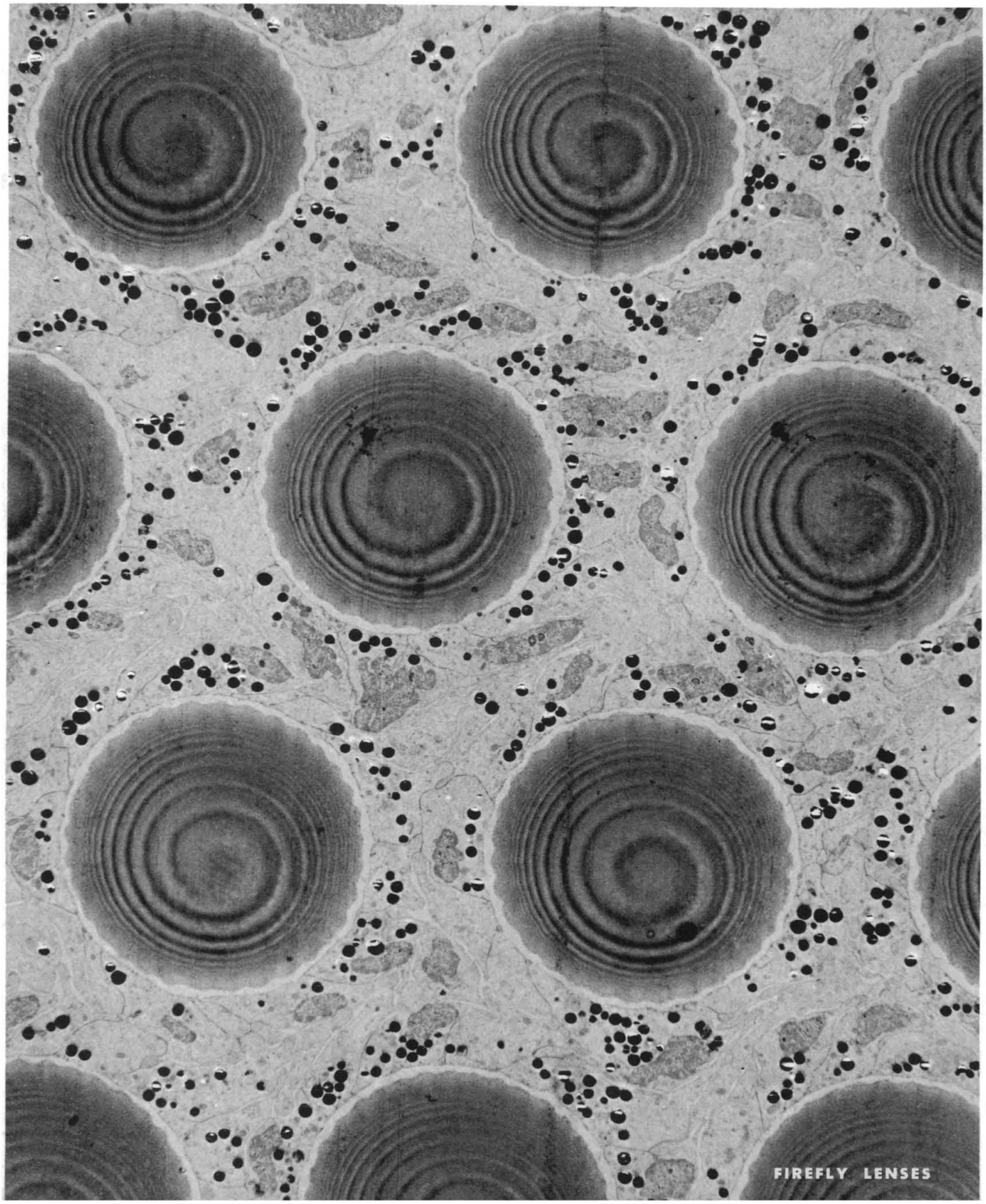
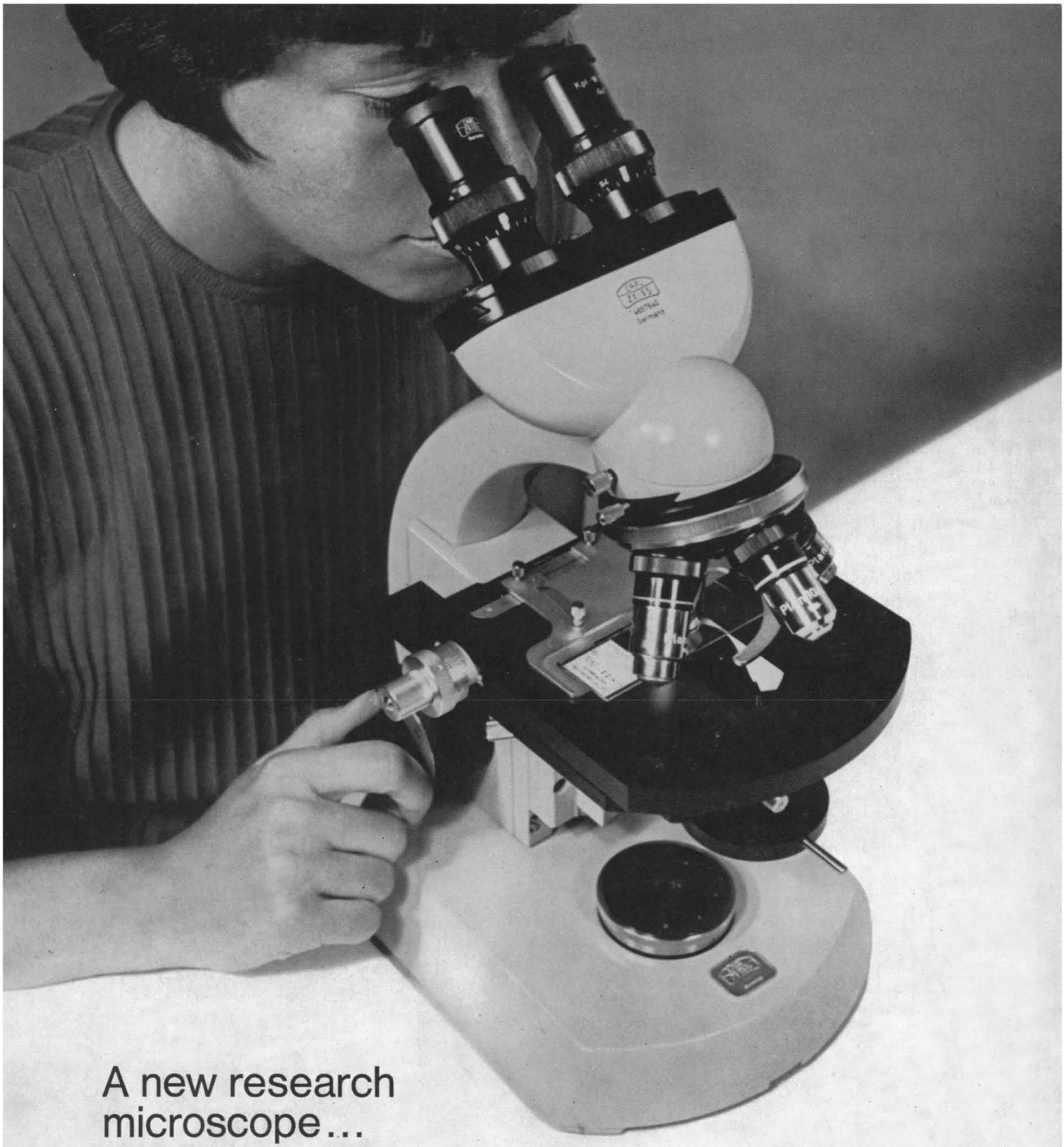
SCIENCE 6 September 1968
Vol. 161, No. 3845
AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE





A new research microscope... the Standard R

You'll never know ease of focusing until you turn the fine-focusing control on the "R." It operates throughout the entire range of stage movement. No backlash. No annoying stops.

We added a large new rectangular base for solid stability. The new light gray finish is easier to clean, more corrosion-resistant. We couldn't improve the optics, nor the silken ease of the mechanics, nor expand on interchangeability, for which all Zeiss microscopes are noted. No one can. So we maintained them.

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Mettler guide to the budget balance

Low cost, a fair consideration in any purchase, is only one of several compelling benefits resulting from Mettler's thoughtful re-design of its classic substitution balance.

Mettler's objective was to produce five new weighing instruments providing the ultimate in balance performance for the user, whether he be researcher or technician or student. To this end, Mettler applied the latest in design, manufacturing and human engineering concepts.

SIMPLICITY IS THE KEY

Mettler began by simplifying the balance mechanism.

- Individual molded parts were substituted for multi-part assemblies.
- Mettler's exclusive concentric ring weights were used, cutting in half the number of weights needed.
- Optical and mechanical control systems were simplified by placing them at the operator's eye level.

From this re-design comes better balances that are faster and easier to make . . . and they cost considerably less than the instruments they replace.

IMPROVED PERFORMANCE, NEW CAPACITIES

The five new balances range from an economical student model through standard analytical models to a semi-micro balance. All have capacities of 160 grams or greater.

Their new beam designs and pan brakes make them far more stable and permit faster weighings than conventional balances.

Their precision-to-capacity relationships are exceptional. The Model H20, for example, combines the 160.1-gram capacity of an analytical balance with the ±0.01 mg precision of a semi-micro instrument.

READING DIGITS IS EASIER

The new Mettlers are available with either digital or vernier readout of weighing data.

Vernier reading costs less and sometimes is preferred by those who want to read that last numeral without adjusting a digital control knob. Digital readout is preferred by most users because of its speed and convenience. Human factors research has shown digital readout to be twice as fast and three times as accurate as reading dials or scales.

Clear, aligned digital readout

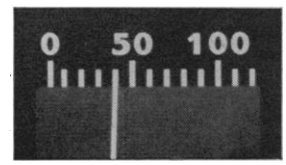
Mettler's digital readout has all numerals grouped and clearly aligned. Even an inexperienced technician or student can obtain highest levels of accuracy in weighing after only a few minutes of instruction.

All controls are clearly labeled and the readout has directional indicators, arrows on the readout panel to tell which way to dial the weight set.

PRE-WEIGHING UNLIMITED

One balance, the Mettler H10W, is equipped with an advanced pre-weighing feature. Pre-weighing gives an immediate indication of approximate weight with no intermediate dialing step. The new Mettler pre-weighing feature operates over the full range of the balance, avoiding the delay of a second dialing step if the sample exceeds 100 grams.

Instrument	Capacity	Precision	Readout
H8 Semi-analytical	160 grams	±0.3 mg	Vernier
H10 Analytical	161 grams	±0.05 mg	Digital
H10W Analytical pre-weighing	161 grams	±0.05 mg	Digital
H18 Analytical	160.1 grams	±0.03 mg	Vernier
H20 Semi-micro	160.1 grams	±0.01 mg	Digital



High-speed filling guide

ONCE AGAIN, WITH FILLING

All five have the exclusive Mettler filling guide. This lets you do one of the most common and time-consuming weighing jobs—filling to a target weight—in less than half the usual time. There are no repeated interruptions to the work. You proceed in orderly manner, filling to within the last few milligrams.

OPTICAL RANGE TARING

Taring across the optical range enables you to return the balance scale to zero to compensate for odd or fractional weights of the container. It goes a long way toward eliminating arithmetic calculations from the weighing operation.

BELOW-BALANCE ACCESSORY

Weighing objects below the balance, as in specific gravity measurements, is a simple job with the new Mettlers. An accessory kit which attaches directly to the balance pan provides the means.

TRY ONE NOW

Call any major laboratory supply dealer. Or write us for descriptive literature. We are Mettler Instrument Corporation, 20 Nassau Street, Princeton, New Jersey 08540.

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6 September 1968
Vol. 161, No. 3845

SCIENCE

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AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

COVER

Corneal lenses of firefly, *Photuris pennsylvanica*. Transverse section, about × 2100. [Biophysical Research Laboratory, Carnegie-Mellon University, Pittsburgh, Pennsylvania]

unattended time/rate

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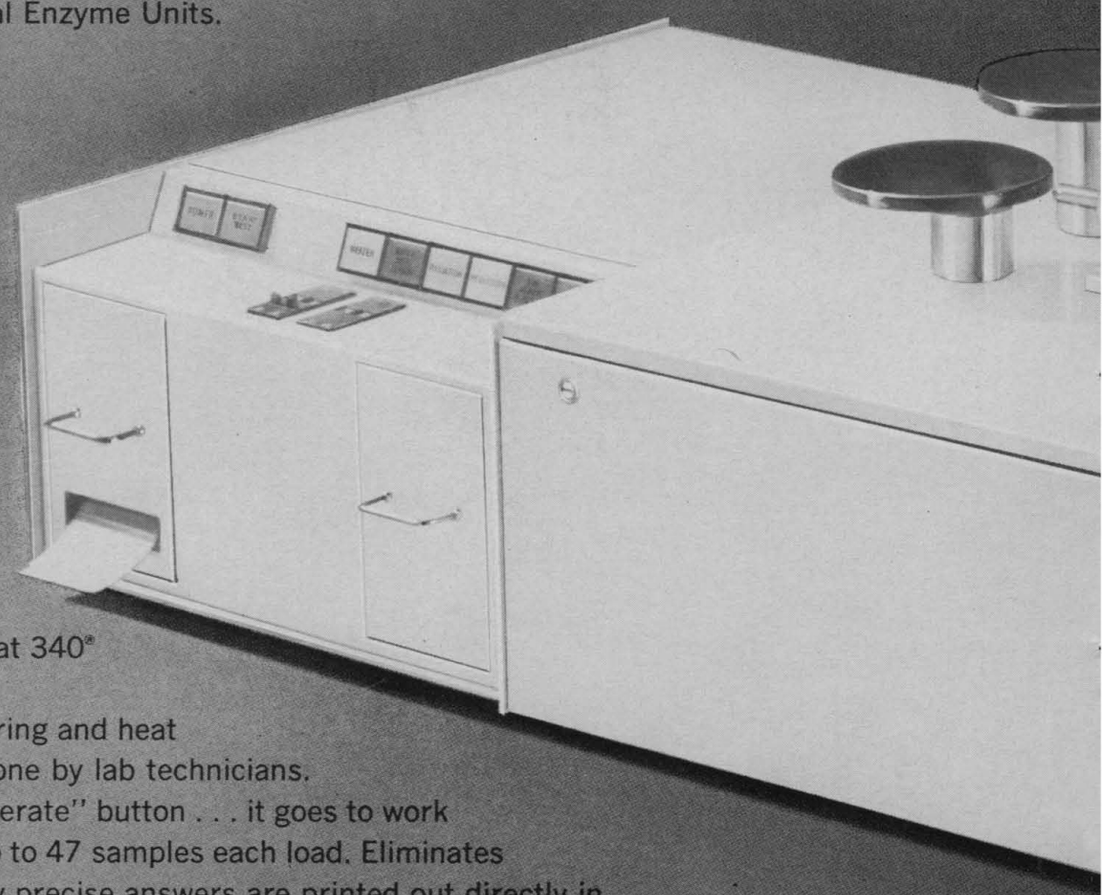
. . . this unique, kinetic reaction instrument gives automatic, accurate determinations of LDH, GOT, GPT. Uses approved wet chemistry methods. Follows recommendations of the International Union of Biochemistry* for initial reaction rates, precise temperature control at 30° ± .1°C and use of International Enzyme Units.



