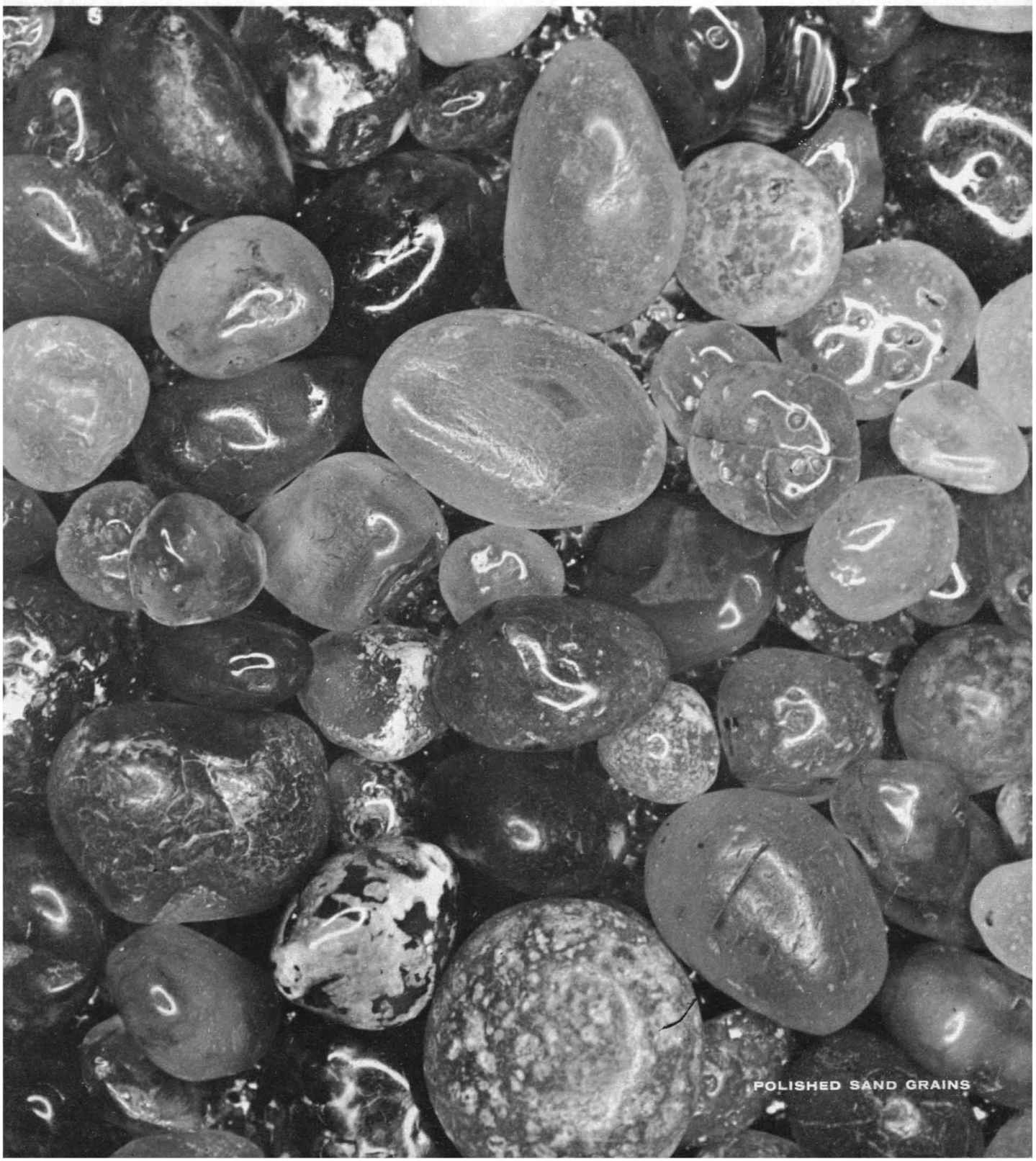
SCIENCE

9 September 1966

Vol. 153, No. 3741

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE



POLISHED SAND GRAINS

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Even less if you already have a controller.

Here's a bargain. With this handsome new Lindberg Hevi-Duty split-tube furnace, you can run complex tests with a low-cost furnace.

The Mini-Mite has temperature repeatability of ±4°F. It heats to the maximum 1850°F in just 30 minutes. And temperature recovery is rapid.

For $195, the furnace comes complete with an exclusive no-lag integral manual controller. Ready to work. Just plug it into a 115 volt outlet. Also available for 208 or 230 volts.

The controller has an indicating pyrometer with an accuracy of 2% full scale. And it's marked in both Fahrenheit and Centigrade.

Already have a controller? Then you can buy the Mini-Mite without integral control—for much less. It's the same furnace, with the same quality performance. It works with any Lindberg Hevi-Duty automatic or portable manual controller. And with most other brands.

Want to know more about Mini-Mite—or other furnaces in the broad line of Lindberg Hevi-Duty precision laboratory heating equipment? See your laboratory supply dealer, or write to us in Watertown, Wisc.

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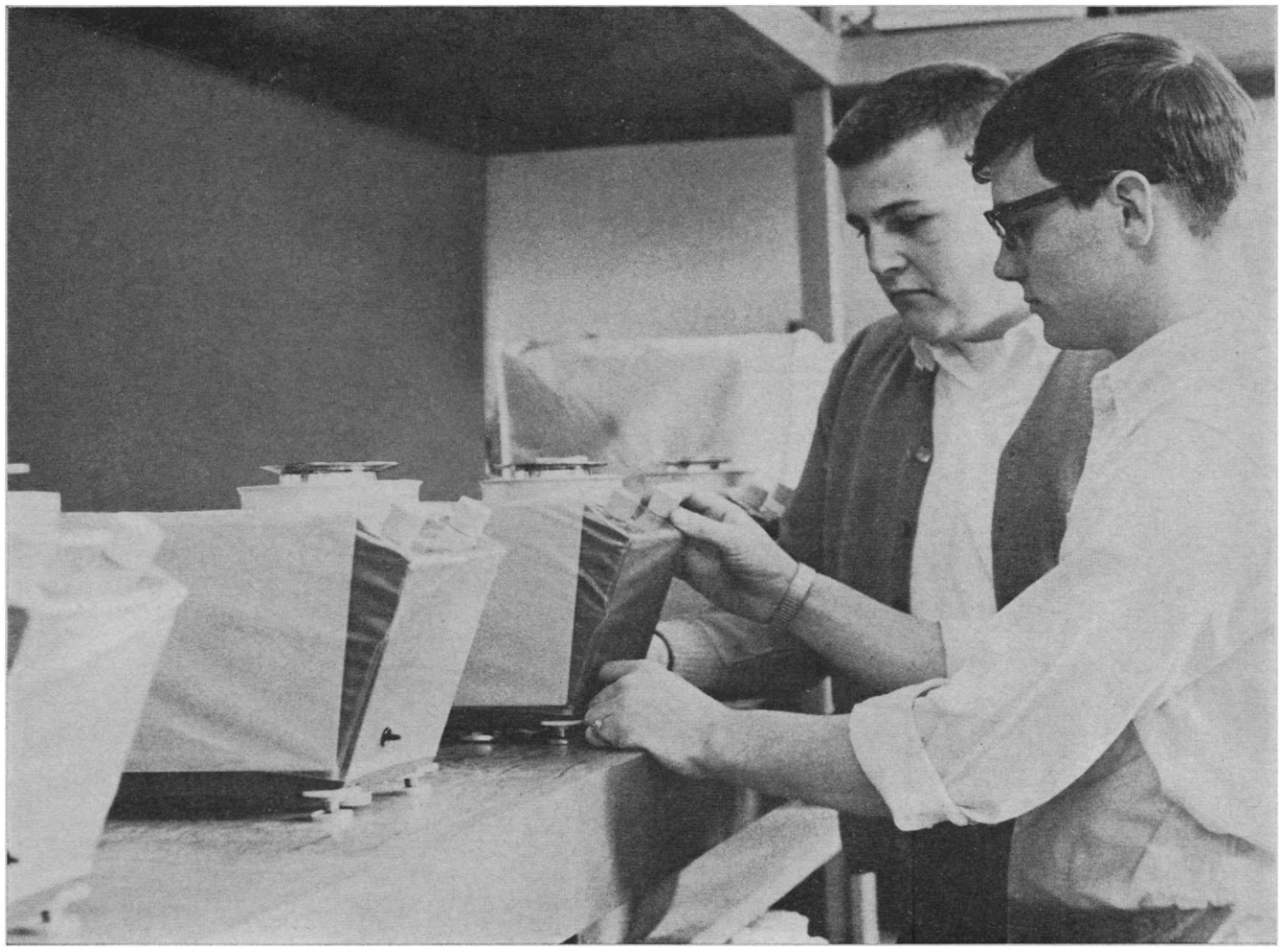
DIVISION OF SOLA BASIC INDUSTRIES



AT THE AGRICULTURAL AND TECHNICAL COLLEGE IN CANTON, NEW YORK...

Mettler balances aid small school in big move

One small school in upstate New York is representative of the vast expansion now taking place in the huge (58-campus) educational complex of the State University of New York. Plans for this school, a two-year Agricultural and Technical College at Canton call for the entire college to move across town to a completely new campus in the fall of 1967.

To Herman Kalberer, Assistant Professor of Physical Sciences, falls the responsibility of selecting instrumentation to equip his present facilities while building up an inventory of up to date equipment to meet the needs of his new chemistry laboratories.

Complicating his task is an expected 25% increase in enrollment in 1967, and also the introduction of a new Chemical Technology curriculum. This course places heavy emphasis on "hands on" student operation of laboratory instruments now in widespread industrial use.

Six Mettler P120 top-loading and three Mettler H-series analytical balances form the nucleus of Professor Kalberer's laboratory equipment and meet the special needs at Canton:

- top-loading speed enables his beginning chemistry classes to complete their work on time.
- the space-saving P120's give him the extra room he will need for atomic absorption, CHN and other advanced instrumentation.
- because they are the most widely-used balances in the world, Mettlers give his students the chance to use the instruments they will work with in industry.

Find out how the speed, compactness and convenience of Mettler balances can be used in beginning chemistry. Request the new brochure, "Top-loading Balances for Teaching," from Mettler Instrument Corporation, 20 Nassau Street, Princeton, N. J. 08540.

Mettler®

9 September 1966
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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., N 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¢, except **Guide to Scientific Instruments**, which is 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 rece address label. SCIENCE is indexed in the **Reader's Guide to Periodical Literature.**

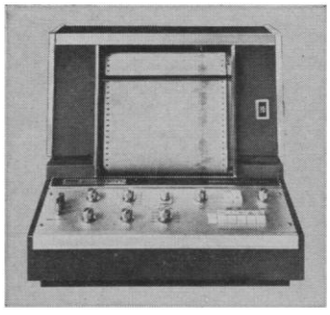
AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

COVER

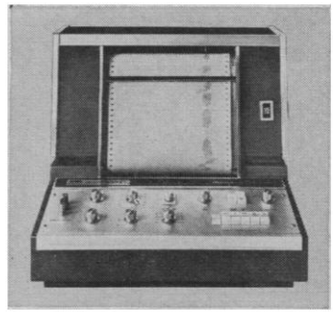
Coarse grains of sand, mostly quartz, from the ocean beach at Yachats, Oregon. The surface sheen is a result of wave action (about × 3.5). See review of *The Movement of Beach Sand*, page 1232. [Victor B. Scheffer, Bellevue, Washington]

Yes, our MR Recorder often seems like many instruments at work

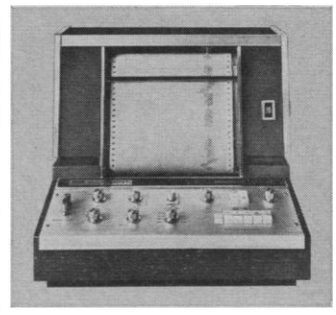
(and the specs tell you why)



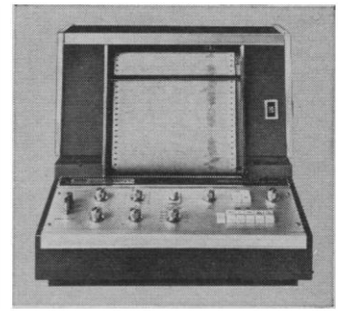
DESCRIPTION: SARGENT MODEL MR RECORDER—automatic, self-balancing, 10-inch potentiometer recorder. Includes special high gain amplifier, and high stability solid state reference power supply requiring no standardization. Line operated.



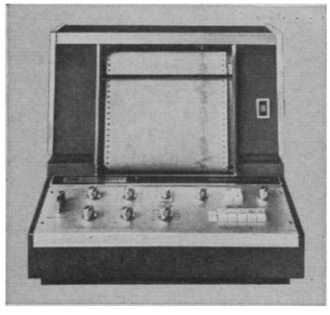
QUANTITY RECORDED: mV, V, μa and ma—selected by panel switch.



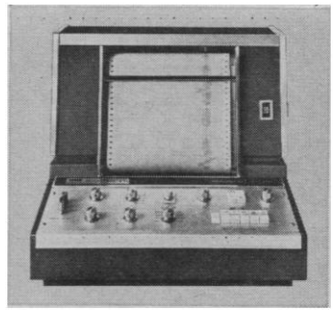
ELECTRICAL RANGE: twelve pre-calibrated ranges by switch selection — 0.5, 1, 2, 5, 10, 20, 50, 100, 200, 500, 1000, 2000. Variable range expansion from 100% (off) to 40% of selected range with continuously adjustable dial.



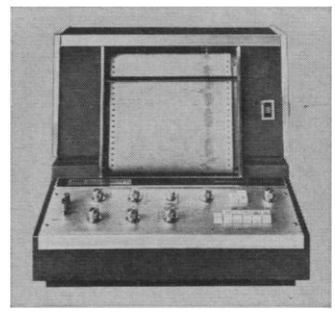
LIMIT OF ERROR: 0.1% or 5 μv, whichever is greater.



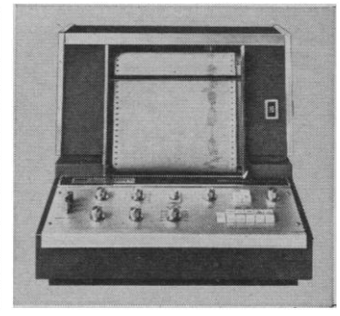
ZERO DISPLACEMENT: calibrated ranges of 10, 100, 1000 and 5000 of the selected units, upscale or downscale. Continuously adjustable reading dial for 0 to 100% of selected range.



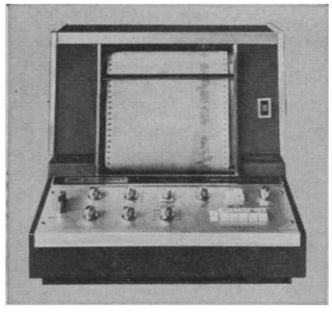
SOURCE RESISTANCE TOLERANCE: 50,000 ohms in most sensitive range, increasing with increasing range.



ELECTRICAL FILTERING: four position switch to reject transverse and common mode A.C. superimposed on the D.C. signal, without loss of sharp balancing characteristics.



PEN SPEED: 1 second for full scale transverse.



DAMPING GAIN ADJUSTMENT: automatic with range change; panel dial for fine adjustment—particularly for low resistance systems like thermocouples.

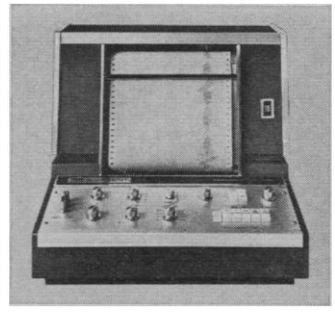


CHART DRIVE: twelve synchronous speeds—0.5, 1, 2, 4, 10, 20—by dial selection, inches per hour or per minute by panel switch. Magnetically braked in "off" position. Free clutch system scans chart with rapid drive; averages 50 feet per minute in forward or reverse directions.

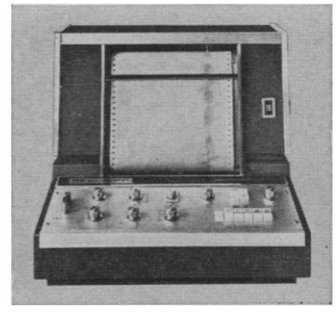
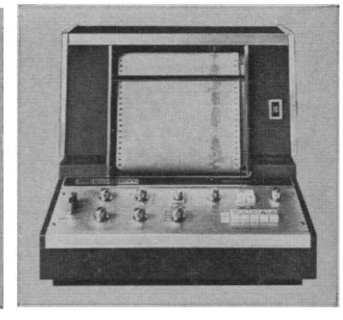


CHART TAKE-UP: automatic, by motor with preset torque—or by-pass for free end chart tear off.



SYNCHRONIZATION: chart drive may be synchronized with external systems connected to rear panel, and operated by the chart drive switch. Or chart drive may be operated from an external switch.

This gives you some idea why the SARGENT MODEL MR RECORDER can do the work of *several* less versatile recorders, manual potentiometers or precision meters. To get the complete picture, write for Bulletin MR.

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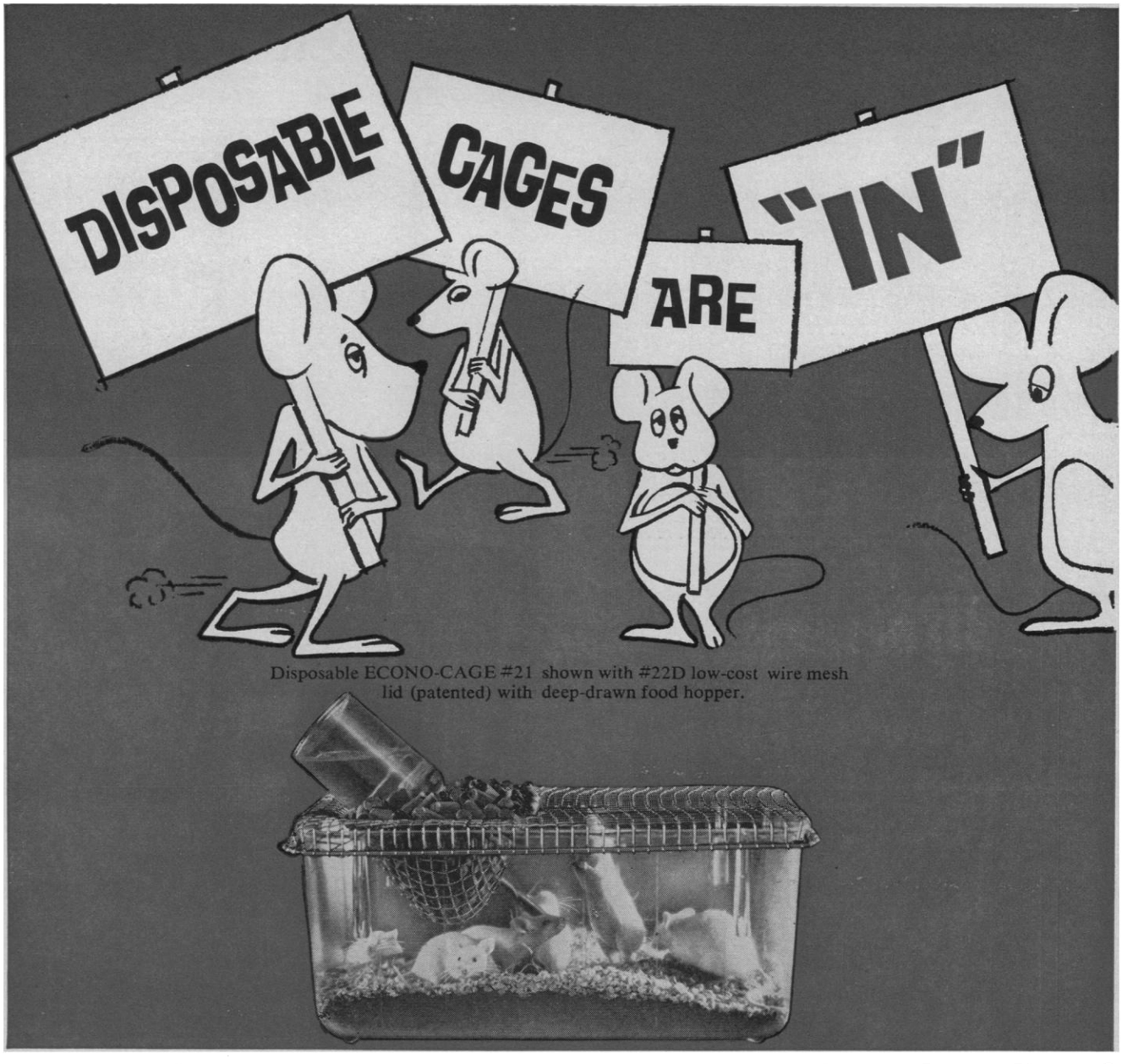


Disposable ECONO-CAGE #21 shown with #22D low-cost wire mesh lid (patented) with deep-drawn food hopper.

More and more hospital, government and private breeding & testing labs are using these low-cost, rigid cages for mice.

Disposable ECONO-CAGE #21 eliminates the need for costly washing and sterilizing equipment, materials and labor... and is easily incinerated, leaving a residue of only 1-2%.

These cages, made of polystyrene, allow each experiment to be conducted in a new, unused cage at minimum cost. They require no expensive supports that may prevent full visibility.

Ideal size of 11½" x 7½" x 5" is based on ILAR standards for housing mice; floor area is 84 sq. in., housing up to 12 mice. Can be used with any of 4 lids, illustrated in our catalog.

Contact your ECONO-CAGE distributor for complete details and prices... or send for our new catalog showing our entire line of disposable and permanent cages for mice, rats, hamsters and guinea pigs.

MP SCIENTIFIC DIVISION

MARYLAND PLASTICS, INC.

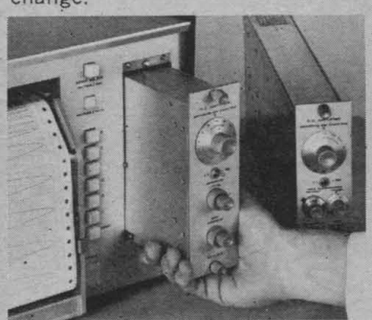
9 EAST 37TH STREET, NEW YORK, N. Y. 10016

Announcing the Brush Mark 250, first strip chart recorder for the perfectionists of the world.

Meet the fastest, most accurate strip chart recorder on record: The new Brush Mark 250. When you read about all the features you'll know why we call it the first recorder for the perfectionists of the world!

1 Unmatched frequency response. Flat to 10 cycles on full 4½" span! Useful response to 100 cycles. Nobody has a strip chart recorder in the same league.

2 Wide selection of signal conditioners. Choose from 21 interchangeable preamps. Use one today; plug in a different one when your recording requirements change.

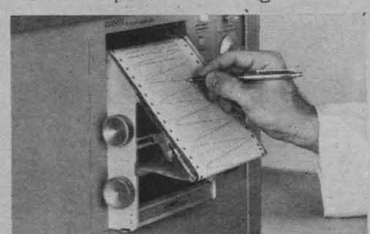


3 Crisp, clean rectilinear writing. Patented, pressurized inking system puts smudge-proof trace *into* the paper not just on it.

