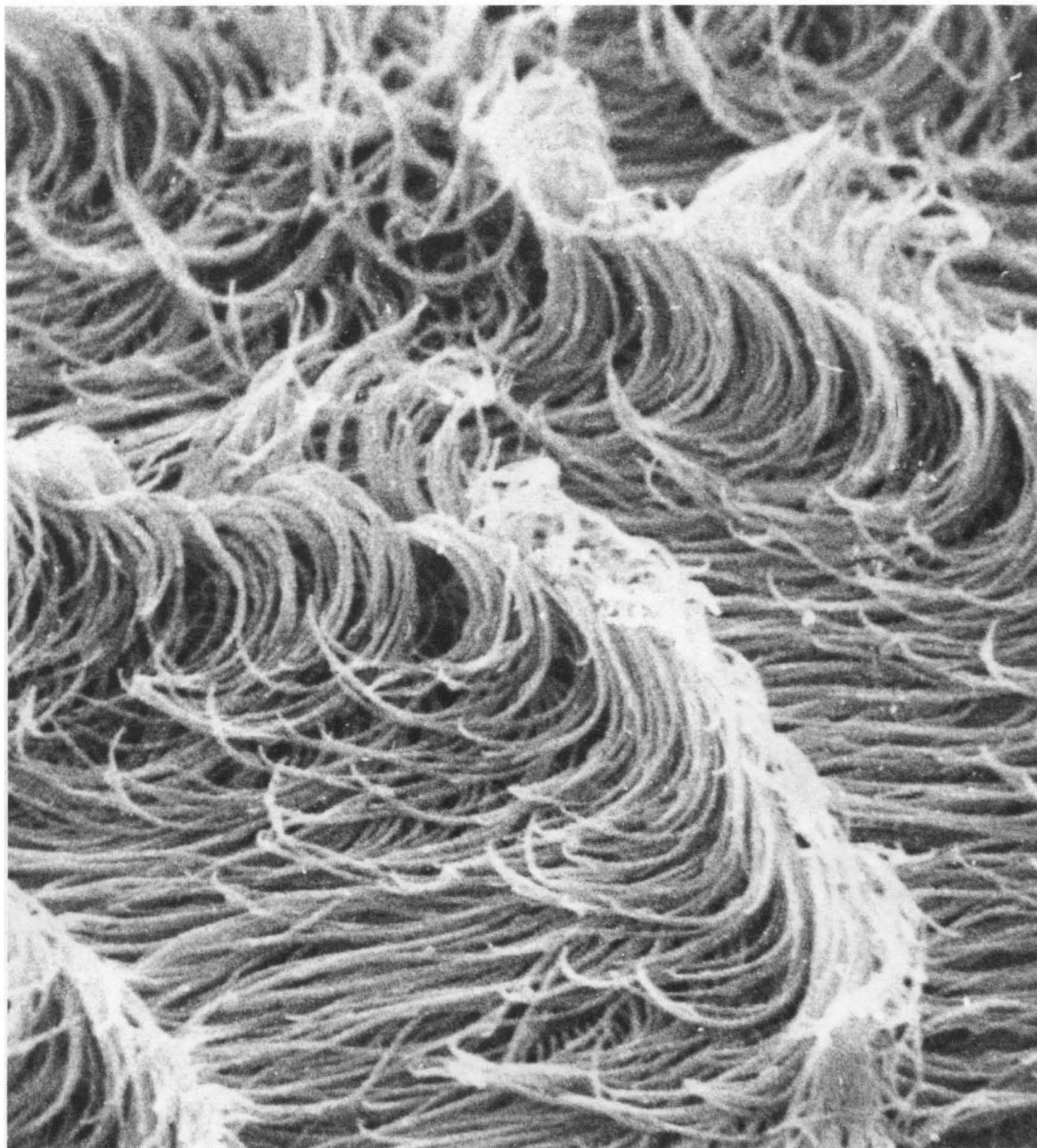


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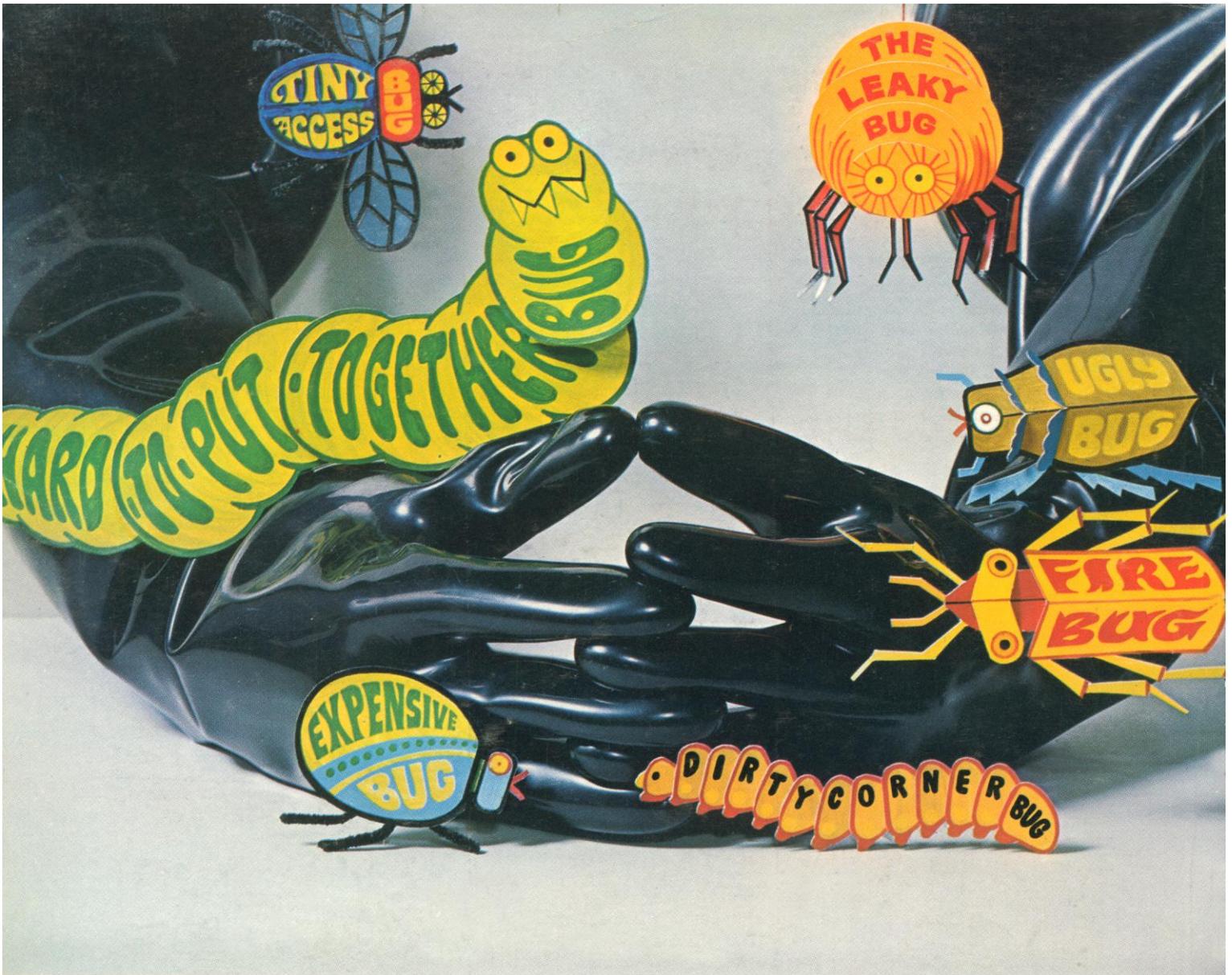
21 February 1969

Vol. 163, No. 3869

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE



Proceedings Issue



Some of the things bugging you about your glove box are some of the bugs we've taken out of ours!

Fiberglass is what does it. It makes our one-piece glove boxes rugged, with almost no chance for leaks.

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We make three types of glove boxes (controlled atmosphere, bacteriological and radioisotope) each with an extra large access door. And, we can supply a whole line of gloves and other glove box accessories.

About the only thing bugging us about our bugless glove boxes is that you may not have one yet. And at the rate they're selling, that shouldn't bug us long. For more information, contact your laboratory supply dealer or write for a fully illustrated catalog containing all details, prices and specifications, to LABCONCO CORPORATION, 8805 Prospect, Kansas City, Mo. 64132.



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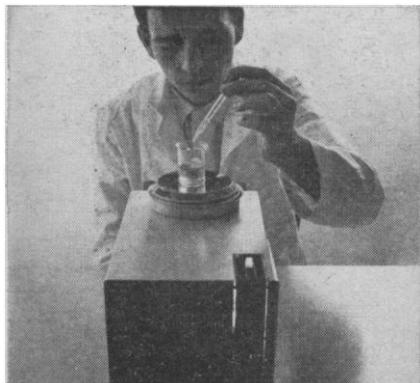
Circle No. 15 on Readers' Service Card

WEIGHT WATCHERS: These Mettler balances can help reduce your weighing problems

If you have weight problems, chances are they can be solved with one of these three Mettler balances. Two are top-loaders, one an analytical. Collectively, they solve virtually any weighing problem in the laboratory. Individually, they perform their special jobs with unique speed, ease and precision.

Weight Watching Has Never Been Easier

The Mettler P1200, a well established and versatile top-loading balance, now has digital readout. This feature permits even relatively unskilled operators to obtain accurate results without misinterpretation or reading errors.



The P1200 will tackle weighings to 1200 grams (plus 100-gram tare), and give you a precision of ± 5 mg. That's better than one part in 250,000. But despite its capabilities for handling the bigger weighing jobs, the P1200 will also complete a weighing in just three seconds. It will also checkweigh to plus or minus values as fast as you can place an object on the scale, and without referring to scale readout. Powdery, granular or liquid substances can be filled rapidly by the use of a filling guide which shows the approximate weight on the pan throughout the entire weighing operation. This eliminates time-consuming interruptions for reading the balance.

Remove Grams — Positively

The P160, another top-loader, weighs unknowns to 160 grams with a precision of ± 1 mg. In addition to having all the features of the P1200, it is ideally suited for weight loss studies. It has a reverse scale which gives a



positive reading as weight decreases in drying, evaporation and residue determination studies. This feature eliminates time-consuming calculations and the possibility of arithmetical errors. It also simplifies gravimetric titrations (for more information on the advantages of gravimetric titrimetry, write for Bulletin M-1014A).

A Well-Balanced Balance

Slight changes in the balance level of the P1200 and the P160 (as in all Mettler top-loaders) are automatically compensated for by a zero point restoration feature. We call it Mettler Levelmatic. If your balance is out of plumb beyond its compensation range, you won't be able to make a weight reading because the readout is automatically obscured. Because Levelmatic automatically compensates for most shifts in zero position, it is rarely necessary to re-zero the balance before weighing.

Have Your Cake and Eat It

If you need an analytical balance to watch your weight, consider the Mettler H20 . . . it's really two balances in one. It gives you the 160.1-gram capacity of a macro-analytical balance, and the ± 0.01 mg precision of a semi-micro instrument. The H20 readout, like the P1200 and P160, is digital. It also has a high-speed filling guide, and an optional accessory will let you weigh objects below the balance; for example, to make specific gravity measurements by weighing objects submerged in liquids.

Because of the unrestricted optical taring feature of the H20, you can tare off the weight of your container in seconds, and begin weighing-in with readout at zero. You can't make a weighing mistake. If you're adding several components, you can dial back to zero for each one.



Some Food For Thought

In case you have a weighing requirement that can't be solved by one of these three balances, Mettler has 35 more models ranging from top-loaders that weigh to 13 kilos all the way through analyticals to ultra micro instruments with precision of ± 0.1 μ g. We'll bet a gram-cracker that one of these will fill the bill. To arrange for a free demonstration or trial, or for further particulars, write to Mettler Instrument Corporation, 20 Nassau Street, Princeton, New Jersey 08540.