No more manual analysis drudgery. Zymat 340® does all the pipetting, measuring, mixing, stirring and heat controlling ordinarily done by lab technicians. Once you press the "Operate" button . . . it goes to work **unattended.** Handles up to 47 samples each load. Eliminates calculations, too. Highly precise answers are printed out directly in International Enzyme Units (U) with identifying serial numbers.

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* "ENZYME NOMENCLATURE" Recommendations 1964 of the International Union of Biochemistry

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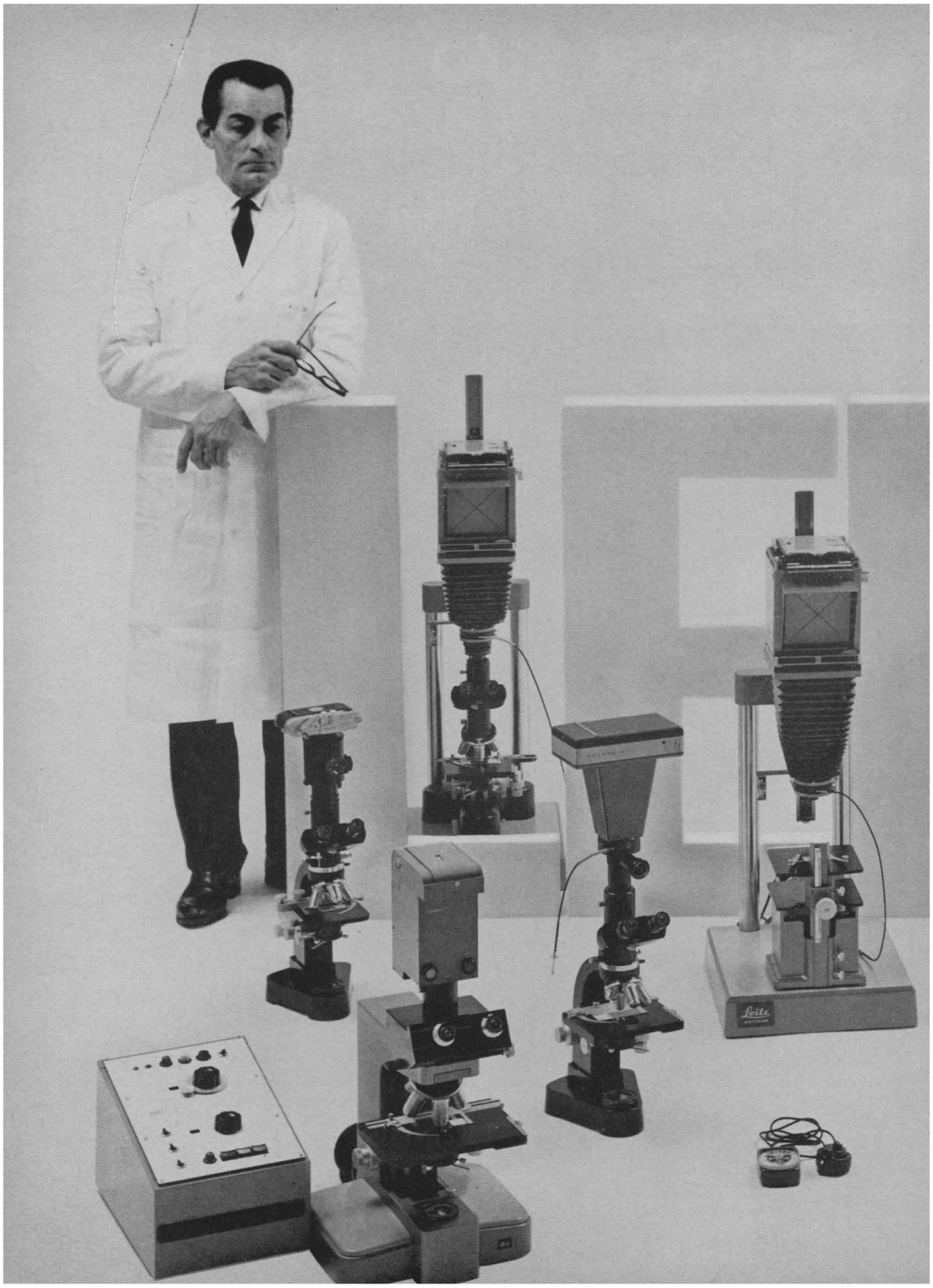
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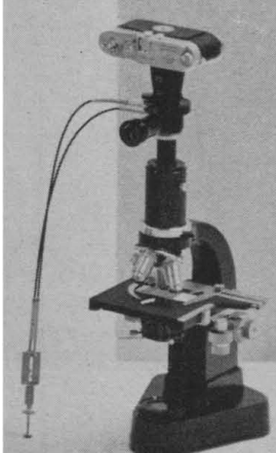

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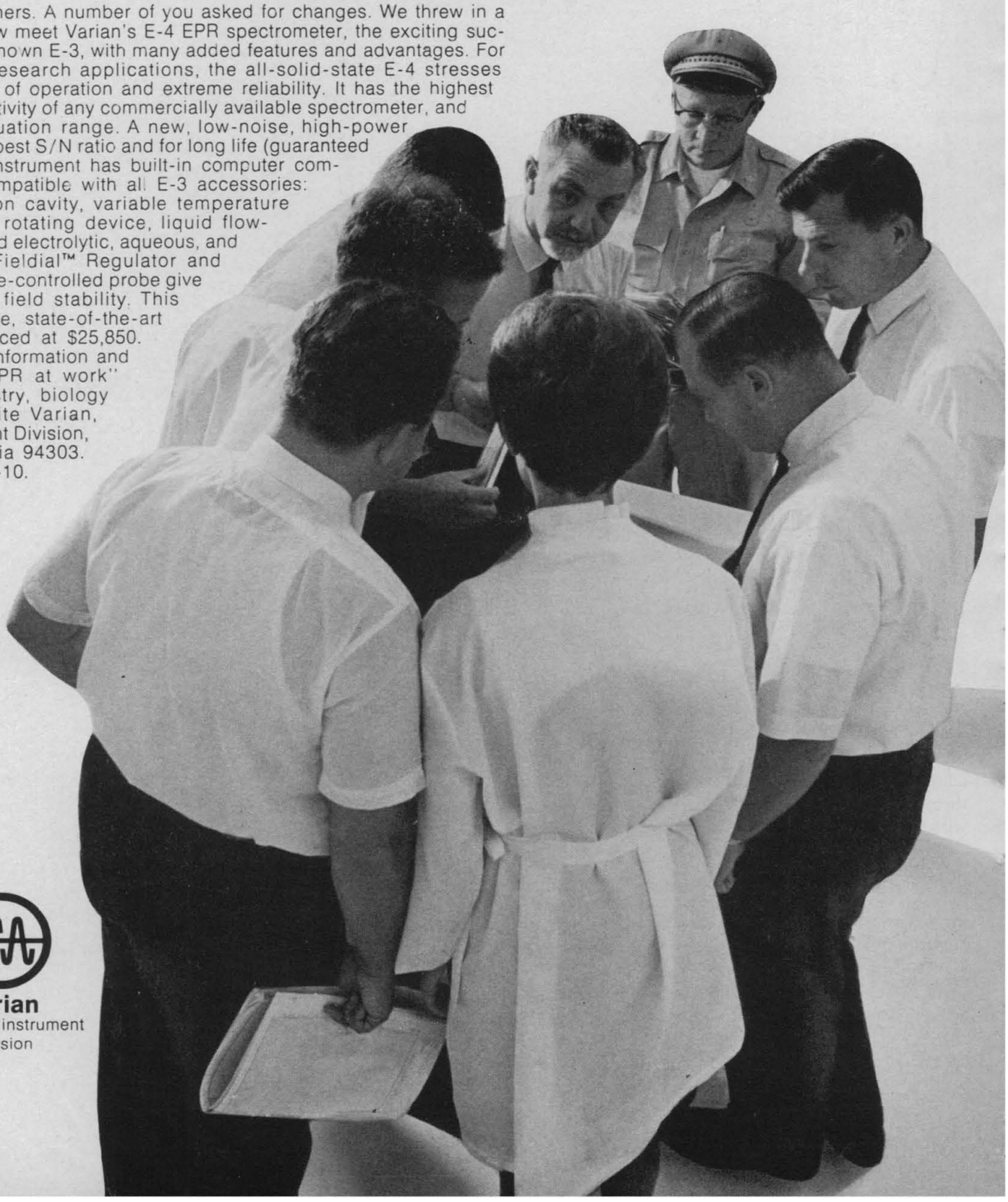

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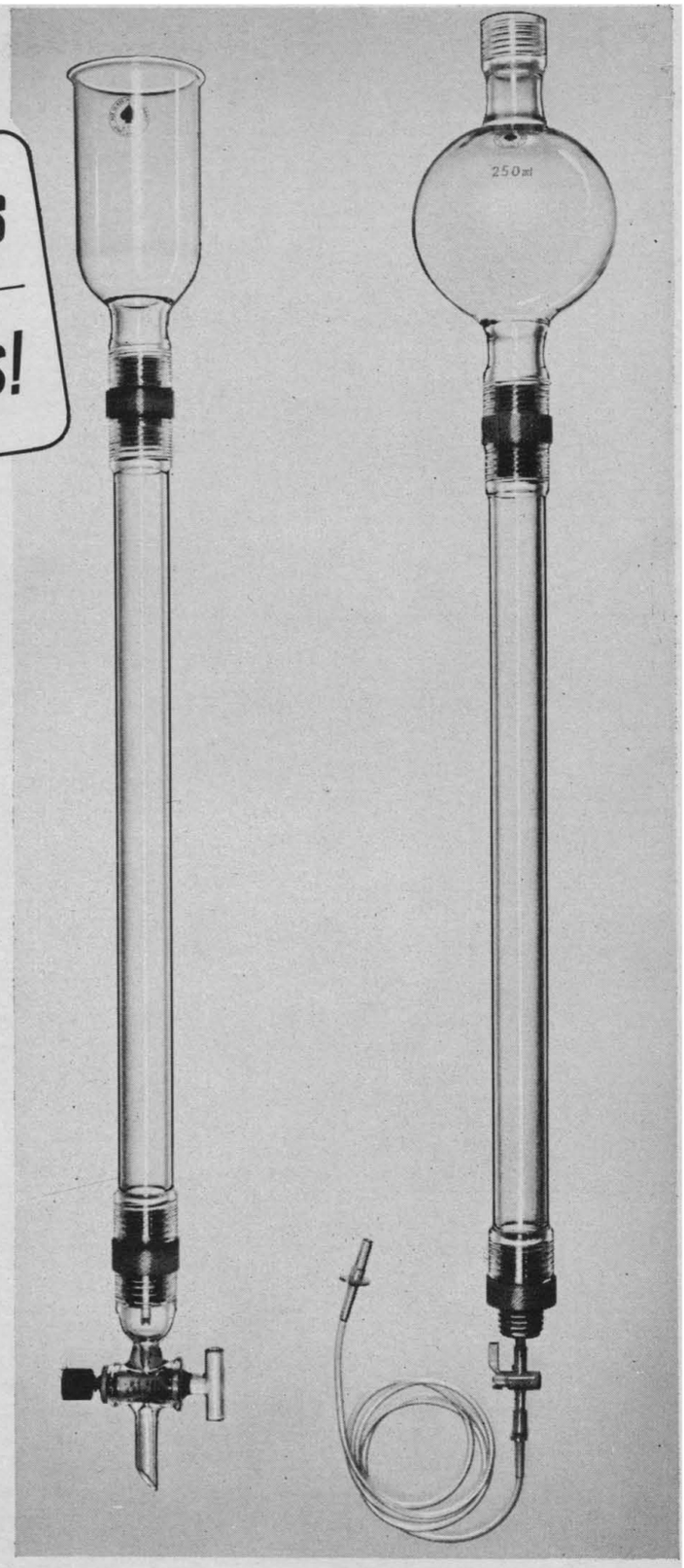

Easy assembly without springs or clamps. Internally threaded glass parts and nylon "O" ring couplings screw together in firm but not rigid engagement to make a positive seal at pressures far above those normally used for chromatography. The system features an unusual variety of end fittings which provide means for the introduction of controlled atmospheres or pressure drop controls. Syringe introduction of samples is possible through a septum side arm; eluent samples can be withdrawn by the same means. The septum can be removed and replaced with a side arm feed tube for dual or alternate flow. Platinum wire electrodes can be introduced. Adjustable height feed tubes allow various packing heights to be employed with one column. A polyethylene float receives the droplets and prevents agitation at the surface. The rapid flow porous polyethylene or Teflon® standard packing support has straight through holes which retard mixing. The stopcocks are Teflon clad and require no lubricant. All components are described in the Ace October bulletin—send for your copy.

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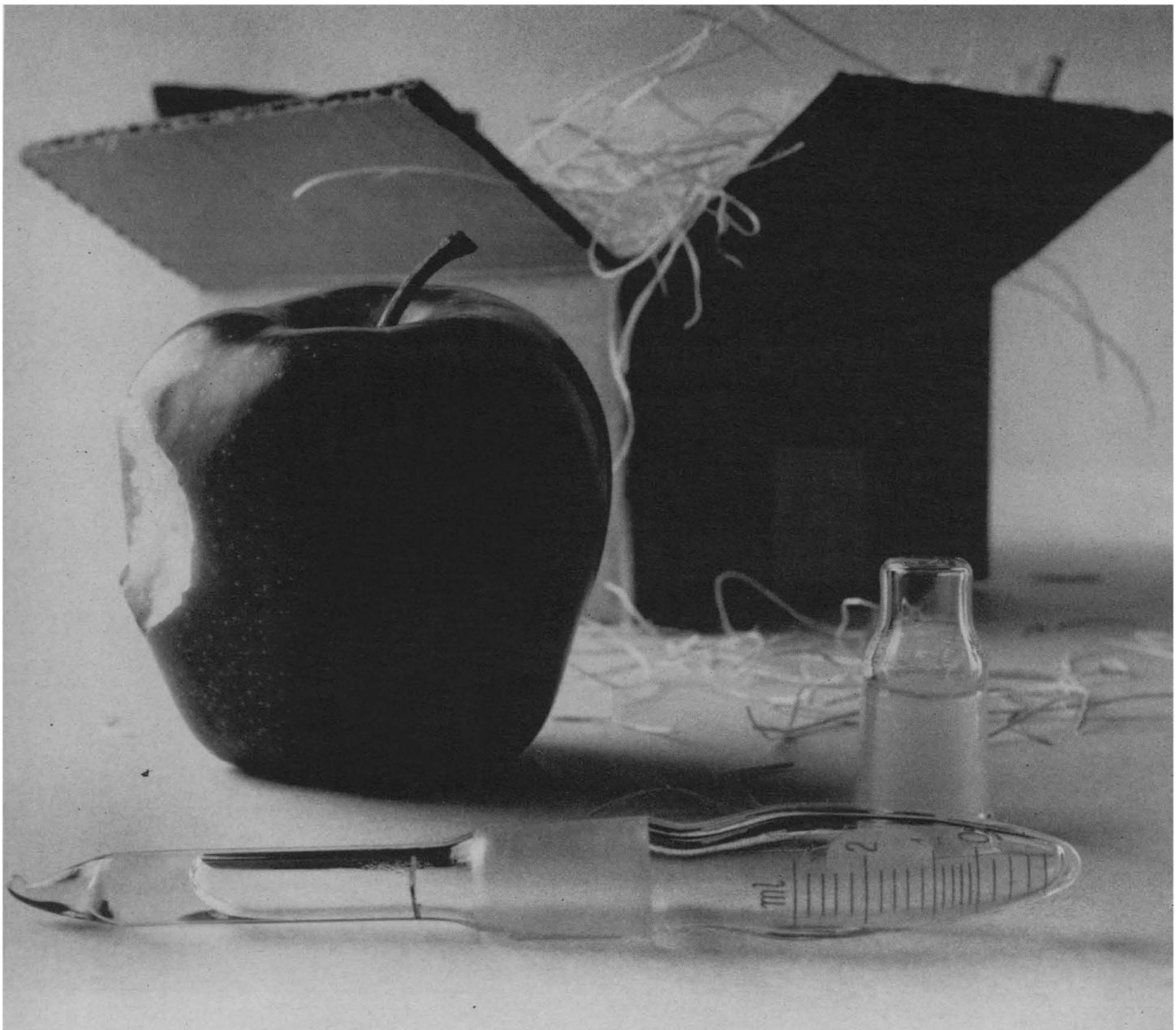

Sorry, we just never ship [^{3}H] acetic anhydride to anyone until after lunch.