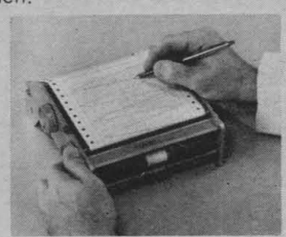
4 Contactless, non-wearing feedback system. Same one used in our multi-channel Mark 200 recorders. (No slide wires!) Accuracy? Better than ½%!

5 Multiple chart speeds. Push-button choice of twelve . . . from 5 inches/second to 1/10 of an inch/minute (up to 8 days of continuous recording).

6 Portable or Rack mounting. And either way you get the exclusive new dual position writing table.

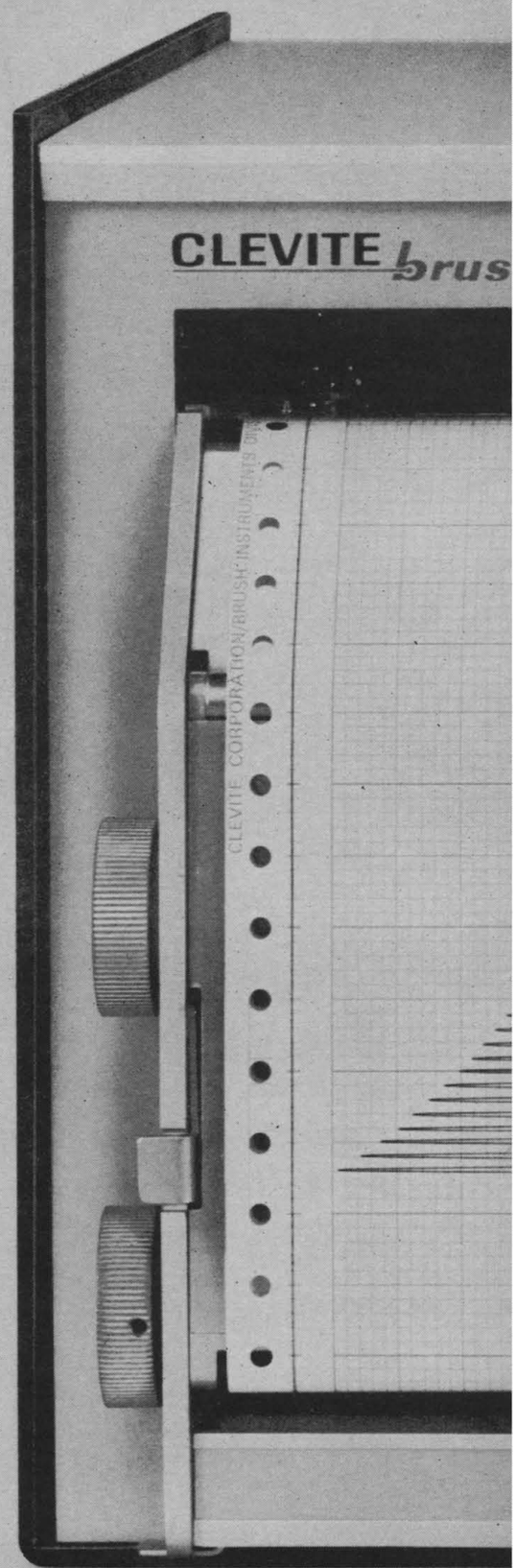


7 Removable chart paper magazine. Great for desk top record reviews. Man-sized manual winding knobs let you roll chart forward *and* back. Chart reloading is a cinch.

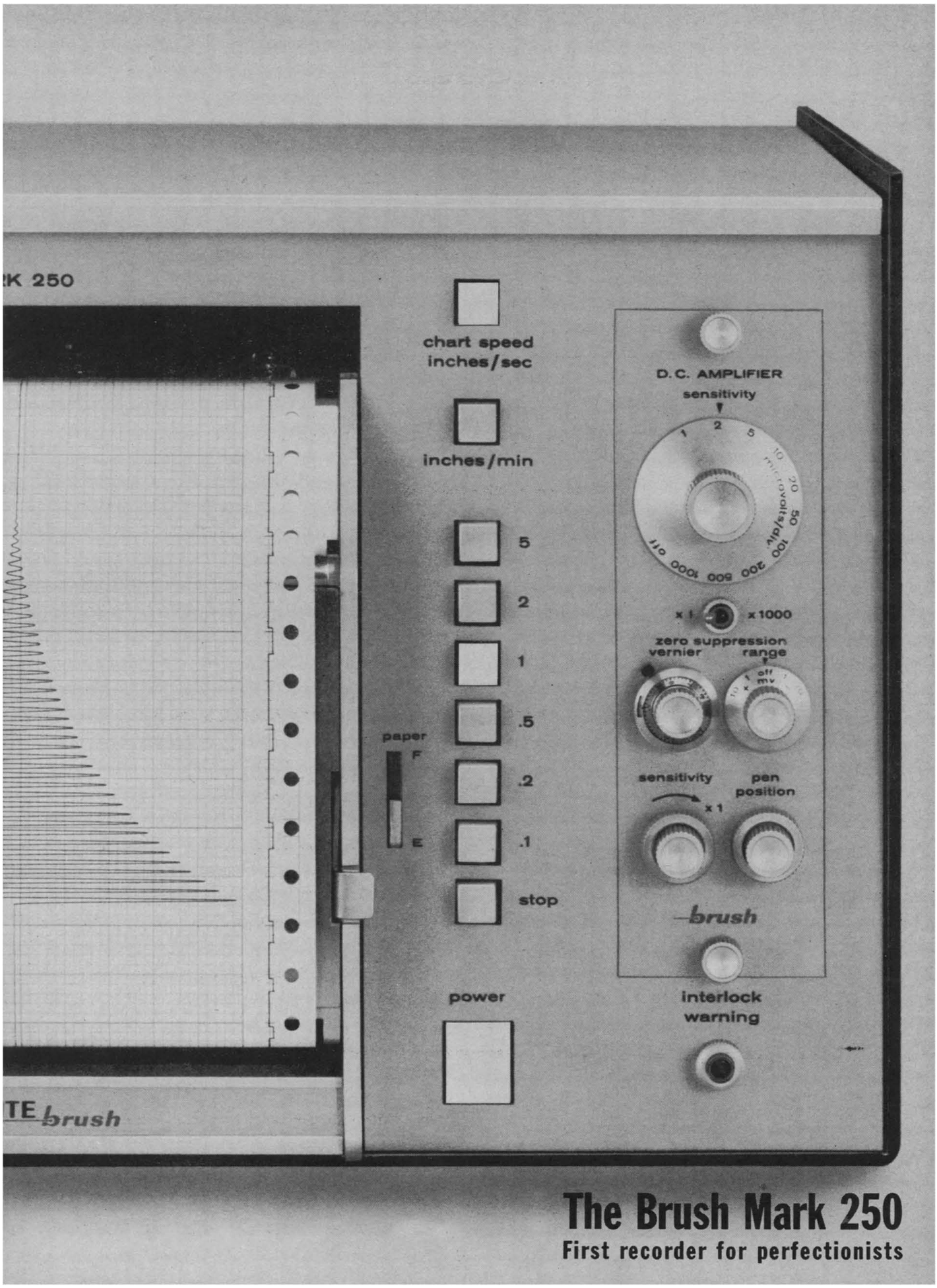


See what we mean? The Mark 250 is for the perfectionists of the world. Ask your Brush Sales Engineer for a demonstration. Or, write for chart sample and specifications. Clevite Corporation, Brush Instruments Division, 3633 Perkins Ave., Cleveland, Ohio 44114.

CLEVITE
brush INSTRUMENTS DIVISION

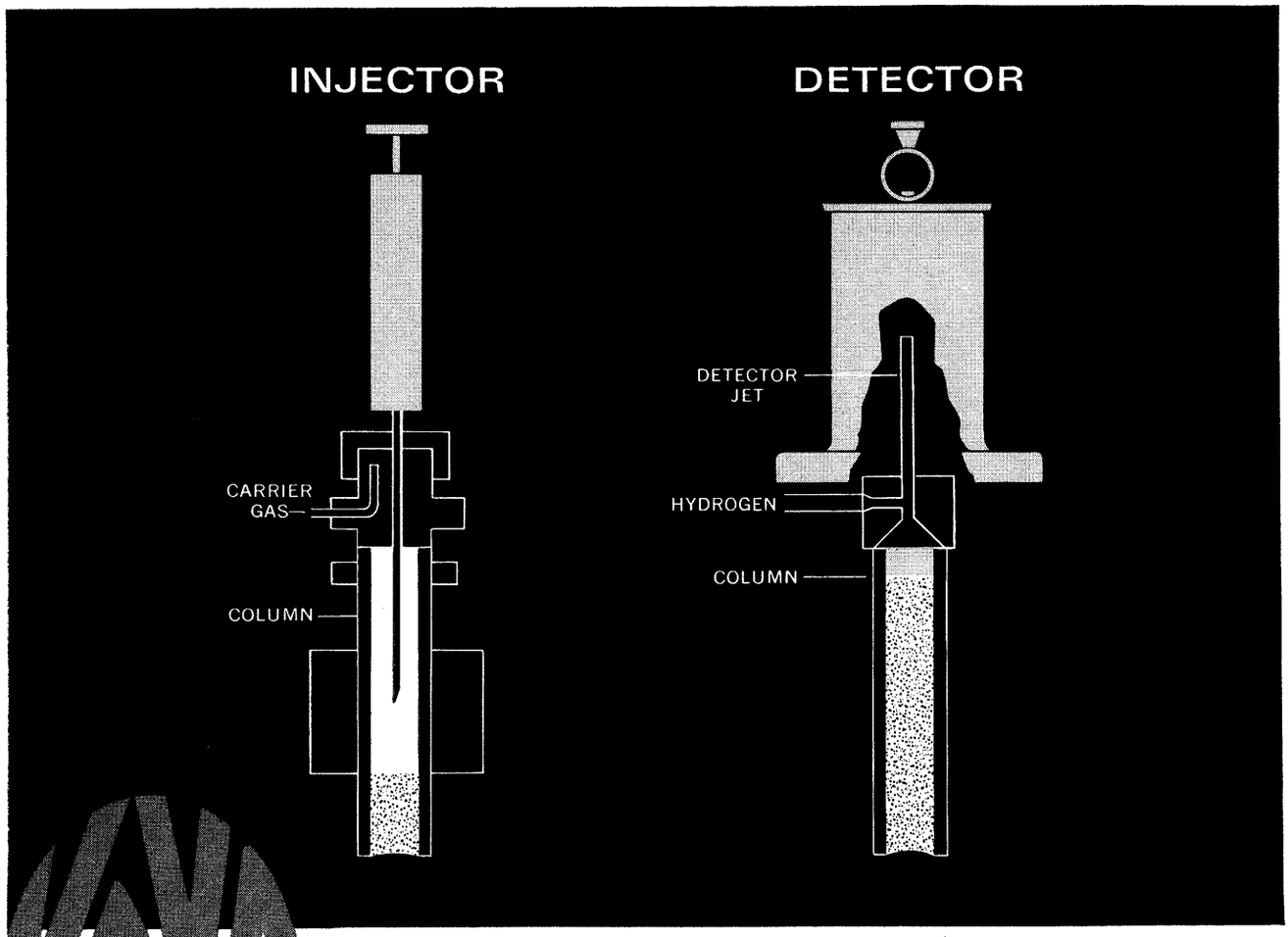


Shown approx. 76% of actual size with 1 μv preamplifier RD 4215-70; event markers optional.



The Brush Mark 250

First recorder for perfectionists



KEYS TO HIGH-EFFICIENCY GAS CHROMATOGRAPHY

Chromatographing thermally sensitive and polar materials involves serious problems that are only too well known to the chromatographer: component loss, low efficiency, peak tailing. Far from being an immutable phenomenon of the materials themselves, these problems have their origin, to a large extent, in the instrument hardware . . . and these instrumental limits can be completely eliminated through careful attention to the design characteristics of the injection and detector ends of the gc system. The F & M Series 402 High-Efficiency Gas Chromatograph is a case in point.

Injection Port Design. Rather than the standard T-shape injection port, the 402 has a straight-through design which reduces injection volume to a minimum, eliminates dead space, and sweeps the entire volume with high-velocity carrier gas. This unique design prevents thermal downgradients, sample flashback and hold-up. It also accomplishes true on-column injection thus preventing sample contact with metal in the hot injection zone.

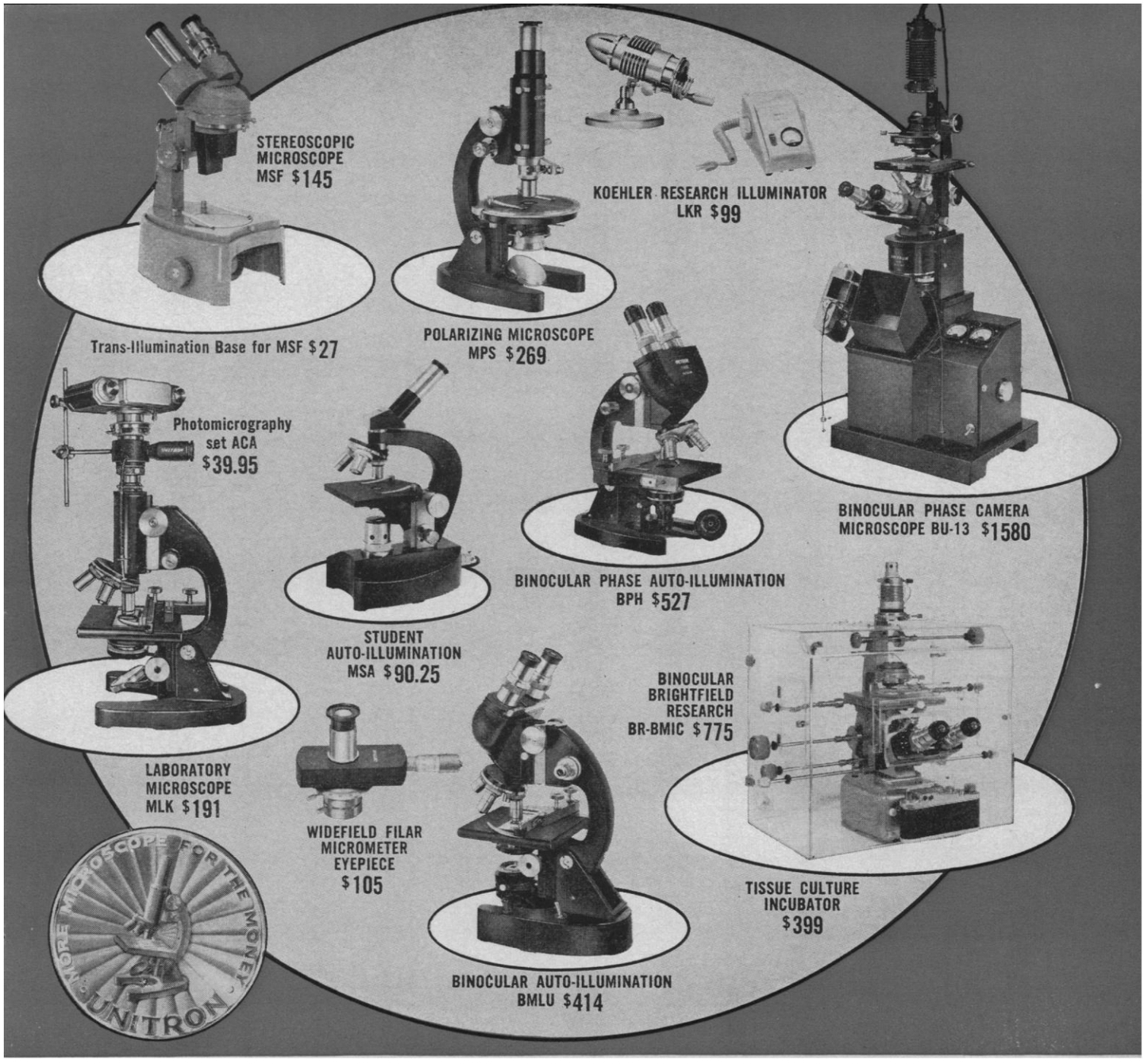
Detector Design. Most standard gc's have considerable 'plumbing' in the detector proper and where the column joins the detector, thus creating dead volume and sample contact with metal . . . the two deadliest enemies of high-efficiency gas chromatography of thermally sensitive polar compounds. In the 402 this problem is diminished to its irreducible minimum by attaching the column directly to the detector, and by designing a straight-through flow path for the detectors.

It's these two key design features, above all, that give the 402 its superior performance capability in the analysis of sensitive and polar materials. No matter what kind of difficult-to-chromatograph material you want to analyze, the 402 will respect its chemical integrity and produce a chromatogram that is unsurpassed qualitatively and quantitatively.

For more information, write for Bulletin 4020 or call the Chemical Instrumentation Sales Representative at one of the 41 Hewlett-Packard sales offices in the U.S. Price for the F & M Model 402 with dual flame ionization detector and recorder is $4800.00 (f.o.b. Avondale, Pa.)

Hewlett-Packard, F & M Scientific Division, Route 41 and Starr Road, Avondale, Pennsylvania 19311. In Europe: F & M Scientific Europa N.V., Basisweg (Sloterdijk), Amsterdam, The Netherlands.

HEWLETT PACKARD hp *F&M SCIENTIFIC DIVISION*



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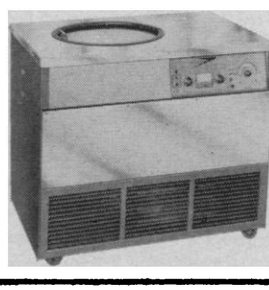

LOURDES Clini-Fuge 30R

Capacity 6,000 ml. Forces to 54,400 x G. Combines low speed, super speed and ultra speed in one unit. Automatic, Refrigerated. (Also available as non-refrigerated) . . . $2,775.00 plus $385.00 for high speed attachment (only one is needed to increase maximum rpm from 6,000 to 25,000).

These are FREE, if you buy either of the above.

1. "Fail-Safe" Brush Control to prevent motor damage due to brush failure.
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5. Many other Lourdes exclusive convenience features.

Write for Bulletin S-9-6

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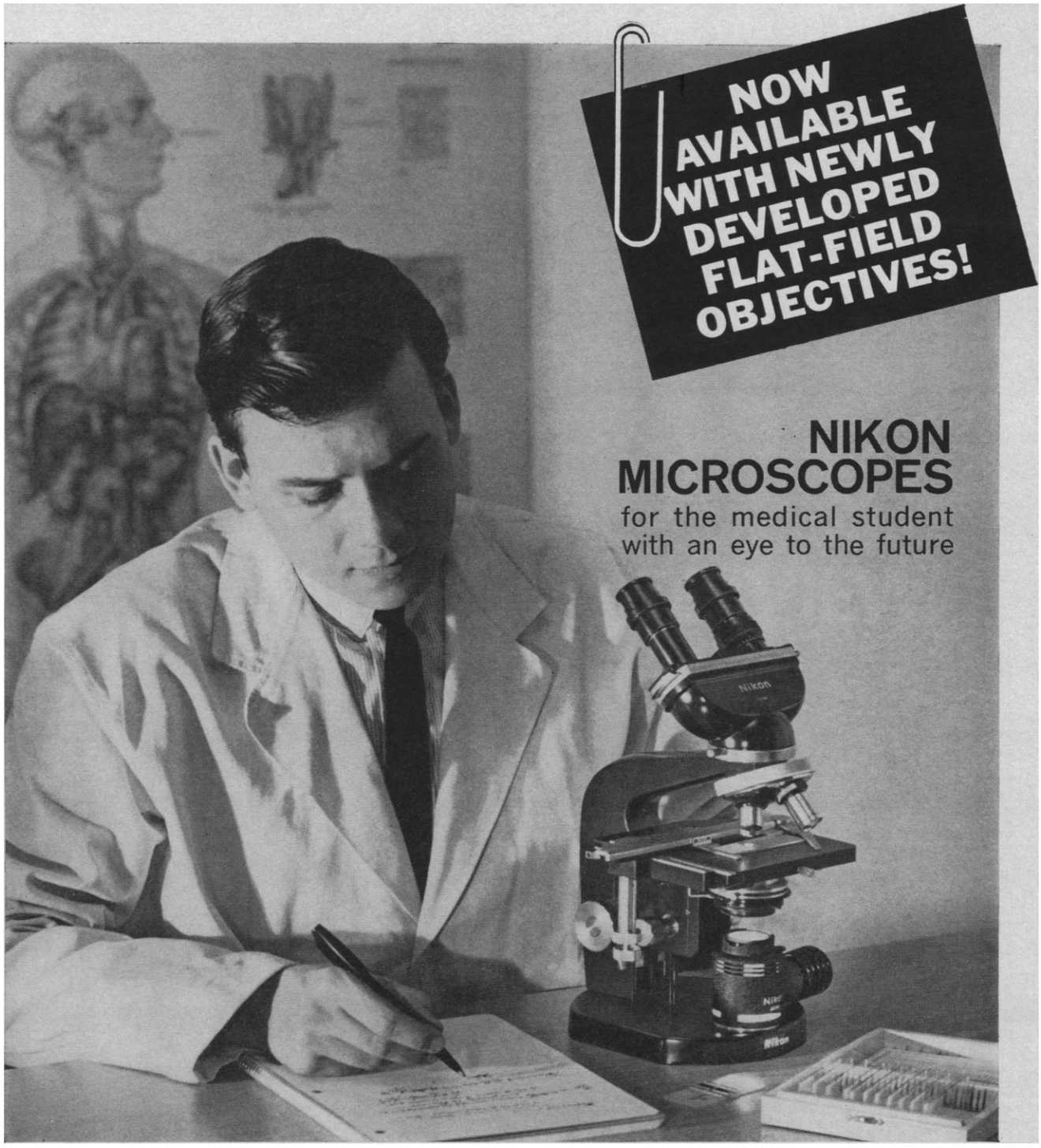
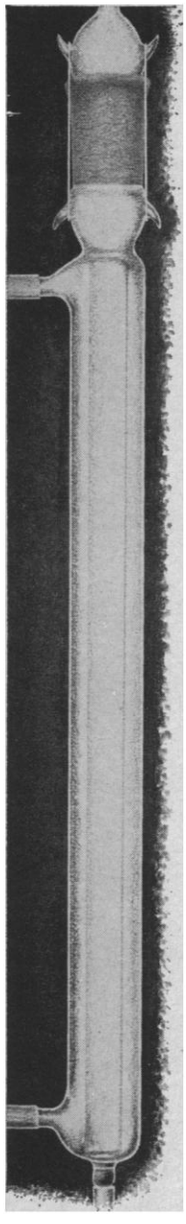


There are no Nikon *student* microscopes, in the sense of limited quality or usefulness. They are all professional units built around the same basic system, and differ only in the type of stage and eyepiece employed.
Complete interchangeability of these components, and other attachments, give each instrument a flexibility capable of serving the most specialized requirements of professional use long after it has served the student's needs at medical school.
The flat-field objectives, newly developed by Nikon, further enhance this versatility. They achieve extreme flatness-of-field without impairment of image quality or resolution. Moreover, they can be used with any Nikon microscope without modification or change in the instrument.
The SBR, shown above, is one of the models most favored by medical students. It is a sophisticated unit, widely used in schools, hospitals and research laboratories.