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Mettler®

21 February 1969

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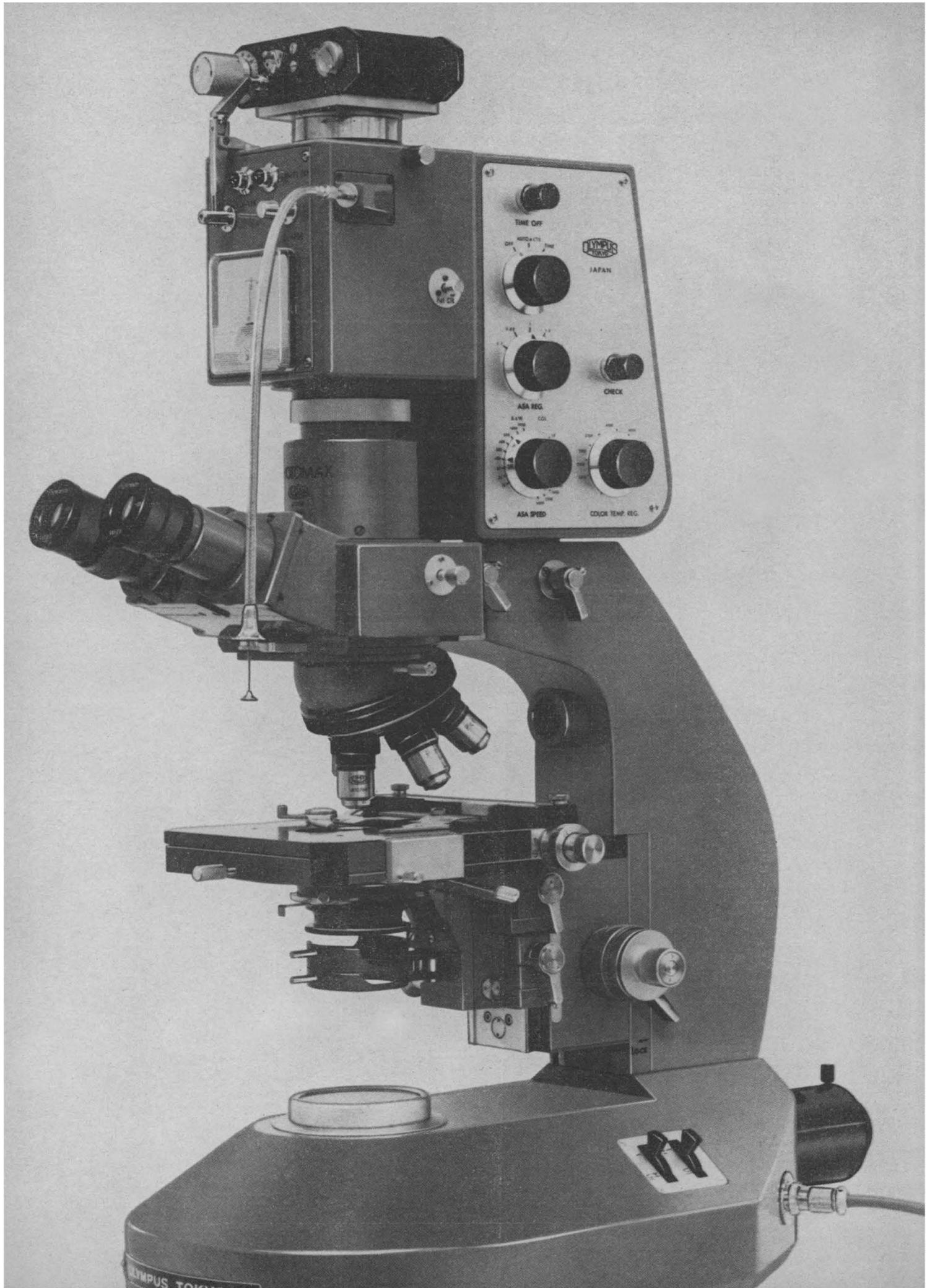
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COVER

Scanning electron micrograph of meta-chronal ciliary waves on *Opalina rana-rum*. The three-dimensional form of ciliary beat and the pattern of ciliary coordination are preserved. See page 817. [G. A. Horridge and S. L. Tamm, Gatty Marine Laboratory, University of St. Andrews, St. Andrews, Scotland]

The American Association for the Advancement of Science was founded in 1848 and incorporated in 1874. Its objects are to further the work of scientists, to facilitate cooperation among them, to improve the effectiveness of science in the promotion of human welfare, and to increase public understanding and appreciation of the importance and promise of the methods of science in human progress.



If the color on your film doesn't match the color of your specimen, you might as well have shot in black and white.

Look at any color photomicrograph. If the white background around the specimen is not pure white, then the colors aren't accurate. If the white is pure, and the colors are accurate—you probably shot it on a Photomax.

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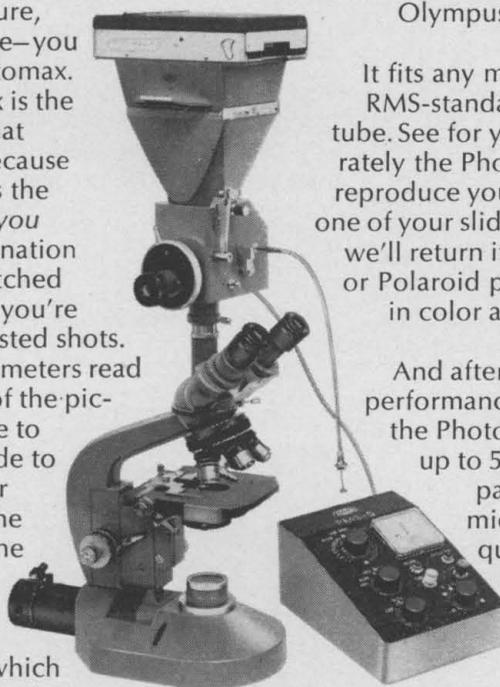
Photomax sets your exposure automatically, too. And you can choose which specimen details receive optimum exposure: just center one such detail in the meter frame, and press the trigger.

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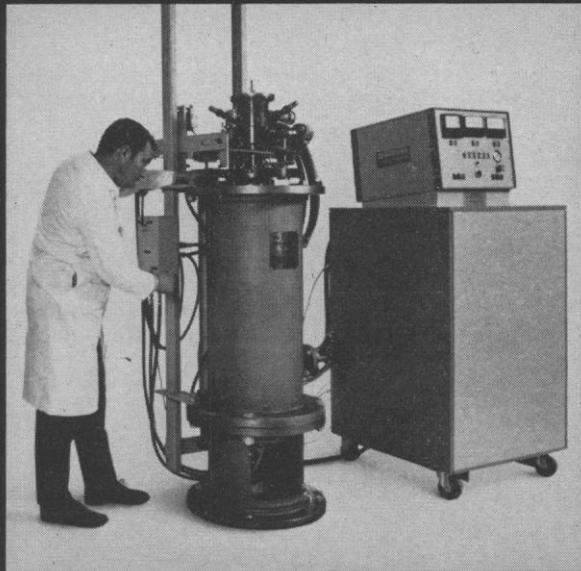
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This Model K liquid zonal ultracentrifuge can be used to achieve separations

with any of these techniques: continuous flow with banding, continuous flow with pelleting, rate zonal separation, or gradient resolubilization. The continuous-flow-with-banding technique is now being used by several major pharmaceutical companies for the production purification of influenza virus vaccine. This instrument is providing vaccine up to ten times purer than any previously available commercially. The benefits: fewer local and systemic reactions, full potency with half the dosage volume, marked reduction of non-viral antigens.

This high capacity zonal ultracentrifuge was developed by the AEC and the NIH as part of their joint Molecular Anat-

omy Program. Electro-Nucleonics, Inc. is the only company making this device available commercially.

Invitation: the availability of a production-scale machine delivering such high gravitational forces should lead to the development of new applications in a wide variety of fields. So whatever your area of interest, if you think the Model K might have applicability to your particular separation problems, talk to us. We'll be most happy to cooperate in exploring its possible usefulness to you. Or for more information, call Walter Carow, collect, at (201) 228-0515, or write to him at Electro-Nucleonics, Inc., Box 803, Fairfield, N.J. 07006. Request File KS.

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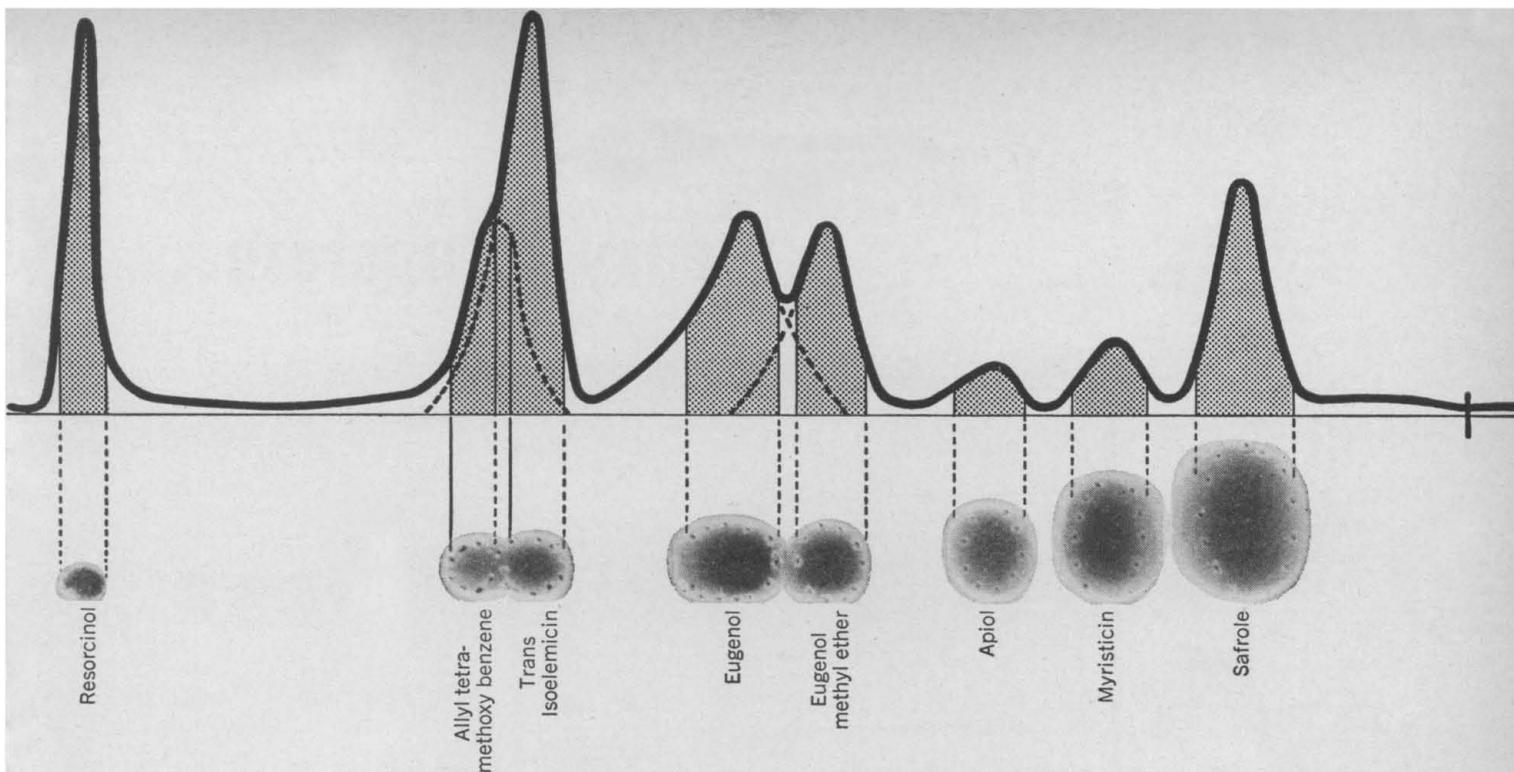
"reading maketh a wise man"

When Catalog N was conceived, NEN had high hopes that it would become an integral part of laboratory life. From the vast number of requests for replacement copies, we suspect our fondest dreams have been realized. If you've lost track of your copy, we'd be delighted to send another.