Because on the *morning* of the day that we ship it to you, we are busily distilling it. *Double*-distilling it.

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But despite this extra processing and unusual purity, the prices are low. To get a listing of these prices and further details, write [^{3}H]AcOAc on a postcard with your name, address and zip code, please.

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On yet another subject: We offer high quality labeled orotic acid (affectionately known around here as 1,2,3,6,-tetrahydro-2, 6-dioxo-4-pyrimidine carboxylic acid). For further information, write *that*—or "Orotic Acid"—on a postcard with your name, address and zip code too.

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A new look at an old flame

... reveals some vital statistics

Look at the flame shown at left below. Now take a meaningful, quantitative look at the tracing of its image brightness variations.

Data such as that shown in the quantized tracing is hidden in virtually all film and print records. Tech/Ops' Radiation Products Division has new image analysis instruments that can automatically measure, quantize and plot this hidden data in under six minutes. Had it been necessary, our equipment could have taken an even closer look at the flame below by plotting many more contours.

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Are you overlooking vital data in film records in any of the above applications? You may be. For more information on how our instruments and broad experience can help you get more meaningful measurements, write to Technical Operations, Inc. Dept. K-9, South Avenue, Burlington, Massachusetts 01803.

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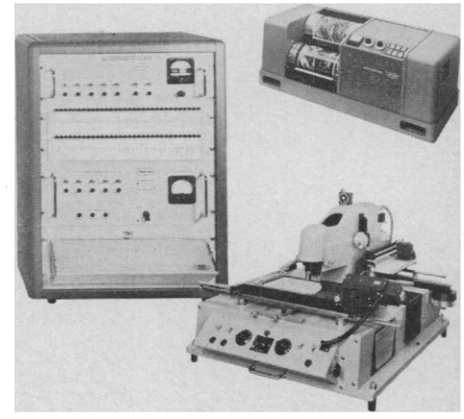

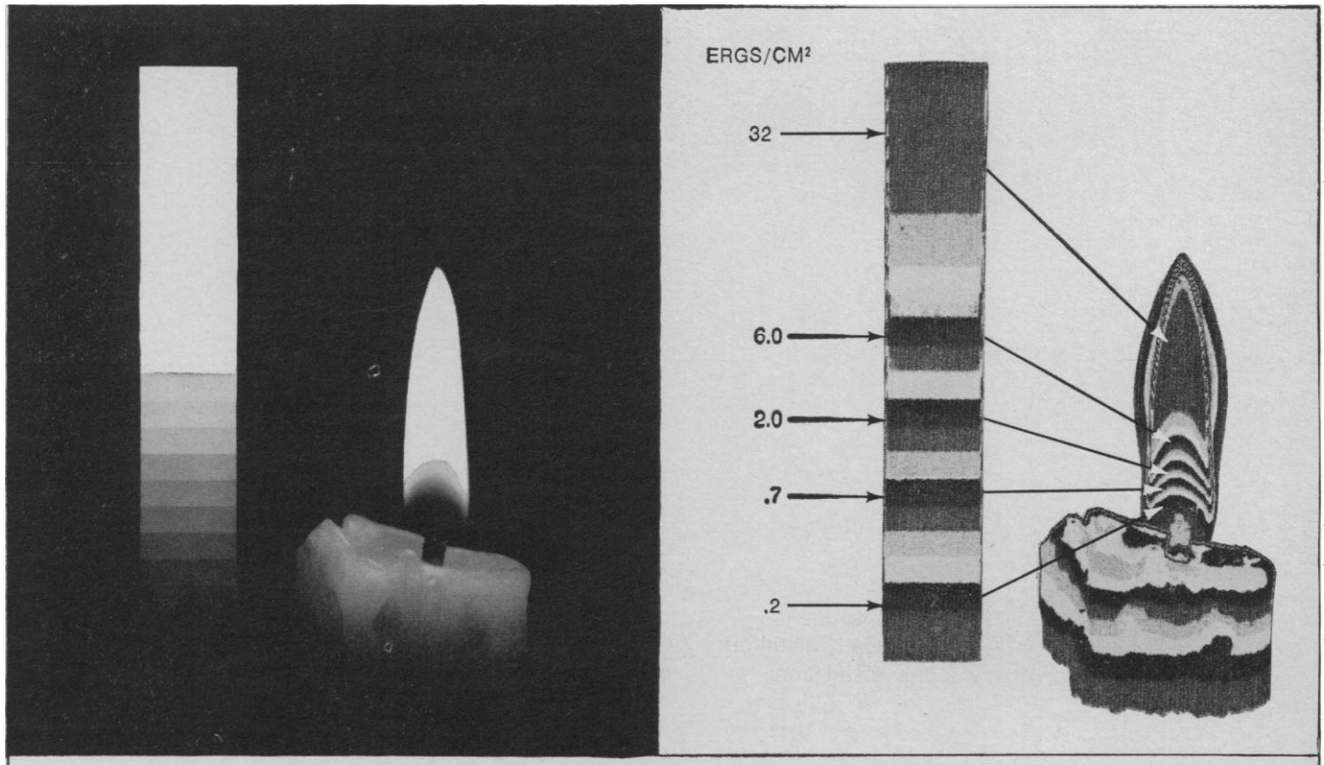

Photo of candle and step wedge along with tracing by our Image Quantizer™ (IQ). Exposing a uniformly illuminated step wedge on the same piece of film as the candle calibrates the system, since each density level on the film then corresponds to a known exposure. The IQ then produced contours of equal density and hence equal exposure. Dividing by the exposure time discloses the luminance at each point in the candle flame image. From this, and the aperture of the camera, the luminance of the flame itself was obtained.

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The Reichert Zetopan is one of the most advanced research microscopes available today. And that's just the start of it.

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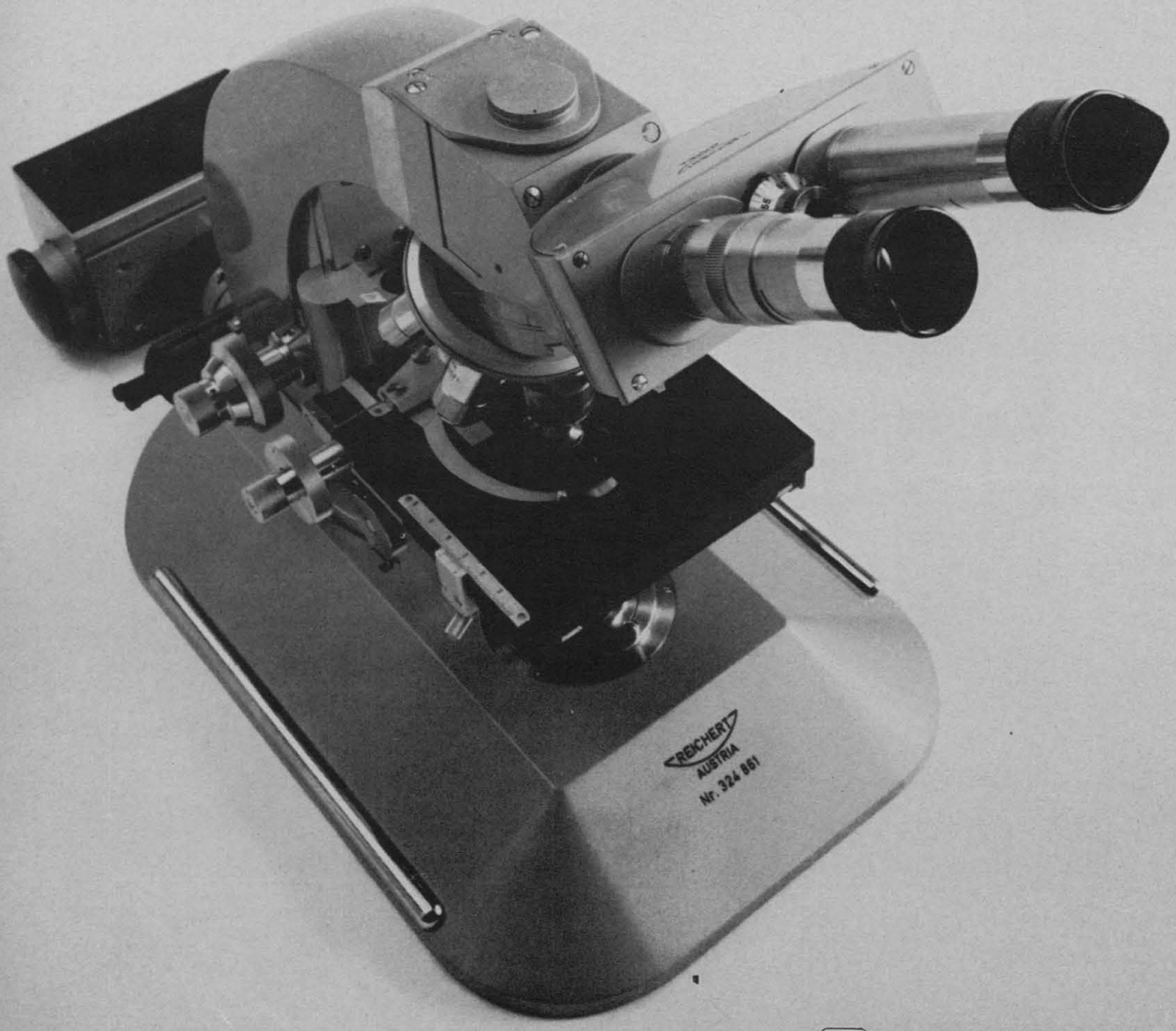

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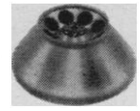
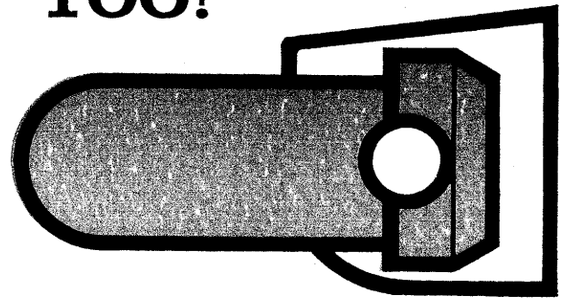


...AND THE HORIZONTALS, TOO!



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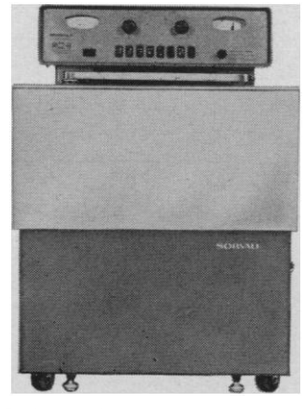

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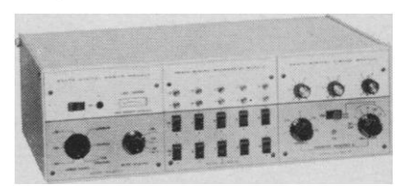

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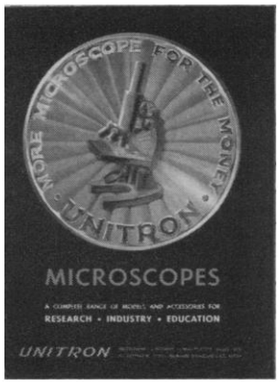

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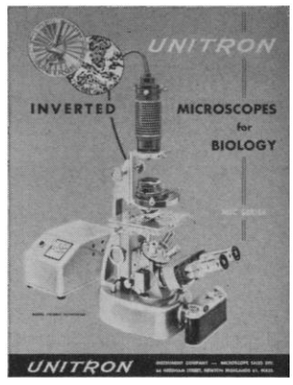

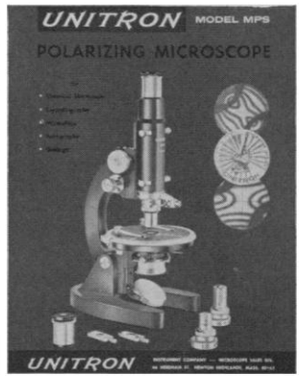

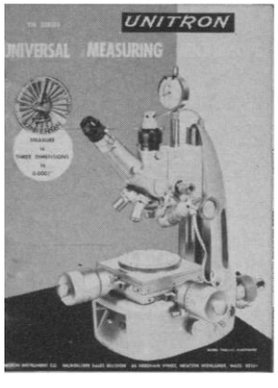

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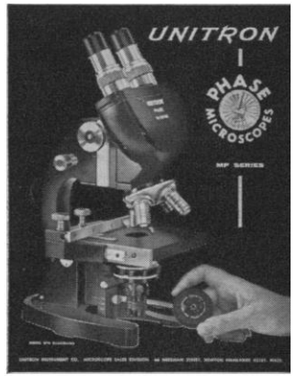

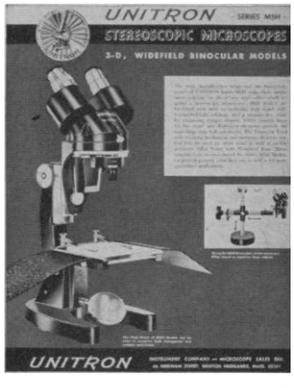

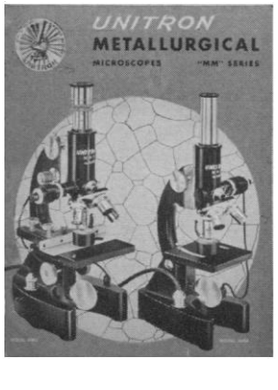

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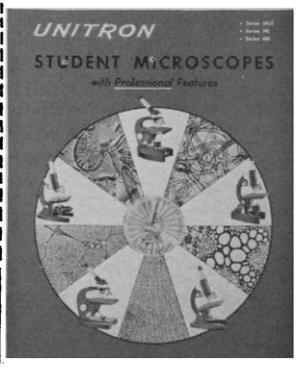