For medical student microscope catalog, write:
Nikon Inc., Instrument Div., Garden City, N.Y. 11533, Subsidiary of Ehrenreich Photo-Optical Industries, Inc.



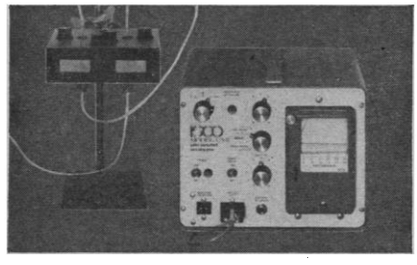
Column Chromatography in Three Easy Lessons*

* Three Easy Prices Too!
For Complete Information
Send For Brochure CC171

Lesson No.1

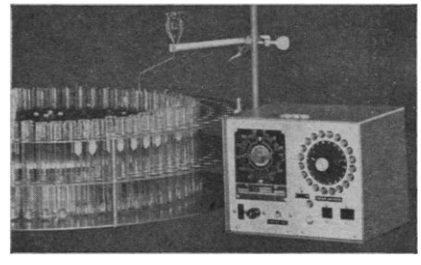
Begin by pumping your solvent into the column in a smooth concentration or pH gradient. ISCO's new programmed gradient pump, the DIALAGRAD, will handle this perfectly. In fact any simple or complex gradient formed by combining two liquids can be dialed directly into the DIALAGRAD. Program duration and pumping rates are easily adjustable over very broad ranges. No more mixing numerous solutions to guessed-at concentrations.

Lesson No.2



Now to identify your fractions. Use an ISCO UA-2 or 222 Ultraviolet Analyzer to get quantitative results with no need for further assay. Select linear absorbance, single or dual-beam monitoring at either 254 or 280 mμ or both. Absorbance recording minimizes need for base-line compensation and allows direct integration of chart record. As each UV absorbing fraction is recorded it is also automatically deposited in a separate collecting tube.

Lesson No.3



Collecting the effluent is then a simple task when ISCO fraction collectors are used. Choose from any of four basic models offering timed or volumetric control. Some have lift-off reels that can be changed as often as they fill, and when not collecting can be used as convenient storage racks. Extras such as drop counters and volumetric dispensers make things even easier. No after-school sessions necessary when you use ISCO equipment.

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If you're looking for a way to reduce cross-contamination and safeguard experiments, now is the time to try the versatile new **ISO**SYSTEM, animal housing system engineered by Bioquest. **ISO**SYSTEM is the only one ready-made to control the spread of airborne infections. And it is compact and easy to use. Overall dimensions with filter cap in place are only 12¾ x 8 x 8 inches.

This new compact **ISO**SYSTEM coordinates: (1) **ISO**CAP*, the disposable efficient filter cap, a fibreglass-plastic web, with clear vinyl end windows; (2) made-to-measure **ISO**LID*, laboratory cage lid of stainless steel or chrome plated with divider separating food and water bottle (lids nest for storage); and (3) **ISO**CAGE*, featuring the narrow molded flange for snug fit of component systems—in clear polycarbonate, opaque polypropylene or clear styrene acrylonitrile (SAN)—design permits nesting 8 cages to one foot, twice the usual number of plastic cages.

Write or call us for full details: LAB CAGES, INC.
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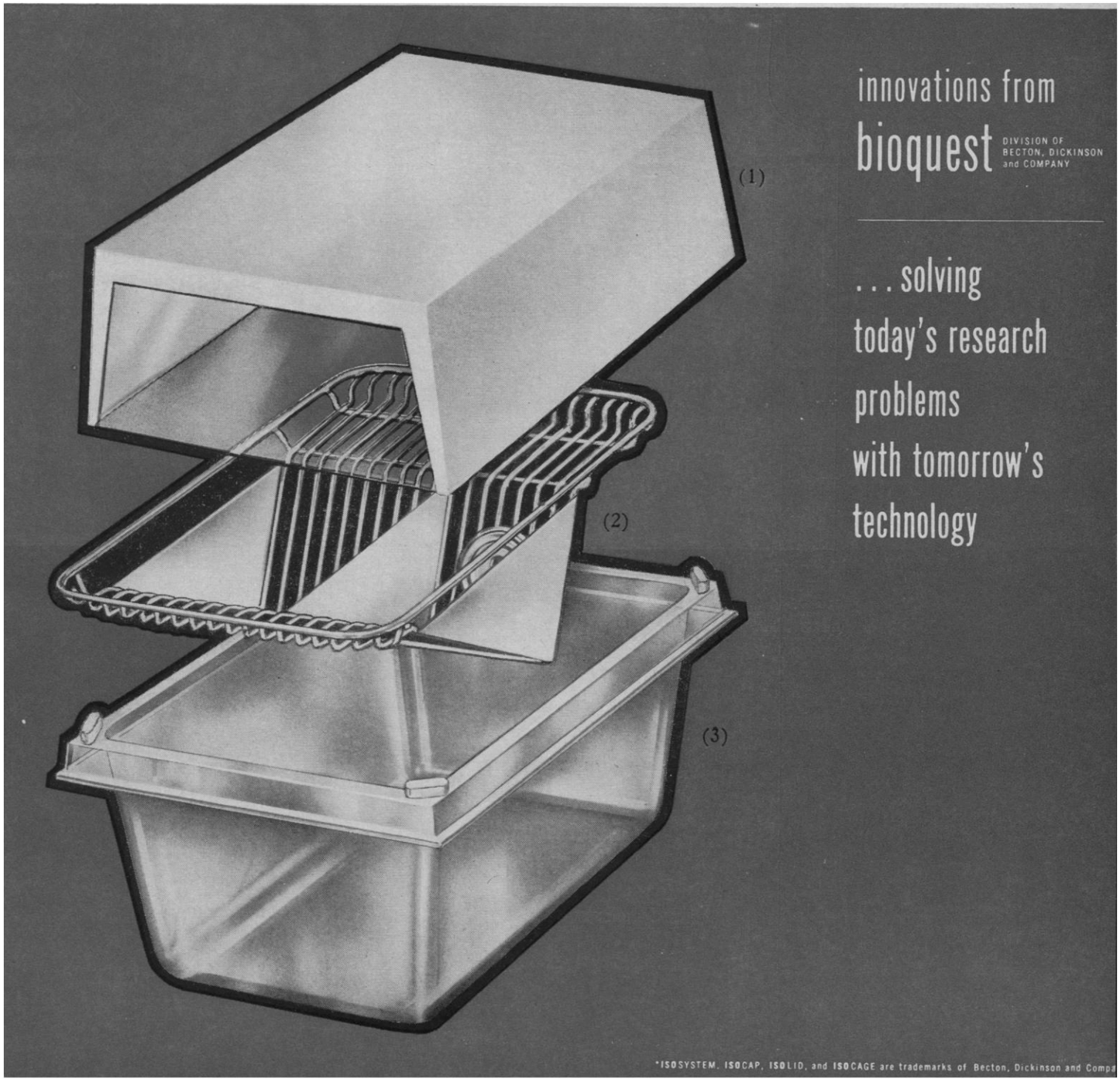
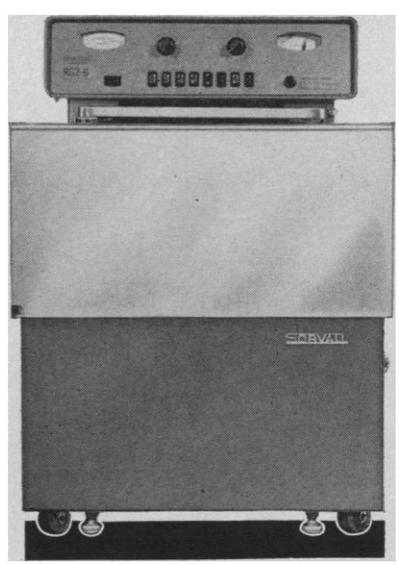


SORVALL®

RC2-B

ONE OF THE MOST FAMILIAR SHAPES IN THE LAB!



The new, improved RC2-B Automatic Superspeed Refrigerated Centrifuge now offers many additional features in the same functional cabinetry.

Up to 49,500 x G in Batch Centrifugation
Up to 48,200 x G with "SZENT-GYORGYI & BLUM" Continuous Flow System

The SORVALL RC2-B is the compact refrigerated centrifuge designed to do more for smaller cost with greater reliability than competitive centrifuges. The new SORVALL designed and built high-speed, high-torque motor *delivers 49,500 x G with the SM-24 Rotor and 48,200 x G with the standard 8 x 50 ml SS-34 Rotor.* Non-modulating electronic speed control maintains complete accuracy of setting regardless of voltage fluctuations. A patented Gyro-Action Self-Balancing Direct Drive gives greater tolerance of rotor imbalance than any other drive in its range. The RC2-B improvements result from continuing design development of proven engineering concepts. Learn more about the RC2-B — one of the most familiar shapes in the lab. Ask for Bulletin SC-9MFS

(only $2,610)

IVAN SORVALL INC.
NORWALK • CONNECTICUT • 06852

How The New Heath DC Triggered-Sweep Oscilloscope Up-Dates The Value Standards For All Lab Oscilloscopes

THE NEW HEATH IO-14 OSCILLOSCOPE OFFERS TRULY SOPHISTICATED CAPABILITIES. It features a high-quality flat-face 5″ CRT with an accurately-ruled 6 x 10 cm graticule • DC to 8 MHz bandwidth with 40 nanosecond rise time • 0.25 microsecond vertical signal delay through high-linearity delay line circuitry • 3% calibrated vertical attenuation — from 0.05 v/cm to 20 v/cm • 3% calibrated time base — from 0.2 microseconds/cm to 0.5 seconds/cm • Forced air cooling for the toughest industrial applications • Input for Z axis modulation • Input for direct access to vertical deflection plates • Highly-stable fiberglass circuit board construction • Wiring options for 115/230 volt, 50-60 hertz operation • The IO-14 is designed with modern circuitry, engineered with high-quality close-tolerance components, and capable of satisfying the most critical demands upon its performance specifications.

THE HEATH IO-14 INCLUDES ENGINEERING FEATURES YOU EXPECT ONLY IN HIGH-PRICED OSCILLOSCOPES. For example, switches are ball-detent type; all major control potentiometers are precision high-quality sealed components; all critical resistors are 1% precision; and vertical signal delay is provided through precision coaxial delay lines — circuitry considered by all knowledgeable electronic engineers to be the most desirable for high linearity and maximum frequency response.

THE HEATH IO-14 PROVIDES THE ULTRA-STABLE LOW-NOISE PERFORMANCE DEMANDED FOR TRULY PROFESSIONAL INDUSTRIAL, ACADEMIC, ELECTRONICS-ENGINEERING, AND BIO-MEDICAL REQUIREMENTS. Here's what engineer Adam L. Keller of Swiss Controls & Research Inc., Michigan City, Indiana says about the IO-14: "*May I take this opportunity to congratulate your company on the fine job you have done on your new IO-14 oscilloscope kit. In my opinion there is not a scope on the market which can compare with your fine new product, at least until you start talking 4 or 5 times the price. We are most satisfied with the instrument in every respect ... your IO-14 is probably the finest kit you have ever put on the market, bar none.*" **WE AT HEATH AGREE.**

Kit IO-14 (with standard P-2 phosphor), 53 lbs. . **$299.00**
Assembled IOW-14 (P-2 phosphor), 47 lbs. **$399.00**
Assembled IOW-14S (with long persistance P-7 phosphor for bio-medical or industrial use), 47 lbs. **$410.00**
Kit PK-1, Low-Capacitance Probe, 1 lb. **$4.95**

IO-14 SPECIFICATIONS—(Vertical) Sensitivity: 0.05 v/cm AC or DC. **Frequency response:** DC to 5 mc, —1 db or less; DC to 8 mc, —3 db or less. **Rise time:** 40 nsec (0.04 microseconds) or less. **Input impedance:** 1 megohm shunted by 15 uuf. **Signal delay:** 0.25 microsecond. **Attenuator:** 9-position, compensated, calibrated in 1, 2, 5 sequence from 0.05 v/cm. **Accuracy:** ±3% on each step with continuously variable control (uncalibrated) between each step. **Maximum input voltage:** 600 volts peak-to-peak; 120 volts provides full 6 cm pattern in least sensitive position. **(Horizontal) Time base:** Triggered with 18 calibrated rates in 1, 2, 5 sequence from 0.5 sec/cm to 1 microsecond/cm with ±3% accuracy or continuously variable control position (uncalibrated). **Sweep magnifier:** X5, so that fastest sweep rate becomes 0.2 microseconds/cm with magnifier on. (Overall time base accuracy ±5% when magnifier is on.) **Triggering capability:** Internal, external, or line signals may be switch selected. Switch selection of + or — slope. Variable control on slope level. Either AC or DC coupling. "Auto" position. **Triggering requirements:** Internal; ½ cm to 6 cm display. **External:** 0.5 volts to 120 volts peak-to-peak. **Horizontal input:** 1.0 v/cm sensitivity (uncalibrated) continuous gain control. Bandwidth: DC to 200 kc ±3 db. **General:** 5ADP81 or 5ADP2 Flat Face C.R.T. interchangeable with any 5AD or 5AB series tube for different phosphor characteristics. 4250 V. accelerating potential. 6 x 10 cm edge lighted graticule with 1 cm major divisions & 2 mm minor divisions. **Power supply:** All voltages electronically regulated over range of 105-125 VAC or 210-250 VAC 50/60 cycle input. (Z Axis) Input provided. DC coupled CRT unblanking for complete retrace suppression. **Power requirements:** 285 watts. 115 or 230 VAC 50-60 Hz. **Cabinet dimensions:** 15″ H x 10½″ W x 22″ D includes clearance for handle and knobs. **Net weight:** 40 lbs.

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"Low-level counting"

You can now buy the instruments that experts developed for their own demanding research.

An assemblage of experts doing research in low-level counting techniques needed (but could not find) instruments that met their exacting requirements. So, as you just might surmise, they solved their problems over the years by developing several rather distinctive low-level counters—*not* to develop instrumentation for the sake of developing instrumentation (or even for the sake of selling it), but only as functional, reliable means to ends. And then, inevitably, as they used this equipment in their own research programs, they de-bugged it. Result: user-designed, user-perfected, user-seasoned, low-level counters which can do what no existing instruments can do. Now as other workers see these counters working in our laboratories, we get, with increasing frequency, requests for duplicate copies. Accordingly, we are now making these counters available (not reluctantly, it should be noted) to others with similarly exacting requirements. For the specifics, read on.

Precise measurement of low-energy beta emitters.

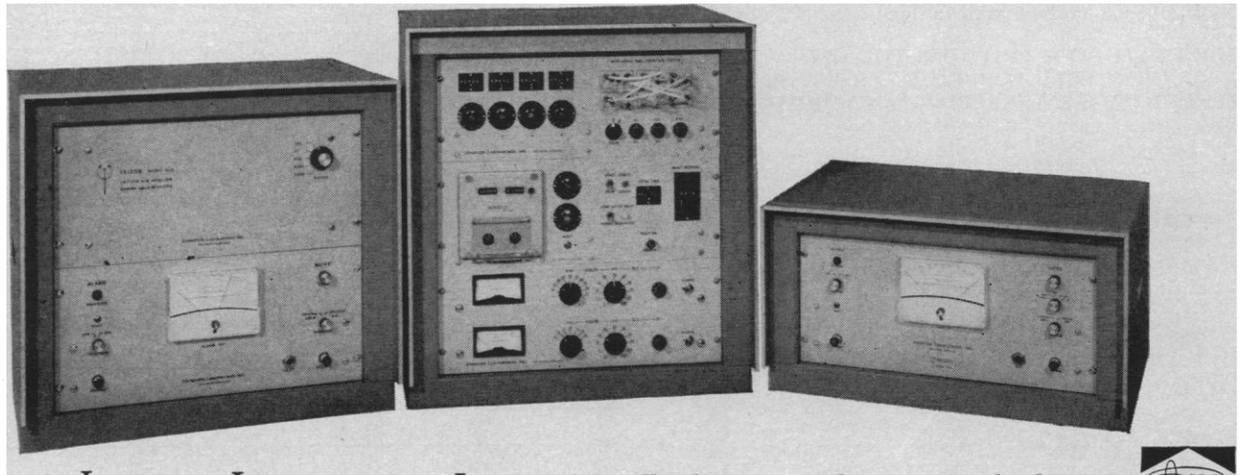
The Beta-Logic Gas Counting System was specifically designed for carbon-14 age-dating, natural tritium and low-level tracer analysis. The system utilizes proportional internal gas counting. A three-channel pulse charge analyzer provides data on the energy distribution of counts and allows simultaneous measurement and correction for contaminant activities such as H^3 and Rn in C^{14} samples. A two-channel printer records the number of counts for each of the preset time periods, which repeat automatically. Four independent scalers accumulate during each run. The energy analyses are accomplished through the use of computer-type logic circuitry.

This is an ideal system for serious work requiring maximum counting efficiency and low-background levels for utmost sensitivity. For complete data: request bulletin GC-10.

Tritium air and gamma area monitors.

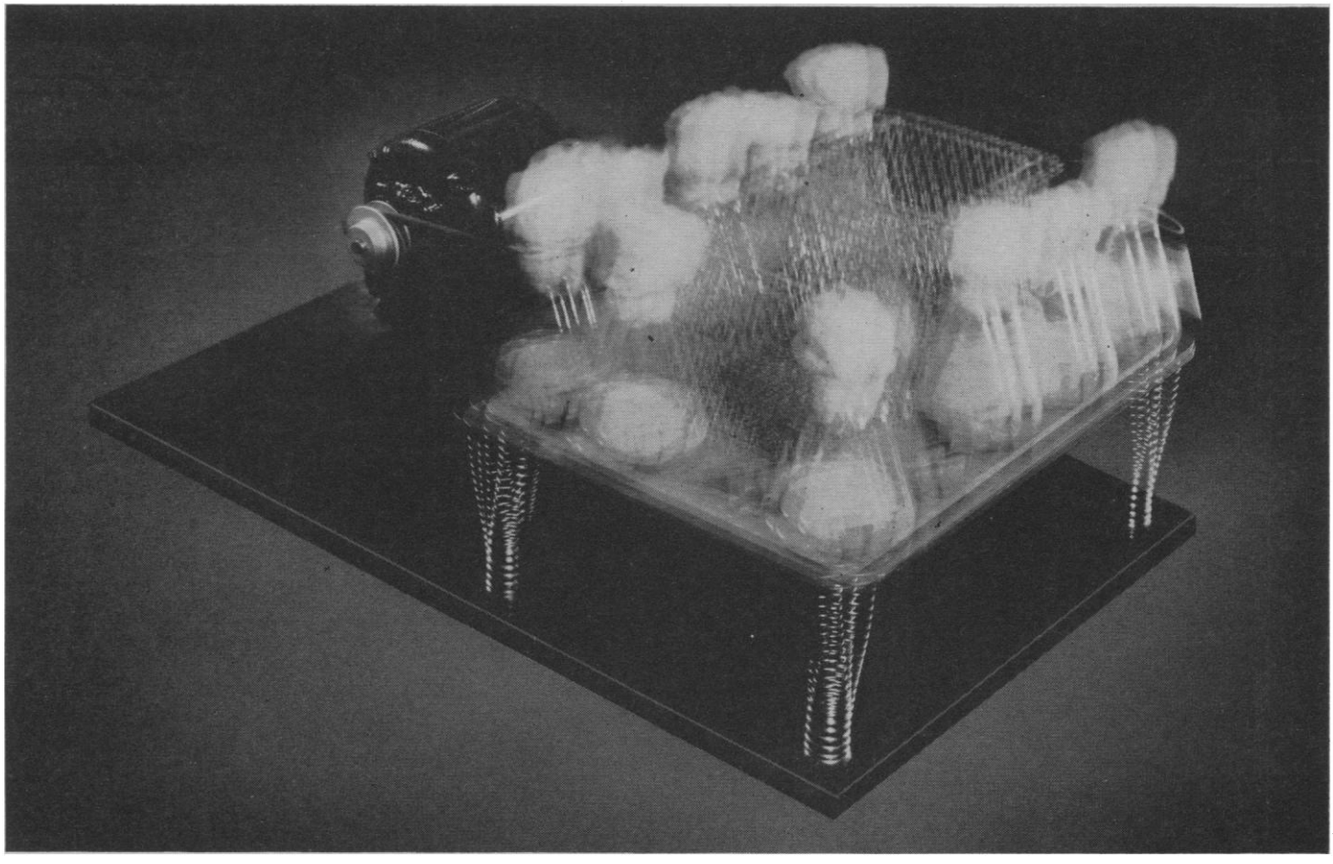
Johnston Laboratories has perfected two instruments for tritium air and gamma area monitoring: the Model 755B Triton, and the more sensitive model 855 Triton. The Model 755B Triton accurately monitors airborne beta-emitting radioisotopes such as H^3, C^{14}, and Kr^{85} or, alternatively, ambient low-level gamma radiation. The design of this instrument eliminates the errors usually associated with tritium air monitors and provides a new high level of accuracy and reliability. Its exceptional stability and sensitivity also permit analytical applications when incorporated into the closed atmospheric circuits of controlled environmental experiments. The 755B Triton may also be used as a low-level gamma monitor with much higher sensitivity than most gamma survey meters. For much more information: request bulletin 755B.

The Model 855 Triton, more sensitive than its progenitor above, is ideal where the measurement of extremely small amounts of gaseous radioactive contamination is a necessity. This instrument is particularly suited for monitoring the maximum permissible concentration of tritium in air ($5\mu c/M^3$) since the sensitivity is 10 $\mu c/M^3$ full scale. It can also serve to measure other beta emitters and is a very sensitive gamma area monitor too (.05 mr/hr. full scale). Ask for bulletin 855 for complete data.



JOHNSTON LABORATORIES, INC., 3617 Woodland Avenue, Baltimore, Maryland 21215

this 17-year-old shaker has been running for 51 years!

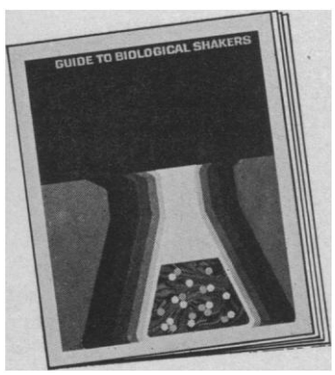


While other equipment sleeps, this New Brunswick shaker works overtime. It has been running almost 24 hours a day for 17 years . . . day-in, day-out . . . at the Rutgers University College of Agriculture. This Model "C" sustains three times more shaking action than those machines that are switched off after a normal 8-hour day. Simple multiplication shows that this workhorse has provided 51 years of service . . . and it's still going strong!

During the intervening years, NBS has developed a score of new shakers. Some are simply for shaking, others are for controlling environment as well as agitation. All feature uniform, continuous motion — either gyrotory or reciprocal. And they all shake and shake and shake for a long, long time.