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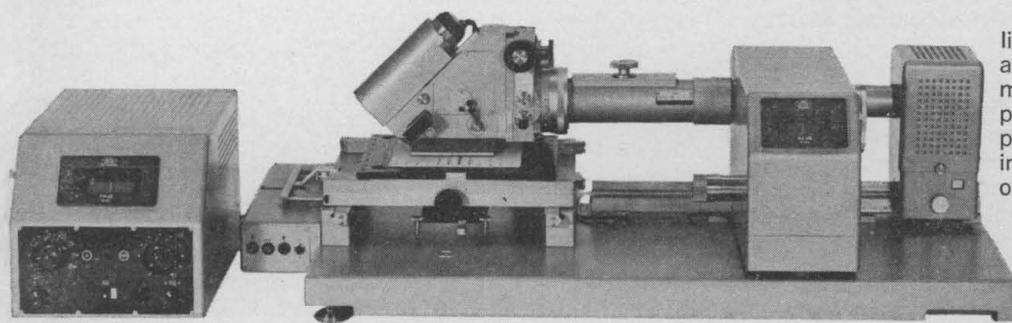
The ZEISS Chromatogram Spectrophotometer not only provides rapid identification of chromatographic zones by direct examination, scanning at any wavelength between 200-2500nm, it also enables you to make quantitative evaluations. We repeat, quantitative evaluations, with no loss of substance. The method is the measurement of light absorption by diffuse reflectance, transmission, or fluorescence at the proper wavelengths.

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And its versatility is such that it is not limited to TLC plates alone. It can, as examples, make transmission measurements of films and plastics, photographic plates, electrophoresis and chromatography strips; reflectance measurements of individual spots or reflectance variations on paper, plastics, tiles and paper chromatographs; fluorescence measurements of individual spots or variations on all of the above.

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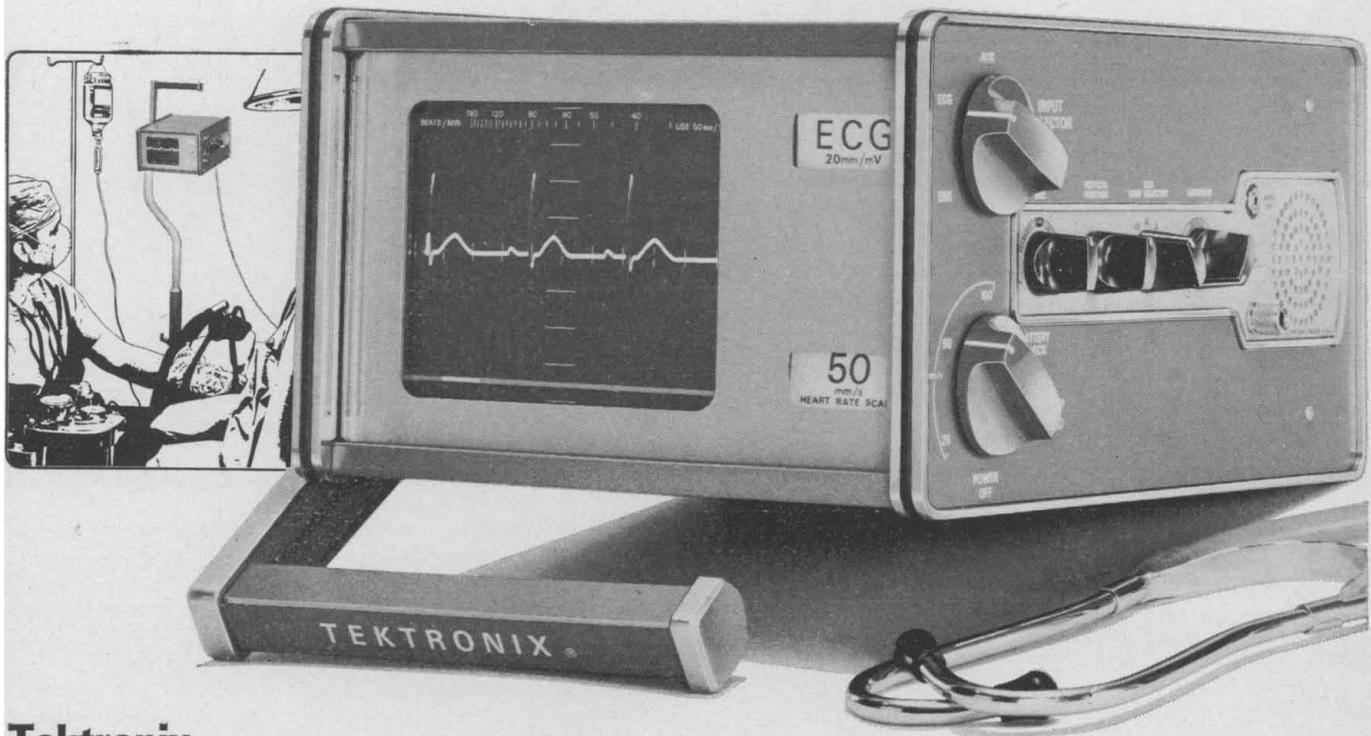
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- Clear displays of ECG, EEG or related waveforms on 5-inch screen
- Audible heartbeat monitor with automatic alarm
- Direct-reading heart rate scale

The Type 410 Physiological Monitor is a small, self-powered, portable instrument designed specifically to monitor physiological signals in the operating room. Clear displays of ECG, EEG and other related waveforms can be viewed easily on its 5-inch (8 x 10 cm) screen.

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The solid-state Type 410 is 5 3/8 inches high, 9 1/8 inches wide and 12 7/8 inches long, including carrying handle. It weighs 12 1/2 pounds, including batteries. It can be operated continuously from self-contained batteries for up to 12 hours. AC operation and battery recharging is accomplished by simply plugging the instrument into an AC outlet. A six-pin output connector permits driving of external amplifiers or recorders.

Type 410 Physiological Monitor with Accessories \$850

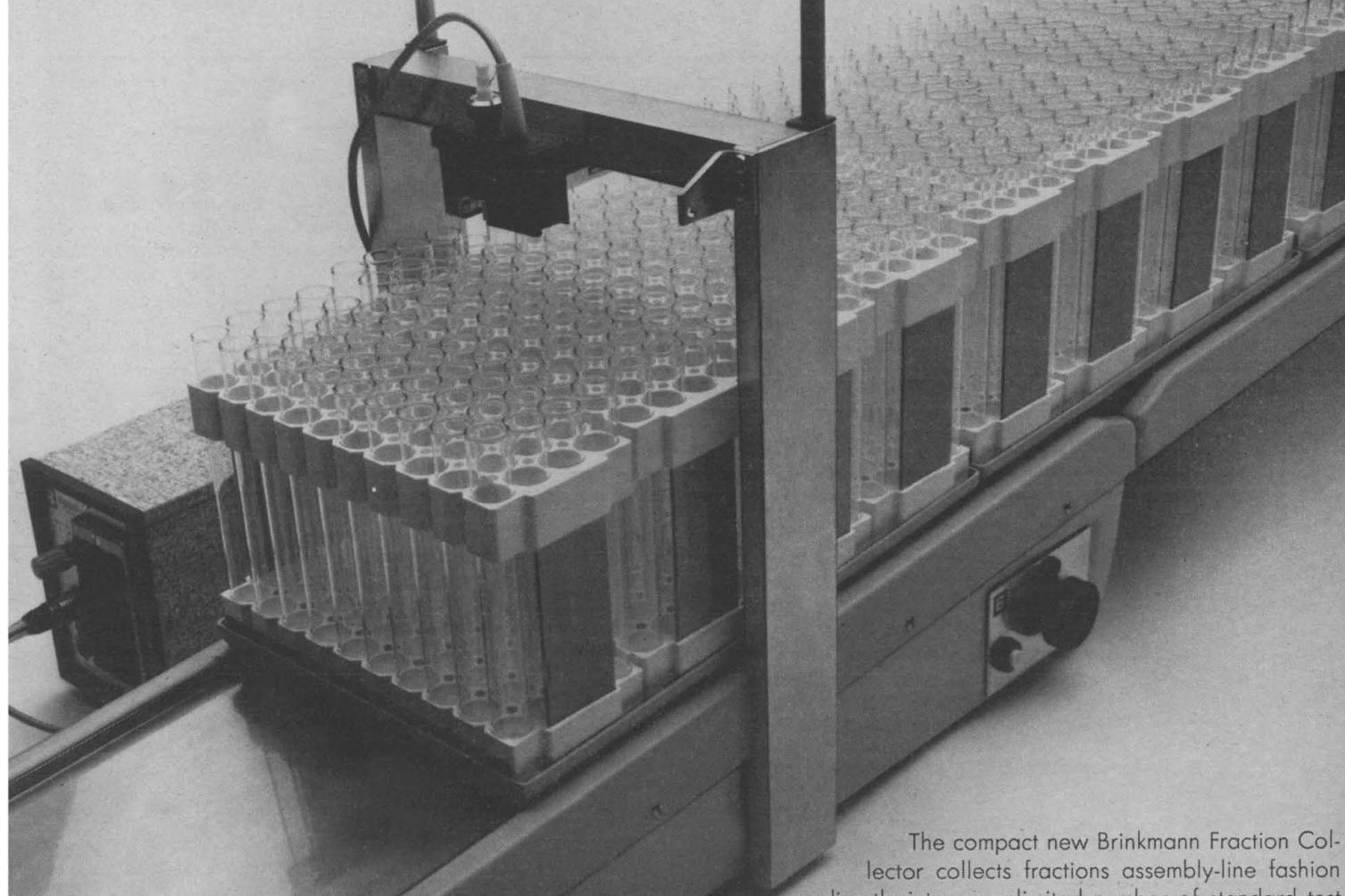
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You wouldn't think this versatile instrument would be light enough to be portable, but it is. It is also corrosion-resistant and spill-proof. It can operate at temperatures as low as -20°C . The distributor travels in either of several zig-zag or meandering patterns. With an optional multiple distributor, streams of effluent can be delivered into as many as ten test tubes simultaneously.

Furthermore, this fraction collector practically runs itself. It counts drops or measures volume photoelectrically for any pre-set period of time. An optional programmer can be used to automate the whole procedure. Other accessories include UV monitor, elution pumps, infra-red siphon, refrigeration unit, and of course, extra tracks, trays and test tube racks.

There's a lot to be said for the new Brinkmann Fraction Collector. It's all in our free catalog. Just write: Brinkmann Instruments, Cantiague Road, Westbury, N.Y. 11590.



Here's our new Model 402 ultraviolet-visible spectrophotometer. It's your best buy anywhere!