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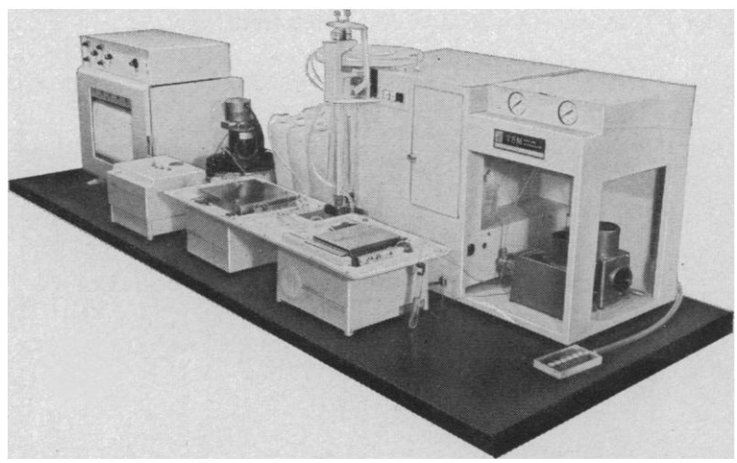

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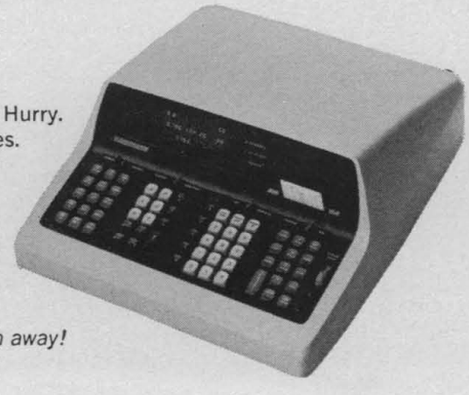

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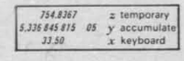

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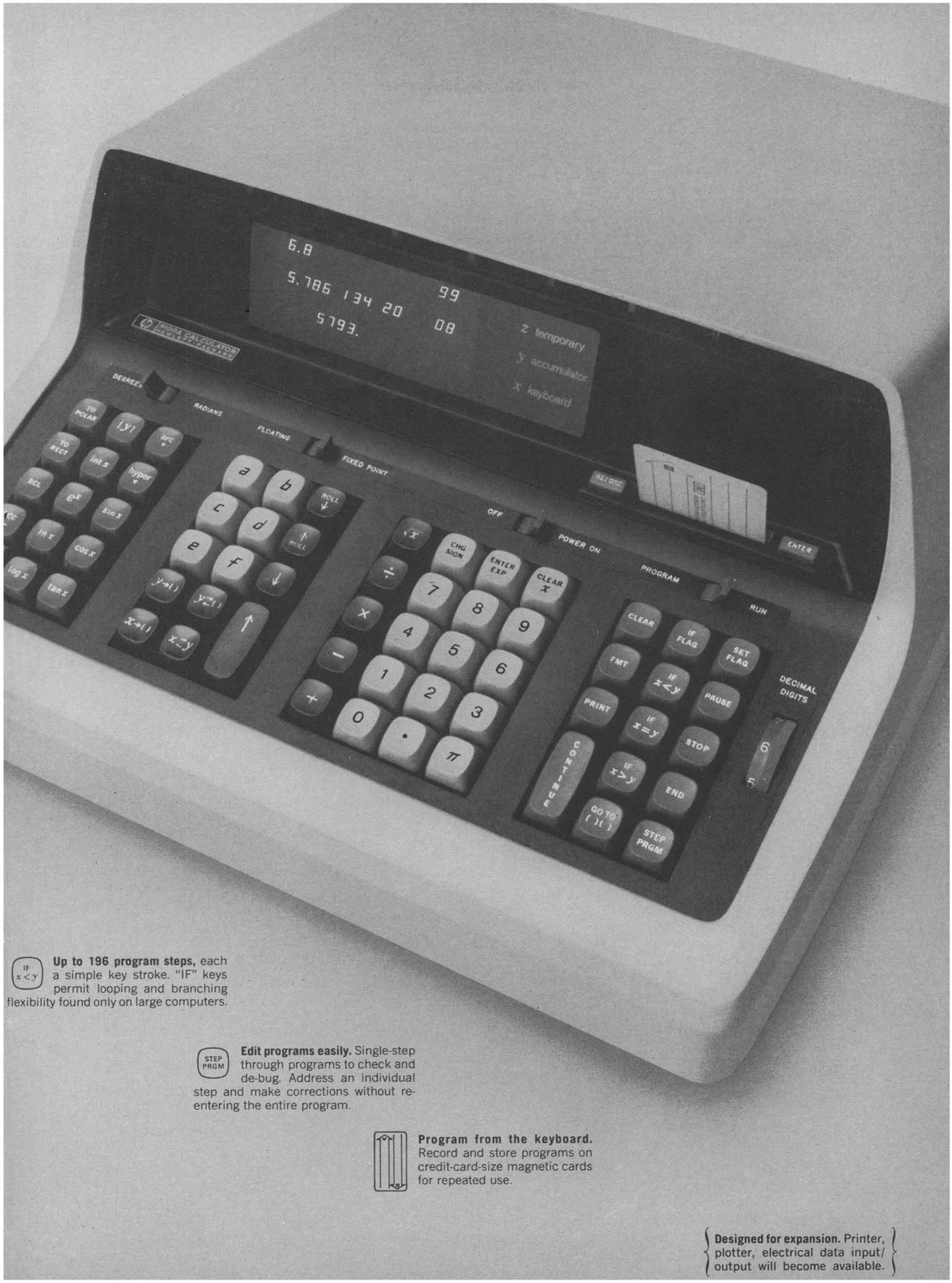

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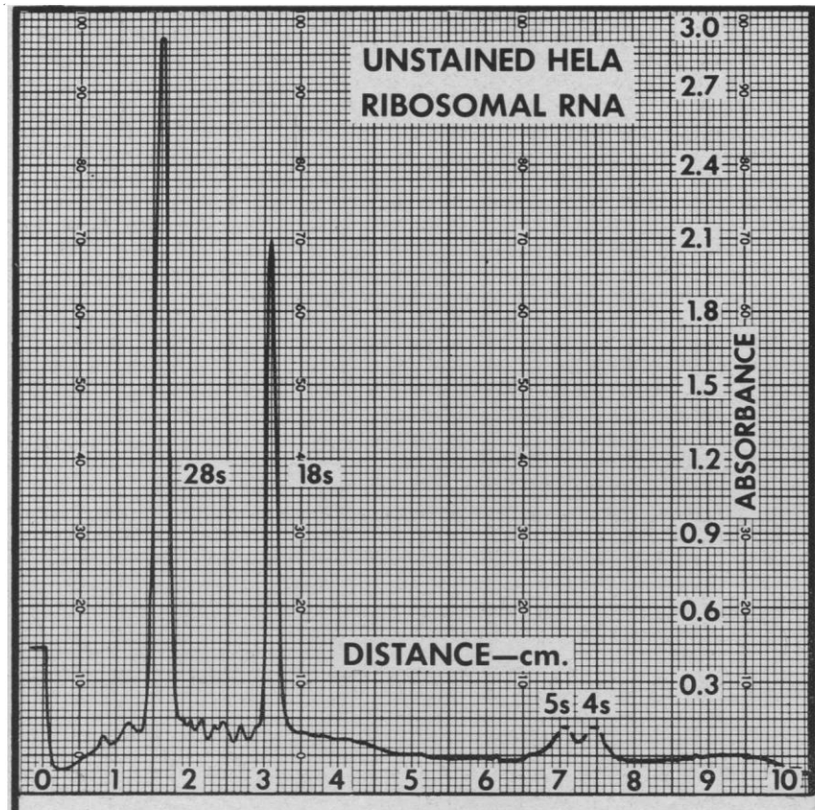

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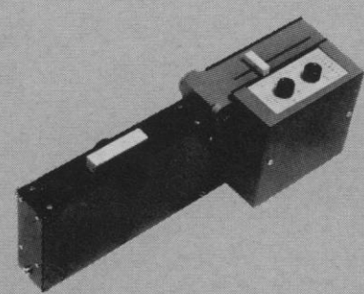
WITH THE

MODEL 2410 LINEAR TRANSPORT



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1. Richards, E. G., Coll, J. A., and Gratzer, W. B., "Disc Electrophoresis of Ribonucleic Acid in Polyacrilamide Gels." Anal. Biochem. *12*, 452-471, *1965*.

2. Leoning, W. E., "The Fractionation of High Molecular Weight Ribonucleic Acid by Polyacrylamide Gel Electrophoreses." Biochem. J. *102*, 251, *1967*.

Gilford Instrument Laboratories, Inc., Oberlin, Ohio 44074

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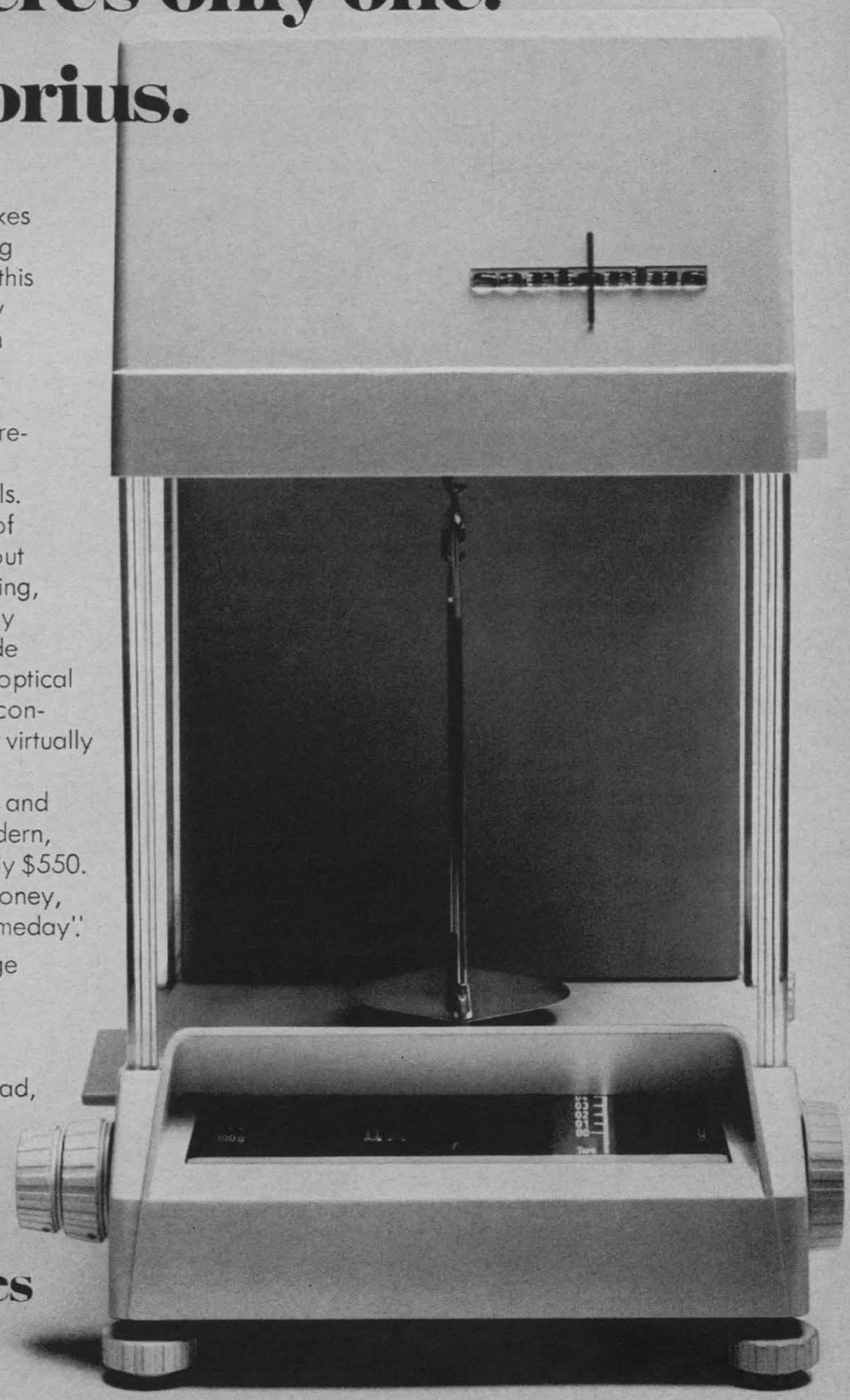

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Introducing Nikon auto-photomicrography

New Auto-Microflex AFM reduces exposure problems to automatic simplicity

The new Nikon AFM Auto-Microflex does away with the need for measuring, calculating and timing photomicrographic exposures. It does it all electronically, with automatic certainty and simplicity.

The AFM consists of two units: **The microscope attachment** contains the photo-image optics, a sensitive cadmium-sulfide light sensor, electronically controlled shutter, and finder-observation system. It fits any standard microscope, and may be used with a variety of standard camera bodies and film backs ranging from 35mm to 4 x 5", including Polaroid.

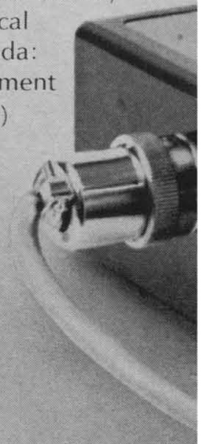
Two interchangeable viewers are supplied: a focusing telescope for high-power microscopy and a ground-glass screen with 7x magnifier for low power work. The latter is useful for group viewing.

The control unit is a compact, solid-state computer, electrically connected to the microscope attachment. The light sensor in the attachment measures the integrated brightness of the specimen, and transmits this information to the unit. The unit, having first been preset for the ASA film speed rating, translates this information into exposure duration or shutter timing.

A conventional camera cable release, fitted into the microscope attachment, is used to trigger the exposure. The shutter opens and closes automatically, precisely timed for the interval computed by the control unit. The range is from 1/125th second to 10 minutes.

A calibrated, compensation adjustment on the control unit permits increasing or decreasing the programed exposure in 1/3-stop increments where a somewhat different image density is desired. The control unit also permits manually selected exposures from 8 seconds to 1/125th. And it is provided with a standard PC terminal for photomicrography with synchronized electronic flash.

Price of the Nikon Auto-Microflex AFM, less camera back, is $795. For more details and specifications, write. Nikon Inc., Instrument Division, Garden City, N.Y. 11533 Subsidiary of Ehrenreich Photo-Optical Industries, Inc. (In Canada: Anglophoto Ltd. Instrument Division, Rexdale, Ont.)