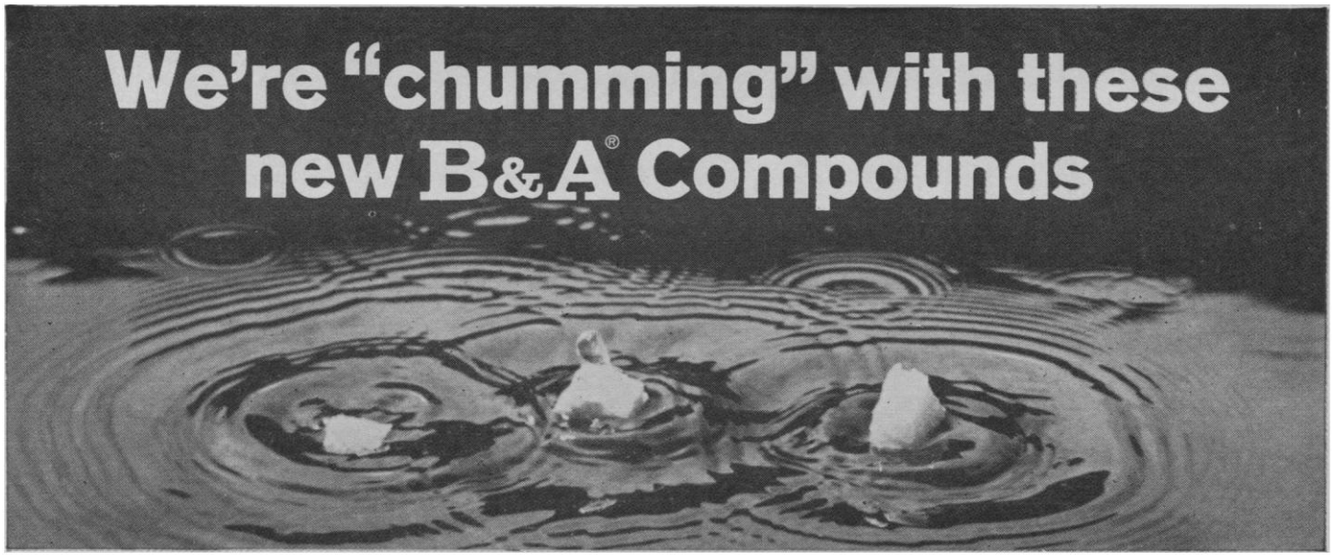
A "Guide to Biological Shakers" has just been published. We'll be happy to send a copy to you on request.

Visit us at the Federated Show Booths D20 - D23.



NBS **New Brunswick Scientific Co., Inc.**
1130 Somerset Street, New Brunswick, New Jersey 08903
West Coast Office: P.O. Box 5606, San Jose, California 95150

We're "chumming" with these new B&A® Compounds



chum (chŭm), *n.* (Origin obscure) Chopped fish, or bait, thrown overboard to draw fish.

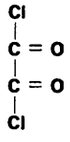
chum, *v. i.* To fish with the aid of chum.

We're using these new compounds as "chum" to see if we can arouse any interest from you. Some of the products that we advertised in earlier "fishing trip" ads proved so useful to readers that we're now supplying them in pilot and production quantities.

Monochloroacetyl Chloride: $CH_2ClCOCl$
Dichloroacetyl Chloride: $CHCl_2COCl$
Trichloroacetyl Chloride: CCl_3COCl

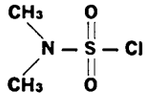
Convenient intermediates for introducing the corresponding chloroacetyl group in a variety of organic syntheses.

Oxalyl Chloride



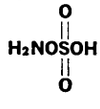
Synthesis of acid chlorides. Condensation reagent with $AlCl_3$ for ethers of aromatic hydrocarbons to form open diketones.

N,N-Dimethyl Sulfamyl Chloride



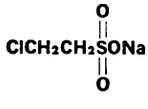
Reacts with amines, sodium alcoholates, sodium phenates, etc. to give the corresponding amides and esters.

Hydroxylamine-O-Sulfonic Acid



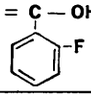
Reacts with organic amines to form hydrazines.

Sodium 2-Chloroethane Sulfonate



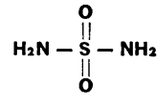
For introducing the sulfoethyl group in organic synthesis.

O-Fluorobenzoic Acid



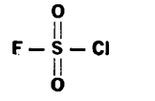
Pharmaceutical intermediate.

Sulfamide



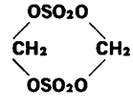
Similar to urea in many of its reactions, except it is more acidic and can act as a dibasic acid.

Sulfuryl Chlorofluoride



Gives selective reactivity between SO_2F_2 & SO_2Cl_2. Reacts with phenol or substituted phenols forming the corresponding aryl fluorosulfonates.

Methylene Sulfate

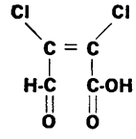


Reacts with alcohols & glycols to give formals; with tertiary amines such as pyridine, quinoline & dimethylaniline compounds of a type analogous to betaine results.

Sulfur Trioxide Pyridine Complex
Sulfur Trioxide Trimethylamine Complex
Sulfur Trioxide Triethylamine Complex

Specialty sulfating and sulfamating agents.

Mucochloric Acid



This compound and its derivatives exhibit bactericidal, fungicidal and insecticidal properties.

Thioacetamide, Tech.

CH_3CSNH_2

Highly reactive with organic halides, aldehydes, nitriles, acid chlorides, etc.

If any of these makes your mouth water, don't hesitate to write for more information. B&A Fine Chemicals, Allied Chemical Corporation, P.O. Box 353, Morristown, N. J.

Allied Chemical

ALLIED CHEMICAL MAKES
B&A® Fine Chemicals
AND THAT MAKES A **BIG** DIFFERENCE

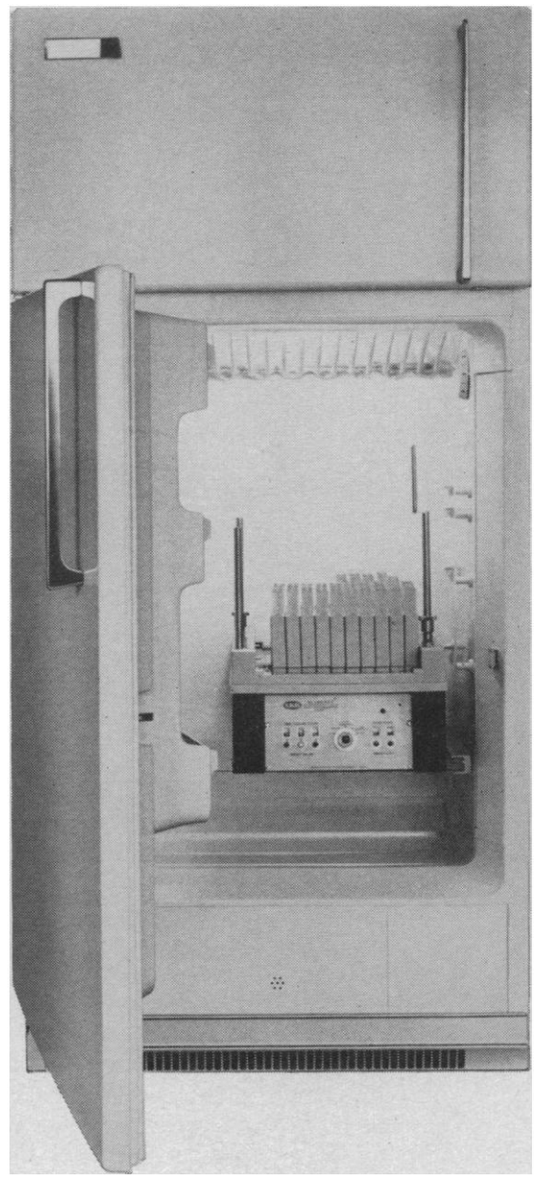
Laboratory refrigerators are repositories for solvents and standards, fractions and foodstuffs, buffers and beverages and, sometimes, even ice.

But a fraction collector?

Our new UltroRac® fraction collector is the smallest, most compact unit on the market. It is barely larger than this open journal. As such, it can fit into virtually any refrigerator. (Rather a significant advantage this, since it can often eliminate the need for using a cold room.) And outside of the refrigerator, the modest size of the rectangular UltroRac (only 13.5″ wide by 20″ deep) is a most appealing attribute in a world where laboratory bench space gets scarcer and scarcer. Ask anybody.

Does such miniaturization sacrifice capacity? Not a bit. The UltroRac takes two hundred tubes (up to 18 mm. X 200 mm.) in twenty rugged, inert polypropylene racks that can be removed, incidentally, without fuss, muss, gymnastics, or contamination at any time during collection, and then replaced with new racks without interrupting the program. And two or more UltroRacs can be coupled together to expand capacity further.

Other pertinent characteristics: the UltroRac allows timed flow, drop-counting or volumetric-siphoning methods of collection; programmed collection with the greatest possible variation; remote control operation wherein the control unit can be readily removed from the collector; no long plastic delivery tubing—absolute minimum holdup between column and tube.



How about reliability, since a fraction collector that is unreliable can be the bane of a researcher's existence, a waster of his time, and a frustrator of his plans? Well, since unreliability in fraction collectors often originates with exposed microswitches and relays that eventually become corroded, we've done this: most of our switches, all of our relays, and the counting mechanism also, are hermetically sealed into our control unit. The only switches not sealed into our control unit are of the glass-enclosed, hermetically-sealed dry-reed type which are operated magnetically from outside the glass envelope. Also, all parts of the UltroRac which might come in contact with liquids are of stainless steel or plastic. These precautions do wonders for reliability and peace of mind.

Final germane thought: we are also the designers and manufacturers of the RadiRac® line of fraction collectors and there are more of these in use in the world than any other fraction collector. *They're* reliable too. (But don't try to fit these RadiRacs—or those other fraction collectors that shall remain nameless—into your refrigerator.)

For information on our new compact UltroRac and/or our RadiRac line of fraction collectors, please write and request bulletin **7000S9.**

LKB INSTRUMENTS, INC., 12221 Parklawn Drive, Rockville, Maryland 20852
LKB-PRODUKTER AB, P.O. Box 76, Stockholm-Bromma 1, Sweden

LKB

to simplify waveform-comparison applications

Type 502A TEKTRONIX® oscilloscope

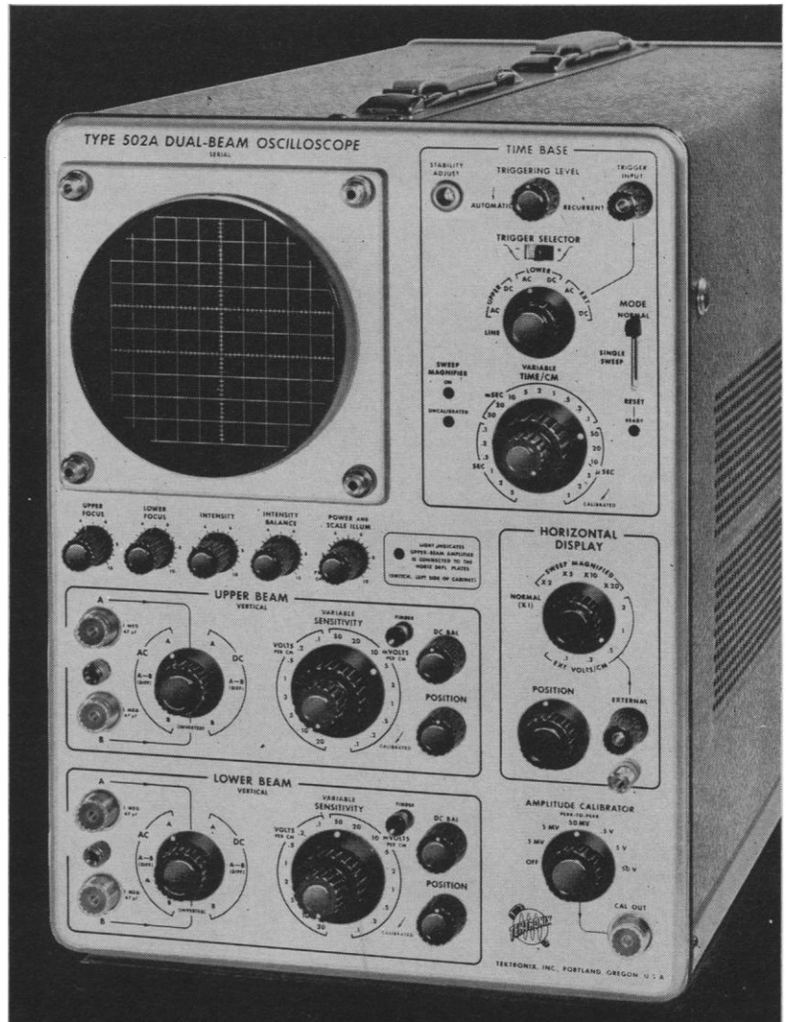
To measure stimulus and reaction on the same time base.

To measure transducer outputs, such as pressure vs. volume.

To measure phase angles and frequency differences.

To measure plots of X-Y curve-tracing presentations.

To measure other characteristics of low-level displays.



Features • 2 identical vertical amplifiers • 17 calibrated steps of sensitivity • 21 calibrated sweep rates • 4 steps of sweep magnification • Continuously adjustable sweep and sensitivity controls • Push-button beam finders • Intensity-balance control.

Main Performance Characteristics Include:

Passbands from dc-to-50 kHz, minimum, to dc-to-1 MHz maximum • Calibrated Vertical Sensitivity in 17 steps from 100 μV/cm to 20 V/cm, both amplifiers • Calibrated Sweep Range in 21 rates from 1 μsec/cm to 5 sec/cm • Common-Mode Rejection —Up to 40,000 to 1 • Phase Difference—Less than 5 degrees, at —3 db • Variable, Uncalibrated, Sensitivity and Sweep Range Controls • 2X, 5X, 10X, or 20X Sweep Magnification • Flexible Trigger Facilities • Amplitude Calibrator • Electronically-Regulated Power Supplies.

Type 502A Dual-Beam Oscilloscope $1050
Rack Mount Type RM502A Oscilloscope $1150

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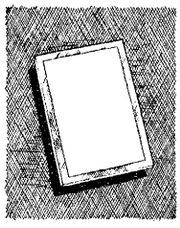
For a demonstration, please call your Tektronix field engineer.

Tektronix, Inc.

The facts have changed!

Three new pre-coated systems for Thin Layer Chromatography have lowered cost, raised quality, widened its application.

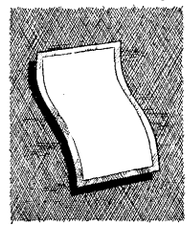
New facts about pre-coated glass



The new E. Merck, A. G. (Darmstadt) Pre-Coated Glass Plate is the finest, most versatile pre-coated TLC system ever developed. Yet a 20 x 20 cm. plate costs as little as 68¢ (in quantity) — about half as much as previously available glass systems. And it offers 5 notable advantages:

- glass only 1 mm. thick —easier to store, easier to cut into strips
- a sorbent layer (Silica Gel F 254) 250 microns in thickness—the same as you get with your own coating apparatus—offering higher capacity than thinner pre-coated systems currently available
- the hardest coating yet developed—meaning plates that are abrasion-proof under normal conditions—guaranteed to arrive in good condition—may be stacked one on top of another
- the best separating characteristics of any pre-coated system now available—equivalent to the plate you make yourself
- unique organic binder—may be used with corrosive sprays (including sulphuric and perchloric acids) and charring techniques —cannot be eluted by organic solvents— does not interfere with stains

New facts about plastic foils



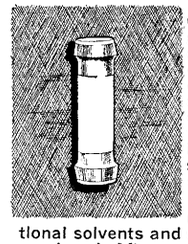
Although it is the most elegant TLC system in existence, use of the pre-coated plastic foil has been extremely limited due to its relatively high cost and narrow range of applications. Now Brinkmann introduces the MN Polygram pre-coated foil, far more versatile but costing about 30% less.

The MN Polygram foil features a dry layer with significantly higher capacity than that of previously available coated foils.

Four different types of coating are available: silica gel with starch binder, silica gel with starch binder and fluorescent indicator, cellulose powder without binder, and cellulose powder without binder but with fluorescent indicator. Each type comes in both 20 x 20 and 5 x 20 cm sizes.

Where a binder is used, starch has been selected because previously used binders (such as polyvinyl alcohol) have a substantial negative effect on the adsorption characteristics, especially when non-polar solvents are employed. Starch, however, is normally satisfactory except with highly aqueous systems, in which case the foils must be handled with care.

The Chromatotube—a new fact in itself



Chromatotubes are round glass tubes (12.5 x 2.5 cm) coated with sorbent on the inside. Since one end is closed, they are also self-contained developing tanks. After spotting, the open end is immersed in an auxiliary solvent tube sealed to the side by a plastic ring.

Special binders are not required and all conventional solvents and staining reagents may be employed. After separation, the tube can be eluted overnight and reused after activation.

Providing the most reliable, reproducible Rf values, Chromatotubes are probably the best TLC system for maintenance of uniform standards. The developing distance of 10 cm is marked so that the Rf is read at a glance. Thus the Chromatotube is ideal for mass analyses as in production control, clinical testing, and teaching procedures involving numerous students. At a relatively low cost each student has a complete chromatographic assembly.

Two types are available: Series AT tubes have been activated for 30 minutes at 110°C and subsequently sealed against external moisture; Series IT tubes are air dried and can be activated according to individual requirements.

Become up to date.

Please send me the following literature:

1. Pre-Coated Systems for TLC. 2. Catalog on apparatus, sorbents and ion exchangers for TLC. 3. I have the following problem:

_____

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Institution: _____

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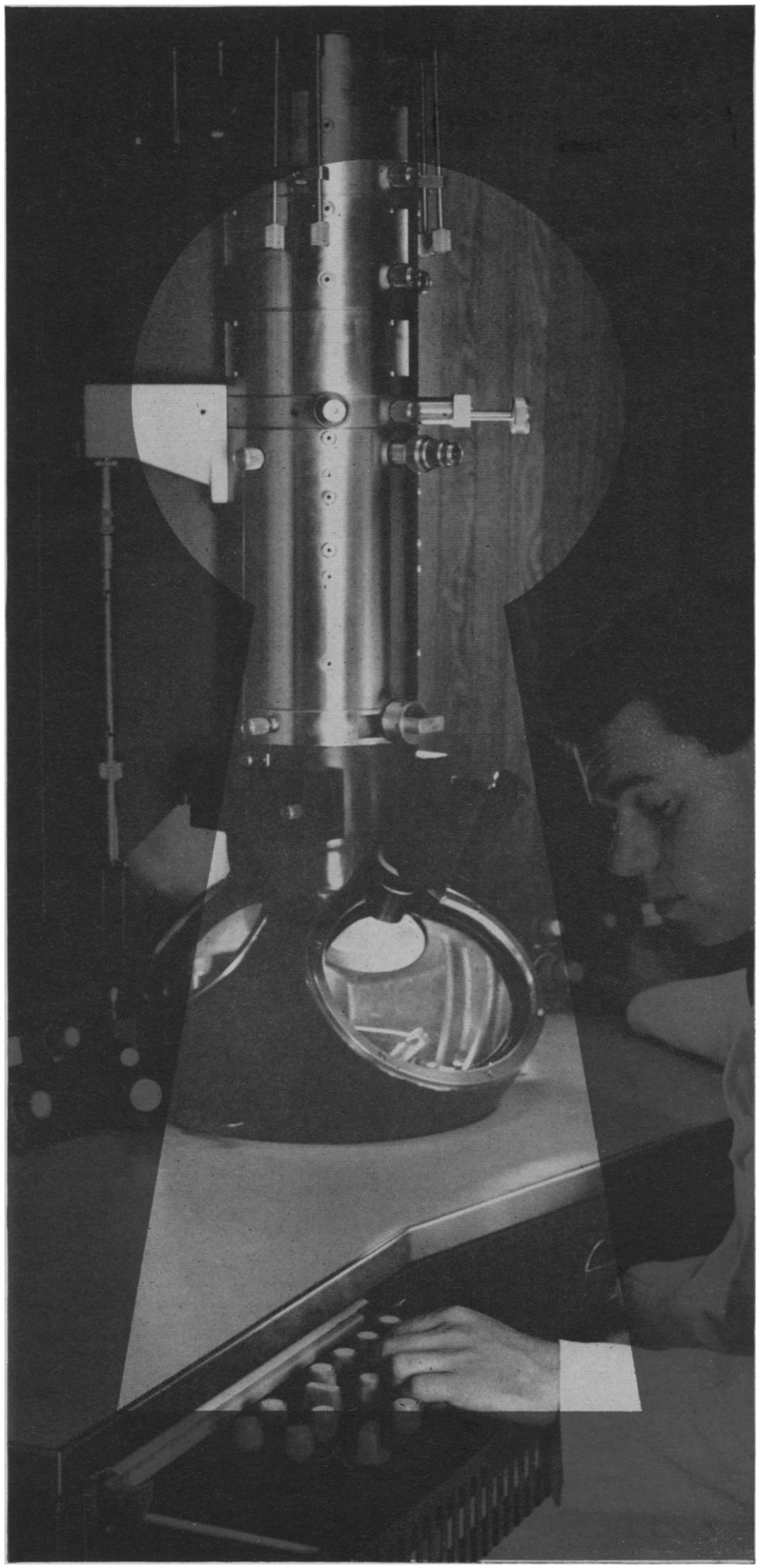

2.3Å

it is possible to achieve this theoretical limit with the New Norelco EM 300 Electron Microscope 5Å Point Resolution Guaranteed

The Norelco EM 300 is the latest in electron microscope design! It forges ahead with the ultimate in performance, compact design and outstanding versatility. Specimens can be preferentially oriented, rotated, cooled, heated, or stretched. With the "Plumbicon" TV adaptation—another great Philips' innovation—the microscope image can be intensified and displayed to an unlimited number of spectators and can also be recorded on videotape.

BREAKTHROUGH!!!!!
This is an advanced instrument made possible by the renowned Philips' research and development laboratories! A point resolution of 5Å is guaranteed! It is even possible to achieve the theoretical limit of the objective lens—2.3Å under favorable conditions! The EM 300 features the shortest focal length of any microscope of this caliber! New high-stability transistorized circuits help make all this possible!

When you have finished reviewing this ad, take a moment to request more complete information. EM-76

World's Highest Standards in Quality Instrumentation

Norelco® PHILIPS ELECTRONIC INSTRUMENTS

Division of Philips Electronics and Pharmaceutical Industries Corp.
750 South Fulton Avenue, Mount Vernon, New York 10550

PDP-8/S, the $10,000 computer...

PDP-8/S: A full, general purpose, digital computer for real time analysis.
4K core memory (expandable). usec speeds. 66 plus instructions.
Complete, proven software, including FORTRAN.
Flexible input/output bus. Teletype included.

Available now, the new PDP-8/S — a direct lineal descendant of the PDP-8, the most flexible, versatile, approachable, on-line, real time, high speed digital computer ever made.

Both use the same basic design concept. Both have the same size memories. Both are expandable. Both use the same instructions, use the same software libraries.

They do not, however, work at the same speeds. And they do not cost the same amount of money.

The PDP-8/S adds in 32 microseconds (compared with 3.0 microseconds for its parent). If you need the speed, the PDP-8 is for you.

The PDP-8/S costs $10,000. Think of it. Full computer. Proven hardware. Proven software.