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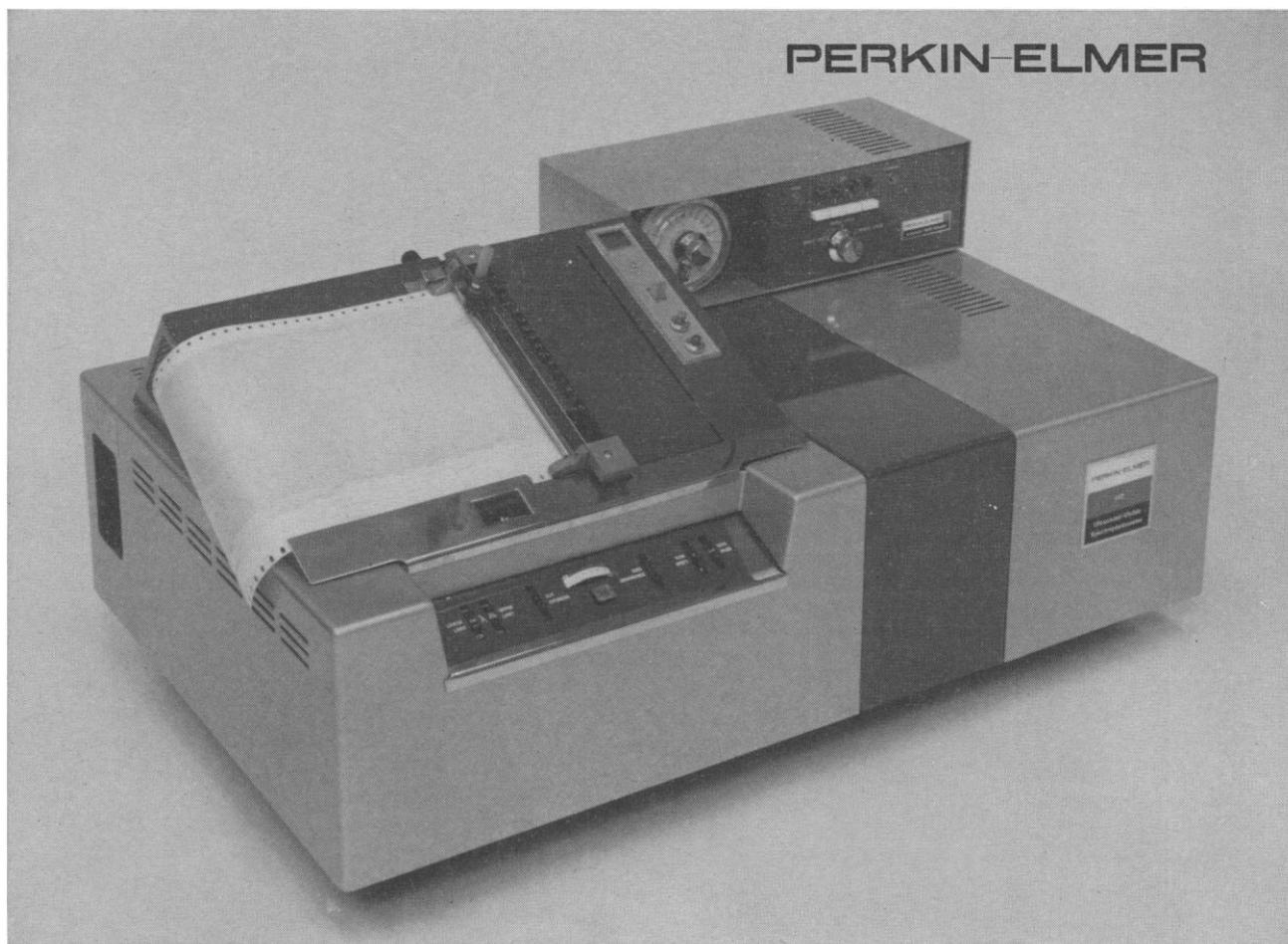
The 402 has a unique Flowchart recording system (Pat. Nos. 3363259, 3396403) using preprinted roll charts for precise, simplified data handling. Any 0.3 absorbance units can be expanded 5X to cover the full ordinate scale with a precision of 0.002 absorbance units.

You can do single, repetitive, or superimposed scans of one to four samples sequentially or at chosen time intervals over the range of 190-850 $m\mu$. You can select any 40 millimicron wavelength interval (or multiples of 40 $m\mu$). You can stop or start scans in any of these wavelength regions at three selected scanning rates.

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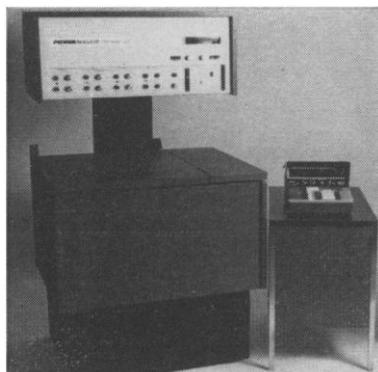


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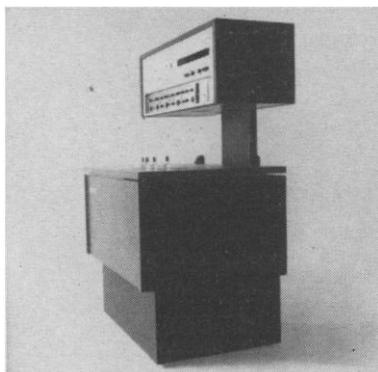
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β-γ Liquimat

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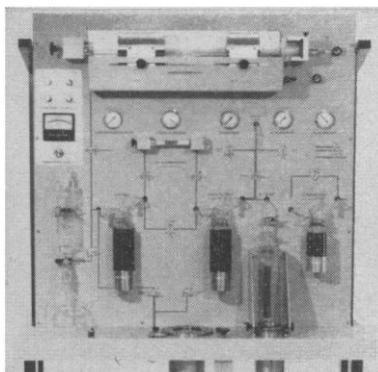
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The combination of Picker's Benzene Synthesizer and a high-performance version of the Liquimat 220 provides a complete ¹⁴C dating (and ³H counting) laboratory for less than \$17,000. Converts all low activity ¹⁴C materials to benzene for high-efficiency liquid scintillation counting. Non-explosive catalyst produces no fractionation. High yield: typically > 90%. Incorporates standard glassware; all connections easily accessible.

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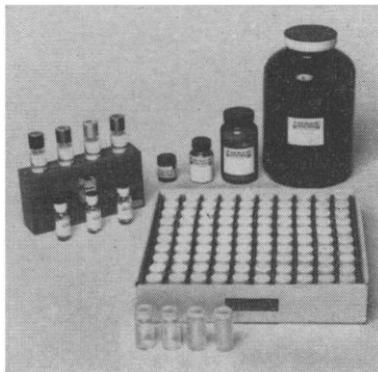
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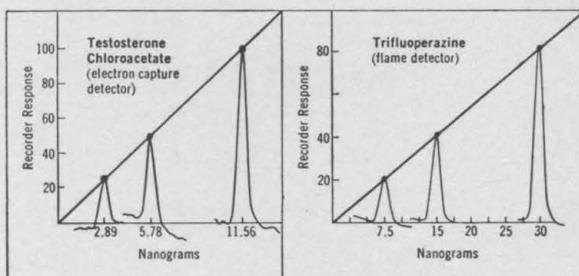
It has system detectability and linearity

There's a long list of materials that have always been hard-to-chromatograph: steroids, pesticides, vitamins, organo-metallics, polyfunctional industrial organic chemicals, to name the most common. The chromatographer who attempts to analyze these materials with an ordinary gc usually runs into two serious problems: inadequate *system* detectability and linearity. In plain English, he is unable to detect very small quantities (around the nanogram level) of these easily degradable materials; and, at higher concentrations, his gc does *not* respond proportionately to different amounts.

In the two plots reproduced here, we offer objective evidence that the HP Model 402 High-Efficiency GC possesses excellent system detectability and linearity. In the first place, the 402 easily detected trifluoperazine and testosterone chloroacetate, both hard-to-chromatograph materials, in the low nanogram range. Moreover, the 402's response is almost perfectly linear.

Neither of these *system* characteristics is likely to show up in the long list of specs that usually describe high-efficiency gc's. But you'd be well advised to make sure that your gc possesses them if you intend to handle hard-to-chromatograph samples. One sure way is to call the nearest HP sales office, or write for Bulletin 4020. Prices start at \$4000.

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43906



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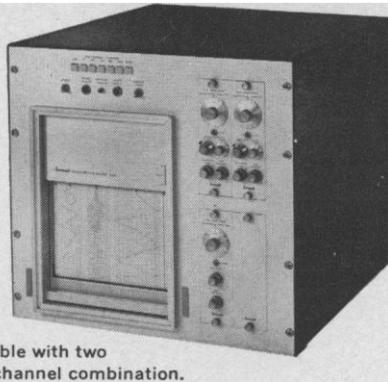
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Guaranteed Sensitivity	1×10^{-9} mol	1×10^{-8} mol
Scale Expander	X3, X10, built-in	X5 optional extra *
Detection System	dual beam with preamplifiers	single beam with no preamplifiers
Automatic Multi-sampler	built-in	optional extra *
Fractionation System	built-in	optional extra *
Automatic Buffer Exchanger	8-step, built-in	4-step, optional extra *
Programmer (punched tape)	built-in multi-program	optional extra * single-program
U. V. Detector	extra	not available
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* Included in total price.



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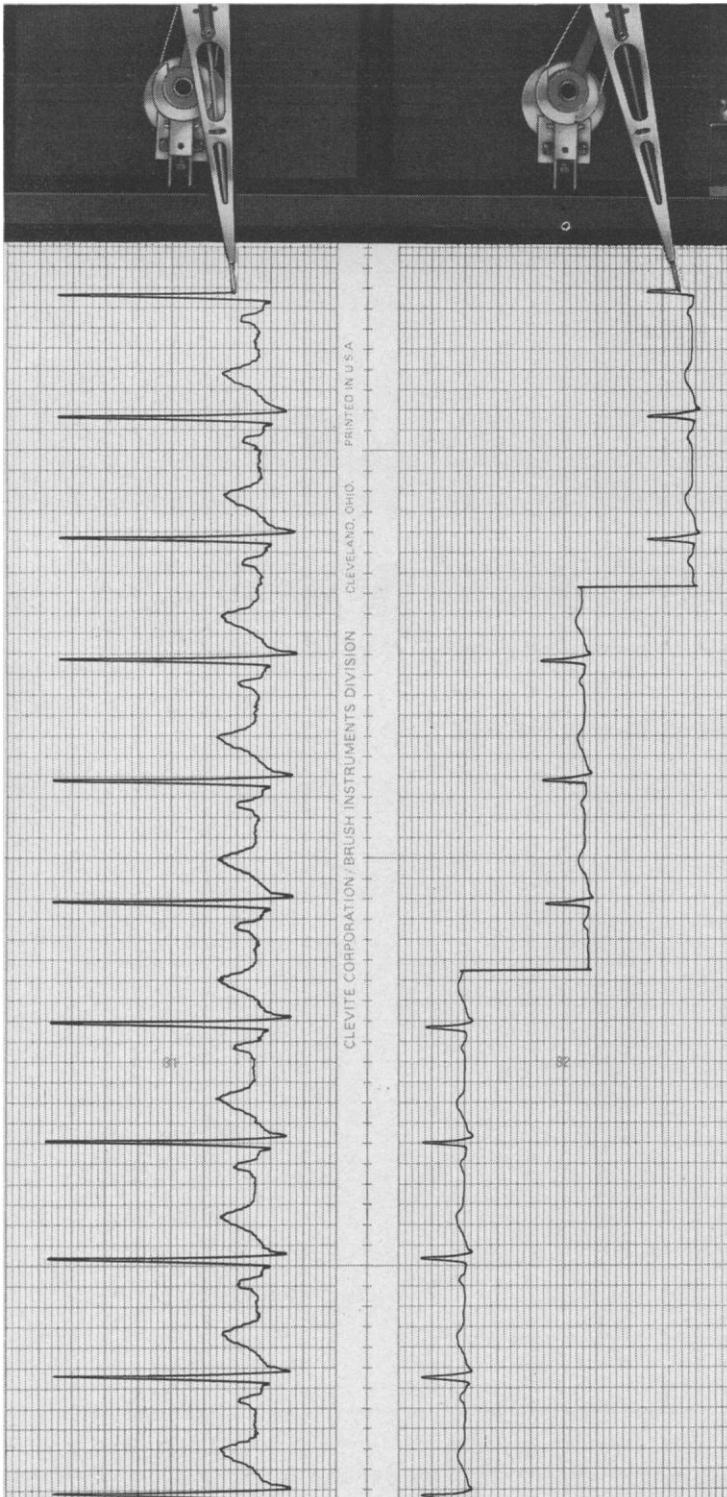
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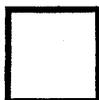


