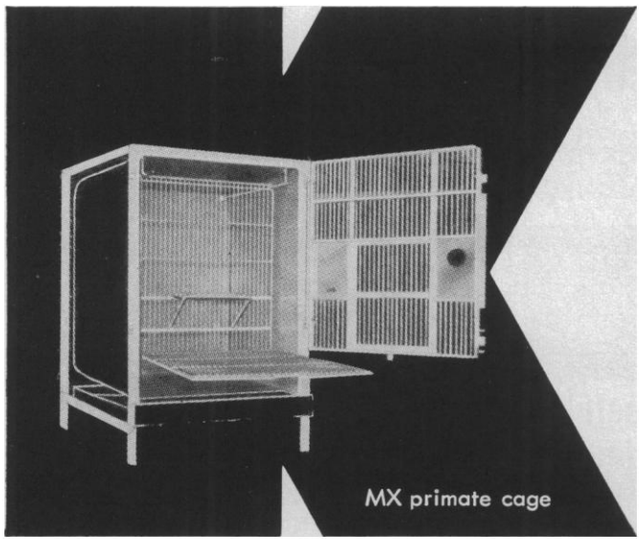
The Theory of Inbreeding. Sir Ronald A. Fisher. Academic Press, New York, ed. 2, 1965. 158 pp. Illus. $6.

The Uniqueness of Biological Materials. A. E. Needham. Pergamon, New York, 1965. 613 pp. Illus. $15. This book is part of the International Series of Monographs on Pure and Applied Biology, zoology division, vol. 25.

Vascular Differentiation in Plants. Katherine Esau. Holt, Rinehart, and Winston, New York, 1965. 172 pp. Illus. $4.50. Biology Studies Series.

Viruses, Cells, and Hosts. M. Michael Sigel and Ann R. Beasley. Holt, Rinehart, and Winston, New York, 1965. 176 pp. Illus. Paper. Holt Library of Science Series II.

Vitamin B_{12}. E. Lester Smith. Methuen, London; Wiley, New York, ed. 3, 1965. 192 pp. Illus. $4.25. Methuen's Monographs on Biochemical Subjects, a series edited by Sir Rudolph Peters and F. G. Young.



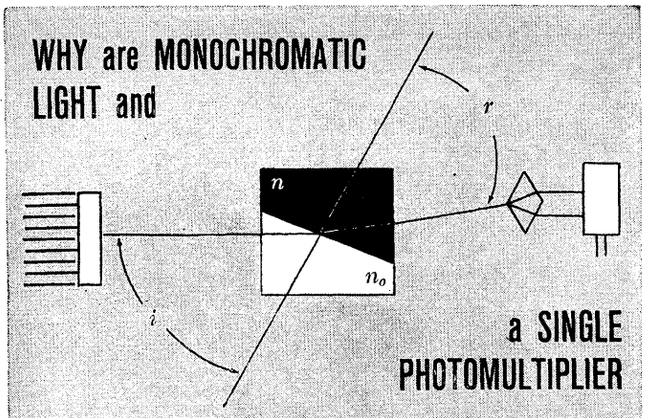
MX primate cage

dog & primate cages

Molded seamless construction of rugged fiber glass reinforced plastics... minimum effort required to clean and disinfect...maximum animal comfort... extremely strong doors with fool proof catches...economical to purchase and maintain....For further information write:
Department KS

Kirschner MANUFACTURING COMPANY
Vashon, Washington

WHY are MONOCHROMATIC LIGHT and



a SINGLE PHOTOMULTIPLIER

VITAL to AUTOMATIC DIFFERENTIAL REFRACTOMETRY?

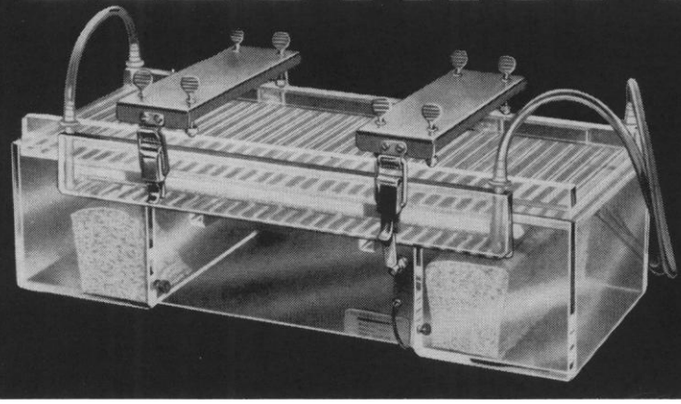
MONOCHROMATIC LIGHT?
The use of monochromatic light eliminates the dispersion effect found in instruments employing polychromatic light. Only the use of monochromatic light permits differential refractometers to be calibrated in terms of absolute refractive index difference.