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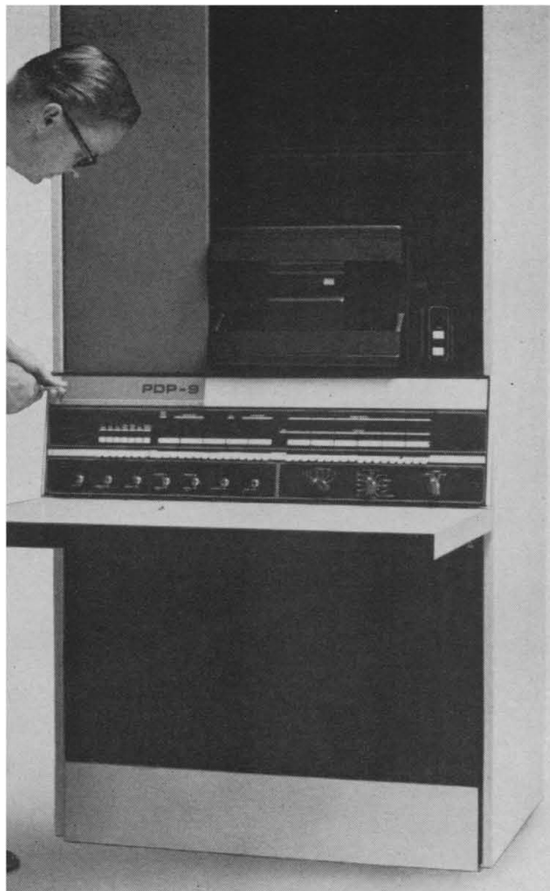

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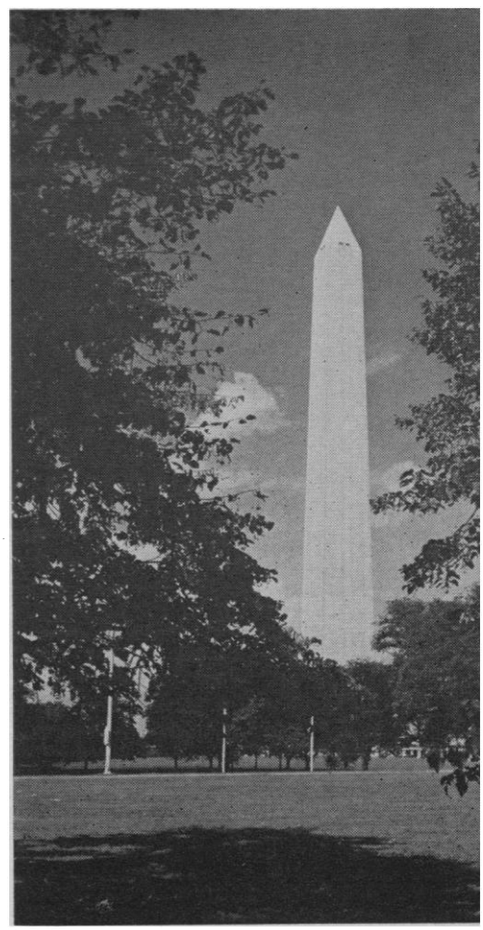

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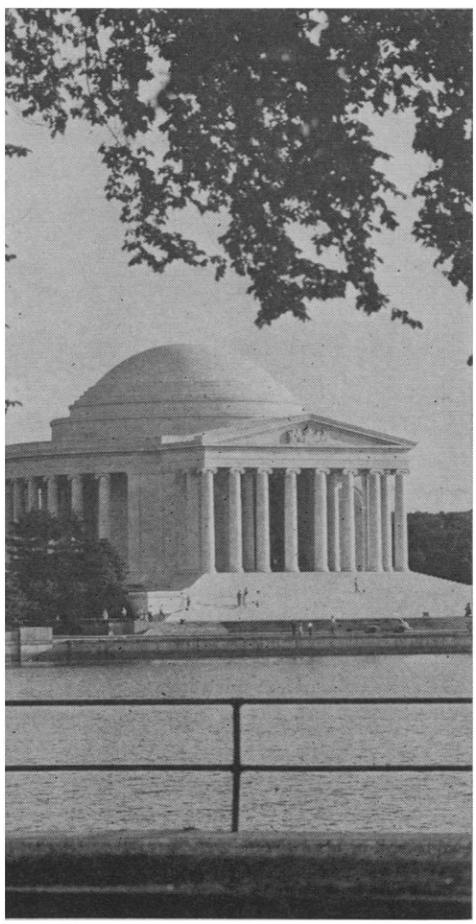

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The hotel sleeping accommodations are for your convenience in making your room reservation in Washington. **Please use the coupon below and send it directly to the AAAS Housing Bureau in Washington.** Give a definite date and estimated hour of arrival, and also your probable date of departure. The Housing Bureau will make the assignment and promptly send you a confirmation.

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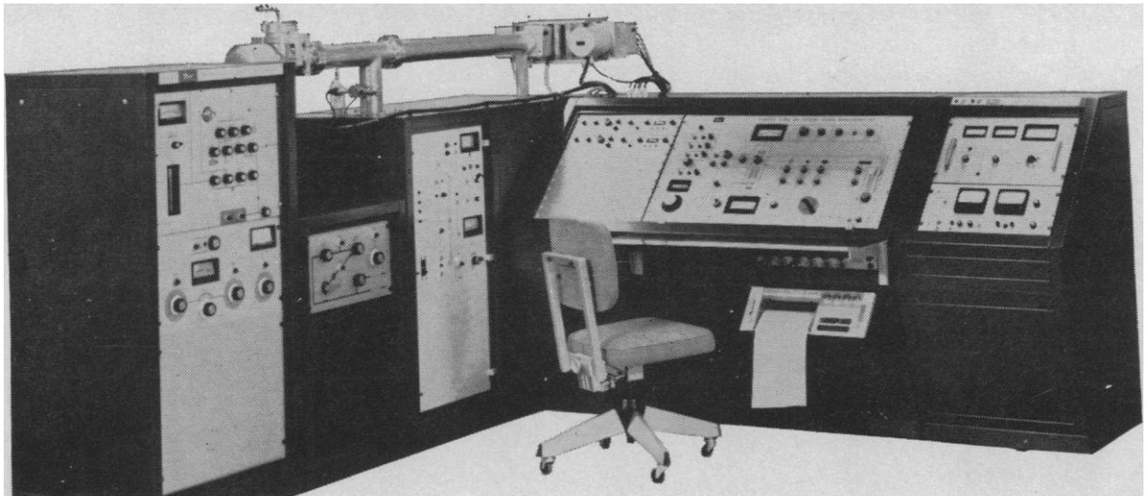

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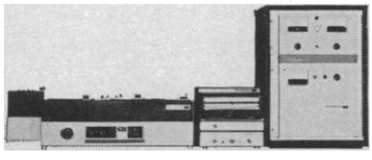

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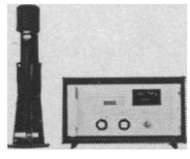

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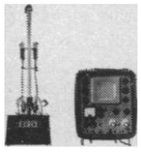

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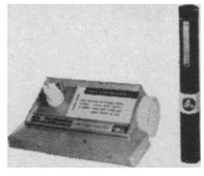

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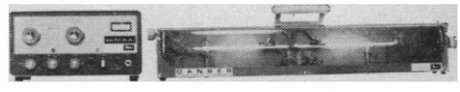

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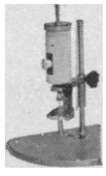
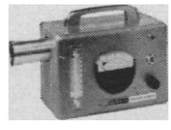


8. Contraves Rheometers: Accurately measure Newtonian and non-Newtonian liquids; cone and plate accessories available.



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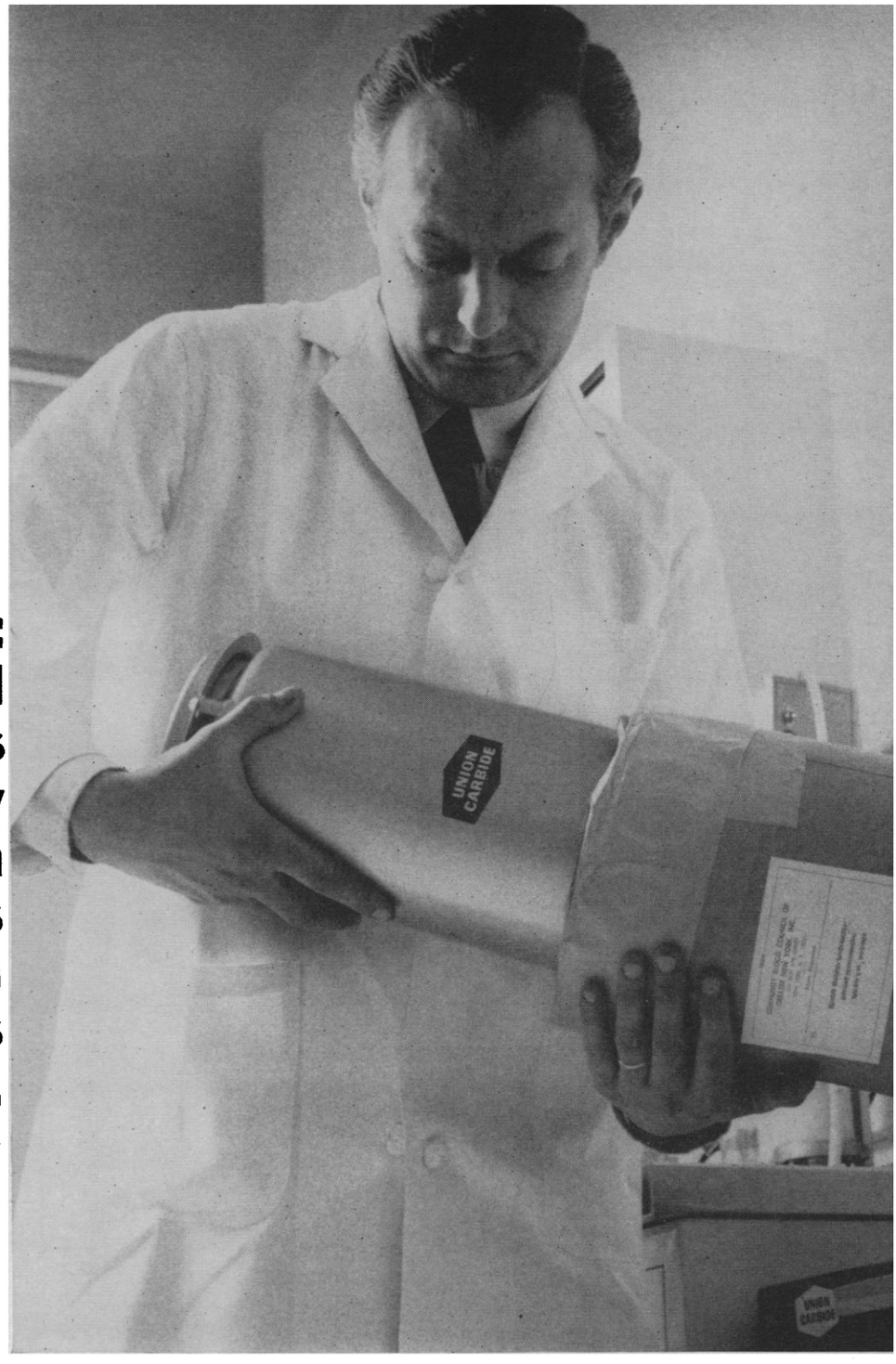

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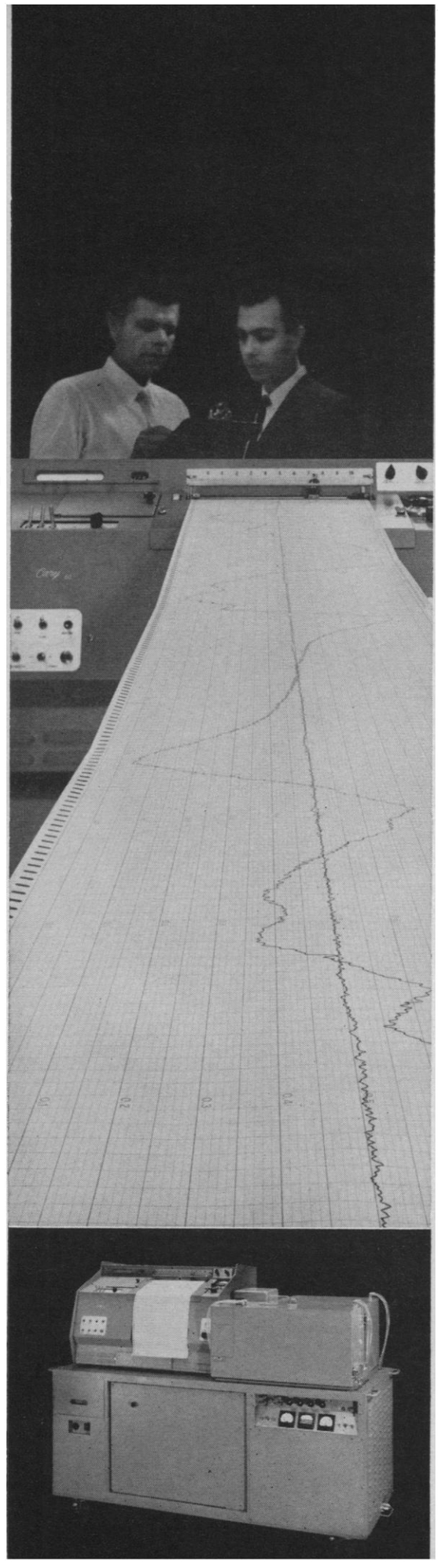
when you select a Spectro-polarimeter ...take a long look



LOOK AT THE CARY 60

Consider three basic factors that determine the value of any spectropolarimeter — performance, reliability, versatility.

Look at performance. Absorption tolerance must be sufficient to permit UV penetration where sample or solvent absorbs heavily. Sensitivity has to be adequate to detect minute amounts of optical activity. Baseline stability is vital.

Next, look at reliability. Can the instrument repeat yesterday's performance tomorrow? Next week?

Then, look at versatility. The instrument should adapt to a variety of samples. Controls must be provided for matching the instrument to sample limitations.

Now, look at the CARY 60. What are its performance benefits? Absorption tolerance: with absorbances as high as 3, valid readings are obtained in the important 2300Å region of bio-polymer activity. Sensitivity: 0.0004° rotation detectable with sample absorbance of 1.0 at 3000Å (15Å spectral bandwidth, 30 sec pen period). Baseline stability: less than 0.003° drift in a 15-hour period.

Reliability? Records show CARY 60's have been used as much as 10 hours daily for periods up to 2 years. With such reliable performance, data is accepted with complete confidence.

Versatility is inherent in the CARY 60. Adapts easily for differential measurements. Precisely calibrated controls permit selecting operating conditions for optimum performance. This means fewer time-consuming dilutions and minimum sample handling.

Take a longer look at the CARY 60. Write for Data File **E607-96.**

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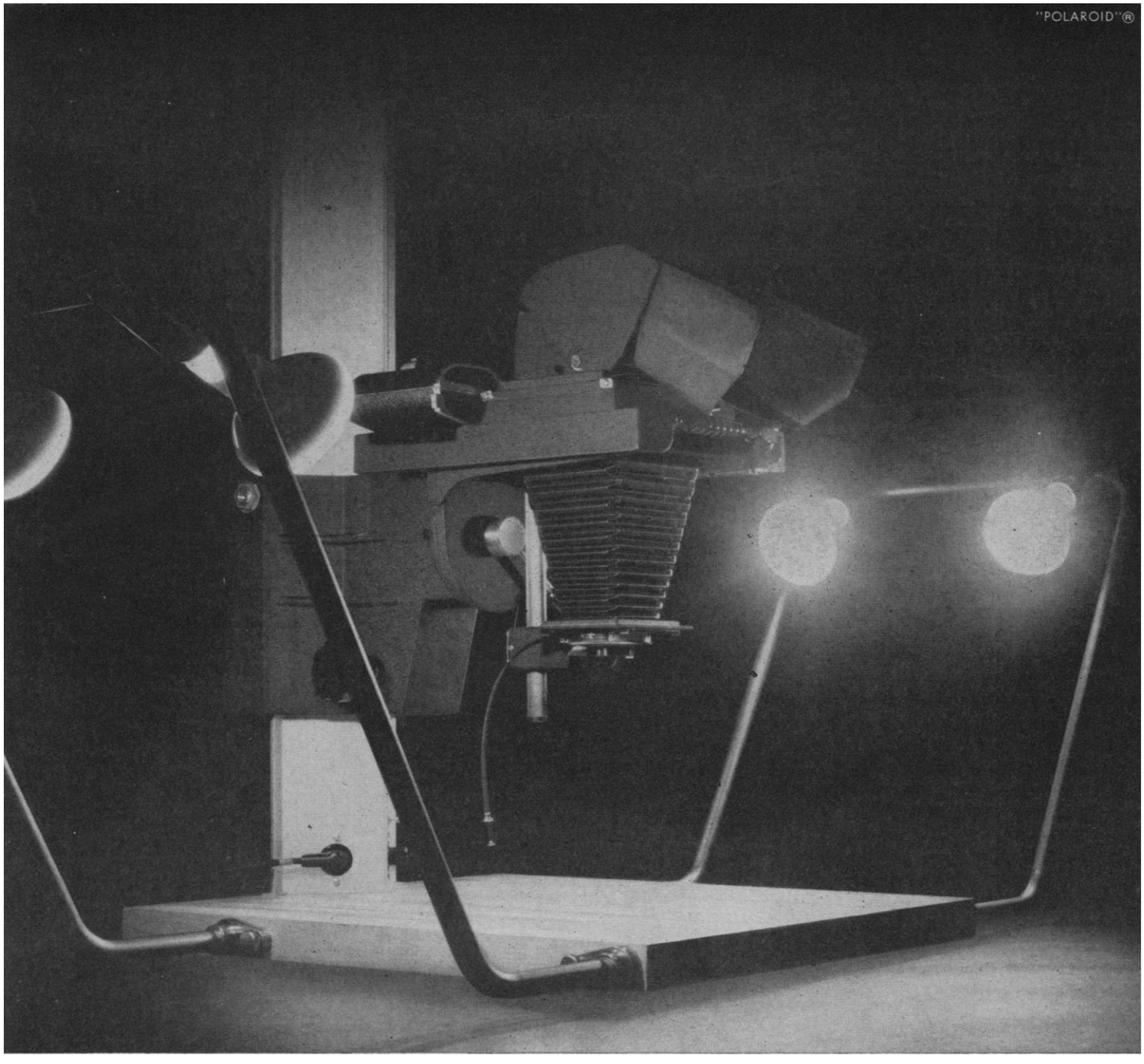

The MP-3 is virtually an industrial studio in itself.

If you need a picture of an assembly, for instance, you can put it on the lighted base, click the shuttter and peel out a finished picture 10 seconds later. If you need a macrophotograph of a small part you can make a 4 x 5 print in 10 seconds. If you need a photomicrograph put a microscope under the camera. If you need any of these in color, you can get them in a minute. If you want to make a black and white slide of a wall chart, you can swing the camera head 90°, and with transparency film, get one in 90 seconds. If you want a negative you can make one in 20 seconds. If you need multiple records, make multiple originals. And finally, if you aren't in a hurry, use any conventional roll or sheet film.

The MP-3 does all this with interchangeable camera backs. With them, you can use any of thirteen different Polaroid Land films plus conventional films (35–90 mm).

For all its flexibility, the MP-3 is extremely simple to use. Controls are almost self-explanatory. You set up your shot and focus at eye level on a bright ground glass screen. And if you don't get exactly the picture you want the first time, you can take another on the spot.

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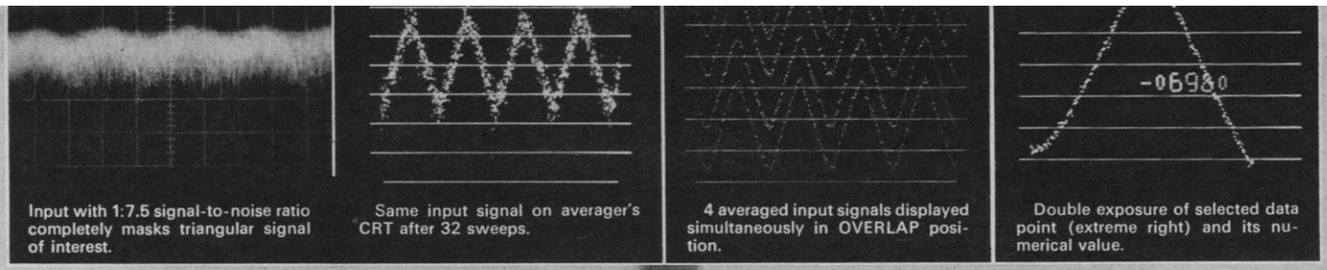

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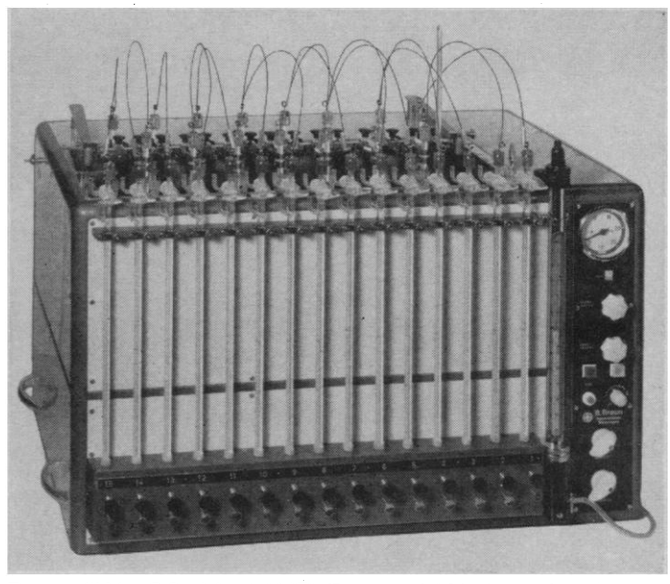

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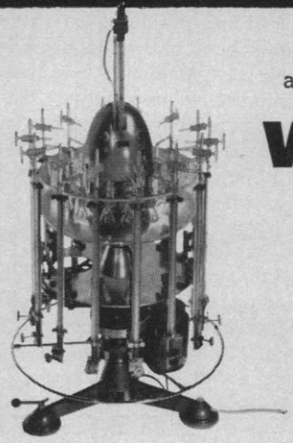