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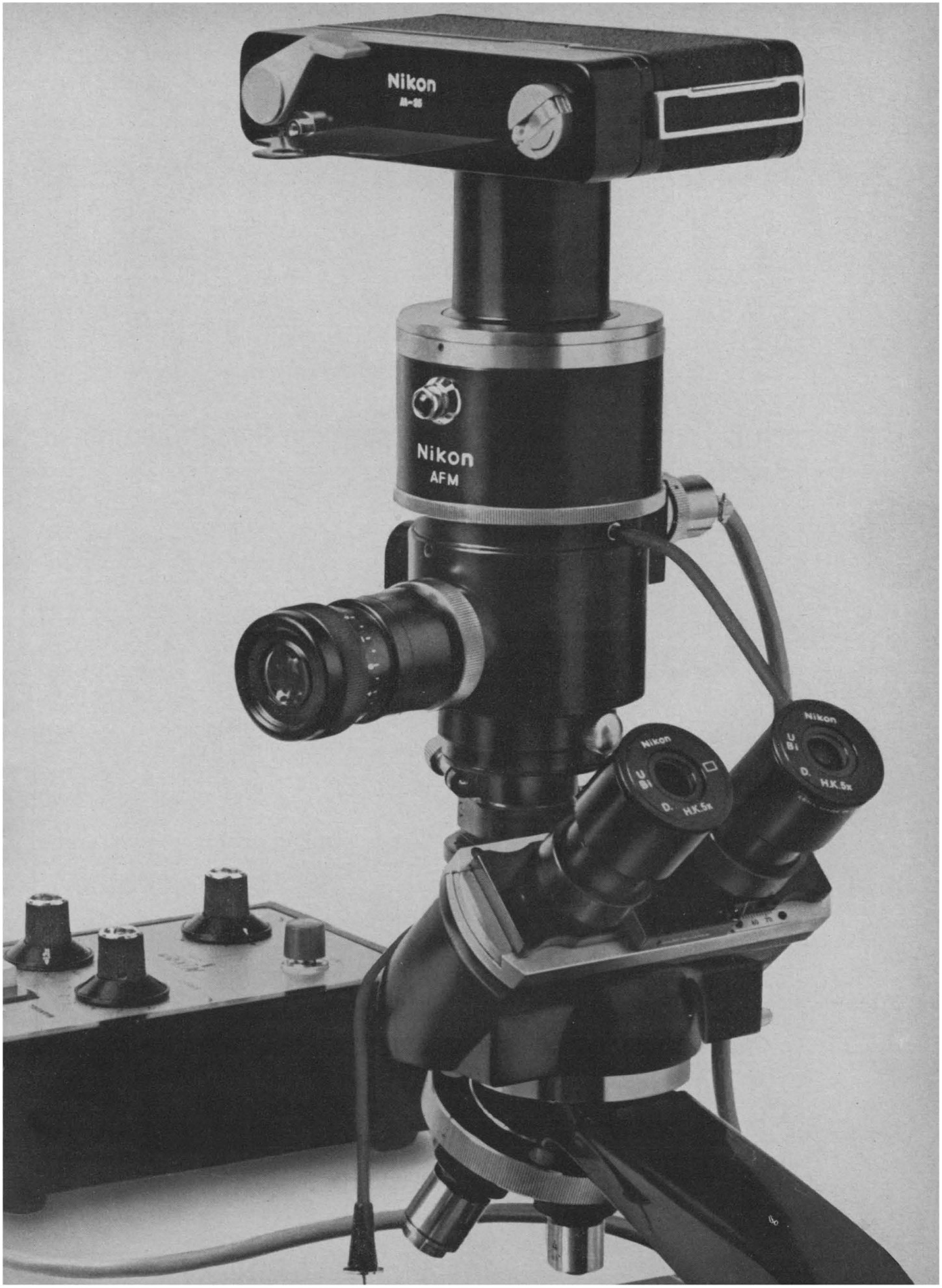
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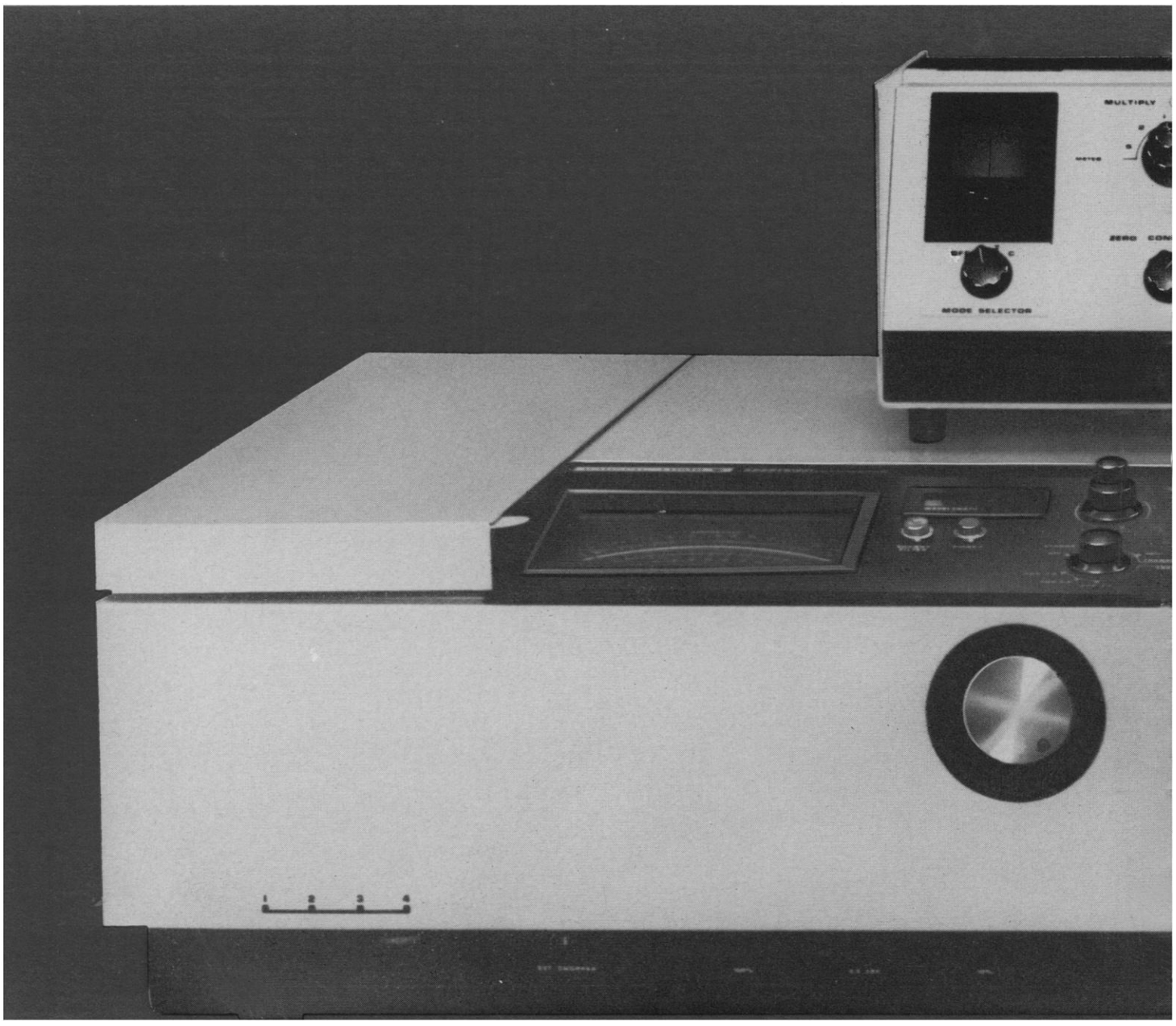

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ANALYTICAL SYSTEMS DIVISION

Many labs need to determine the presence of metallic elements—and often in trace amounts. The best way is atomic absorption analysis; it's specific for a given element and requires only simple preparations.

The Bausch & Lomb AC2-20 Atomic Absorption Spectrophotometer can make your AA procedures successful. It's a total performance instrument—tops in sensitivity and accuracy at low cost. It's simple, fast and convenient to use—with many failsafe features built-in. It's designed for safety—all the way through.

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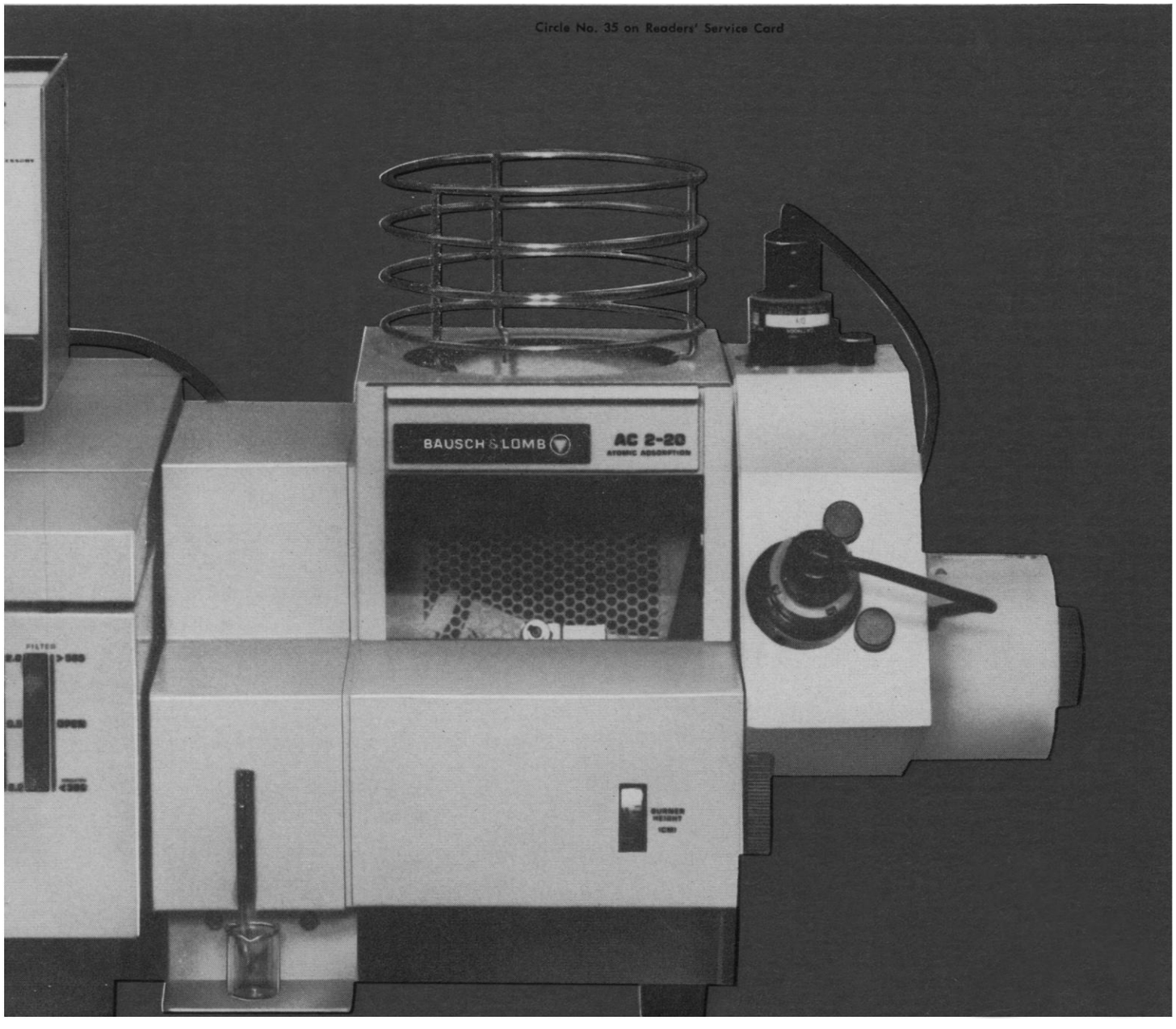

New from Coleman—fast-scanning Double-beam, UV-VIS Spectrophotometer with LINEAR absorbance readout.

Coleman's Model 124 brings you rapid scanning speeds and the *only* linear absorbance readout ever offered in a low-cost, double-beam, grating instrument.

With the new Model 124 Hitachi Spectrophotometer you can now do fully automatic ratio recording in the 190 to 800 mμ range, *without logarithmic scales.* Model 124 presentation is linear in both absorbance and transmittance. Now, for the first time, you get maximum readability with *both* high and low absorbance values. You can obtain readings in 0 to 2.0 absorbance, or expand your readings with the 0 to 1.0 absorbance range.

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Learn more about the outstanding performance characteristics of this new spectrophotometer, available in two ranges—190 to 700 mμ and 190 to 800 mμ. Send today for Coleman Bulletin S-312.

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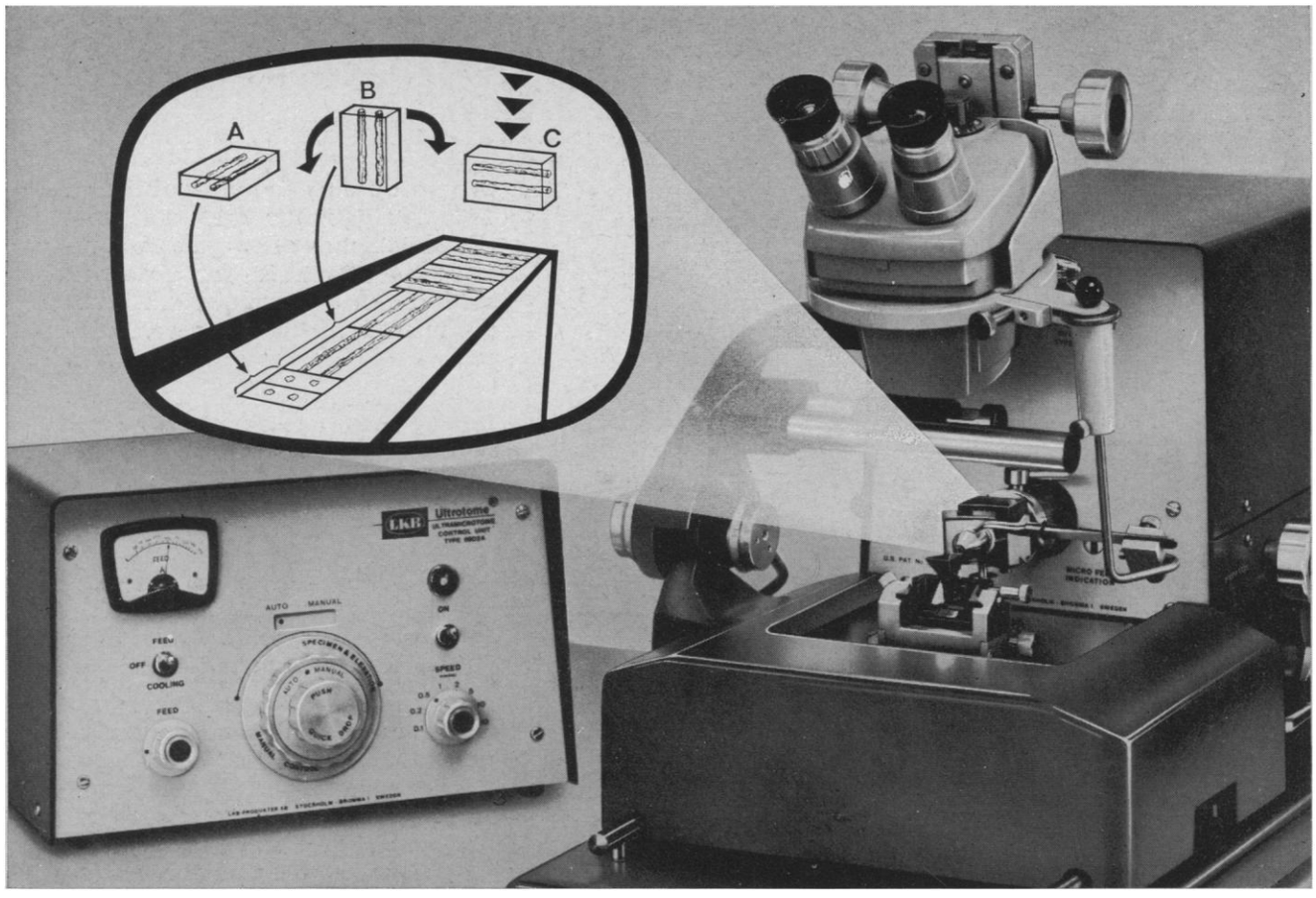

Focus on Ultramicrotomy

This is the second of a series presenting the LKB Ultrotome III by explaining its ability to solve problems in Ultramicrotomy.