A SINGLE PHOTOMULTIPLIER?
Drift due to temperature changes, spectral shifts, and fatigue are eliminated with the use of a single photomultiplier tube. This also permits measurement of highly absorbing and turbid samples, a capability not provided by other photo-detectors.
The end result is an instrument with greater accuracy, more sensitivity, extended range and increased stability . . . the Phoenix Differential Refractometer. Want more reasons? Write for Bulletin R-2000.

PPI

PHOENIX PRECISION INSTRUMENT COMPANY
A Subsidiary of CENCO INSTRUMENTS CORP.
3803-05 N. 5th Street, Phila., Penna. 19140, U.S.A.

ELECTROPHORESIS



EC 451 PRESSURE PLATE
ELECTROPHORESIS CELL
FOR PAPER ELECTROPHORESIS

Circle Reader Service Card for bibliography and data sheets.

EC451 electrophoresis apparatus makes paper electrophoresis possible under uniform conditions of paper wetness. Six—2½" or sixteen—1" paper strips are placed between nonwettable plastic surfaces, thus preventing evaporation and allowing sample to travel through uniformly wet paper from beginning to end.

The paper strips with sample applied are then clamped between water-cooled plates. When ice water is circulated through these plates, as much as 2000 V at 200 MA can be passed through the cell, permitting rapid separation.

AMONG MANY RECENT APPLICATIONS FOR THE EC451

- **Mobility studies of iodinated human serum albumin.**
- **Two-dimensional paper agar electrophoresis of hemoglobin.**
- **High-voltage electrophoresis BAIB.**
- **Super-cooled electrophoresis of P-esters in non-aqueous buffers.**

E-C APPARATUS CORPORATION
ELECTROPHORESIS/COUNTERCURRENT
220 So. 40th St., Philadelphia, Pa. 19104
PHONE: Area Code 215—383-2204

General

American Scientific Books, 1964–1965. Phyllis B. Steckler, Ed. Bowker, New York, 1965. 260 pp. $8. This volume covers the period April 1964 through March 1965 and is a cumulation of titles, arranged by subject, from the monthly issues of the *American Book Publishing Record*. Scientific, medical, and technical books published in the United States are included, but juveniles and texts below the college level as well as government and business publications and most serials are excluded.

Black Brant: Sea Goose of the Pacific Coast. Arthur S. Einarsen. Univ. of Washington Press, Seattle, 1965. 160 pp. Illus. $5.

Canine and Feline Nutritional Requirements. Proceedings of a symposium organized by the British Small Animals Veterinary Association (London), May 1964. Oliver Graham-Jones, Ed. Pergamon, New York, 1965. 170 pp. Illus. $9.50. Fifteen papers.

The Career of Philosophy. vol. 2, *From the German Enlightenment to the Age of Darwin.* John Herman Randall, Jr. Columbia Univ. Press, New York, 1965. 687 pp. $12.95.

The Case for Going to the Moon. Neil P. Ruzig. Putnam, New York, 1965. 256 pp. Illus. $4.95.

The Century of the Detective. Jürgen Thorwald. Translated from the German edition by Richard Winston and Clara Winston. Harcourt, Brace, and World, New York, 1965. 512 pp. Illus. $8.95. An account of the uses of science in police work.

Chemistry in the Soviet Union. John Turkevich. Van Nostrand, Princeton, N.J., 1965. 576 pp. $12.

The Common Cold. Christopher Andrewes. Norton, New York, 1965. 187 pp. Illus. $4.50. The Advancement of Science Series, edited by Richard Carrington.

Cone-Bearing Trees of the Pacific Coast. Nathan A. Bowers. Pacific Books, Palo Alto, Calif., 1965. 231 pp. Illus. $4.95.

The Doctorate: A Handbook. George K. Schweitzer. Thomas, Springfield, Ill., 1965. 114 pp. Illus. $4.75.