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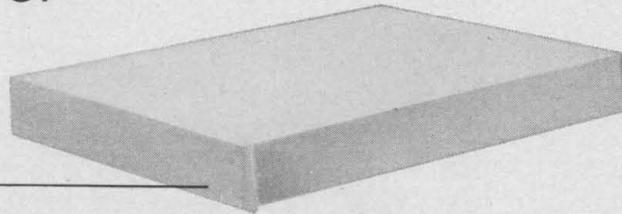
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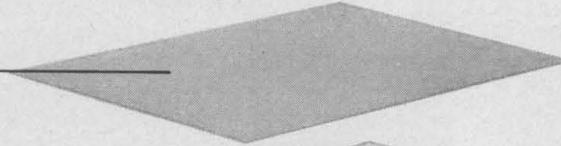
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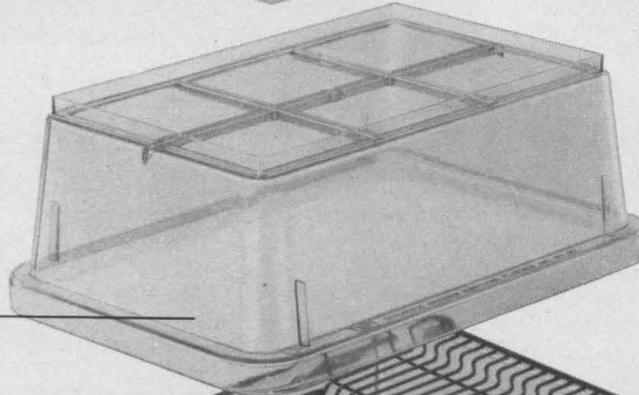
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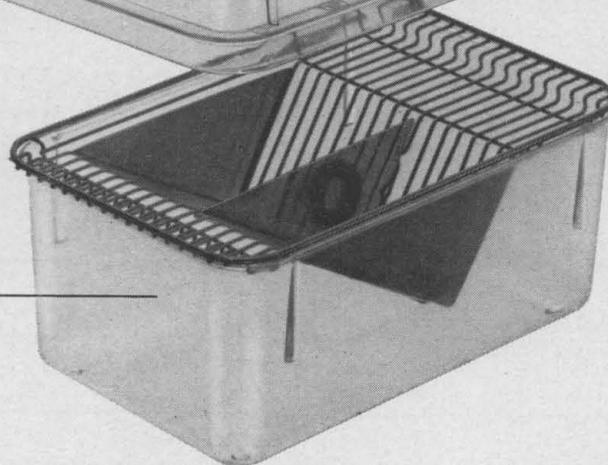