LKB ULTROTOME III SOLVES PROBLEM OF ORIENTATION.

The grain of the structural detail of many specimens, such as fibers, films, membranes, muscle, skin and others, lies in more than one direction. Therefore this structural detail within the specimen must be located and the cutting correctly aligned to enable the best sections to be produced.

It is a great advantage to be able to produce sections either by cutting the specimen longitudinally or by making transverse cuts. The universal orientation head of the Ultrotome III used together with the vise-type specimen holder allows one and the same specimen to be adjusted in three directions perpendicular to each other without any need to loosen the specimen in the holder. Due to the goniometer-type construction of the orientation head with its unique 45° arc displacement, the axis of the specimen block can be positioned, and rigidly fixed at angles up to 45° with respect to the axis of the specimen arm. This provides the fastest and most precise structure orientation possible without the need for any reembedding or other additional procedures.

Having all-round mobility, and a vernier scale on the arc which allows adjustments of 0.1°, the orientation head needs only one precision adjustment to enable cutting sequences in two or three directions to be carried out.

This orientation head is exclusive to the LKB Ultramicrotome LKB 8800.

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from the patient's verbalizations, but confirm and verify its controls from ego and superego material. However, he would be presumptuous were he to anthropomorphise animal behavior.

In keeping with Tinbergen's extrapolations to groups perhaps one might remark that there is today no worldwide Institute for Interpopular Ideals.

HERMAN M. SEROTA
55 East Washington Street, Chicago, Illinois 60602

More on Forest Defoliation

Newton's statement "High forest is not particularly good habitat for many animals, birds, and insects . . ." ("Defoliation effects on forest ecology," Letters, 12 July) has no relevance to his conclusion that the use of herbicides and defoliants in Vietnam should not be criticized on the basis of ecological considerations.

It may well be true, as he implies, that the clearing or defoliation of near pure-stand temperate forests (by "game biologists") might lead to development of second growth or undergrowth vegetation which is more diverse than the forest and is thus a more suitable and more available habitat for many "animals." However, the situation is quite different in the tropical forests of Vietnam. There it is again true that "High forest is not particularly good habitat for many animals, birds, and insects . . . ," but it is also true that the tropical forest canopy, with its diversity of tree species, is the *only* habitat for countless more species of insects, birds, aboreal reptiles, mammals, and epiphytes. In short, most of the life in a tropical forest is connected with the canopy in some vital way. For the most part these organisms are not an important part of the naturally occurring second growth vegetation (river clearings, land slides) or of man-made clearings choked with second growth. These organisms have their specific food plants, nectar sources, nests, and territories in the canopy. They cannot be expected to move successfully into adjacent second growth (or even adjacent forest) when their part of the canopy is defoliated.

The life functions of tropical forest organisms take for granted, so to speak, the predictability of tropical climate. Defoliation or killing of vast areas of forest is an event unprecedented in the

evolutionary history of any tropical species. Even several months of defoliation in the forests of Vietnam is certain to cause the extinction of many animal populations. Improved productivity in the subsequent regeneration phase, which Newton deems to be beneficial, is of little consequence to these extinct populations.

Destruction or disruption of nature in vast areas of the tropics by *any* means is not, in our opinion, warranted by even the most noble goals of any country. The United States is setting a most unfortunate precedent in forest defoliation in Vietnam, but this is not the only aspect of our foreign policy which requires the advisory capabilities of competent tropical ecologists. Any use of pesticides, the building of dams, or initiation of large-scale agriculture in the tropical regions of the world, by the United States or any other nation, should have the approval of not only agriculture experts and other applied biologists, but of tropical ecologists and population biologists who are just beginning to understand the nature of the tropical forest—a crucial factor in the future of all mankind.

LAWRENCE E. GILBERT
PETER H. RAVEN
PAUL R. EHRLICH
Department of Biological Sciences,
Stanford University,
Stanford, California 94305

There is a point to be made about the illegality of the defoliation operation. The Geneva Protocol of 1925 prohibits ". . . the use in war of asphyxiating, poisonous, or other gases, and . . . all analogous liquids, materials and devices. . . ." Although this statute was signed by our representatives at Geneva, it has not to this day been ratified by the United States. Why? Nations by the score have adopted the agreement; it was fully respected by the belligerents in World War II; and it certainly has the support of the collective conscience of civilized mankind.

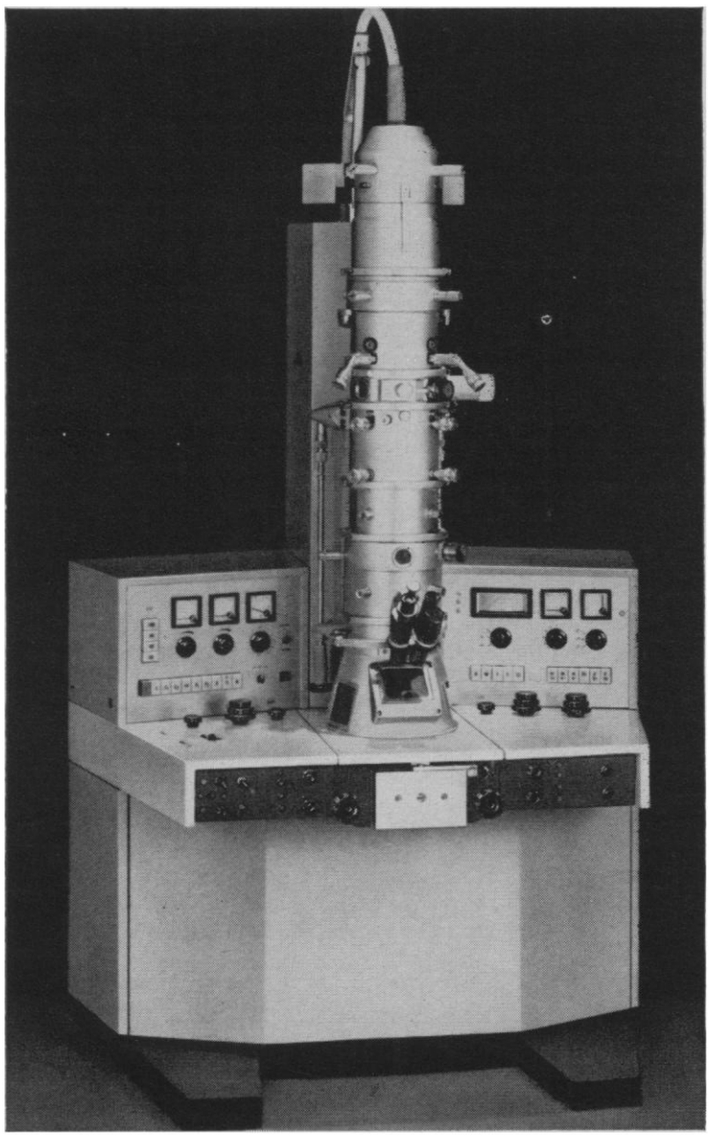
The widespread use of defoliants and herbicides and the massive application of CS (*o*-chlorobenzalmalononitrile) and other gases in Vietnam is not just illegal in terms of international law. It could open a Pandora's Box leading ultimately to the acceptance and use of ever more toxic and lethal materials. . . .

J. B. NEILANDS
Department of Biochemistry,
University of California,
Berkeley 94720

SIEMENS

High-Performance Electron Microscope

ELMISKOP 101



Now—the builders of the first commercial electron microscope present a new instrument that embodies the experience of nearly thirty years of series production. In the tradition of the ELMISKOP 1 and ELMISKOP 1A, of which over 1,000 have been supplied, the ELMISKOP 101 will prove to be the "workhorse of the industry."

The microscope column, from electron gun to photographic chamber, is ruggedly built for consistent performance. The microscope desk is designed for ease of use and ready extension of equipment for an almost infinite variety of applications.

Point to point resolution of 3.0 AU, a magnification range of 285 X to 280,000 X, high image stability and simplified operation are but a few outstanding high performance features... see listing below.

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Partial list of specifications:

Diffraction without image forming lenses, camera length... 770mm

Diffraction with image forming lenses, diffraction length... 90m

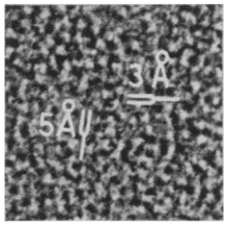
X-Ray Microanalysis Attachment available

Condenser stigmator, objective stigmator, intermediate lens stigmator... all 8-pole electromagnetic

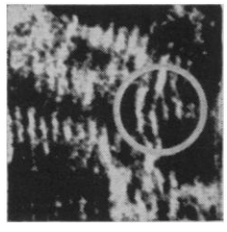
Intermediate screen... 42mm

All lenses automatically temperature controlled

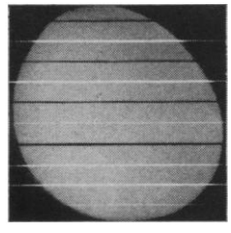
Large viewing screen... 203mm diameter



Resolution test showing point-to-point resolution up to 3 AU.



Layer planes of 3.4 AU spacing in graphitized carbon black. A dislocation is seen in the circled area. R. D. Heidenreich, Bell Laboratories.



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6 September 1968, Volume 161, Number 3845 **SCIENCE**

The Next Rosetta Stone

The pessimistic fear that man will destroy the genus *Homo* may be justified. But most catastrophes that could have that effect are more likely to spare at least a few human beings, perhaps persons already adapted or ones who can adapt most quickly to primitive conditions. Survival would be their principal business for some generations, but after a time there would be scholarly curiosity about the remains of earlier civilizations.

If "a great society is ultimately known for the monuments it leaves for later generations," as Professor Abraham Pais of Rockefeller University has said, what a puzzle we have constructed for those future scholars! The pyramids would probably still stand. Remains of great cities would persist, as would highways, canals, and airfields. Architectural styles of neighboring ruins would often be very different. Latin inscriptions would appear in widely scattered parts of the world. In the rubble of Washington would be found a misleadingly large number of bronze men on horseback. A few books might survive, but the odds would favor *Dick and Jane* over Toynbee. Myths and legends about the ancient times before the great catastrophe would often be at odds with the physical remains. We can be sure there would be arguments over what those earlier people and earlier times were like.

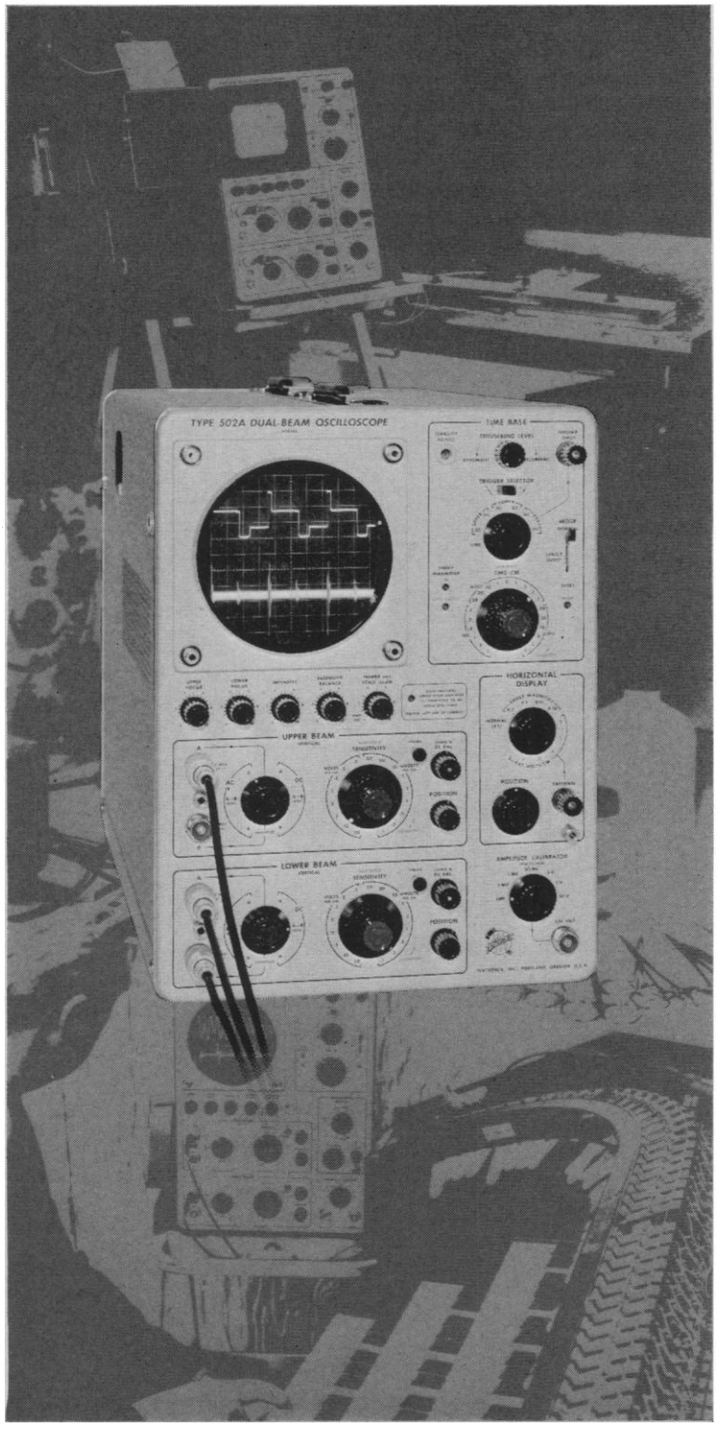
How might we help future scholars solve the puzzles we leave? Already there are a number of time capsules buried here and there. This year, to commemorate the 100th anniversary of the discovery of helium, a selection of products of the contemporary world, including microprint copies of *Science*, are being sealed in capsules in Amarillo, Texas, to be opened in 25, 50, 100, and 1000 years. Such capsules might be helpful, but something more carefully planned for the indefinite future is called for. Any amateur archeologist who has imagined himself the lucky finder of the Rosetta Stone will know that this is just the thing those future archeologists would like to find.

How, and of what, and where should we construct our modern Rosetta Stone? The physical material should obviously be long lasting but not intrinsically valuable; the basalt of the original Rosetta Stone would be better than gold. But we know more about materials than did our ancestors; we should be able to select a better material.