European Philosophy Today. George L. Kline, Ed. Quadrangle Books, Chicago, Ill., 1965. 172 pp. Paper, $2.25; cloth, $5.50. Five papers: "The philosophy of Xavier Zubiri" by José Ferrater Mora; "The new image of man in Martin Heidegger's philosophy" by J. Glenn Gray; "The 'modernity' of Franco Lombardi" by Henry S. Harris; "Three stages on Sartre's way" by Eugene F. Kaelin; and "Leszek Kolakowski and the revision of Marxism" by George L. Kline.

Evolution of Mathematical Thought. Herbert Meschkowski. Translated from the second German edition (Braunschweig, 1960) by Jane H. Gayl. Holden-Day, San Francisco, 1965. 169 pp. Illus. $5.95.

Flight. H. Guyford Stever, James J. Haggerty, and the Editors of *Life*. Time Inc., New York, 1965. 200 pp. Illus. $3.95. Life Science Library Series.

Focus on Bacteria. Emmy Klieneberger-Nobel. With a chapter by Ruth M. Lemcke. Academic Press, New York, 1965. 153 pp. Illus. $5.50.

Food Technology the World Over. vol. 2, *South America, Africa and the Middle East, Asia.* Martin S. Peterson and Donald K. Tressler, Eds. Avi, Westport, Conn., 1965. 424 pp. Illus. $14.

From Zero to Infinity. What makes numbers interesting. Constance Reid. Crowell, New York, ed. 3, 1965. 191 pp. Illus. $4.50.

Forest-Soil Relationships in North America. Papers presented at Second North American Forest Soils Conference (Corvallis, Ore.), August 1963. Chester T. Youngberg, Ed. Oregon State Univ. Press, Corvallis, 1965. 544 pp. Illus. $8. Thirty-five papers.

Fundamentals of Geography. Earl B. Shaw. Wiley, New York, 1965. 424 pp. Illus. Plates. $8.50.

Geochronology of North America (*Publ. 1276*). Committee on Nuclear Science, NAS–NRC. Natl. Academy of Sciences–Natl. Research Council, Washington, D.C., 1965. 321 pp. Paper, $6.

Graduate Education Today. Everett Walters, Ed. American Council on Education, Washington, D.C., 1965. 260 pp. $4. Thirteen essays by Everett Walters, Moody E. Prior, John W. Ashton, John L. Snell, Roy F. Nichols, Leonard B. Beach, Henry E. Bent, Robert S. Ford, John Perry Miller, Gustave O. Arlt, W. Gordon Whaley, Bryce Crawford, and Allan M. Cartter.

A Guide to Information Sources in Mining, Minerals, and Geosciences. Stuart R. Kaplan, Ed. Interscience (Wiley), New York, 1965. 613 pp. Illus. $12.50. Guides to Information Sources in Science and Technology series, vol. 2, edited by Bernard M. Fry and Foster E. Mohrhardt.

Homer William Smith: His Scientific and Literary Achievements. Herbert Chasis and William Goldring, Eds. New York Univ. Press, New York, 1965. 306 pp. Illus. Plates. $4.50.

Human Factors Evaluation in System Development. David Meister and Gerald F. Rabideau. Wiley, New York, 1965. 319 pp. Illus. $9.95.

Human Motivation. Symposium (Washington, D.C.), August 1963. Marshall R. Jones, Ed. Univ. of Nebraska Press, Lincoln, 1965. 95 pp. Illus. $4.25. Four papers: "Some general implications of conceptual developments in the study of achievement-oriented behavior" by John W. Atkinson; "Criteria for judging needs to be instinctoid" by Abraham H. Maslow; "Theories of motivation: An overview and a synthesis" by K. B. Madsen; and "Motivation as a component of the regulatory system of behavior" by Janusz Reykowski. Discussions on the papers were given by Ingmar Dureman and Marshall R. Jones.

An International Bibliography of Non-Periodical Literature on Documentation and Information. Compiled and edited by Hans Zell and Robert Machesney. Maxwell, Long Island City, N.Y., 1965. 300 pp. $4. The bibliography contains 1555 references to books, pamphlets, reports, and technical papers published during the years 1930 to 1964. Russian material is not included. Entries are arranged alphabetically by author.

Kirk-Othmer Encyclopedia of Chemical Technology. vol. 6, *Complexing Agents*

to Dextrose and Starch Syrups. Anthony Standen, Ed. Interscience (Wiley), New York, ed. 2, 1965. 946 pp. Illus. $45.