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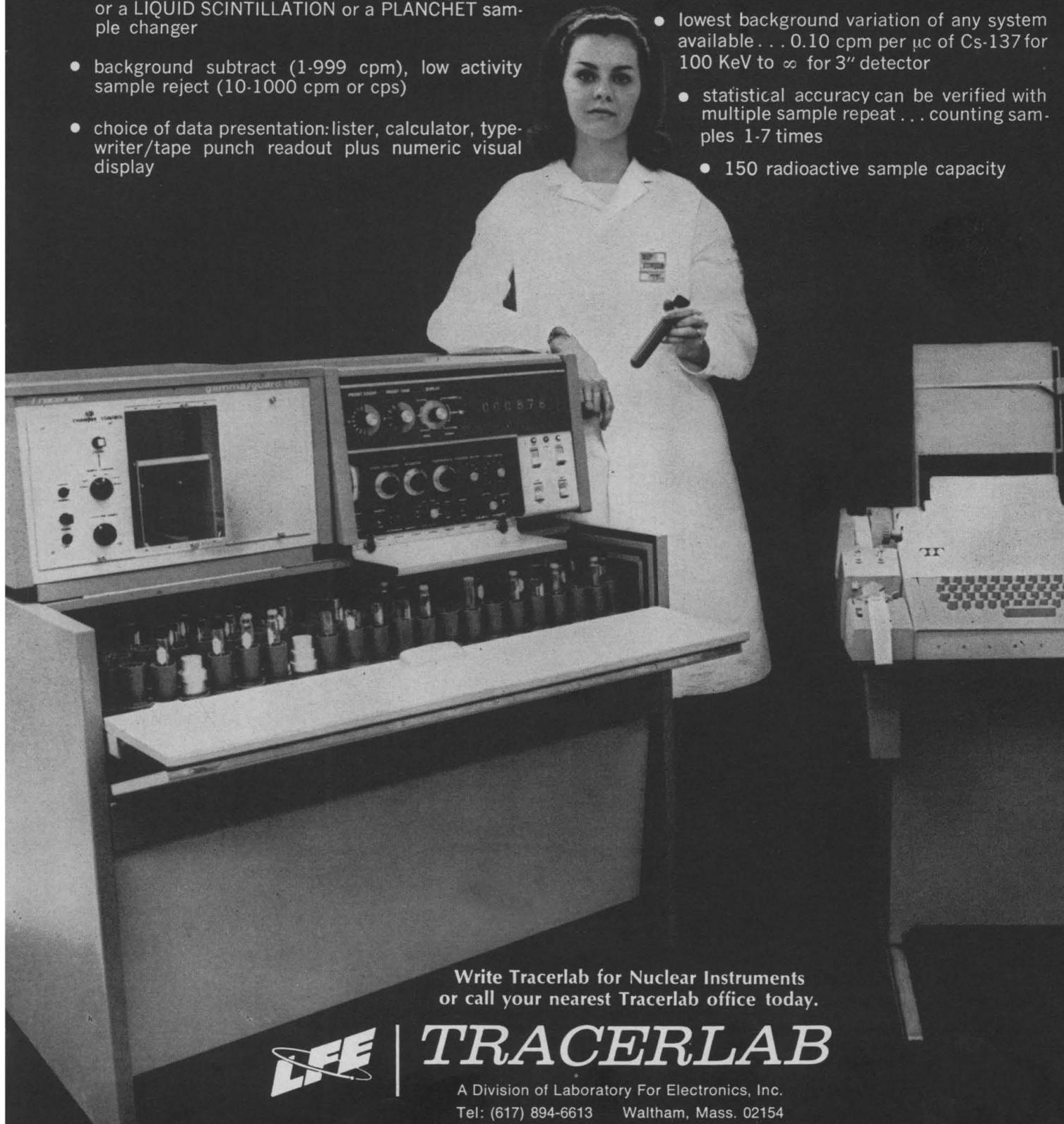
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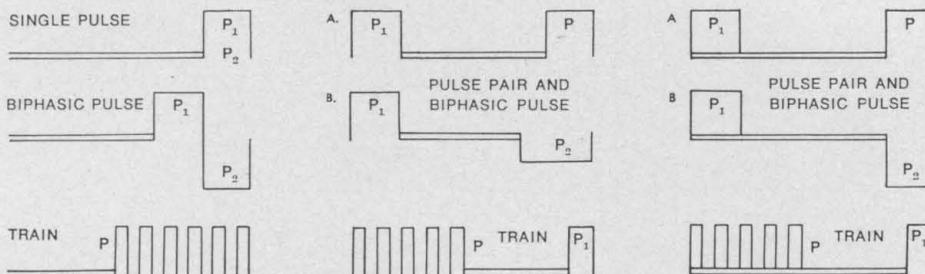
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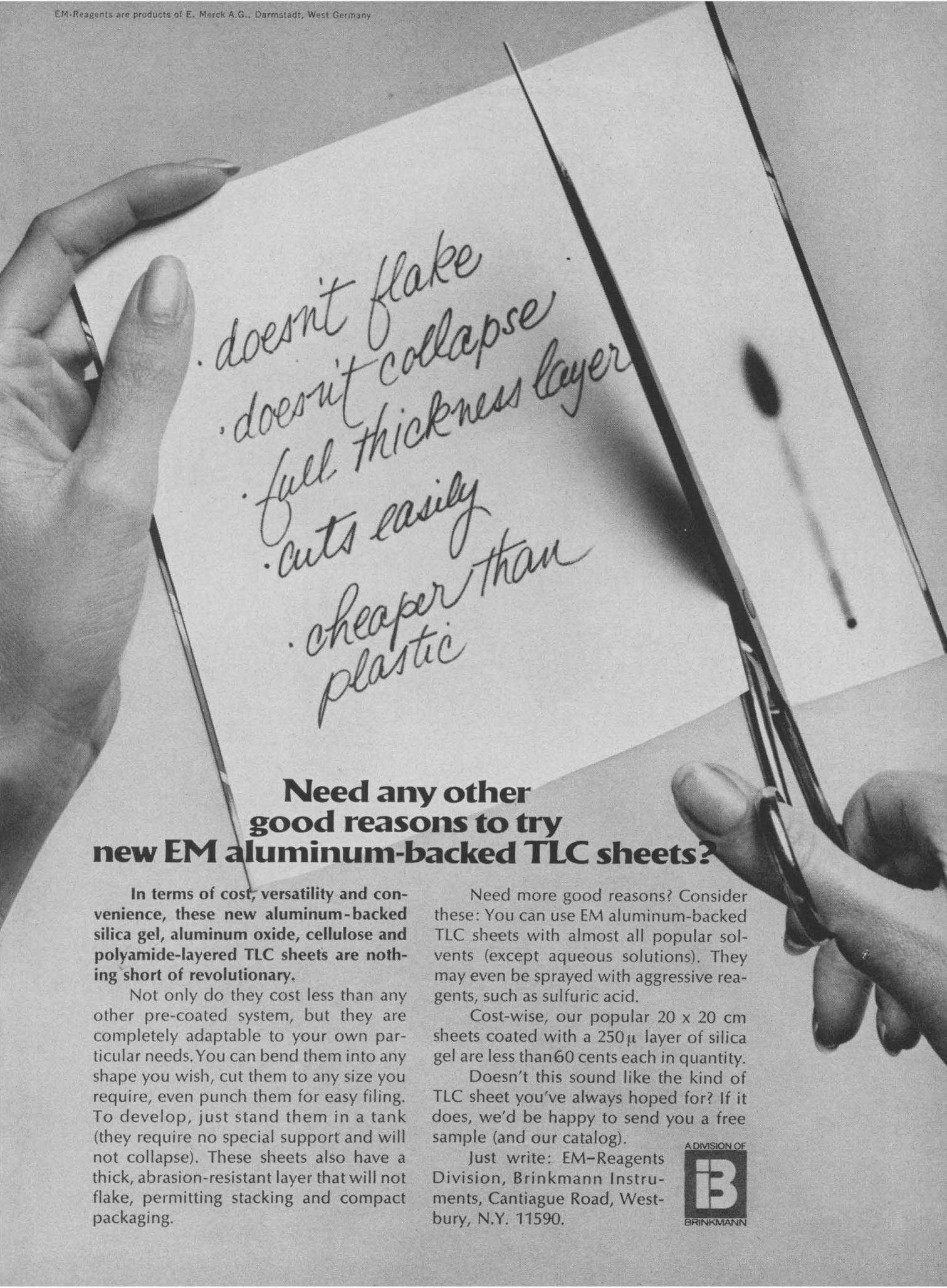
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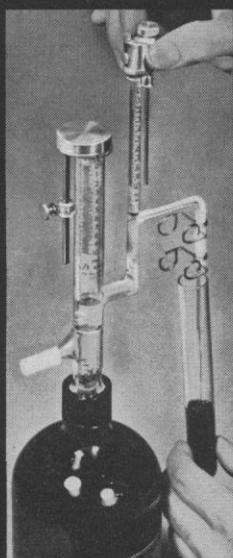
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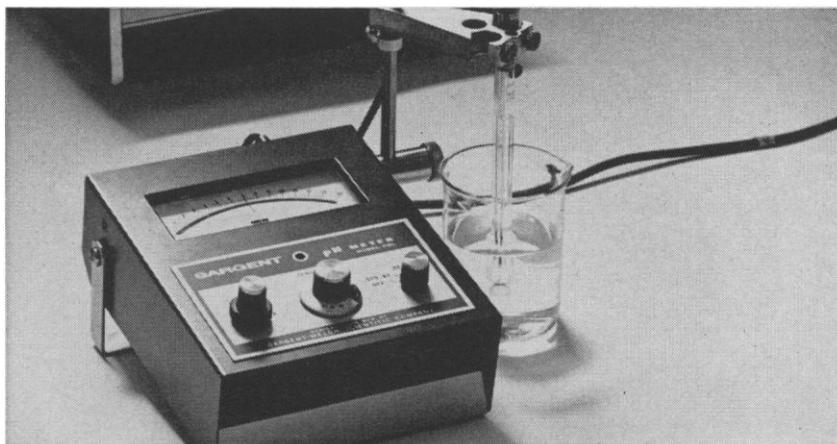
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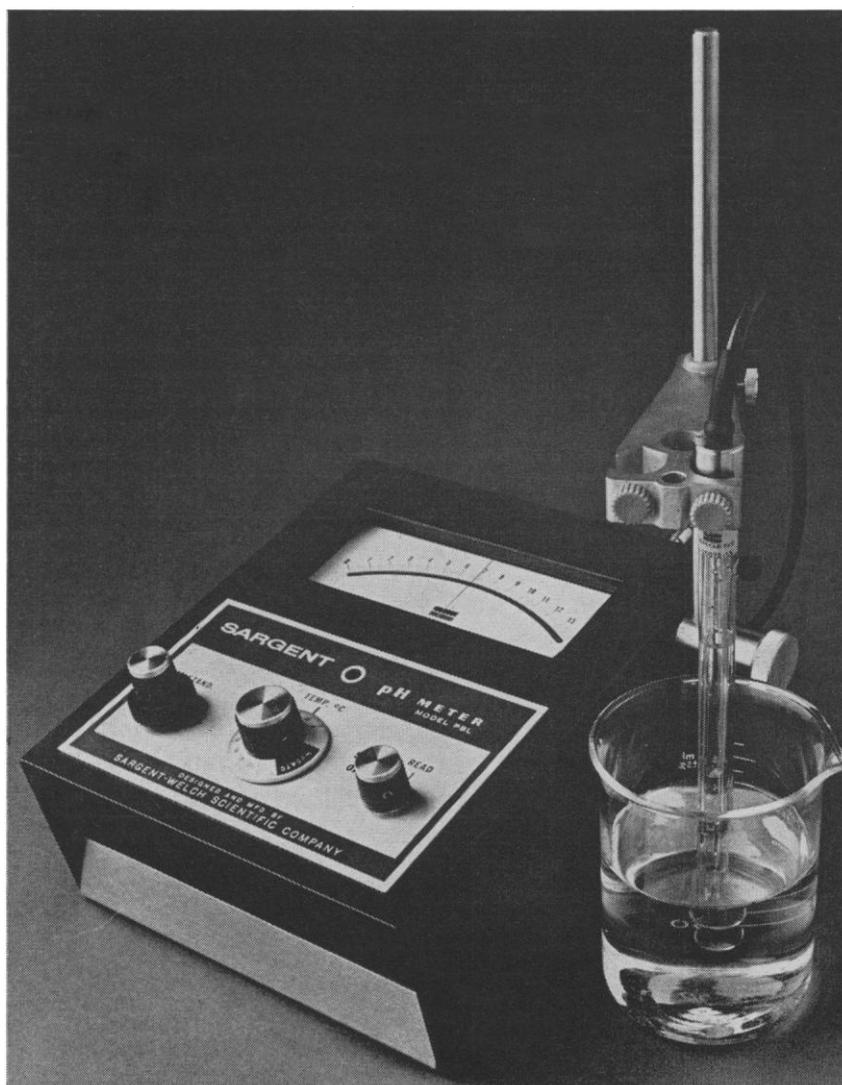
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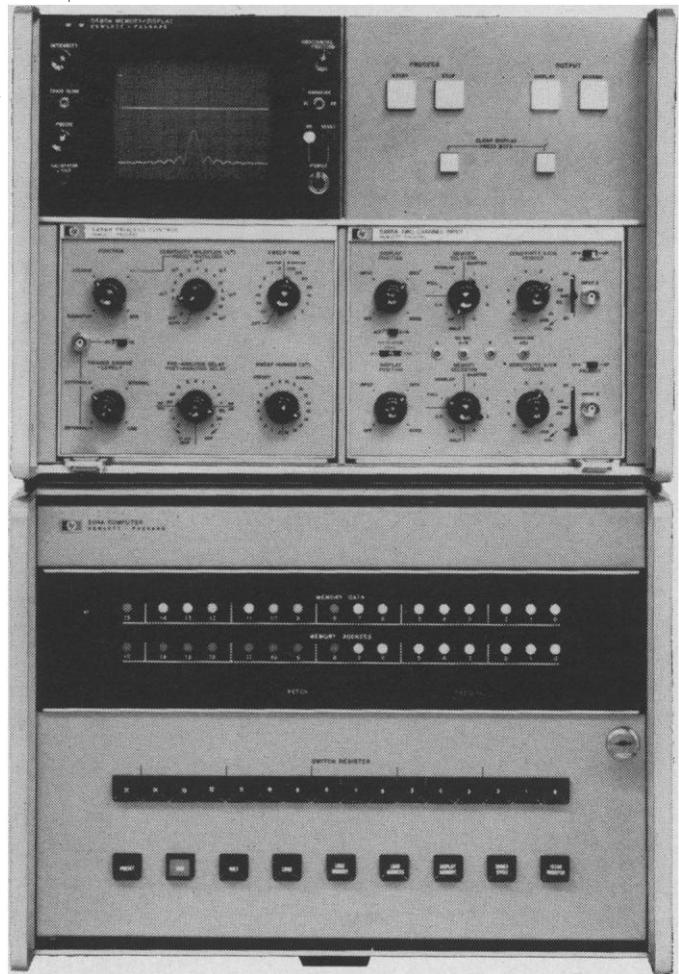
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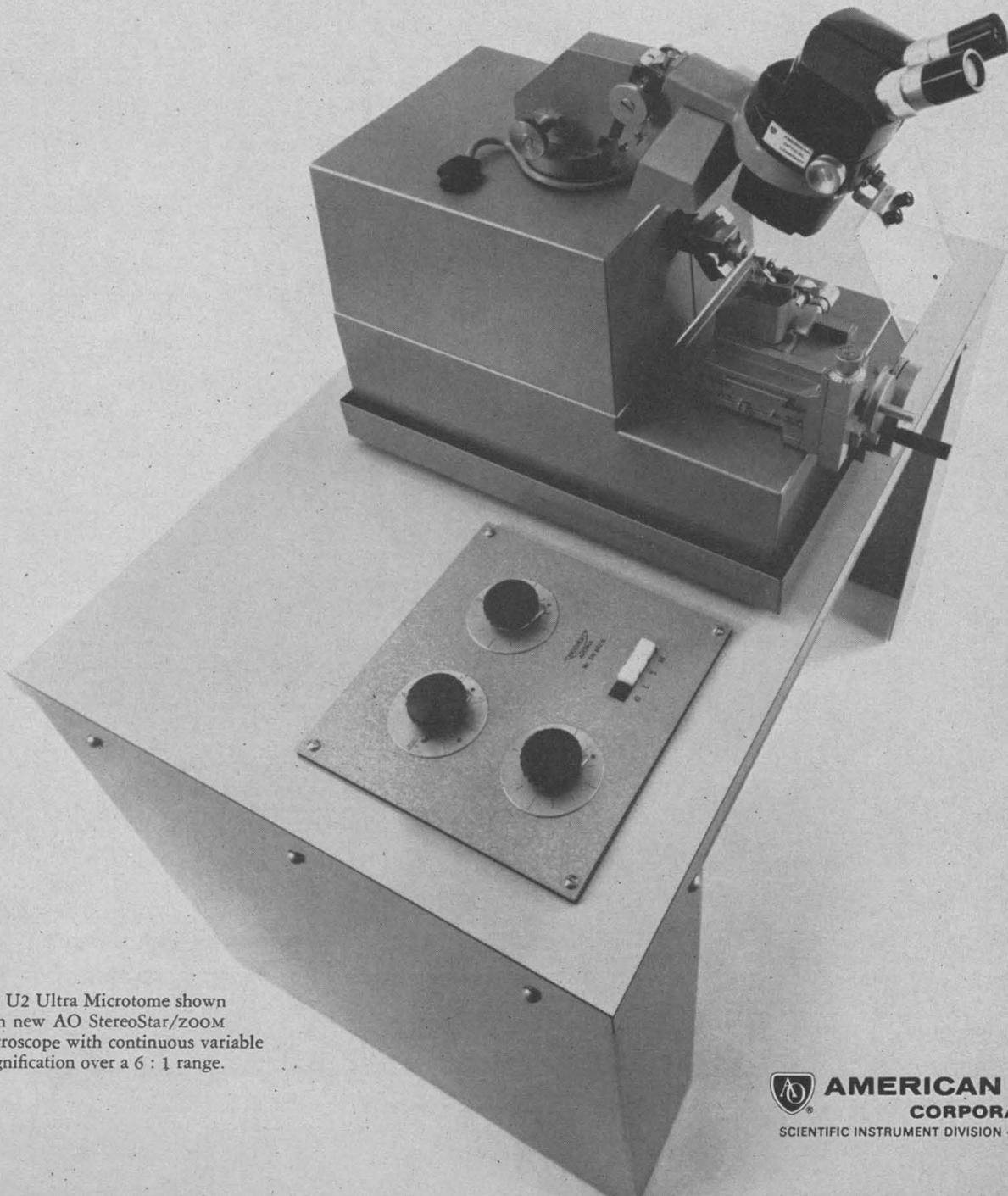
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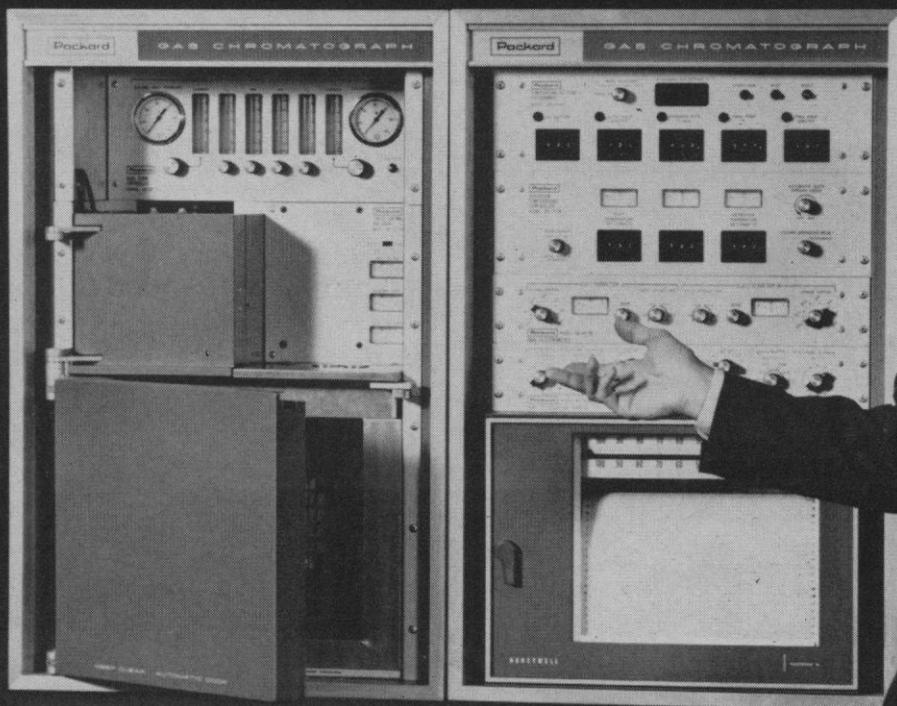
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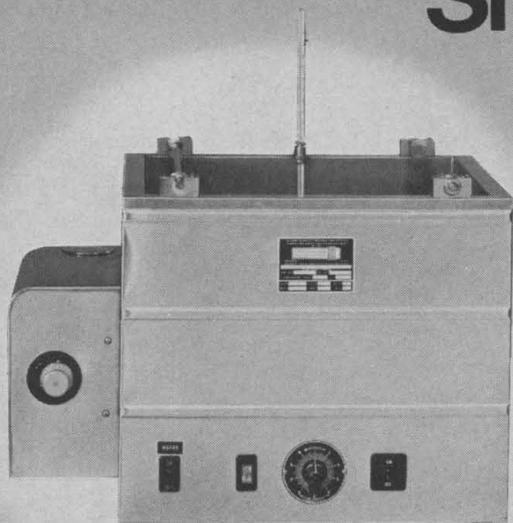
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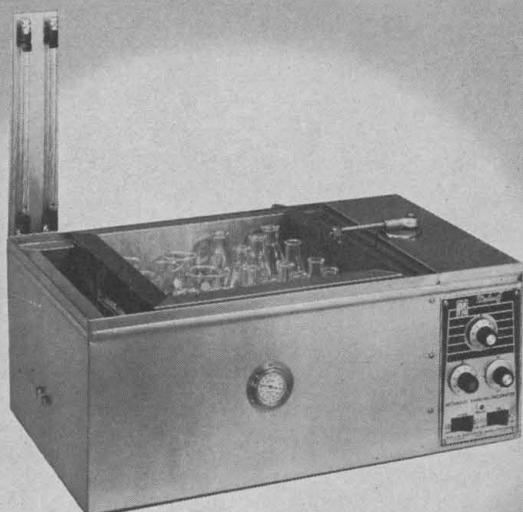