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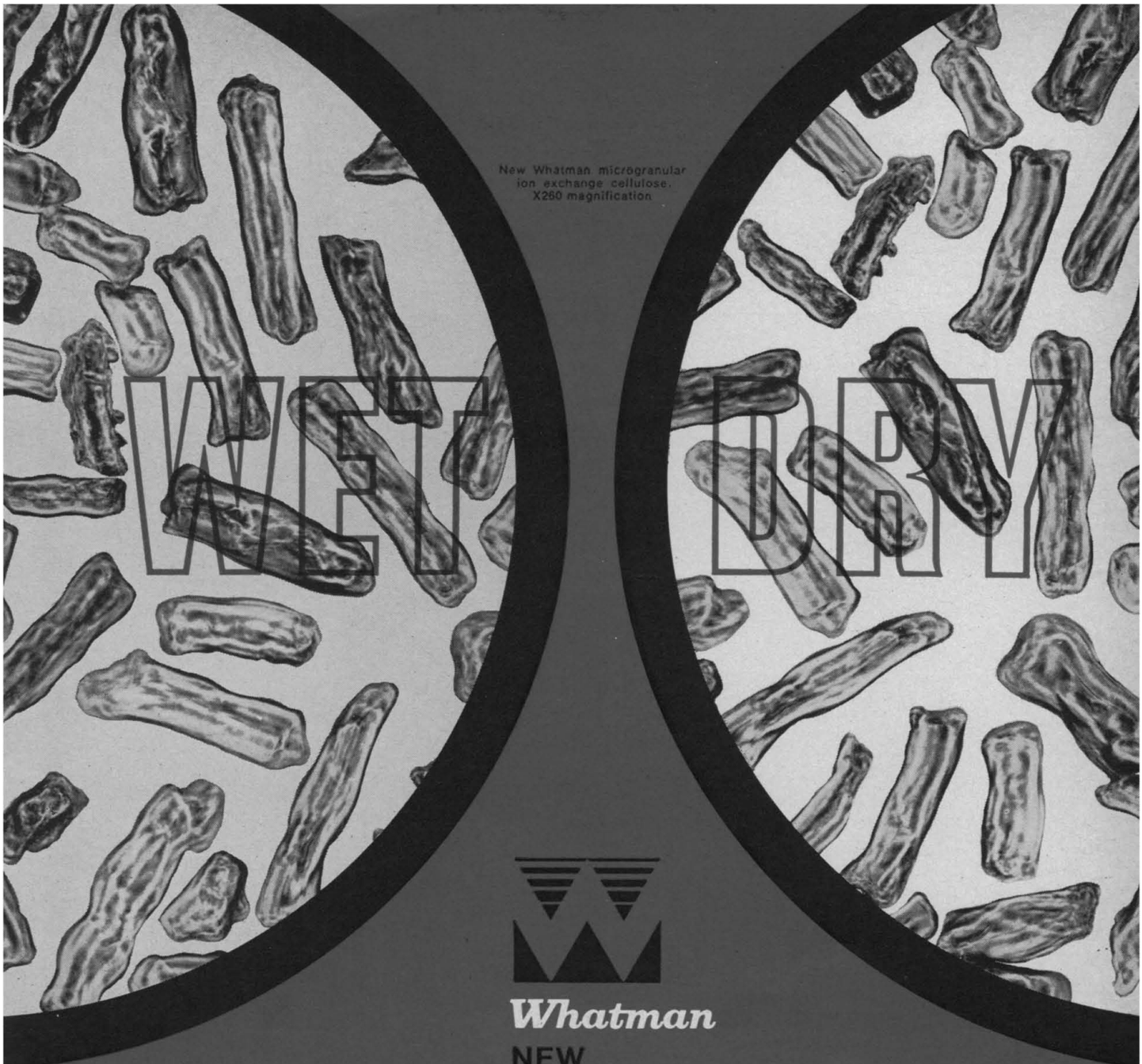

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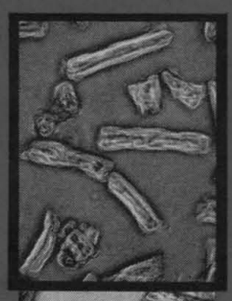

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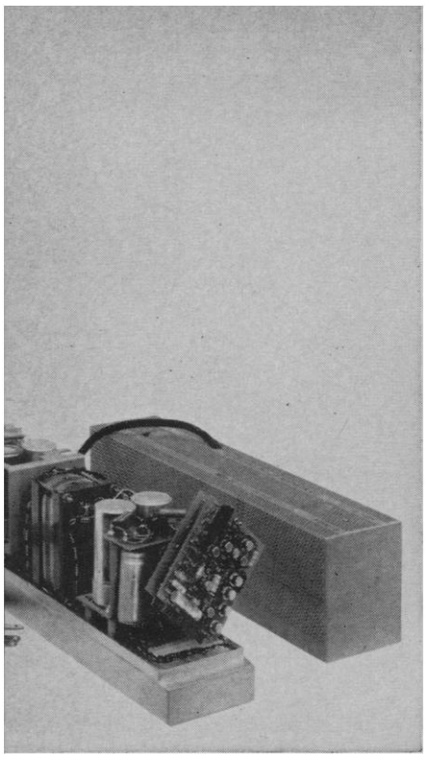

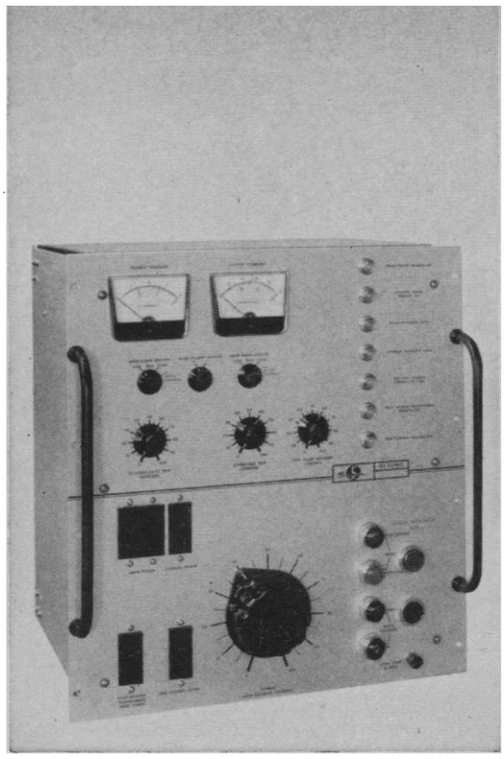

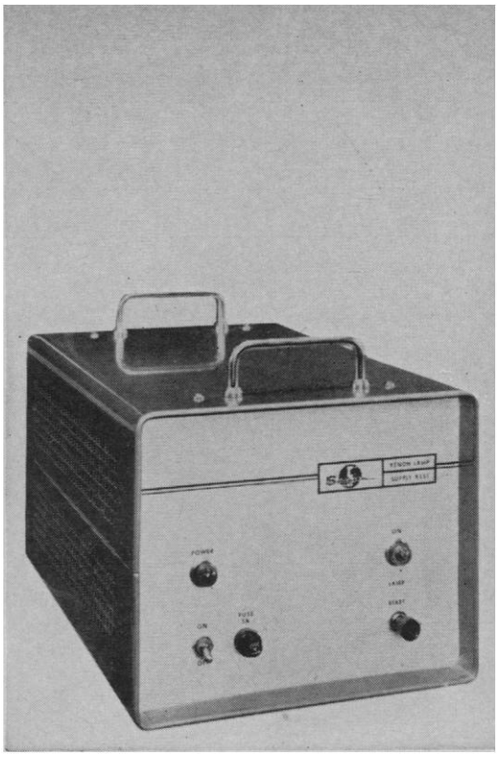

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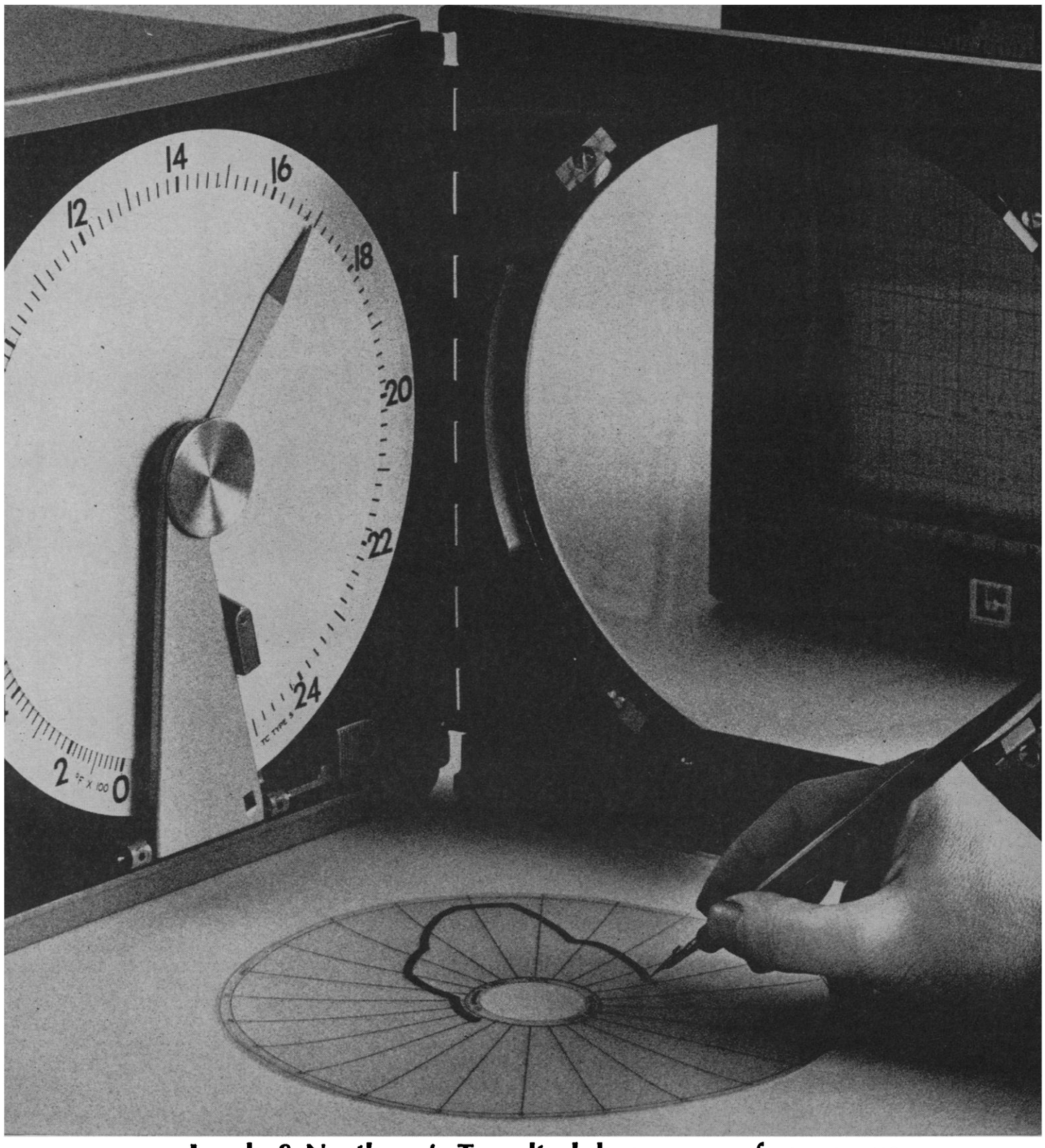

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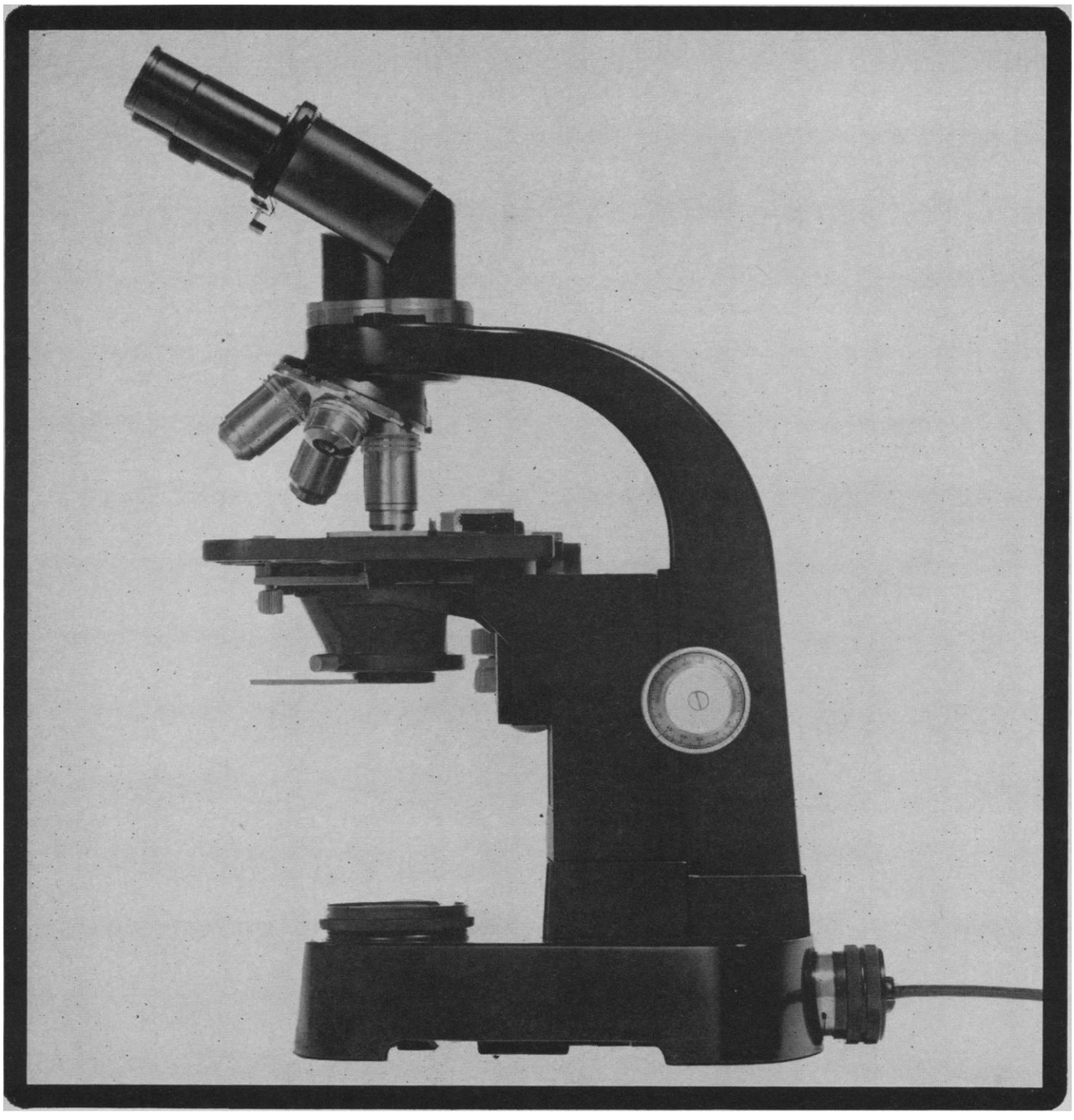

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9 September 1966, Volume 153, Number 3741 **SCIENCE**

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Preschool Education

The education of 3- to 5-year-olds is no longer a subject of interest only to a few specialists and certain parents of young children. A combination of urgent need, new money, and fresh ideas has created a climate highly favorable to research and action.

The demand for more knowledge and better practice in preschool education springs from several sources. Children of poverty need help to break out of the cycle of inadequate education, low occupational skill, low pay. Many children in low-income and minority groups have neither adequate educational opportunities nor the ability to take full advantage of the meager opportunities they have. In addition, the last decade has seen a premium placed on the intellectual content of education, and people are asking why children cannot acquire significant intellectual skills before entering first grade and thus accelerate their progress. Recently the Educational Policies Commission of the National Education Association called for universal preschool education at public expense for 4- and 5-year olds.

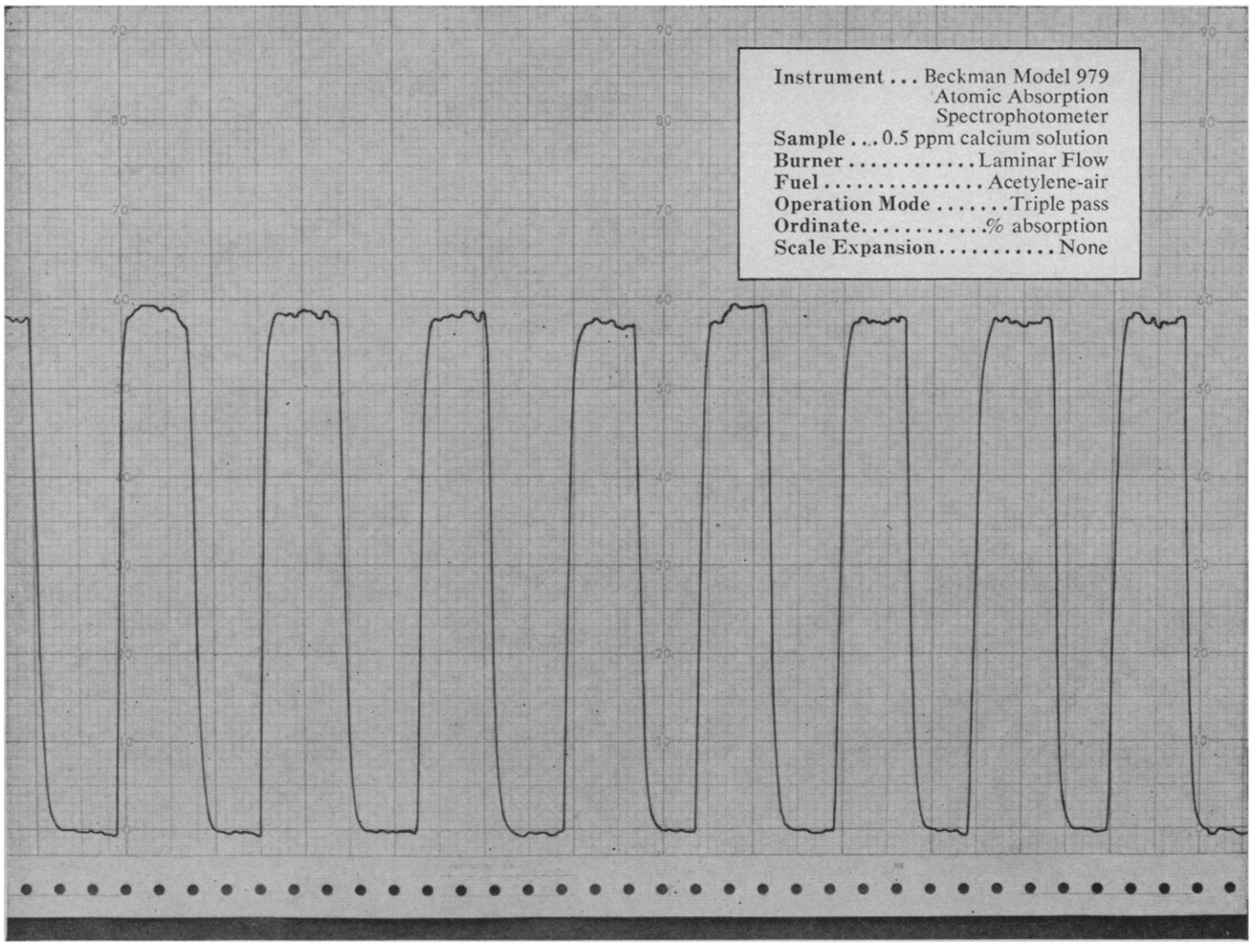
In 1964 total preschool enrollment was 3,187,000 children, with 471,000 in nursery schools and 2,716,000 in kindergartens. The Office of Economic Opportunity began its preschool program, Operation Head Start, in the summer of 1965 and estimates that 550,000 children were enrolled in the 1966 summer program at a cost of $110 million to the federal government. In only 2 years this one new federal program increased preschool enrollment by 17 percent.

Although we know comparatively little about the effectiveness of early-education techniques, it is increasingly clear that the preschool child is an extremely plastic organism capable of widely varying intellectual behavior under different conditions of environment and training. Jean Piaget's monumental work and other studies of the reception of information from the environment, information processing, and language and communication all demonstrate that the preschool child is developing intellectually as he grows physically and matures in emotional and social behavior. A corollary conclusion is that inadequate stimulation at early ages results in long-term deficiencies in cognitive functioning.

We do not have enough scientific knowledge to design with confidence the kinds of preschool programs that will meet the needs of young children. More research is called for on several levels—in the laboratory, to analyze and understand the relation of those environments to development; and in different settings, to evaluate the effects of many different approaches to early education.

At the same time society will not wait. Preschool education will inevitably become more and more widespread, but it is too soon to systematize early education. Increased public financial support is necessary, and it should be used to help develop the best of traditional nursery school education as well as radically different approaches. Television is an untapped resource, and its potential for early education should be fully tested.

A better understanding of the limits of early achievement—intellectual, social, emotional, and physical—is the key scientific problem in this area. Once we attain that understanding we will be able to decide on the appropriate obectives. At the same time, we should be sure our system of preschool education is broad enough and flexible enough to accommodate and test new ideas.—LLOYD N. MORRISETT, *Vice President, Carnegie Corporation of New York*



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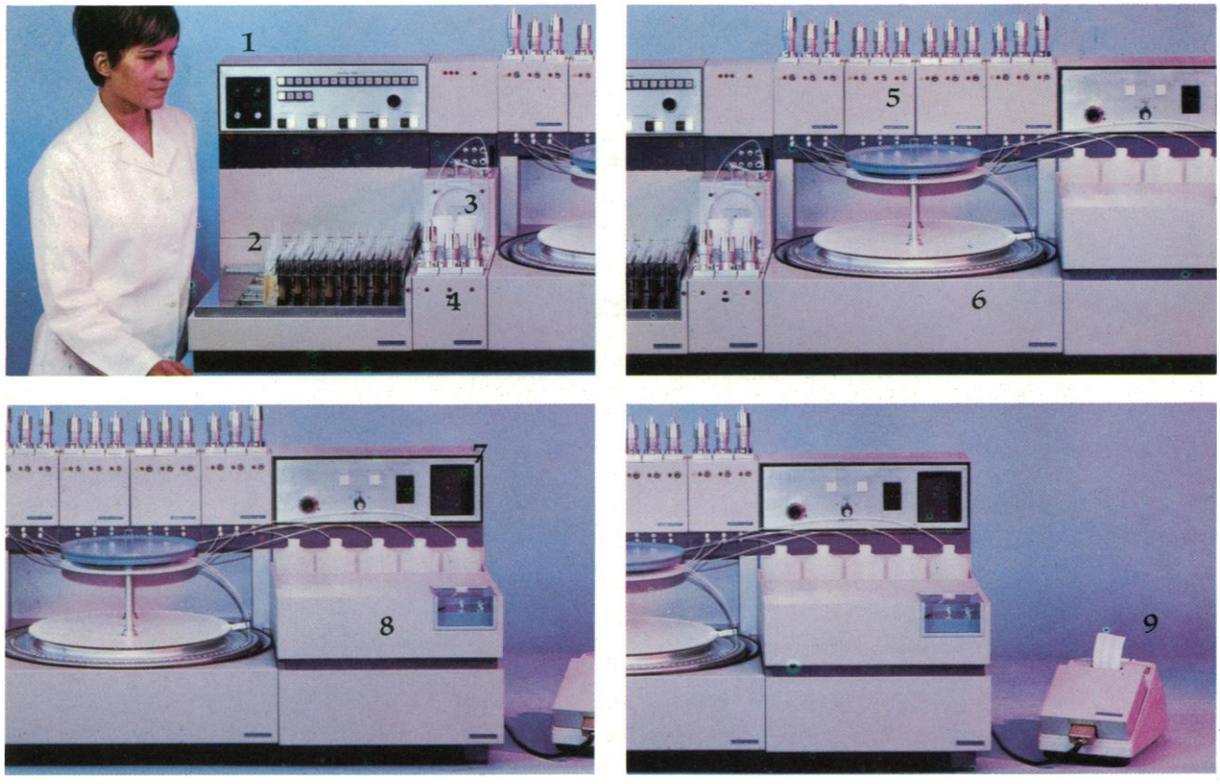

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tally retarded, institutionalized children. In these, infectious processes are listed as the cause in 9, 7, and 4 percent of the cases. One study of children with cerebral palsy showed that infectious diseases were responsible for 21 percent. In another, of 143 children with acquired cerebral palsy, infections of the central nervous system were listed as the cause in 67 cases, or 60 percent.