Man, Culture, and Animals. The role of animals in human ecological adjustments. A symposium (*AAAS Publ. No. 78*). Anthony Leeds and Andrew P. Vayda, Eds. AAAS, Washington, D.C., 1965. 312 pp. Illus. Members, $7; others, $8. Most of the 15 papers are based on a symposium presented at the Denver meeting of the AAAS (1961). The papers are "Anthropologists and ecological problems" by Andrew P. Vayda; "The association between Australian Aborigines and dingoes" by J. M. Meggitt; "A re-examination of hunting, trapping, and territoriality among the northeastern Algonkian Indians" by Rolf Knight; "The Virginia deer and intertribal buffer zones in the upper Mississippi Valley" by Harold Hickerson; "Southern Atabaskan herding patterns and contrasting social institutions" by Peter Kunstadter; "Reindeer herding and Chukchi social institutions" by Anthony Leeds; "Camel pastoralism in North Arabia and the minimal camping unit" by Louise E. Sweet; "Native cattle keeping in eastern Africa" by W. W. Deshler; "Animal and social types in the exploitation of the Tibetan Plateau" by James F. Downs and Robert B. Ekvall; "Herds and herders in the Inca State" by John V. Murra; "The myth of the sacred cow" by Marvin Harris; "The Euro-American ranching complex" by Arnold Strickon; "Comments on the symposium" by Homer Aschmann; and "Functional analyses in the symposium" by Paul W. Collins.

Meaning and Knowledge: Systematic Readings in Epistemology. Ernest Nagel and Richard B. Brandt. Harcourt, Brace, and World, New York, 1965. 684 pp. $8.95.

Medical Aspects of Boxing. Proceedings of a conference (London), November 1963. A. L. Bass, J. L. Blonstein, R. D. James, and J. G. P. Williams, Eds. Pergamon, New York, 1965. 132 pp. Illus. $7.50. Thirteen papers.

Men and Snakes. Ramona Morris and Desmond Morris. McGraw-Hill, New York, 1965. 224 pp. Illus. $6.95.

Mysterious Phenomena of the Human Psyche. Leonid L. Vasiliev. Translated from the Russian by Sonia Volochova. University Books, New Hyde Park, N.Y., 1965. 240 pp. $6.

Oceanography. Warren E. Yasso. Holt, Rinehart, and Winston, New York, 1965. 176 pp. Illus. Paper. Holt Library of Science, Series II.

Physiologie Nutritionnelle et Sevrage des Porcelets. Séminaire international organisé par l'Institut National de la Recherche Agronomique (Paris), September 1964. E. Salmon-Legagneur and A. Aumaitre, Eds. Institut National de la Recherche Agronomique, Paris, 1965. 236 pp. Illus. Paper, F. 24. Twenty-one papers.

Proceedings of the Fourth International Congress on Rheology. Providence, R.I., August 1963. pts. 1 to 4. pt. 1 (383 pp., 22 papers; $15.50) E. H. Lee and Alfred L. Copley, Eds.; pt. 2 (726 pp., 47 papers; $30) E. H. Lee, Ed.; pt. 3 (651 pp., 59 papers; $26) E. H. Lee, Ed.; pt. 4, *Symposium on Biorheology* (646 pp., 55 papers) Alfred L. Copley, Ed. Interscience (Wiley), New York, 1965. Illus.

Russian Philosophy. vols. 1 to 3. vol. 1, *The Beginnings of Russian Philosophy, The Slavophiles, The Westernizers* (454 pp., $7.50); vol. 2, *The Nihilists, The Populists, Critics of Religion and Culture* (332 pp., $6.50); vol. 3, *Pre-Revolutionary Philosophy and Theology, Philosophers in Exile, Marxists and Communists* (541 pp., $8.50). James M. Edie, James P. Scanlan, and Mary-Barbara Zeldin, with the collaboration of George L. Kline, Eds. Quadrangle Books, Chicago, Ill., 1965.

Science in the Age of Space. Dan Q. Posin. Quadrangle Books, Chicago, 1965. 271 pp. Illus. $4.95.