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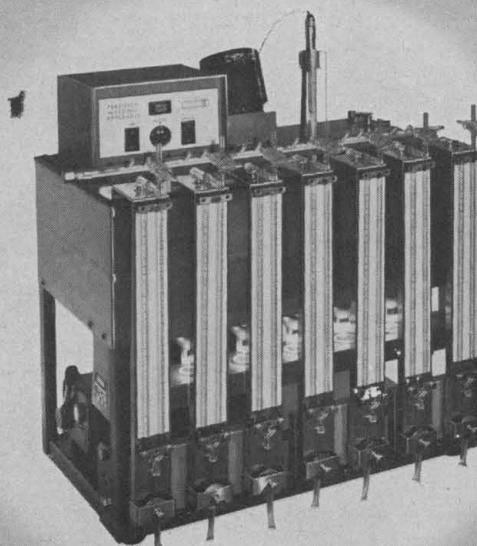
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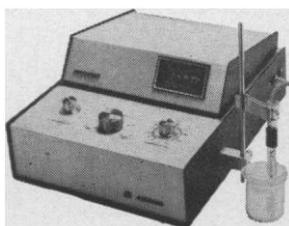


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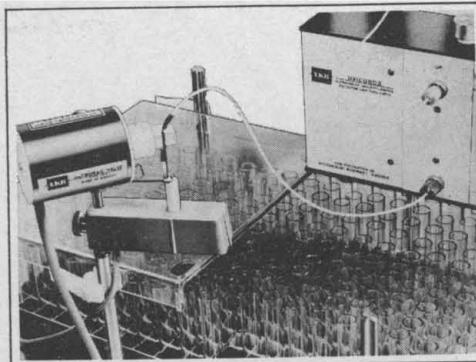
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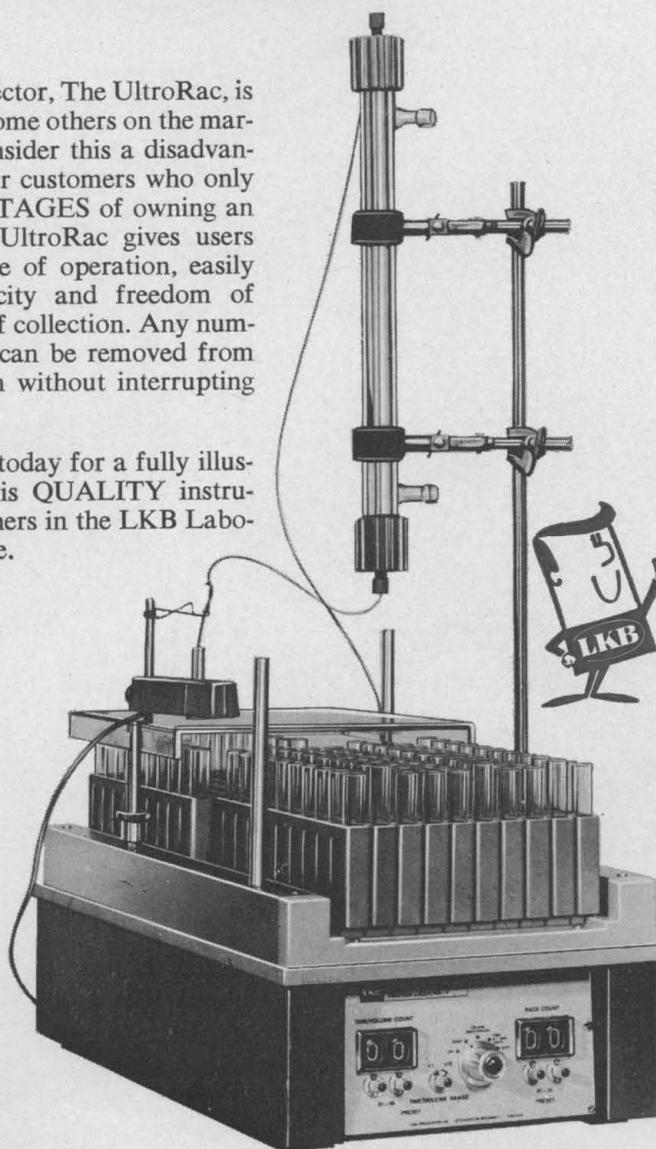
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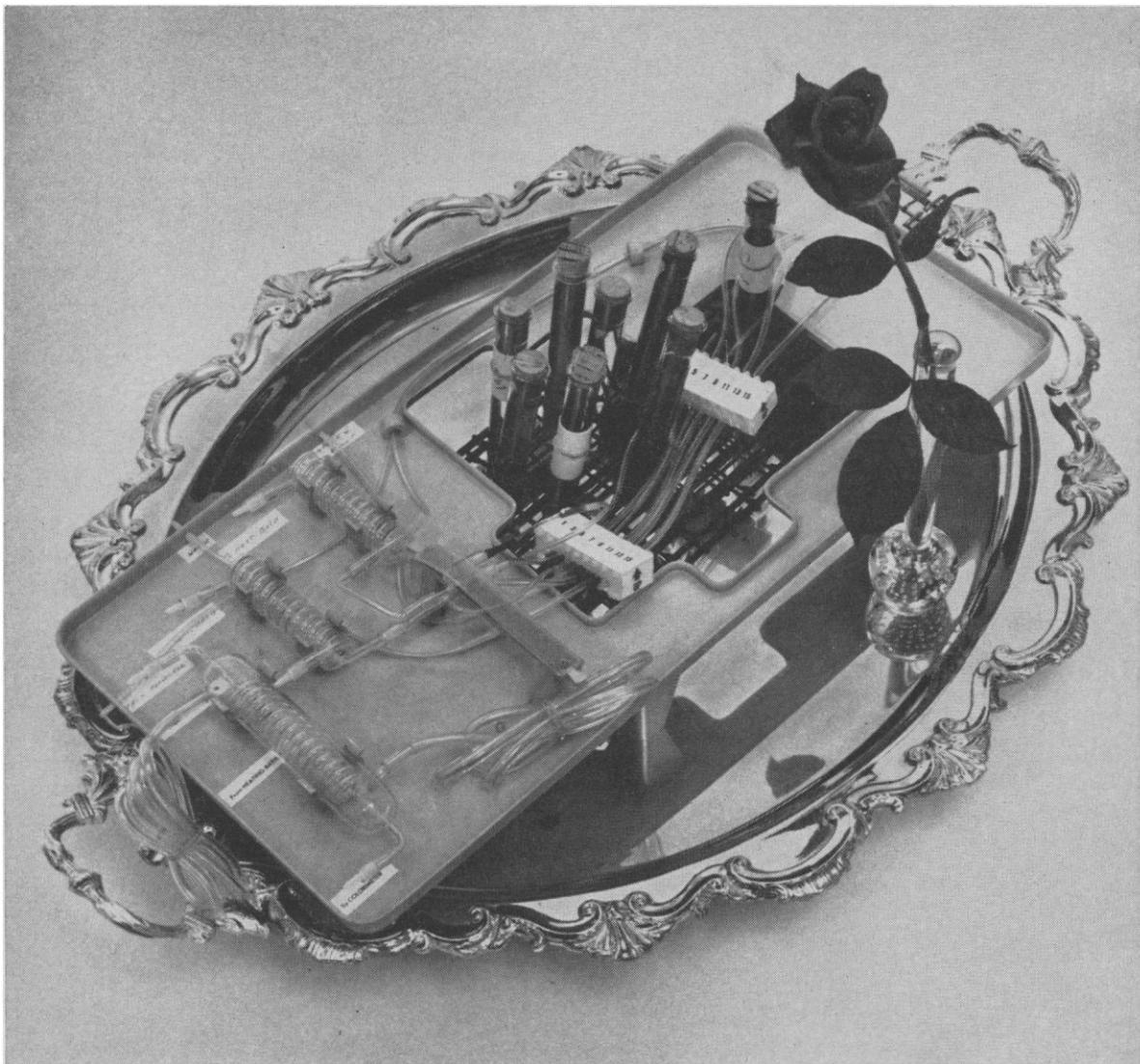
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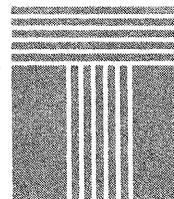
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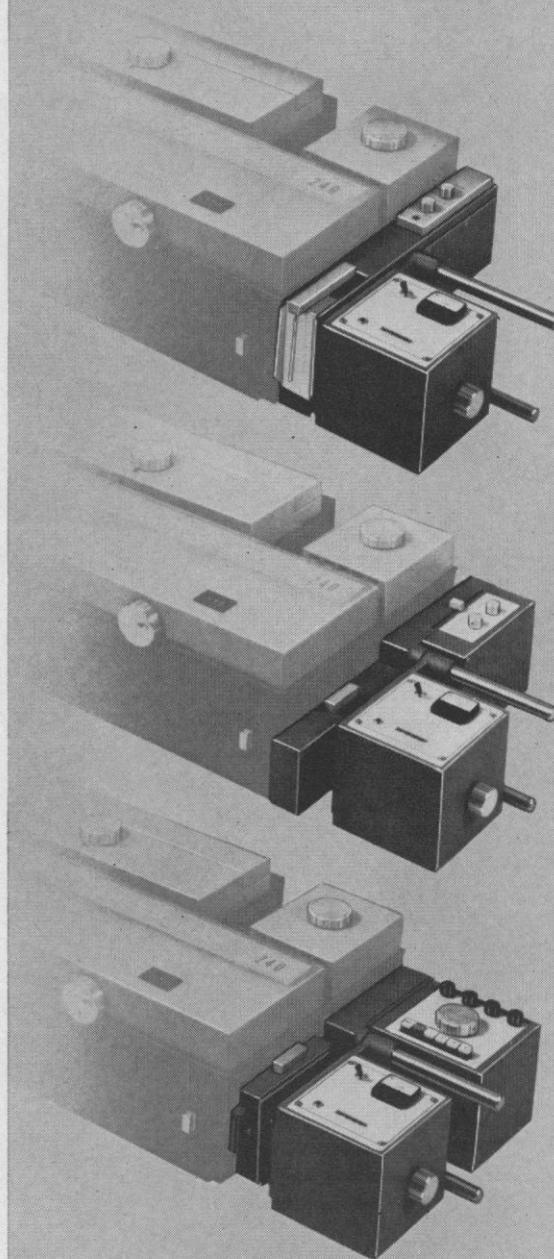
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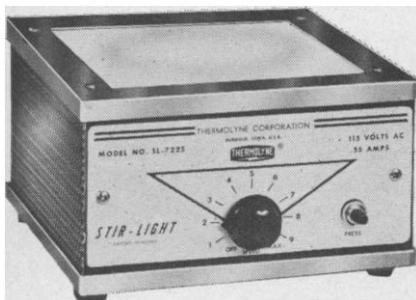
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cepted, usable methodology for evaluating, even in relative terms, "the social return commensurate with the cost of investment" of various research activities. What is actually taking place is that agencies doing pure science on a large-scale—NSF, NASA, AEC, and NIH—respond to pluralistic pressures from the various segments of the scientific community and also apply judgments on what areas of research are ripe for major investments. Inasmuch as these agencies, except for NSF, act as spokesmen for particular scientific research areas, Carey's arguments for setting priorities and for centralized decision-making may be quite legitimate.