Where should we place it? Perhaps we should leave identical copies in several places. Or perhaps, instead of duplicating each other, different "stones" should carry different information, including instructions for finding the others. As for languages, Latin and English are good candidates, but which others would be most helpful? Should the "stones" be periodically revised to be brought up to date? Should they be buried in the largest cities, preserved in great monuments of their own, or treated in some other way that would protect them well and also signal their presence? In the recent science fiction success, *2001*, a magnetic anomaly was used as a signaling device.

But most important of all, what would we want to tell the future scholars? What information would best help them to learn about this civilization, to interpret the puzzles we leave behind, and to understand why and how a civilization that could build so greatly could not preserve itself? There is a possibility that our decisions of what we would most like to tell a future civilization will in fact help determine what that civilization will know of us and our time. It is also possible that deciding what to tell those future scholars would put the accomplishments of our civilization in perspective for ourselves.—DAEL WOLFLE

The TEKTRONIX Type 502A means . . .



DUAL BEAM

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100 μV/cm DEFLECTION FACTOR

Usable sensitivity for difficult low-level measurements. Bandwidth is 100 kHz at 100 μV/cm, increasing to 1 MHz at 5 mV/cm and above. Drift is typically $\leq$400 μV/h with constant temperature and line voltage. Internal noise is typically $\leq$30 μV referred to the input.

DIFFERENTIAL INPUTS

Common-mode rejection ratio is $\geq$50,000: 1, DC coupled, from 100 μV/cm to 2 mV/cm with a dynamic range of $\pm$15 V. Translated into operational terms this means the ability to exclude unwanted signals or dc levels over a wide range of applications.

IDENTICAL X-Y AMPLIFIERS

The upper beam vertical amplifier can be switched to drive the horizontal deflection system. The result is an X-Y measurement capability with less than one degree phase difference between channels (DC to 100 kHz measured at 100 μV/cm) and the operational control of identical, high sensitivity, differential amplifiers.

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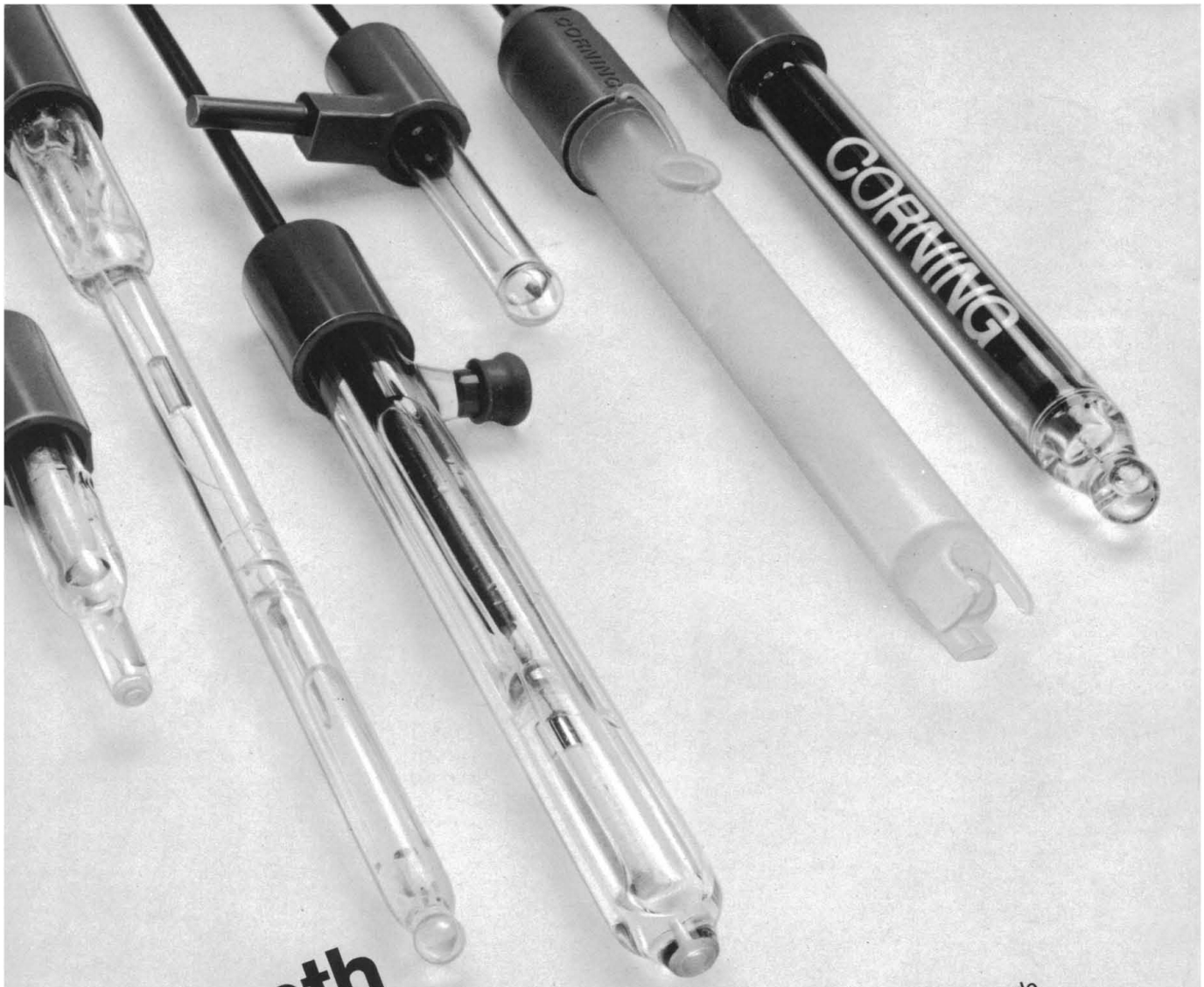

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7–11. Armed Forces Inst. of **Pathology**, Washington, D.C. (Director, MEDEM-PG, Armed Forces Inst. of Pathology, Washington, D.C. 20305)

8–10. Conference on **Analytical Chemistry in Nuclear Technology**, 12th, Gatlinburg, Tenn. (L. J. Brady, Oak Ridge Natl. Lab., P.O. Box X, Oak Ridge, Tenn. 37830)

8–13. American Soc. of **Clinical Hypnosis**, Chicago, Ill. (F. D. Nowlin, 800 Washington Ave., SE, Minneapolis, Minn. 55414)

9–11. American **Ceramic** Soc., Bedford, Pa. (C. R. Kurkjian, Bell Telephone Labs., Murray Hill, N.J. 07974)

9–11. **Meteoritical** Soc., 31st., Cambridge, Mass. (U. B. Marvin, Smithsonian Astrophysical Observatory, 60 Garden St., Cambridge 02138)

9–11. American **Physical** Soc., Athens, Ga. (L. W. Seagondollar, Dept. of Physics, North Carolina State Univ., Raleigh 27607)

9–12. **Optical** Soc. of America, Pittsburgh, Pa. (M. E. Warga, Optical Soc. of America, 2100 Pennsylvania Ave., NW, Washington, D.C. 20037)

10–11. Symposium on **Applications of Ferroelectrics**, Washington, D.C. (H. L. Stadler, Ford Motor Co., Dearborn, Mich.)

10–12. American **Thyroid** Assoc., Washington, D.C. (W. McConahey, 200 First St., SW, Rochester, Minn. 55901)

11–13. Midwest Forum on **Allergy**, Chicago, Ill. (D. B. Frankel, 111 N. Wabash Ave., Chicago 60602)

11–13. **Philosophy of Science** Assoc., Pittsburgh, Pa. (G. J. Massey, Michigan State Univ., East Lansing)

11–18. American Soc. of **Clinical Pathologists**, New York, N.Y. (Administrative Secretary, 445 N. Lake Shore Dr., Chicago, Ill. 60611)

13–16. **Rare Earth Research,** 7th conf., San Diego, Calif. (J. F. Nachman, Applied Science Dept., Solar, San Diego 92112)

14–17. Association of Official **Analytical Chemists**, Washington, D.C. (L. G. Ensminger, P.O. Box 540, Benjamin Franklin Sta., Washington, D.C. 20014)

14–17. **Clay Minerals** Soc., Bloomington, Ind. (J. B. Droste, Dept. of Geology, Indiana Univ., Bloomington 47401)

14–17. Conference on **Plasma Instabilities in Astrophysics**, Pacific Grove, Calif. (P. A. Sturrock, Inst. for Plasma Research, Via Crespi, Stanford Univ., Stanford, Calif. 94305)

14–17. **Metallurgical** Soc., Detroit, Mich. (C. K. Carlson, American Inst. of Mining, Metallurgical and Petroleum Engineers, 345 E. 47 St., New York 10017)

14–18. American Soc. of **Civil Engineers**, Pittsburgh, Pa. (W. H. Wisely, American Soc. of Civil Engineers, 345 E. 47 St., New York 10017)

14–18. American College of **Surgeons**, Atlantic City, N.J. (Director, 55 E. Erie St., Chicago, Ill.)

15–16. **Industrial Hygiene** Foundation, 33rd, Pittsburgh, Pa. (R. T. P. deTreville, Industrial Hygiene Foundation, 4400 Fifth Ave., Pittsburgh 15213)

15–18. American **Dietetic** Assoc., 51st, San Francisco, Calif. (The Association, 620 N. Michigan Ave., Chicago, Ill.)

17. Animal **Nutrition** Research Council,

Washington, D.C. (L. Michaud, Merck Sharp & Dohme Research Labs., Rahway, N.J. 07065)

17–18. National **Fluid Power** Assoc., Chicago, Ill. (W. R. Smith, 3300 S. Federal St., Chicago 60616)

17–19. California Assoc. of **Criminalists,** 32nd semiannual, Lake Tahoe. (The Association, Box 2172, Redwood City, Calif. 94064)

17–19. Central **Neuropsychiatric** Assoc., Oklahoma City, Okla. (C. S. Hoekstra, 8215 Westchester Dr., Dallas, Tex. 75225)

17–19. American Assoc. for the **Surgery of Trauma,** Montreal, P.O., Canada. (S. R. Gaston, 180 Fort Washington Ave., New York, N.Y.)

19–23. American Soc. of **Anesthesiologists** Inc., Washington, D.C. (Assistant Executive Secretary, 515 Busse Highway, Park Ridge, Ill.)

19–24. American Acad. of **Pediatrics,** Chicago, Ill. (The Academy, Dept. of Public Information, 1801 Hinman Ave., Evanston, Ill. 60204)

20–21. American Assoc. of **Poison Control Centers,** 11th, Chicago, Ill. (C. A. Walton, Drug Information Center, Univ. of Kentucky Medical Center, 800 Rose St., Lexington)

20–24. American Soc. for **Information Science,** 31st., Columbus, Ohio. (J. B. Fox, Chemical Abstracts Service, Ohio State Univ., Columbus 43210)

21–23. Interscience Conf. on **Antimicrobial Agents and Chemotherapy,** 8th, New York, N.Y. (American Soc. for Microbiology, 115 Huron View Blvd., Ann Arbor, Mich. 48103)

21–23. **Solar Energy** Soc., Palo Alto, Calif. (The Society, Arizona State Univ., Tempe 85281)

21–24. Society for **Industrial and Applied Mathematics,** Philadelphia, Pa. (B. R. Agins, Courant Inst. of Mathematical Sciences, New York Univ., 251 Mercer St., New York 10012)

21–25. American Assoc. for **Lab. Animal Science,** 19th, Las Vegas, Nev. (J. J. Garvey, Box 10, Joliet, Ill. 60434)

22–24. **Shock and Vibration** Symp., Monterey, Calif. (W. W. Mutch, Code 6020, Shock and Vibration Information Center, Naval Research Lab., Washington, D.C. 20390)

23. American Oil **Chemists** Soc., New York, N.Y. (C. H. Hauber, The Society, 35 E. Wacker Dr., Chicago, Ill. 60601)

23–24. **Helium Applications** Symp., Washington, D.C. (L. A. Gutkind, 725 Liberty, Pitsburgh, Pa. 15222)

23–25. American **Ceramic** Soc., Pasadena, Calif. (H. L. Hedrick, Southern Counties Gas Co., 720 W. 8 St., Los Angeles, Calif. 90017)

23–25. **IEEE Nuclear Science** Symp., Montreal, Canada. (O. L. Tiffany, Bendix Corp., Aerospace Systems Div., 3300 Plymouth Rd., Ann Arbor, Mich. 48107)

24–25. Metropolitan Engineers Council on **Air Resources,** New York, N.Y. (R. A. Fox, P.O. Box 270, Mount Vernon, N.Y. 10550)

24–26. Association for **Research in Ophthalmology,** Chicago, Ill. (Dept of Ophthalmology, Univ. of Florida College of Medicine, Gainesville 32601)

24–26. Society for the **Scientific Study of**

Religion, Montreal, P.Q., Canada. (S. Z. Klausner, 3800 Locust St., Philadelphia, Pa. 19104)

25–26. **Orton** Soc., Inc., New York N.Y. (M. B. Rawson, Orton Soc., Inc., Box 153, Pomfret, Conn. 06258)

26–27. American College of **Dentists,** Miami Beach, Fla. (O. W. Brandhorst, 4236 Lindell Blvd., St. Louis, Mo. 63108)

26–27. Southern **Electroencephalographic** Soc., Birmingham, Ala. (G. S. Ferriss, 1542 Tulane Ave., New Orleans, La. 70112)

27–30. Computer Aided **Circuit Design and Analysis,** St. Charles, Ill. (Natl. Electronics Conf., Inc., Oakbrook Executive Plaza No. 2, 1211 W. 22 St., Oak Brook, Ill. 60521)

27–1. American Acad. of **Ophthalmology and Otolaryngology,** Chicago, Ill. (W. L. Benedict, 15 Second St., SW, Rochester, Minn. 55901)

27–1. American Soc. of **Plastic and Reconstructive Surgeons,** New Orleans, La. (P. P. Pickering, 2850 Sixth Ave., Suite B, San Diego, Calif. 92103)

28–29. Conference on **Evaluation of Safety of Cosmetics,** Washington, D.C. (AMA Committee on Cutaneous Health and Cosmetics, 535 N. Dearborn St., Chicago, Ill. 60610)

28–29. International Conf. on **Materials,** Pittsburgh, Pa. (R. B. Barnhart, Conf. Manager, Warner Hall 111, Carnegie-Mellon Univ., Pittsburgh)

28–30. **Hybrid Microelectronics** Symp., Chicago, Ill. (J. English, Cozzens and Cudahy, 9501 W. Devon Ave., Rosemont, Ill. 60018)

28–31. American Assoc. of **Blood Banks,** Washington, D.C. (L. J. James, 30 N. Michigan Ave., Chicago, Ill. 60602)

28–31. **Instrument** Soc. of America, New York, N.Y. (H. S. Kindler, The Society, 530 William Penn Pl., Pittsburgh, Pa. 15219)

28–1. Society for **Experimental Stress Analysis,** San Francisco, Calif. (The Society, 21 Bridge Sq., Westport, Conn. 06880)

29–31. Conference and Workshop on **Applied Climatology,** Asheville, N.C. (H. T. Harrison, Route 1, Box 266, Weaterville, N.C. 28787)

31–1. **Educational** Conf., 33rd, New York, N. Y. (W. S. Litterick, Educational Records Bureau, 21 Audubon Ave., New York 10032)

31–1. **Entomological** Soc. of America, 40th, Philadelphia, Pa. (J. P. Johnson, Connecticut Agricultural Experiment Sta., Box 1106, New Haven 06504)

31–2. **Gerontological** Soc., Denver, Colo. (The Society, 660 S. Euclid, St. Louis, Mo. 63110)

31–1. American Soc. for **Microbiology,** 8th, New York, N.Y. (R .W. Sarber, 115 Huron View Blvd., Ann Arbor, Mich.)