Science in the Nineteenth Century. René Taton, Ed. Translated from the French edition (Paris, 1961) by A. J. Pomerans. Basic Books, New York, 1965. 646 pp. Illus. $17.50. Thirty-four papers on the following topics: Mathematics (3 papers); Mechanics and astronomy (2 papers); Physical science (7 papers); Geological sciences (2 papers); Biological sciences (14 papers); and Science and society (6 papers).

Science Teaching and Testing. Leo Nedelsky. Harcourt, Brace and World, New York, 1965. 384 pp. Illus. $6.95.

The Scientific Analysis of Personality. Raymond B. Cattell. Penguin Books, Baltimore, 1965. 399 pp. Illus. Paper, $1.65.

The Scientific Estate. Don K. Price. Harvard Univ. Press, Cambridge, Mass., 1965. 335 pp. $5.95.

Selected Readings in the History of Chemistry. Compiled by Aaron J. Ihde and William F. Kieffer. Division of Chemical Education, American Chemical Soc., Easton, Pa., 1965. 304 pp. Illus. Paper, $4.50. Fifty-nine papers reprinted from the *Journal of Chemical Education* (1933 to 1963) on the following topics: General history (12 papers); Analytical chemistry (12 papers); Physical chemistry (10 papers); Inorganic chemistry (6 papers); Nuclear and radiochemistry (4 papers); Organic chemistry (11 papers); and Industrial chemistry (4 papers).

The Sky at Night. Patrick Moore. Norton, New York, 1965. 224 pp. Illus. $5.95.

Sociology and the Military Establishment. Morris Janowitz and Roger Little. Russell Sage Foundation, New York, ed. 2, 1965. 136 pp. Paper, $1.50.

Soils in Relation to Crop Growth. Firman E. Bear. Reinhold, New York, 1965. 303 pp. Illus. $12.50.

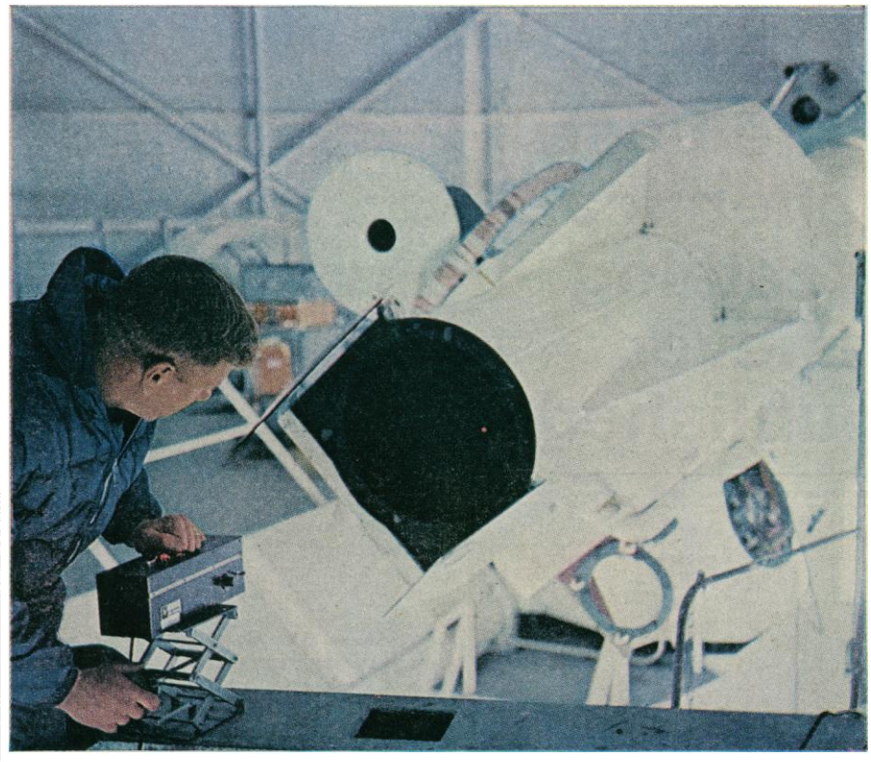
Teaching Genetics in School and University. C. D. Darlington and A. D. Bradshaw, Eds. Oliver and Boyd, Edinburgh; Philosophical Library, New York, 1964. 128 pp. Illus. $7.50.

Topics in Public Health. J. M. Mackintosh. Livingstone, London; Williams and Wilkins, Baltimore, 1965. 301 pp. $9.