Maternal and fetal infections from such viral agents as herpes simplex, hepatitis, cytomegalovirus, rubella, and vaccinia and from bacteria such as *Escherichia coli, Pseudomonas aeruginosa, Staphylococcus albus, Proteus vulgaris*, and pathogenic cocci dominated discussion by John Sever (National Institute of Neurological Diseases and Blindness), Kurt Benirschke (Dartmouth Medical School), and Heinz Flamm (Vienna). Between 10 and 20 percent of delivered placentas show an acute inflammatory infiltration in the fetal membranes, and less often in the umbilical cord, said Benirschke. In what he termed the amniotic sac infection syndrome, Benirschke said this leukocytic migration usually is in response to an infectious agent within the amniotic fluid which has gained access from the vaginal-cervical tract either before or after rupture of the membranes. Thus, the pus can be aspirated by the fetus. It is far more frequent in premature deliveries, and Benirschke believes the inflammation often is the cause of premature labor. Conceding that the topic is controversial, Benirschke also believes the evidence is in favor of an infectious etiology even though a majority of newborns with an inflamed placenta show no clinical evidence of infection and have an uneventful neonatal course. Babies dying of bacterial infections in the neonatal period or having a clinical infection are invariably associated with an inflamed placenta, he said. Flamm said the means of entry of viruses into the fetus is not yet clear, but is believed to be similar to that of bacteria. Bacteria infecting the fetus can originate in the maternal blood, in local processes in the genital region or abdominal cavity, or can be introduced by criminal abortion or rupture of the membranes. Sever commented that development of vaccines with even short periods of immunity could greatly assist in overcoming disease in the fetal area of infectious processes and the resulting central nervous system sequelae.

Eichenwald (The University of Texas Southwestern Medical School) emphasized the importance of long-term follow-up in evaluating the results of infections. He reported a series of 17 premature infants with mild diarrhea of proven viral cause. Five years later, 16 showed severe neurological damage, whereas in a control group of 28 premature infants, 7 showed minor neurologic changes.

Raymond Adams (Massachusetts General Hospital), outling mechanisms of neuropathologic reaction, said only in early embryonal life will tissue damage cause maximal damage to the nervous system without an inflammatory response. In the antenatal period the nervous system is most vulnerable to infective agents, and infection may result in fetal death and miscarriage or in survival with variable injury to the nervous system. The majority of fetal infections are viral, treponemal, or protozoan. One of the most treacherous infections in early infancy is bacterial meningitis, because diagnosis may be delayed and thus much damage results. In early childhood, the whole range of direct infective inflammation, post-infectious auto-immune processes, and toxic encephalopathies consequent to systemic infection appear. Each is capable of seriously injuring the nervous system and resulting in mental retardation. Adams pointed out that only by understanding the mechanisms will ways of preventing or interfering with the processes be found.

R. Walter Schlesinger (Rutgers Medical School) noted increasing evidence implicating viruses in the genesis of chronic degenerative diseases, congenital malformations, and malignant tumors. He suggested that viruses may play a larger than suspected role in brain damage. Schlesinger said the direct attack of isolating, identifying, and culturing viruses and reproducing pathological lesions may uncover only some of the possibilities of the role of viruses and other intracellular pathogens in mental retardation, and may miss possibilities in other areas of research. The production of infectious progeny virus is not a necessary *sine qua non* of infection or cell damage, he said. Schlesinger asked if it is possible that viruses, acting as bearers of genetic information, may play a role in the genesis of those hereditary or acquired mental deficiencies for which a biochemical basis has been found.

Knox Finley (San Francisco) said postnatal infections as a cause of men-

tal subnormality would be considerably more common than presently considered if a broader definition of subnormality were used, and if all such cases were identified. There are differing opinions over differential diagnosis between febrile convulsions and convulsions due to encephalitis. He said etiology remains an open question, but fever convulsions should not be overlooked as a warning of an otherwise subclinical encephalitis that is a potential contributor to mental retardation. Frederick Robbins (Western Reserve School of Medicine, Cleveland), deplored the tendency to think of mental retardation in gross terms and urged that consideration be directed toward those with less evident degrees of loss of mental capacity. In the latter category would be persons who do not necessarily fall below what is considered normal today, but what may not be normal for those individuals. Frederick Gibbs (University of Illinois School of Medicine) discussed the use of electroencephalograms and described the slowing of brain waves during acute infectious episodes as a potential means of predicting sequelae in the central nervous system. However, Albert Sabin (Children's Hospital Research Foundation, Cincinnati) and others in the audience questioned whether present criteria are adequate to make such measurements meaningful.

Sequelae of postnatally acquired direct and indirect infections of the central nervous system in infants, and effects on the fetus of therapy of infectious processes in mothers, were considered by Saul Krugman's (New York University Medical Center) panel. Krugman commented that in the previous 4 months he had observed five cases of measles encephalitis, 3 years after the introduction of a safe and effective vaccine. He said there is need for more education, not necessarily of the public but of physicians, who think that naturally acquired measles is benign and who are not aware of the incidence of measles encephalitis. Laurence Finberg (Montefiore Hospital and Albert Einstein College of Medicine, New York City) said that problems associated with water and electrolyte imbalance in indirect infections, specifically infectious diarrhea, are of far greater consequence in damage to the central nervous system than those of direct infections in the nervous system. Management of physiologic disturbances in in-

fantile diarrhea is more important in salvage and prevention of brain injury than specific treatment. Finberg said hyponatremic dehydration accompanying infectious enteritis is common in poorly developed countries, and evolutionary development has given considerable protection for the brain against this challenge. But in more developed countries with what are considered advanced eating practices, hypernatremic dehydration is more common. It accounts for 16 to 25 percent of hospitalized dehydration problems in Europe and North America. Evolution has provided very little in the way of protective mechanism for the brain against this hazard of civilization. The two most important mechanisms through which damage to the central nervous system occurs in infectious diarrhea are hemorrhaging and alterations of the colligative nature of intracellular solute, Finberg said. While mechanisms of nervous system damage are generally agreed upon, management and prevention remain controversial. Philip Dodge (Massachusetts General Hospital, Boston) commented that in some areas of the United States infant diarrhea is one of the most important measurable causes of mental retardation; much of this damage could be eliminated by application of current knowledge. Several participants commented that sources of public health funds are not as sympathetic to programs which would combat brain damage from diarrhea as they are for statistically lesser problems such as phenylketonuria.

Julius Richmond (University of the State of New York College of Medicine, Syracuse), considering cultural and social factors, said that 20 to 30 percent of the U.S. population lives in poverty, and that in many underdeveloped areas of this otherwise overdeveloped country illiteracy frequently is a factor working against the prevention and control of infectious diseases. In less developed countries, said John Gordon (Massachusetts Institute of Technology), failure of the population to grow is primarily one of multiple repeated infections. Herbert Birch (Albert Einstein College of Medicine) and Leon Eisenberg (Johns Hopkins) contributed discussion on the influence of nutrition and cultural factors on the incidence of mental retardation and infectious disease and pointed out some of the problems encountered in cross-cultural studies.

Hilary Koprowski (Wistar Institute,

Philadelphia) pointed out that rabies incubates up to 2 years and scrapies up to 6 years; he said there may be many more unidentified, slow viruses responsible for destruction, proliferation, or dysfunction of tissue. He said the recent development of a syndrome resembling kuru in four chimpanzees suggests that a slow viral agent may be implicated in kuru and other nervous system diseases of as yet unknown etiology. Geoffrey Edsall (Boston) said many causes of mental retardation, perhaps totaling 20 percent, are completely unexplained. Sabin, summarizing the discussion, said it is still unclear what proportion of mental retardation is caused by infectious diseases, alone or combined with other processes. Estimates range from 5 to 10 percent or more. Sabin pointed out that not only is there a need for further research, but that application of knowledge already accumulated would lead to a sharp reduction in the toll of mental retardation.

The conference was sponsored by the National Institute of Child Health and Human Development, the Department of Pediatrics at the University of Texas Southwestern Medical School, and Children's Medical Center in Dallas. Heinz Eichenwald (University of Texas Southwestern Medical School) was general chairman.

HEINZ EICHENWALD
Department of Pediatrics, University of Texas Southwestern Medical School, Dallas, Texas 75235

Forthcoming Events

September

26–28. **Organic Geochemistry**, 3rd intern. mtg., Imperial College of Science and Technology, London, England. (G. D. Hobson, Geology Dept. Imperial College of Science and Technology, London S.W.7)

26–28. **Point Defects in Non-Metallic Solids**, mtg., British Ceramic Soc., Falmer, England. (J. P. Roberts, Houldsworth School of Applied Science, Univ. of Leeds, Leeds 2, England)

26–30. **Animal Care Panel**, 17th annual mtg., Chicago, Ill. (J. J. Garvey, 4 E. Clinton St., Joliet, Ill. 60434)

26–30. **Health Physics**, 2nd autumn symp., Pecs, Hungary. (Eötvös Loránd Fizikai Társulat, Szbadság ter 17, Budapest 5)

26–3. **Bionic Models of the Animal Sonar System**, symp., Frascati, Italy. (R. G. Busnel Laboratory of Acoustical Physiology, Domaine de Vilvert, Jouy-en-Josas, Seine-et-Oise France)

27–29. **Analytical Chemistry in Nuclear Technology**, conf., Gatlinburg, Tenn. (L. J. Brady, Oak Ridge Natl. Laboratory, P.O. Box X, Oak Ridge, Tenn. 37830)

27–29. Society for **General Microbiology**, mtg., Bristol, England. (Soc. for Visiting Scientists, 19 Albemarle St., London W.1, England)

27–29. **Vestibular and Kinaesthetic Mechanisms**, symp., London, England. (Ciba Foundation, 41 Portland Pl., London W.1)

28–30. **Energy Beams**, conf., Univ. of York, York, England. (Meetings Officer, Inst. of Physics and the Physical Soc., 47 Belgrave Sq., London S.W.1)

28–30. **Marine Geodesy**, Present and Future, intern. symp., Columbus, Ohio. (A. G. Mourad, Columbus Laboratories, Battelle Memorial Inst., 505 King Ave., Columbus 43201)

28–4. **Macromolecular Chemistry**, intern. symp., Tokyo and Kyoto, Japan. (Organizing Committee, C.P.O. Box 1966, Tokyo)

29–1. Association of **Clinical Pathologists**, autumn mtg., London, England. (Dr. Sandler, Queen Charlotte's Maternity Hospital, 339-351 Goldhawk Rd., London W.6)

29–2. American **Medical Writers'** Assoc., mtg., New York, N.Y. (J. E. Bryan, 2000 P St., NW, Washington, D.C. 20036)

30–1. **Medical Library** Assoc., southern regional group mtg., Winston-Salem, N.C. (The Association, 919 N. Michigan Ave., Chicago, Ill.)

30–1. **Neuroendocrinology**, intern., symp., Paris, France. (H. P. Klotz, Hôpital Beaujon, 100 Blvd. du General Leclerc, Clichy)

October

1–2. Nomenclature, Definition, and Classification of the **Pathology of Renal Diseases**, intern. conf., New York Medical College, New York, N.Y. (K. Lange, Dept. of Medicine, New York Medical College, 5th Ave. at 106th St., New York 10029)

1–4. International College of **Surgeons**, 15th congr., Mexico City, Mexico. (G. de Velasco Polo, Zacatecas 117, Mexico 7, D.F.)

2–8. **Animal Nutrition**, 1st world congr., Madrid, Spain. (C. Luis de Cuenca, Consejo Superior de Investigaciones Cientificas, Via de Serrano 121, Madrid)

2–8. **Fluid Dynamics** of Heterogeneous Multi-Phase Continuous Media, intern. symp., Naples, Italy. (L. G. Napolitano, Inst. of Aerodynamics, Univ of Naples, Naples)

3–4. **Reactor Chemistry**, symp., Jülich, West Germany. (W. Fritsche, Gesellschaft Deutscher Chemiker, Postfach 9075, 6 Frankfurt am Main 9)

3–5. **Aerospace and Electronic Systems**, conv., Washington, D.C. (H. Schultz, MS 443, Aerospace Div., Westinghouse Electric Corp., P.O. Box 746, Baltimore, Md. 21203)

3–5. **Electrical Insulation**, conf., NAS-NRC Pocono Manor, Pa. (D. W. Thornhill, The Conference, NAS, 2101 Constitution Ave., NW, Washington, D.C. 20418)

3–5. National **Electronics** Conference, 22nd annual conf. and exhibition, Chicago,

Ill. (NEC, 228 N. LaSalle St., Chicago 60601)

3–5. Metallurgical Soc., Nuclear Metallurgy symp., **"High Temperature Nuclear Fuels,"** Delavan, Wis. (C. L. Hopkins, American Inst. of Mining, Metallurgical, and Petroleum Engineers, 345 E. 47th St., New York 10017)

3–5. Association of **Medical Illustrators**, 21st annual mtg., Atlanta, Ga. (L. V. Schaubert, Dept. of Surgery, Univ. of California Medical Center, San Francisco 94122)

3–5. **Pediatricians** of Latin Countries, congr., Genoa, Italy. (S. Nordio, Clinica Pediatrica dell'Universita, Inst. Gaslini, Genoa)

3–5. **Solar Astronomy**, mtg., American Astronomical Soc., Boulder, Colo. (J. W. Firor, High Altitude Observatory, P.O. Box 1558, Boulder 80302)

3–5. **Spectral Analysis of Time Series**, seminar, Univ. of Wisconsin, Madison. (B. Harris, Mathematics Research Center, U.S. Army, Univ. of Wisconsin, Madison 53706)

3–6. Institute of **Electrical and Electronics Engineers, Industry and General Applications** group, 1st annual mtg., Chicago, Ill. (R. Oliverson, *Plant Engineering*, 308 E. James St., Barrington, Ill. 60010)

3–6. **Instrument** symp. and **Research Equipment**, exhibit, 16th annual, National Insts. of Health, Bethesda, Md. (J. B. Davis, NIH, Bethesda 20014)

3–7. International Union of Air Pollution Prevention Assocs., 1st intern. Clean Air congr., **"Air Pollution Prevention in Practice,"** London, England. (Director, Natl. Soc. for Clean Air, Field House, Breams Bldgs., London E.C. 4)

3–7. American **Documentation** Inst., 29th annual mtg., Santa Monica, Calif. (C. A. Cuadra, System Development Corp., 2500 Colorado Ave., Santa Monica)

3–7. Solid State and Chemical **Radiation Dosimetry** in Medicine and Biology, symp., Vienna, Austria. (J. H. Kane, Div. of Technical Information, U.S. Atomic Energy Commission, Washington, D.C. 20545)

3–7. Institute for Materials Research, Natl. Bureau of Standards, 1st intern. symp., **"Trace Characterization**—Chemical and Physical," Gaithersburg, Md. (R. G. Bates, IMR, Natl. Bureau of Standards, Washington 20234)

3–8. **Clinical Pathology**, 6th intern. congr., Rome, Italy. (B. L. Della Vida, Via L. Magolotti, 15, Rome)

3–8. **Therapy and Pharmacological Research**, 4th Hungarian conf., Budapest. (J. Purman, P.O. Box 18, Budapest 502)

3–9. **Nuclear Biology and Medicine**, 1st Latin American congr., Lima and Cuzco, Peru. (J. Bedoya, Hospital Obrero de Lima, Lima)

3–10. **Programming by Numerical Analysis**, intern. colloquium, Besançon, France. (Natl. Center of Scientific Research, 15, quai Anatole France, Paris 7)

3–10. **Veterinary Pathology**, seminar, Istanbul, Turkey. (Central Treaty Organization, Old Grand Natl. Assembly Bldg., Ankara)

3–12. International Council for the **Exploration of the Sea**, 54th annual mtg., Copenhagen, Denmark. (Charlottenlund Slot, Charlottenlund, Denmark)

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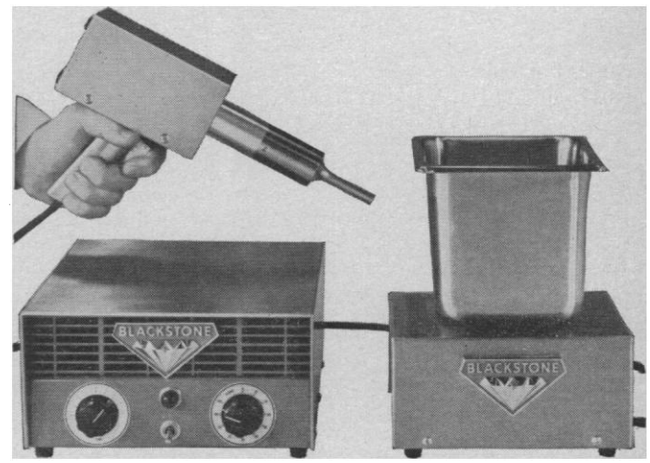

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4. **Physics and Chemistry of Excited Materials**, symp., Univ. of North Carolina, Chapel Hill. (R. C. Jarnagin, Chemistry Dept., Univ. of North Carolina, Chapel Hill 27514)

4–5. Fine Structure of **High Polymers**, colloquium, East Berlin, Germany. (Inst. für Faserstoff-Forschung, Deutsche Akad. der Wissenschaften zu Berlin, Kantstr. 55, 153 Teltow-Seehof, East Germany)

4–6. **Medical Mycology**, intern. dermatological symp., Bratislava, Czechoslovakia. (E. Hegyi, Societas Dermatologica Bohemoslovaca, Mickiewiczova 13/II, Bratislava)

4–6. American **Oil Chemists'** Soc., fall mtg., Philadelphia, Pa. (The Society, 35 E. Wacker Dr., Chicago, Ill. 60600)

4–7. **Space and Flight Equipment** Assoc., 4th symp., San Diego, Calif. (R. L. Wolfe, San Diego Aerospace Museum, San Diego 92101)

5–6. **Veterinary Medicine**, symp., Vienna, Austria. (Oesterreichisches Moorforschungs-Inst., Moorbad Neydharting, Austria)

5–7. **Circuit and System Theory**, conf., Univ. of Illinois, Monticello. (W. R. Perkins, Dept. of Electrical Engineering, Univ. of Illinois, Urbana 61801)

5–8. Society for **Clinical and Experimental Hypnosis**, 18th annual scientific mtg., New York, N.Y. (M. Kenn, 353 W. 57 St., New York 10019)

6–8. Hungarian Soc. of **Neurology and Psychiatry**, Hungarian Soc. of **Electroencephalography**, joint congr., Budapest, Hungary. (Dr. Csorba, Robert Karoly krt 44, Budapest 13)

6–8. Society for **Nuclear Medicine**, 4th annual mtg., Heidelberg, West Germany. (G. Hoffman, Gesellschaft für Nuclearmedizin, Medizinische Universitätsklinik, Hugstetterstr. 5, Freiburg)

6–8. **Vacuum Technique Applications** in the Semiconductor Industry, intern. seminar, Soc. Française des Ingénieurs et Technicians du Vide, Paris, France. (Administrative Secretary, 147 ter A, Blvd. de Strasbourg, Nogent-sur-Marne, Seine)

6–19. **Geochronology**, mtg., Kiev, U.S.S.R. (W. P. van Leckwijck, Intern. Union of Geological Sciences, Mechelse Steenweg 206, Antwerp)

7–8. American Medical Assoc., 3rd congr. on **Medical Quackery**, Chicago, Ill. (J. G. Thomsen, AMA Committee on Quackery, 535 N. Dearborn St., Chicago, Ill. 60610)

8–11. **Physics and Chemistry of the Crystal Surface**, symp., Halle an der Saale, East Germany. (Deutsche Akademie der Naturforscher Leopoldina, August-Begelstr. 50a, 401 Halle an der Saale)

8–16. Italian Fed. of Scientific and Technical Assocs., 2nd intern. chemical exhibition and 17th intern. "**Chemistry** Days" symp., Milan, Italy. (G. M. Pace, piazzale R. Morandi 2 (piazza Cavour), Milan)

9. International Soc. for **Comprehensive Medicine**, 3rd annual mtg., Boston, Mass. (L. Wollman, 2802 Mermaid Ave., Brooklyn, N.Y. 11224)

9–11. **Hurricane** symp., American Soc. for Oceanography, Houston, Tex. (N. E. Cygan, Standard Oil Co. of Texas, P.O. Box 66247, Houston 77006)

9–11. European Assoc. Against **Polio-**

myelitis and Allied Diseases, 11th symp., Rome, Italy. (P. Recht, 30 boul. General Jacques, Brussels 5, Belgium)

9–14. **Electrochemical** Soc., fall mtg., Philadelphia, Pa. (Director of Publications, the Society, 30 E. 42 St., New York 10017)

9–14. International Soc. for **Fat Research**, 8th biennial congr., Budapest, Hungary. (The Society, 135 Sharps Land, Ruislip, Middlesex, England)

10–11. **Endogenous Factors Influencing Host-Tumor Balance**, Argonne Cancer Research Hospital, intern. symp., Univ. of Chicago, Chicago, Ill. (R. W. Wissler, Dept. of Pathology, Argonne Cancer Research Hospital, 950 E. 59th St., Chicago 60637)

10–11. **Geologists**, intern. conf., "What's New On Earth," Rutgers Univ., New Brunswick, N.J. (H. Johnson, Dept. of Geology, Rutgers, New Brunswick)

10–12. American Soc. of **Mechanical Engineers**, Mechanisms conf., Purdue Univ., Lafayette, Ind., (P. Barkan, General Electric Co., 6410 Elmwood Ave., Philadelphia, Pa. 19142)

10–13. Association of Official **Analytical Chemists**, 80th mtg., Washington, D.C. (L. G. Ensminger, Box 540 Benjamin Franklin Station, Washington 20044)

10–13. **Clay Minerals** Soc., 3rd mtg., and 15th North American Clay Minerals conf., Pittsburgh, Pa. (J. W. Earley, P.O. Drawer 2038, Pittsburgh 15230)

10–13. **Fast Critical Experiments** and Their Analysis, intern. conf., Argonne, Ill. (R. Redman, Argonne Natl. Laboratory, 9700 S. Cass Ave., Argonne, Ill.)