31–1. Symposium on **Social Behavior,** 2nd, Oxford, Ohio. (R. A. Hoppe, Dept. of Psychology, Miami Univ., Oxford 45056)

31–1. American Soc. of **Tropical Medicine and Hygiene,** Atlanta, Ga. (G. M. Jeffery, P.O. Box 295, Kensington, Md.)

31–2. Society of **Photographic Scientists and Engineers,** Washington, D.C. (R. A. Jones, Papers Chairman, Mail Sta. 68, Perkin-Elmer Corp., Norwalk, Conn. 06852)

November

1–2. Central Soc. for **Clinical Research,** Chicago, Ill. (J. Eckstein, Dept. of Internal Medicine, Univ. of Iowa Hospitals, Iowa City 52240)

1–3. National Council for **Geographic Education,** 54th, Kansas City, Mo. (E. Eiselen, The Council, Room 1532, 111 W. Washington St., Chicago, Ill. 60602)

1–4. **Research in Medical Education,** 7th conf., Houston, Tex. (P. J. Sanazaro, Assoc. of American Medical Colleges, 2530 Ridge Avenue, Evanston, Ill. 60201)

6–8. Conference on **Composition and Dynamics of the Upper Atmosphere,** El Paso, Tex. (J. E. Morris, P.O. Box 26065, El Paso 79925)

6–8. **Diffraction** Conf., 26th, Pittsburgh, Pa. (S. Diamond, U.S. Steel Corp., Applied Research Lab., Monroeville, Pa. 15146)

6–8. Northeast **Electronics Research,** Mtg., Boston, Mass. (A. Uhlir, Inst. of Electrical and Electronics Engineers, NEREM-68, 31 Channing St., Newton, Mass. 02158)

6–8. International **Spi Cellular Plastics** Conf., New York, N.Y. (S. Steingiser, Monsanto Research Corp., Station B, Box 8, Dayton, Ohio 45407)

6–9. American **Ceramic** Soc., Pittsburgh, Pa. (The Society, 4055 N. High St., Columbus, Ohio 43214)

6–9. **Operations Research** Soc. of America, 34th, Philadelphia, Pa. (J. H. Engel, c/o Center for Naval Analysis, 1401 Wilson Blvd., Arlington, Va. 22209)

6–9. Conference on **Respiratory Therapy,** Boston, Mass. (M. J. Nicholson, 605 Commonwealth Ave., Boston 02215)

7–9. American Soc. of **Cytology,** Cleveland, Ohio. (W. R. Lang, 1025 Walnut St., Philadelphia, Pa. 19107)

7–10. Association of **Clinical Scientists,** Washington, D.C. (R. P. MacFate, 300 N. State St., Chicago, Ill. 60610)

8–11. American **Physical** Soc., Plasma Physics Div., Austin, Tex. (W. E. Drummond, Physics Bldg. 330, Univ. of Texas, Austin 78712)

10–15. American Soc. of **Agronomy,** New Orleans, La. (M. Stelly, c/o The Society, 677 S. Segoe Rd., Madison, Wis. 53711)

10–15. **Crop Science** Soc. of America, New Orleans, La. (Secretary, 677 S. Segoe Rd., Madison, Wis.)

10–15. American Assoc. for **Inhalation Therapy,** Houston, Tex. (M. T. Bowers, 4075 Main St., Riverside, Calif. 92501)

11–13. Soc. of **Engineering Science,** 6th technical mtg., Princeton, N.J. (A. C. Eringen, Dept. of Aerospace and Mechanical Sciences, Engineering Quadrangle, Princeton Univ., Princeton 08540)

11–13. **Genetics** Soc. of America, Boston, Mass. (B. Wallace, Dept. of Genetics, Cornell Univ., Ithaca, N.Y.)

11–14. American **Nuclear** Soc., Washington, D.C. (Executive Secretary, 244 E. Ogden Ave., Hinsdale, Ill. 60521)

11–15. American College of **Preventive Medicine,** Detroit, Mich. (E. A. Piszcek, 6410 N. Leona Ave., Chicago, Ill. 60646)

11–15. American **Public Health** Assoc., 96th, Detroit, Mich. (Executive Director, 1790 Broadway, New York, N.Y.)

13–15. Eastern **Analytical** Symp., New

York, N.Y. (L. M. Brancone, Lederle Labs., Pearl River, N.Y. 10965)

13–16. National Easter Seal Soc. for **Crippled Children and Adults**, Boston, Mass. (Natl. Easter Seal Soc., 2023 W. Ogden Ave., Chicago, Ill. 60612)

14–16. Southern **Thoracic Surgical** Assoc., San Juan, Puerto Rico. (H. H. Seiler, 517 Bayshore Blvd., Tampa, Fla. 33606)

15–16. American **Psychiatric** Assoc., Chicago, Ill. (L. Rudy, Illinois Psychiatric Inst., 1601 W. Taylor St., Chicago 60612)

17–19. **Fluid Controls** Inst., Oak Brook, Ill. (The Institute, P.O. Box 1485, Pompano Beach, Fla. 33061)

17–20. Academy of **Pharmaceutical** Sciences, 5th, Washington, D.C. (S. W. Goldstein, 2215 Constitution Ave., NW, Washington, D.C. 20037)

18–20. Institute of **Electrical and Electronics Engineers**, 7th, Cocoa Beach, Fla. (L. E. Williams Aerospace Corp., P.O. Box 4007, Patrick Air Force Base, Fla. 32925)

18–20. American **Petroleum** Inst., Chicago, Ill. (Secretary, Program Commission, 1271 Avenue of the Americas, New York 10020)

18–21. Symposium on **Basic Mechanisms of the Epilepsies**, Colorado Springs, Colo. (J. K. Penry, Section on Epilepsy, Room 8A-03, Bldg. 31, National Inst. of Neurological Diseases and Blindness, National Institutes of Health, Bethesda, Md. 20014)

18–21. Conference on **Engineering in Medicine and Biology**, Houston, Tex. (W. T. Maloney, Suite 620, 6 Beacon St., Boston, Mass. 02108)

18–21. Conference on **Magnetism and Magnetic Materials**, 14th, New York, N.Y. (D. T. Teaney, IBM Thomas J. Watson Research Center, Box 218, Yorktown Heights, N.Y. 10598)

18–22. Society of the **Plastics Industry**, Inc., Chicago, Ill. (The Society, 250 Park Ave., New York 10017)

18–22. American **Water Resources** Conf., 4th, New York, N.Y. (P. Cohen, U.S. Geological Survey, 1505 Kellum Place, Mineola, N.Y. 11501)

19. **Air Pollution Control**, Columbia, Mo. (Extension Div., Whitten Hall, Univ. of Missouri, Columbia)

19–20. Council on **Arteriosclerosis** of the American Heart Assoc., Bal Harbour, Fla. (Dept. of Councils and International Program, American Heart Assoc. Natl. Office, 44 E. 23 St., New York 10010)

19–21. **Photovoltaic Specialists** Conf., 7th, Pasadena, Calif. (R. E. Fischell, Applied Physics Lab., Johns Hopkins Univ., 8621 Georgia Ave., Silver Spring, Md. 20910)

19–22. **Acoustical** Soc. of America, Cleveland, Ohio. (The Society, 133 E. 45 St., New York 10017)

20–22. National Soc. for the **Prevention of Blindness**, Inc., New York, N.Y. (J. W. Ferree, 79 Madison Ave., New York 10016)

20–22. **Microelectronic Packaging and Interconnection** Conf., Palo Alto, Calif. (D. H. O'Neill, Soc. of Automotive Engineers, 485 Lexington Ave., New York 10017)

20–24. Society for **Clinical and Experimental Hypnosis**, 20th, Chicago, Ill. (The Society, 353 W. 57 St., New York 10019)

21–22. **Chemical Kinetics** Symp., Chapel

Hill, N.C. (L. Pedersen, Dept. of Chemistry, Univ. of North Carolina, Chapel Hill 27514)

21–24. American **Anthropological** Assoc., Seattle, Wash. (Executive Secretary, 1530 P St., NW, Washington, D.C. 20005)

25–27. American **Physical** Soc., Miami, Fla. (Executive Secretary, 538 W. 120 St., New York 10027)

29–30. **Membrane Proteins** Symp., New York, N.Y. (J. Newkirk, New York Heart Assoc., 2 E. 64 St., New York 10021)

29–30. National Federation of Catholic **Physicians'** Guild, Miami Beach, Fla. (R. H. Herzog, 2825 N. Mayfair Rd., Gelman. Wiley, New York, 1968. xiv + Milwaukee, Wis. 53222)

International and Foreign Meetings

October

7–9. International **Gel Permeation Chromatography** Seminar, 6th, Miami Beach, Fla. (Chairman, The Seminar, % Waters Associates, Inc., 61 Fountain St., Framingham, Mass. 01701)

7–11. International Federation for Preventive **Medicine and Hygiene**, 5th, Rome, Italy. (Via Filippo Civinni 37, Rome)

7–11. **Rheology**, 5th intern. congr., Kyoto, Japan. (M. Horio, Dept. of Polymer Chemistry, Kyoto Univ., Kyoto)

7–16. International Council for the **Exploration of the Sea**, 56th, Copenhagen, Denmark. (H. Tambs-Lyche, Charlottenlund Slot, Charlottenlund, Denmark)

13–19. International **Astronautical** Congr., 19th, New York, N.Y. (Intern. Astronautical Federation, 250, rue Saint-Jacques, Paris 5, France)

18–20. International Congr. on **Higher Nervous Activity**, 1st intern., Milan, Italy. (G. F. Goldwurm, Clinica Psichiatrica della Universita, Via G. F. Besta, 1, Milan, Italy)

21–23. **Spectroscopy** Symp. of Canada, Toronto, Ont. (B. St. George, B-A Research and Development Co., Ontario, Canada)

21–25. Symposium on **Advanced and High-Temperature Gas-Cooled Reactors**, Julich, Germany. (M. A. Khan and D. S. Briggs, Div. of Nuclear Power and Reactors, Intern. Atomic Energy Agency, Karntner Ring 11, 1010 Vienna, Austria)

21–28. International Symp. on **Physicochemical Mechanisms of Carcinogenesis**, Jerusalem, Israel. (E. D. Bergmann, Dept. of Chemistry, Hebrew Univ., Jerusalem, Israel, or B. Pullman, Institut de Biologie Physico-Chimique, 13, rue Pierre Curie, Paris 53, France)

31–1. Symposium on **Artificial Limbs**, London, England. (Public Relations Officer, Institution Soc. of America, 530 William Penn Pl., Pittsburgh, Pa. 15219)

November

3–8. Israel **Surgical** Soc., 8th congr., Jerusalem. (Organizing Committee, 8th Congr. of the Israel Surgical Soc., P.O. Box 7276, Jerusalem)

4–8. Symposium on the Use of **Nuclear Techniques in the Prospecting and Development of Mineral Resources**, Lima, Peru. (S. Eklund, Intern. Atomic Energy Agency, Karntner Ring 11, A-1010 Vienna, Austria)

4–9. Canadian **Heart** Foundation, Canadian Cardiovascular Society, Vancouver, B.C. (Secretary, Canadian Heart Foundation, 1130 Bay St., Toronto 5, Ont.)

11–13. **Geochemical** Soc., Mexico City, Mexico. (E. C. T. Chao, c/o U.S. Geological Survey, Washington, D.C.)

11–13. **Geological** Soc. of America, Mexico City, Mexico. (R. C. Becker, The Society, Colorado Bldg., P.O. Box 1719, Boulder, Colo. 80302)

11–13. Society of **Economic Geologists**, Mexico City, Mexico. (R. A. Laurence, P.O. Box 1549, Knoxville, Tenn. 37901)

11–13. **Mineralogical** Soc. of America, Mexico City, Mexico. (I. J. Holmes, Dept. of Geology, Columbia Univ., New York, 10027)

11–13. **Paleontological** Soc., Mexico City, Mexico. (R. L. Langenheim, c/o Dept. of Geology, Univ. of Illinois, Urbana)

13–15. International **Reinforced Plastics** Conf., London, England. (British Plastics Federation, Reinforced Plastics Group, 47-48 Piccadily, London, W.1)

18–23. International **Seed Testing** Assoc., 15th, Palmerston, New Zealand. (The Association, Binnenhaven 1, Wageningen, Netherlands)

19–20. Symposium on **Tribology** in Railways, London, England. (Public Relations Officer, Institution of Mechanical Engineers, 1, Birdcage Walk, Westminster, S.W.1, London)

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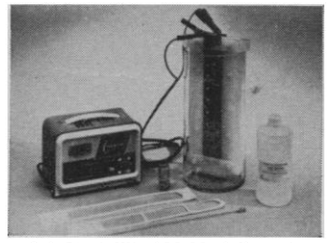

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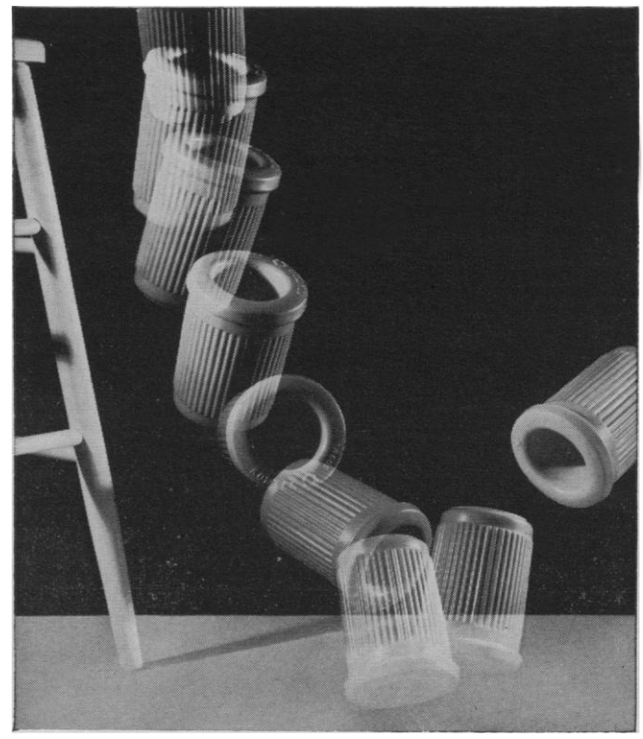

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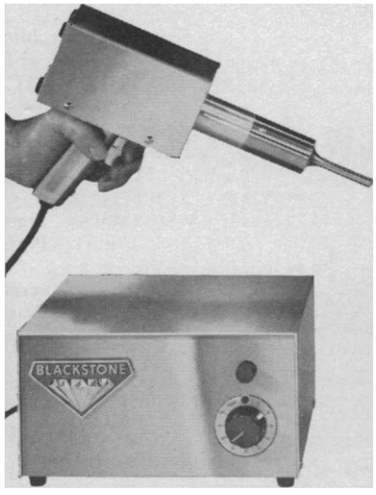

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