United States Government Organization Manual 1965–1966. Natl. Archives and Records Service, Washington, D.C., 1965 (order from Superintendent of Documents, Washington, D.C.). 806 pp. Illus. Paper, $1.75.

The World of the Forest. Henry Clepper and Arthur B. Meyer. Heath, Boston, Mass., 1965. 128 pp. Illus. Paper, $1.32. Science Resource Series.

The Year Book of the National Institute of Sciences of India. Natl. Inst. of Sciences of India, New Delhi, 1964. 139 pp.



At the Climax, Colorado observing station of the High Altitude Observatory, Chief Observer Bob James uses a Model 130 portable laser to align optics of one of the world's largest (40.6 cm) coronagraphs.[1] Laser is also used to align the observatory's spectrograph.

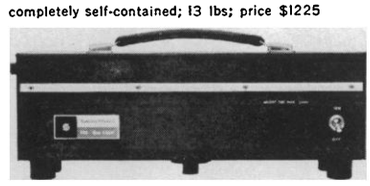
Portable laser makes light work of observatory's alignment tasks

Riding the solar flare patrol can be an exciting job, particularly if you're working in the clear, crisp air of a place like the Climax, Colorado observing station of the High Altitude Observatory. From there you get to see some really spectacular solar scenery. But the work can be tedious, too, when you have to forego your observation for long periods of time while you painstakingly align your optical equipment. And sometimes that's just when you miss the best shows.

But the work of aligning the complex optical equipment has now become easier. Procedures that once took days are now accomplished in hours, thanks to a new labor-saving device called the Spectra-Physics Model 130 gas laser. With their portable Model 130, observatory scientists align the optics of coronagraphs and spectrographs, in bright daylight if desired, with none of the focusing or other problems experienced using a point source of light.

Whether you're working in an observatory, a laboratory, or a classroom, you'll find the Model 130 cw gas laser offers you far more in precision and performance than any other laser at anywhere near the price. May we send you literature, and put your name on the mailing list to receive Spectra-Physics Laser Technical Bulletins? Write us at 1255 Terra Bella Avenue, Mountain View, Calif.

New, high output (0.75 mw uniphase power) Model 130B cw gas laser, 6328A (1.15μ or 3.39μ optional) completely self-contained; 13 lbs; price $1225



Spectra-Physics

EUROPEAN HEADQUARTERS: SPECTRA-PHYSICS, S.A., Chemin de Somais 14, Pully, Switzerland

[1] J. H. RUSH AND G. K. SCHNABLE, APPL. OPT. 3, 1347 (1964)

Reprints

Arizona's Meteorite Crater: Past, Present, Future. H. H. Nininger. American Meteorite Laboratory, Denver, Colo., 1956. 248 pp. Illus. Plates. Paper, $2.25. Reprint.

Atomic Physics Today. Otto R. Frisch. Fawcett, New York, 1965. 176 pp. Illus. Paper, 60¢. Reprint, 1961 edition; Science and Discovery Series.

Atoms and Molecules Simply Explained: An Introduction to Chemical Phenomena and Their Applications. B. C. Saunders and R. E. D. Clark. Dover, New York, 1964. 309 pp. Illus. Paper, $1.50. A reprint *Order and Chaos in the World of Atoms* (1948).

Behavior of Metals under Impulsive Loads. John S. Reinhart and John Pearson. Dover, New York, 1965. 264 pp. Illus. Paper, $2. Reprint, 1954 edition.

Bird Display and Behaviour: An Introduction to the Study of Bird Psychology. Edward A. Armstrong. Dover, New York, 1965. 439 pp. Illus. Paper, $2.50. Reprint, ed. 2, 1947.

Cardano: The Gambling Scholar. With a translation from the Latin of Cardano's *Book on Games of Chance* by Sydney Henry Gould. Oystein Ore. Dover, New York, 1965. 263 pp. Illus. Paper, $1.60. Reprint, 1953 edition.

Complete Report of "Mechanism of Mutagenesis." Sciji Matsumura, Ed. Genetics Soc. of Japan, Mishima, Japan, 1965. 116 pp. Illus. Paper. Reprinted from the *Japanese Journal of Genetics* **39**, September 1964.

Computing Mechanisms and Linkages. Antonín Svoboda. Hubert M. James, Ed. Dover, New York, 1965. 371 pp. Illus. Paper, $2.25. Reprint, 1948 edition.