10–13. American Acad. of **General Practice**, 1st fall scientific assembly, Boston, Mass. (The Academy, Volker Blvd. at Brookside, Kansas City, Mo. 64112)

10–14. **Audio Engineering** Soc., 18th annual fall conv., New York, N.Y. (D. R. von Recklinghausen, H. H. Scott, Inc., 111 Power Mill Rd., Maynard, Mass. 01754)

10–14. **Standardization of Radionuclides**, symp., Vienna, Austria. (J. H. Kane, Conferences Branch Div. of Technical Information, U.S. Atomic Energy Commission, Washington, D.C. 20545)

10–14. American College of **Surgeons**, 52nd annual clinical congr., San Francisco, Calif. (The College, 55 E. Erie St., Chicago, Ill. 60611)

10–15. International **Astronautical Fed.**, 17th intern. congr., Madrid, Spain. (IAF, 250 rue St.-Jacques, Paris 5, France)

10–15. **Hydrology of Lakes and Reservoirs**, symp., Garda Lake, Italy. (Univ. of Padua, Padua, Italy)

10–16. **Chemistry of the Aquatic Habitat**, intern. technical mtg., Nieuwersluis, Netherlands. (H. L. Golterman, Hydrobiological Inst., Rijksstraatweg 6, Nieuwersluis)

11–13. Association of **Analytical Chemists**, 14th conf., Detroit, Mich. (R. E. Marce, Allied Research Products, 400 Midland Ave., Detroit 48203)

11–13. **Physical Activity and Cardiovascular Health**, intern. symp., Toronto, Ont., Canada. (M. H. Robertson, Ontario Heart Foundation, 247 Davenport Rd., Toronto 5)

11–14. Applied Radiation, symp., Leipzig, East Germany. (Inst. for Applied Radiation, Permoserstr. 15, Leipzig 750)

11–15. International Soc. of **Audiology**, 8th biennial congr., Mexico City, Mexico. (Secretary of the Congress, Av. Progresso 141, Mexico 18, D.F.)

12–14. American Council on **Education**, 49th annual mtg., New Orleans, La. (ACE, 1785 Massachusetts Ave., N.W., Washington 20036)

12–14. **Gaseous Electronics**, 19th annual conf., Georgia Inst. of Technology, Atlanta. (J. W. Hooper, School of Electrical Engineering, Georgia Inst. of Technology, Atlanta)

13. National Acad. of **Engineering**, autumn mtg., New York, N.Y. (Secretary, NAE, 2101 Constitution Ave., Washington 20418)

13–14. **Medical Electronics and Engineering**, Science and Industry, seminar, New York, N.Y. (L. J. Smith, Training Services, Inc., P.O. Box 388, Rutherford, N.J. 07070)

13–14. Institute of **Navigation**, natl. marine mtg., U.S. Merchant Marine Acad., Kings Point, N.Y. (G. McLintock, U.S. Merchant Marine Acad., Kings Point)

13–15. **Illumination**, 3rd. technical conf., Budapest, Hungary. (Magyar Elektrotechnikai Egyesület, Szabadság tér 17, Budapest 5)

13–15. Association for Research in **Ophthalmology**, mtg., Chicago, Ill. (H. E. Kaufman, Dept. of Ophthalmology, College of Medicine, Univ. of Florida, Gainesville 32601)

13–15. **Undergraduate Chemistry Curriculum**, conf., North Dakota State Univ., Fargo. (R. M. Fitch, College of Chemistry and Physics, North Dakota State Univ., Fargo 58103)

14–15. **Medical Library** Assoc., midwest regional group mtg., French Lick, Ind. (MLA, 919 N. Michigan Ave., Chicago, Ill.)

16–19. American **Chemical** Soc., 2nd western regional mtg., San Francisco, Calif. (R. L. LeTourneau, Chevron Research Co., P.O. Box 1627, Richmond, Calif. 94802)

16–20. **Planned Parenthood** Fed. of America, annual mtg., New York. (Planned Parenthood—World Population, 515 Madison Ave., New York 10022)

17–18. **Bioengineering Education**, symp., Rose Polytechnic Inst., Terre Haute, Ind. (R. M. Arthur, Rose Polytechnic Inst., Terre Haute)

17–18. **Systems Science and Cybernetics**, conf., Inst. of Electrical and Electronics Engineers, Washington, D.C. (J. E. Matheson, Stanford Research Inst., Menlo Park, Calif. 94025)

17–19. **Automation in Analytical Chemistry**, intern. symp., Technicon Corp., New York, N.Y. (J. E. Golin, Technicon, Ardsley, N. Y.)

17–19. Chemical Inst. of Canada, 16th Canadian **Chemical Engineering** conf., Windsor, Ont. (P. M. Reilly, Polymer Corp., Sarnia, Ont., Canada)

17–19. **National Acad. of Sciences**, autumn mtg., Duke Univ., Durham, N.C. (Home Secretary, NAS, 2101 Constitution Ave., Washington 20418)

17–19. **Plastics**, intern. congr., "Processing Polymers to Products," Amsterdam, Netherlands. (Congress Bureau Royal Netherlands Industries Fair, Vredenburg 49, Utrecht)

17–20. **Cellular Chemistry**, intern. symp., Ohtsu, Japan. (S. Seno, Biwako Hotel, Ohtsu)

17–21. International Union of **Independent Laboratories**, 4th triennial general assembly, Leamington, England. (A. Herzka, Pressurized Packaging Consultants, Ltd., Ashbourne House, Alberon Gardens, London N.W. 11)

17–21. French Soc. of **Metallurgy**, fall mtg., Paris. (Secretariat, 25, rue de Clichy, Paris 9)

17–21. **Nuclear Data, Microscopic Cross Sections and other Data Basic for Reactors**, conf., International Atomic Energy Agency, Paris, France. (J. H. Kane, Conferences Branch, Div. of Technical Information, U.S. Atomic Energy Commission, Washington, D.C. 20545)

17–22. **Neurological Surgeons**, 16th annual mtg., San Juan, Puerto Rico. (J. M. Thompson, 1955 Blossom Way S., St. Petersburg, Fla. 33712)

17–22. German **Physical** Soc., mtg., Munich. (K. H. Riewe, Postfach 169 (Heraeus), 645 Hanau, West Germany)

17–22. **Potash**, 8th intern. congr., Brussels, Belgium. (Intern. Potash Inst., P.O. Box 25 36 44, Bern 14, Switzerland)

18–19. **Industrial Hygiene** Foundation, 31st annual mtg., Pittsburgh, Pa. (R. T. P. deTreville, The Foundation, 4400 Fifth Ave., Pittsburgh 15213)

18–19. **Liquid Scintillation Counting**, symp., Natl. Physical Laboratory, Teddington, England. (Meetings Officer, Inst. of Physics and The Physical Soc., 47 Belgrave Sq., London S.W.1)

18–20. **Telemetry**, intern. conf., Los Angeles, Calif. (J. E. Hinde, Sandia Corp., P.O. Box 5800, Albuquerque, N.M. 87115)

18–22. **International Computation** Centre, general assembly, Rome, Italy. (Viale Civiltà del Lavoro 23, Rome)

19–21. **Design of Experiments**, 12th conf., Gaithersburg, Md. (F. G. Dressel, Army Research Office-Durham, Box CM, Duke Station, Durham, N.C. 27706)

19–21. **Nuclear Science**, symp., Boston, Mass. (J. A. Coleman, Electron Devices Sec., Natl. Bureau of Standards, Washington 20234)

19–22. Biochemistry of **Lipids**, 10th intern. conf., Cologne, Germany. (Physiologisch-Chemisches Inst., Univ. zu Köln, Joseph-Stelzmann-str. 2, Cologne, West Germany)

19–22. **Optical** Soc. of America, annual mtg., San Francisco, Calif. (M. E. Warga, 1155 16th St., Washington, D.C.)

20–21. **Chemical Engineering** in Medicine and Biology, symp., Univ. of Cincinnati, Ohio. (D. Hershey, Dept. of Chemical Engineering, Univ. of Cincinnati, Cincinnati 45221)

20–21. High Performance **Composites**, 2nd annual symp., Washington Univ., St. Louis, Mo. (G. Esterson, inst. for Continuing Education, Washington Univ., St. Louis 63130)

20–21. **Systems Approach to Biology**, 3rd systems symp., Case Inst. of Technology, Cleveland, Ohio. (M. Mesarovic, Systems Research Center, Case Inst. of Technology, Cleveland 44106)

21–22. **Prolonged Pharmacotherapy and the Eye**, conf., State Univ, of New York, Buffalo. (E. B. Hague, School of Medicine, State Univ. of New York at Buffalo, N.Y. 14214)

21–23. **Clinical Pathology of the Liver and Biliary Tract,** mtg., Assoc. of Clinical Scientists, Washington, D.C. (R. P. MacFate, The Association, 300 N. State St. No. 5322, Chicago, Ill. 60610)

22. American Assoc. of **Physics Teachers,** Appalachian sec., Wheeling College, Wheeling W. Va. (D. C. Martin, Dept. of Physics, Marshall Univ., Huntington, W. Va. 25701)

22–27. Muscular Dystrophy Assocs. of America, intern. conf., "Exploratory Concepts in **Muscular Dystrophy and Related Disorders,**" Harriman, N.Y. Muscular Dystrophy Assocs. of America, 1790 Broadway, New York 10019)

23. **Research in Medical Education,** 5th annual conf., Assoc. of American Medical Colleges, San Francisco, Calif. (P. J. Sanazaro, Div. of Education, Assoc. of American Medical Colleges, 2530 Ridge Ave., Evanston, Ill. 60201)

23–25. **Vacuum Microbalance Techniques,** 6th informal conf., Newport Beach, Calif. (7500 Jefferson St., Paramount, Calif. 90723)

23–29. **Cancer** 9th intern. congr., Tokyo, Japan. (Secretariat, Cancer Inst., Nishisugamo, Toshima-ku, Tokyo)

24. American Assoc. of **Poison Control Centers,** 9th annual mtg., Chicago, Ill. (M. S. McIntire, The Association, 44th and Dewey Ave., Omaha, Nebr. 68105)

24–26. Canadian Assoc. for **Applied Spectroscopy,** natl. mtg., Montreal, Que. (S. Barabas, Research Center, 240 Hymus Blvd., Pointe Claire, Que.)

24–26. **Medical Education,** symp., Beirut, Lebanon. (B. Thurston, American Univ. of Beirut, Beirut)

24–27. **Instrument** Soc. of America, 21st annual conf., New York, N.Y. (ISA, 530 William Penn Pl., Pittsburgh, Pa. 15219)

24–27. **Oak Ridge** Inst. of Nuclear Studies, Medical Div., 10th medical symp., "Compartments, Pools, and Spaces," Oak Ridge, Tenn. (Chairman's Office, Medical Division, ORINS, Oak Ridge, Tenn.)

24–28. **Botany,** 3rd Mexican congr., Botanical Soc. of Mexico, Mexico City. (J. Sarukhan K., P.O. Box 19140, Mexico 19, D.F.)

24–28. Synthesis and Characteristics of **Organic Radicals,** symp., Mittenwald, West Germany. (W. Fritsche, Gesellschaft Deutscher Chemiker, Postfach 9075, 6 Frankfurt am Main)

24–28. **Surgery, Orthopedics, and Traumatology,** intern. conf., Budapest, Hungary. (V. Hönig, Országos Traumatological Intézet, Mezö Imre út 17, Budapest 8)

25–28. American Assoc. of **Blood Banks,** 19th annual mtg., Los Angeles, Calif. (The Association, 30 N. Michigan Ave., Chicago, Ill. 60602)

25–30. **Plant Stimulation,** symp., Sofia Bulgaria. (C. I. Popoff, M. Popoff Inst. of Plant Physiology, Bulgarian Acad. of Sciences, 2 Latinka str., Sofia 13)

26–28. **Electron Devices,** intern. mtg., Inst. of Electrical and Electronics Engineers, electron devices group, Washington, D.C. (J. F. Hull, Litton Industries, 960 Industrial Rd., San Carlos, Calif.)

26–28. **Switching and Automata Theory** symp., Univ. of California, Berkeley. (Engineering Extension, Univ. of California, Berkeley)

NEW BOOKS

(Continued from page 1234)

1966. 361 pp. Illus. Paper, $2.50. Reprint, 1950 edition.

An Introduction to Fluvial Hydraulics. Serge Leliavsky. Dover, New York, 1966. 269 pp. Illus. Paper, $2. Reprint of ed. 2, 1959.

Ionospheric Radio Propagation. Kenneth Davies. Dover, New York, 1966. 486 pp. Illus. Paper, $2.25. Reprint, 1965 edition.

The Ivory-Billed Woodpecker. James T. Tanner. Dover, New York, 1966. 123 pp. Illus. Paper, $2. Reprint, 1942 edition.

Magnetohydrodynamic Stability and Thermonuclear Containment. A. Jeffrey and T. Taniuti, Eds. Academic Press, New York, 1966. 230 pp. Illus. $7.50. Reprints of twelve papers published in various journals between 1954 and 1963, and an introduction by A. Jeffrey and T. Taniuti.

Mental Maladies: A Treatise on Insanity. J. E. D. Esquirol. Hafner, New York, 1965. 495 pp. $10.50. The History of Medicine Series, No. 25, issued under the auspices of the Library of the New York Academy of Medicine. Reprint, 1845 edition.

Mental Pathology and Therapeutics. Wilhelm Griesinger. Hafner, New York, 1965. 544 pp. $10.50. The History of Medicine Series, No. 26, issued under the auspices of the Library of the New York Academy of Medicine. Reprint, 1867 edition.

Optimal and Self-Optimizing Control. Rufus Oldenburger, Ed. M.I.T. Press, Cambridge, Mass., 1966. 512 pp. Illus. Paper, $6. Reprints of thirty-eight papers published in various journals between 1950 and 1964.

Personality: A Biosocial Approach to Origins and Structure. Gardner Murphy. Basic Books, New York, 1966. 1015 pp. $10. Reprint with new preface, 1947 edition.

Pregnancy, Birth and Abortion. Paul H. Gebhard, Wardell B. Pomeroy, Clyde E. Martin, and Cornelia V. Christenson. Wiley, New York, 1966. 298 pp. Illus. Paper, $1.65. Reprint, 1958 edition.

Principles of Human Relations: Applications to Management. Norman R. F. Maier. Wiley, New York, 1966. 484 pp. Illus. Paper, $2.65. Reprint, 1952 edition.

Principles of Psychophysiology. An introductory text and readings. Richard A. Sternbach. Academic Press, New York, 1966. 313 pp. Illus. $7.50. Reprints of ten readings published in various journals between 1928 and 1964.

Probability and Experimental Errors in Science. An elementary survey. Lyman G. Parratt. Wiley, New York, 1966. 271 pp. Illus. Paper, $1.65. Reprint, 1961 edition.

The Remaking of a Culture: Life and Education in Puerto Rico. Theodore Brameld. Wiley, New York, 1966. 494 pp. Paper, $2.65. Reprint, 1959 edition.

The Roseate Spoonbill. Robert Porter Allen. Dover, New York, 1966. 162 pp. Illus. Paper, $2. Reprint, 1942 edition.

Scientific Creativity: Its Recognition and Development. Selected papers from the Proceedings of the First, Second, and Third University of Utah Conferences.

Calvin W. Taylor and Frank Barron, Ed. Wiley, New York, 1966. 443 pp. Paper, $2.65. Reprint, 1963 edition.

The Scientific Renaissance, 1450–1630. Marie Boas. Harper and Row, New York, 1966. 376 pp. Illus. Paper, $2.45. The Rise of Modern Science Series, vol. 2, edited by A. Rupert Hall. Reprint, 1962 edition.

Survey and Forecast. Readings for students of science and technology. Samuel I. Bellman, Ed. Chandler, San Francisco, Calif., 1966. 484 pp. Illus. Paper, $3.75. Reprints of thirty papers published between 1961 and 1964.

Tenth Annual Edition the Year's Best S-F. Judith Merril, Ed. Delacorte Press, New York, 1966. 400 pp. $4.95. Reprints of 33 papers.

Thermodynamics and Statistical Mechanics. A. H. Wilson. Cambridge Univ. Press, New York, 1966. 511 pp. Illus. Paper, $2.95. Reprint, 1957 edition.

Toward a Psychology of Art: Collected Essays. Rudolf Arnheim. Univ. of California Press, Berkeley, 1966. 377 pp. Illus. $10. Reprints of twenty-four essays published between 1946 and 1964 and three unpublished essays written between 1958 and 1962.

Travels in North America: The English Version of 1770. vols. 1 and 2. Peter Kalm. Revised and edited by Adolph B. Benson. Dover, New York, 1966. vol. 1, 421 pp.; vol. 2, 396 pp. Illus. Paper, $2.50 each. Reprint, 1937 edition.

A Treatise on Bessel Functions and Their Applications to Physics. Andrew Gray and T. M. MacRobert. Dover, New York, 1966. 341 pp. Illus. Paper, $2.25. Reprint of ed. 2, 1922.

Valence and the Structure of Atoms and Molecules. Gilbert Newton Lewis. Dover, New York, 1966. 174 pp. Illus. Paper, $1.50. Reprint, 1923 edition.

Economics and the Social Sciences

Advances in Experimental Social Psychology. vol. 2. Leonard Berkowitz, Ed. Academic Press, New York, 1965. 360 pp. Illus. $9.50. Eight papers: "Vicarious processes: A case of no-trial learning" by Albert Bandura; "Selective exposure" by Jonathan L. Freedman and David O. Sears; "Group problem solving" by L. Richard Hoffman; "Situational factors in conformity" by Vernon L. Allen; "Social power" by John Schopler; "From acts to dispositions: The attribution process in person perception" by Edward E. Jones and Keith E. Davis; "Inequity in social exchange" by J. Stacy Adams; and "The concept of aggressive drive: Some additional considerations" by Leonard Berkowitz.

The American Indian: Perspectives for the Study of Social Change. Fred Eggan. Aldine, Chicago, 1966. 207 pp. Illus. $5.75. Lewis Henry Morgan Lectures Series.

The American Male. Myron Brenton. Coward-McCann, New York, 1966. 252 pp. $5.95.

Animal Behavior. Keller Breland and Marian Breland. Macmillan, New York, 1966. 224 pp. Illus. Paper, $1.96. The Critical Issues in Psychology Series.

A Casebook of Social Change. Arthur H. Niehoff, Ed. Aldine, Chicago, 1966. 320 pp. Illus. $6. Nineteen case histories, in Latin America, Africa, the Middle East, and Asia.

Communication and Culture. Readings in the codes of human interaction. Alfred G. Smith, Ed. Holt, Rinehart, and Winston, New York, 1966. 640 pp. Illus. $7.95. Fifty-five selections on the following topics: The Theory of Human Communication (15 papers); Syntactics (23 papers); Semantics (9 papers); and Pragmatics (8 papers).

Consumer Behavior and the Behavioral Sciences: Theories and Applications. Steuart Henderson Britt, Ed. Wiley, New York, 1966. 626 pp. Illus. $11.50. The 42 chapters cover the following topics: Foundations of Consumer Behavior (3 chap.); Cultural Influences (3 chap.); Individual Influences (9 chap.); Group Influences (7 chap.); Economic Influences (1 chap.); The Business Firm and the Consumer (3 chap.); Product Attributes and the Consumer (6 chap.); Promotion and the Consumer (5 chap.); and Decision-Making by Consumers (5 chap.).

Corporate Public Relations. Paul Burton. Reinhold, New York, 1966. 240 pp. Illus. $9.50. Reinhold Management Reference Series.

Education and Training in the Developing Countries: The Role of U.S. Foreign Aid. William Y. Elliott, Ed. Praeger, New York, 1966. 415 pp. $7.50. Thirty papers on the following topics: Problems (4 papers); Education and Training in National Growth (8 papers); The Role of the American Government (6 papers); The Role of the University (5 papers); The Role of the Foundation and Private Enterprise (6 papers); and Perspectives (1 paper).

Experimental Methods and Instrumentation in Psychology. Joseph B. Sidowski, Ed. McGraw-Hill, New York, 1966. 813 pp. Illus. $3.50. Eighteen papers.

Experimental Phonetics: Selected Articles. Grant Fairbanks. Univ. of Illinois Press, Urbana, 1966. 280 pp. Illus. $6.50.

Experiments in Induction. Earl B. Hunt, Janet Marin, and Philip J. Stone. Academic Press, New York, 1966. 261 pp. Illus. $9.50.

Fajardo's People: Cultural Adjustment in Venezuela; and the Little Community in Latin American and North American Contexts. Thomas McCorkle. Latin American Center, Univ. of California, Los Angeles, 1965. 164 pp. Illus. Paper.

Feasible Planning for Social Change. Robert Morris and Robert H. Binstock. Columbia Univ. Press, New York, 1966. 185 pp. $5.

Fishermen of South Thailand: The Malay Villagers. Thomas M. Fraser, Jr. Holt, Reinhart, and Winston, New York, 1966. 126 pp. Paper, $1.75. Case Studies in Cultural Anthropology.

Handbook of Soviet Psychology. A comprehensive directory of vital facts about Soviet Psychology. Prepared for the International Congress of Psychology (Moscow), August 1966. Dan I. Slobin, Ed. International Arts and Sciences Press, White Plains, N.Y., 1966. 146 pp. Illus. Paper, $8. *Soviet Psychology and Psychiatry*, Special Issue, Spring-Summer 1966, vol. 4, No. 3–4.

Information Theory and Esthetic Perception. Abraham Moles. Translated from the French edition (1958) by Joel E. Cohen. Univ. of Illinois Press, Urbana, 1966. 227 pp. Illus. $7.50.

An Introduction to Personality: A Research Approach. Donn Byrne. Prentice-Hall, Englewood Cliffs, N.J., 1966. 560 pp. Illus. $7.75. Prentice-Hall Psychology Series, edited by Richard S. Lazarus.

Latin America: A Regional Geography. Gilbert J. Butland. Wiley, New York, ed. 2, 1966. 405 pp. Illus. $5.50. Geographies: An Intermediate Series.

Learning and Human Abilities: Educational Psychology. Herbert J. Klausmeier and William Goodwin. Harper and Row, New York, ed. 2, 1966. 745 pp. Illus. $8.95.

Middle America: Its Lands and Peoples. Robert C. West and John P. Augelli. Prentice-Hall, Englewood Cliffs, N.J. 1966. 496 pp. Illus. $11.95.

Neighbor and Kin: Life in a Tennessee Ridge Community. Elmora Messer Matthews. Vanderbilt Univ. Press, Nashville, Tenn., 1966. 208 pp. Illus. $5.

On Aggression. Konrad Lorenz. Translated from the Austrian edition by Marjorie Kerr Wilson. Harcourt, Brace, and World, New York, 1966. 320 pp. Illus. $5.75.

Personality Research: A Book of Readings. Donn Byrne and Marshall L. Hamilton, Eds. Prentice-Hall, Englewood Cliffs, N.J., 1966. 425 pp. Illus. Paper, $5.50. Prentice-Hall Psychology Series, edited by Richard S. Lazarus. Thirty-six papers on the following topics: Background (5 papers); Methodology (14 papers); Selected Examples of Personality Research (16 papers); and Integration of Personality Variables (1 paper).

Political Geography. Paul Buckholts. Ronald, New York, 1966. 542 pp. Illus. $9.

Population Dilemma in Latin America. J. Mayone Stycos and Jorge Arias, Eds. Potomac Books, Washington, D.C., 1966. 263 pp. Illus. Paper, $2.45; cloth, $3.95. Ten papers.

Poverty: American Style. Herman P. Miller, Ed. Wadsworth, Belmont, Calif., 1966. 318 pp. Paper, $3.95. Forty-one papers on the following topics; Historical Perspectives (8 papers); Perspectives from Four Disciplines (4 papers); Counting Up the Poor (5 papers); How the Poor Get Along (7 papers); Conventional Programs to Combat Poverty (5 papers); The Great Society's Program: Breaking the Chain (6 papers); and Other Solutions: A Peek into the Poverty Toolbag (6 papers).

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