Diophantus of Alexandria: A Study in the History of Greek Algebra. Sir Thomas L. Heath. Dover, New York, 1964. 395 pp. Illus. Paper, $2.75. Reprint, ed. 2, 1910.

The Divided Self: An Existential Study in Sanity and Madness. R. D. Laing. Penguin Books, Baltimore, 1965. 218 pp. Paper, 95¢. Reprint, 1960 edition.

Electrodynamics. Leigh Page and Norman Ilsley Adams. Dover, New York, 1965. 511 pp. Illus. Paper, $2.50. Reprint, 1940 edition.

Electromagnetic Theory: A Critical Examination of Fundamentals. vols. 1 and 2. Alfred O'Rahilly. Dover, New York, 1965. vol. 1, 462 pp.; vol. 2, 892 pp. Illus. Paper, $2.25 each. Reprint, 1938 edition, *Electromagnetics*.

Elements of Chemistry: In a New Systematic Order, Containing All the Modern Discoveries. Antoine-Laurent Lavoisier. Translated by Robert Kerr. With an introduction by Douglas McKie. Dover, New York, 1965. 623 pp. Plates. Paper, $3.

Experimental Researches in Electricity. vols. 1 to 3. Michael Faraday. Dover, New York, 1965. vols. 1 and 2, 896 pp. (bound as one volume); vol. 3, 602 pp. Plates. $15 set. Reprint; vol. 1, 1839 edition, vol. 2, 1844 edition, vol. 3, 1855 edition.

Exploring Behavior. Douglas K. Candland and James F. Campbell. Fawcett, New York, 1965. 160 pp. Illus. Paper, 60¢. Reprint, 1961 edition; Science and Discovery Series.

Fluid Mechanics of Turbomachinery. vols. 1 and 2. George F. Wislicenus. Dover, New York, 1965. vol. 1, 446 pp.; vol. 2, 336 pp. Illus. Paper, $2.75 each. Reprint, 1947 edition.

Galileo and the Scientific Revolution. Laura Fermi and Gilberto Bernardini. Fawcett, New York, 1965. 128 pp. Illus. Paper, 60¢. Reprint, 1961 edition; Science and Discovery Series.

Handbook of Mathematical Functions: With Formulas, Graphs, and Mathematical Tables. Milton Abramowitz and Irene A. Stegun, Eds. Dover, New York, 1965. 1059 pp. Illus. Paper, $4. Reprint, 1964 edition.

A History of European Thought in the Nineteenth Century. vols. 1 to 4, pts. 1 and 2. vol. 1, pt. 1, *Scientific Thought* (472 pp.); vol. 2, pt. 1, *Scientific Thought: Concluded* (821 pp.); vol. 3, pt. 2, *Philosophical Thought* (640 pp.); vol. 4, pt. 2, *Philosophical Thought: Concluded* (837 pp.). John Theodore Merz. Dover, New York, 1965. Paper, $2.75 each. Reprints, originally published between 1904 and 1912.

A History of Mechanical Engineering. Aubrey F. Burstall. M.I.T. Press, Cambridge, Mass., 1965. 456 pp. Illus. Paper, $2.95. Reprint, 1963 edition; M.I.T. Paperback Series.

A History of Pathology. Esmond R. Long. Dover, New York, ed. 2, 1965. 217 pp. Illus. Paper, $2. Enlarged and corrected version of 1928 edition.

Illustrations of the Huttonian Theory of the Earth. John Playfair. Dover, New York, 1964. 568 pp. Paper, $2.75. Facsimile reprint, with an introduction by George W. White, © 1956 edition.

Introduction to Electronics. Prepared by Bureau of Naval Personnel. Dover, New York, 1965. 153 pp. Illus. Paper, $1. Reprint, 1963 edition.

Introduction to Physics. A. Kitaigorodsky. Translated by O. Smith. Dover, New York, 1965. 719 pp. Illus. Paper, $3. Reprint.

An Introduction to the Use of Generalized Coordinates in Mechanics and Physics. William Elwood Byerly. Dover, New York, 1965. 126 pp. Illus. Paper, $1.35. Reprint, 1916 edition.

Kepler's Conversation with Galileo's Sidereal Messenger. Translated by Edward Rosen. Johnson Reprint Corp., New York, 1965. 184 pp. $9. Complete translation of *Kepler's Dissertatio cum nuncio sidereo nuper ad mortales misso a G. Galileo* (1610). The Sources of Science Series, No. 5.

The Logic of Scientific Discovery. Sir Karl Popper. Harper and Row, New York, 1965. 480 pp. Illus. Paper, $2.75. Reprint of second edition, 1960.

Mechanics. William Fogg Osgood. Dover, New York, 1965. 509 pp. Illus. Paper, $2.50. Reprint, 1937 edition.

Microwave Antenna Theory and Design. Samuel Silver, Ed. Dover, New York, 1965. 639 pp. Illus. Paper, $3. Reprint, 1949 edition.

Microwave Transmission Circuits. George L. Ragan, Ed. Dover, New York, 1965. 743 pp. Illus. Paper, $3. Reprint, 1948 edition.

Modern Developments in Fluid Dynamics: An Account of Theory and Experi-

ment Relating to Boundary Layers, Turbulent Motion, and Wakes. vols. 1 and 2. Composed by the Fluid Motion Panel of the Aeronautical Research Committee and others. S. Goldstein, Ed. Dover, New York, 1965. vol. 1, 358 pp.; vol. 2, 384 pp. Illus. Plates. Paper, $2.50 each. Reprint, 1938 edition.

Natural Philosophy of Cause and Chance. Max Born. Dover, New York, 1965. 253 pp. Illus. Paper, $1.50. Reprint, 1949 edition. Waynflete Lectures (Oxford, England), 1948 and a new essay, "Symbol and reality," Nobel Laureates (Lindau, Germany), 1964.

The New Architecture and the Bauhaus. Walter Gropius. Translated from the German edition by P. Morton Shand. M.I.T. Press, Cambridge, Mass., 1965. 112 pp. Illus. Paper, $1.95. Reprint; M.I.T. Paperback Series.

North American Birds Eggs. Chester A. Reed. Dover, New York, revised edition, 1965. 384 pp. Illus. Paper, $3. Reprint.

Photometry. John W. T. Walsh. Dover, New York, 1965. 564 pp. Illus. Paper, $3. Reprint, ed. 3, 1958.

Principles of Microwave Circuits. C. G. Montgomery, R. H. Dicke, and E. M. Purcell, Eds. Dover, New York, 1965. 502 pp. Illus. Paper, $2.25. Reprint, 1948 edition.

Propagation of Short Radio Waves. Donald E. Kerr, Ed. Dover, New York, 1965. 746 pp. Illus. Paper, $3. Reprint, 1951 edition.

Pulse Generators. G. N. Glascoe and J. V. Lebacqz, Eds. Dover, New York, 1965. 755 pp. Illus. Paper, $3. Reprint, 1948 edition.

The Puma: Mysterious American Cat. pts. 1 and 2. pt. 1, *History, Life Habits, Economic Status, and Control* by Stanley P. Young; pt. 2, *Classification of the Races of the Puma* by Edward A. Goldman. Dover, New York, 1964. 373 pp. Illus. Paper, $2.25. Reprint, 1946 edition.

Radar System Engineering. Louis N. Ridenour, Ed. Dover, New York, 1965. 766 pp. Illus. Paper, $3. Reprint, 1947 edition.

Reflexes of the Brain. I. Sechenov. K. Koshtoyants, Ed. Translated from the Russian text (vol. 1, *Selected Works,* Moscow, 1952 to 1956) by S. Belsky. G. Gibbons, Translation Ed. Notes by S. Gellerstein. M.I.T. Press, Cambridge, Mass., 1965. 157 pp. Paper, $1.95. Reprint; M.I.T. Paperback Series.

Semantics: Studies in the Science of Meaning. Michel Bréal. Translated by Mrs. Henry Cust. With a new introduction by Joshua Whatmough. Dover, New York, 1964. 421 pp. Paper, $2. Reprint, 1900 edition.

Solid Analytical Geometry and Determinants. Arnold Dresden. Dover, New York, 1964. 320 pp. Illus. Paper, $2. Reprint, 1930 edition.

Solid Geometry. With chapters on space-lattices, sphere-packs, and crystals. L. Lines. Dover, New York, 1965. 312 pp. Illus. Paper, $2. Reprint, 1935 edition.

Some Properties of Polyhedra in Euclidean Space. V. J. D. Baston. Pergamon, London; Macmillan, New York, 1965. 224 pp. Illus. $10. International Series of Monographs on Pure and Applied Mathematics, vol. 71.