Lacking an accepted metric for deciding, that is, between expanded lunar exploration versus high-energy physics, the Budget Bureau works with the Science Advisor, who may seek guidance on priorities from the President's Science Advisory Committee, from the National Science Board, or from the National Academy of Sciences. Perhaps it would be desirable to combine federal departments, or at least those sections that deal with pure science, with the National Science Foundation as its core, as was suggested by Science Advisor Donald Hornig at the Dallas meeting of the AAAS. The advantage would be that decisions on priorities can then be made within a single department rather than at the White House level, and that there would be a single spokesman for pure science at the level of a cabinet officer. On the other hand, there is no guarantee that Congress would approve a departmental budget as large as the sum of its components.

Regardless of whether a Department of Science is established, pure science, which has a \$2.354 billion budget for FY '69 as compared to the total R&D budget of \$18.077 billion (2), could well be set at a fixed percentage of the total R&D, and perhaps even grow at a moderate rate. [It came to 11.7 percent in FY '67, 12.5 percent in FY '68, and 13.0 percent in FY '69 (2).] The justification would be, of course, that money spent on pure science provides the basic knowledge as well as the manpower to later undertake the mission-related R&D for direct economic and social returns.

One final point: Even mission-oriented R&D cannot be expected to give an immediate return and may require a time scale of, say, 5 to 10 years. As the New York Academy points out, the

argument for long-range funding of both mission-oriented and pure research, particularly in the universities, cannot be made too strongly.

S. FRED SINGER

Office of the Secretary,
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References and Notes

1. *Report to Office of Water Resources Research* by the American Society of Civil Engineers, Urban Water Resources Research Program of Harvard University (Cambridge, Mass., February 1969). Note also that, while R & D funding is nearly all federal, the total national investment is mostly nonfederal.
2. *Federal Funds for Research, Development, and Other Scientific Activities*, vol. 17, NSF Publ. 68-27 (National Science Foundation, Washington, D.C., August 1968).

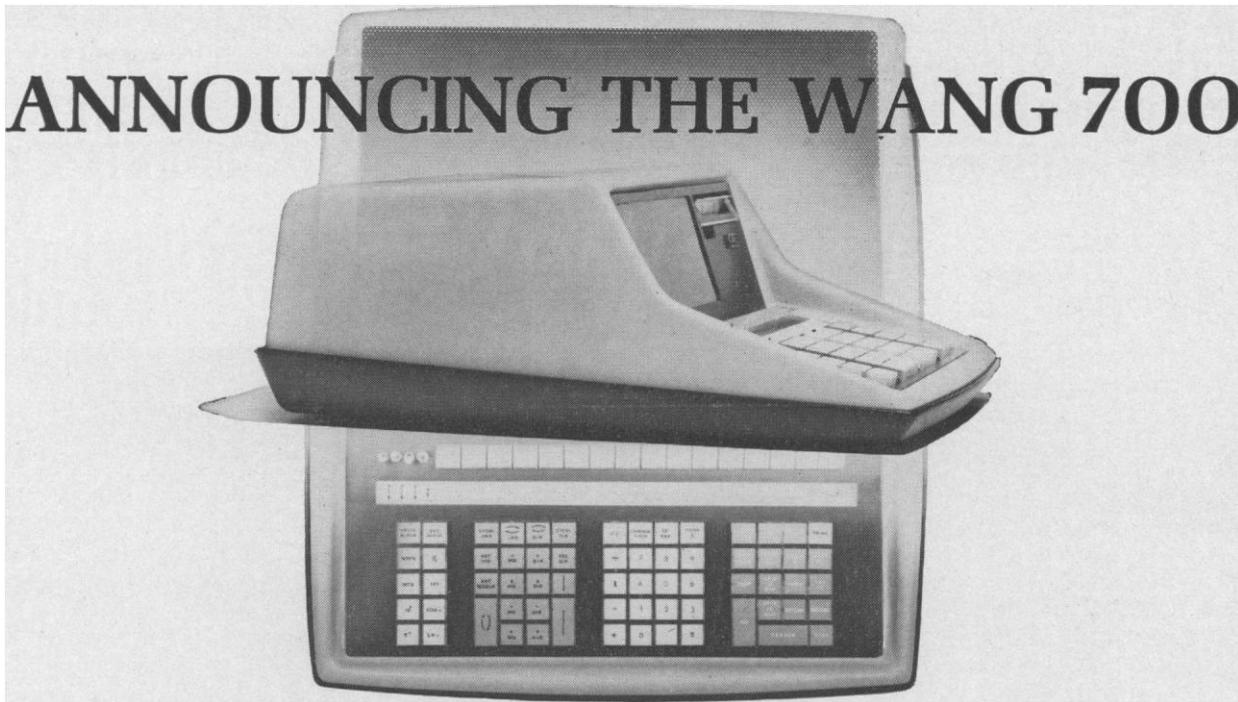
Panama Canal: Widespread Effects

The correspondence of Sheffey and Rubinoff (Letters, 20 Dec.) about the biological effects of a sea-level linking of the Atlantic and Pacific oceans brings to mind an experience I had some years ago as an explorer in the Upernivik district of West Greenland.

On an extensive sledge trip to examine a number of glaciers, I made a stop at Kigtorsak, a small winter colony whose director was a combination of dictator and sage. He was an old man among Greenlanders, but his watery eyes were penetrating and, with the help of a cane fashioned from a willow, he was as spry as a man of 20. He claimed that ice in the area became poor when the Panama Canal was opened and joined the two oceans. This, of course, had an effect upon seal hunting, and the lives of the natives thereabouts were consequently endangered. In many areas of Greenland at that time the seal was still the staff of life. Without it the native would have been unable to penetrate north of the timber line. It provided him with oil for light and heat, with meat to eat, and fur to keep him warm. Because of the lack of seals, hunting had been poor in the Kigtorsak area. Many dogs had to be killed and others kept on starvation rations. No wonder the director was righteously indignant. Two years earlier he had gone so far as to draw up a petition to have the Panama Canal closed (the petition got as far as Godthaab before being shelved).

Fortunately for me, an American, he did not know the exact location of the canal. He believed it to be in Denmark and therefore I was able to enjoy his unstinted hospitality. He entertained me

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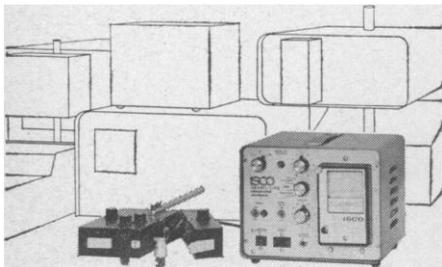
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in his home with seal meat and coffee and the conversation of his friends. On the wall of his sod hut was the picture of a child standing on the shore of a pond watching a duck. The director wondered why Danish parents were allowed to bring up their children so idly. Why wasn't the child taught to shoot the duck—a plump bird, too. On a corner shelf in the hut he had some back copies of a paper *Akuagadlutit* (Reading) that had been launched in 1861 (and today flourishes as a bilingual paper issued twice a week). It was from *Akuagadlutit* that he had read about the opening of the Panama Canal.

WILLIAM S. CARLSON

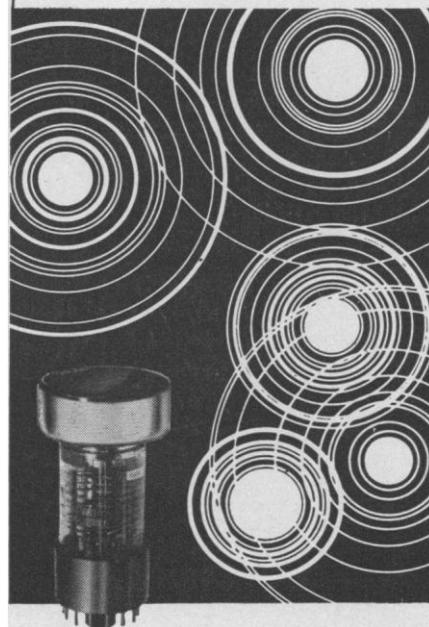
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My letter, published below Sheffey's (20 Dec.), was written independently of his, but I would like to make a specific reply to his comments. My purpose in writing my article ("Central American sea-level canal: Possible biological effects," 30 Aug., p. 857), was not to cause "alarm over the biological consequences of linking the oceans," but rather to provoke action by the scientific community to predict the probable results of permitting two separate biotas to merge, and to measure such changes as may occur when and if the canal is dug.

Such action would also allow us to evaluate Sheffey's suggestion that mixing of the biotas is already proceeding on a substantial scale and his statement that "It seems reasonable to conclude that a sea-level canal would create little or no new threat to the lower links of the ocean food chain." As far as I am aware, the few and incomplete studies which have been made in the past do not support this suggestion. And Sheffey's present assurances are all the more surprising in view of a sentence in the Fourth Annual Report of the Atlantic-Pacific Interoceanic Canal Study Commission (1968 H.R. Document No. 380, p. 8): "The Study of Engineering Feasibility includes biological evaluation of the radiological safety of nuclear excavation, but the bioenvironmental studies are not of sufficient scope or duration to permit determination of the potential effects of biota exchange and the impact of exchange of waters upon environmental resources."

There would appear to be some serious discrepancy here. Of course, intelligent persons can hold different opinions on the subject in the present state of our knowledge. But the point of the

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more detailed preliminary studies recommended in my article would be to remove this uncertainty or, at least, reduce it as much as possible. Any attempt to discount the biological effects of a sea-level canal on the basis of currently available data would seem to be premature.

IRA RUBINOFF

*Smithsonian Tropical Research
Institute, Balboa, Canal Zone*

World Population: Control or Crisis?

Two recent articles on the world population crisis presented the problems but offered no permanent solutions (1). Hardin said, "No technical solution can rescue us from the misery of overpopulation. Freedom to breed will bring ruin to all." Aldrich quotes W. M. Myers' estimate that "with unprecedented effort mankind can buy two or three decades before being overcome by widespread famine" but he himself concludes that "the question we leave here unresolved is how, or whether, mankind will achieve control of its population."

Man *could* achieve control of population growth, but only by drastic methods and new techniques. At the time of puberty, each girl would have a capsule containing a minute amount of progesterone inserted under the skin which would act as a chemical anti-fertility agent for 15 to 20 years. When a baby is wanted, the capsule would be removed. After the birth of the baby a new capsule would be inserted. Some restrictions might be required, such as denying parenthood to women under the age of 18 or 20, to unmarried women, and to those who had already produced three children.

If such proposals seem too drastic and dictatorial, consider some of the alternatives. Mexico, for example, has received extensive aid since 1943 from the Rockefeller Foundation and has made great progress in increasing food production. J. George Harrar of the Foundation has noted that food production there tripled while the population doubled. But if Mexico's present rate of population growth (3.5 percent) (2) should continue, her population would equal the present population of the United States in 42 years, exceed the present population of the world in less than 130 years, and increase 1000-fold in 200 years. Obviously population

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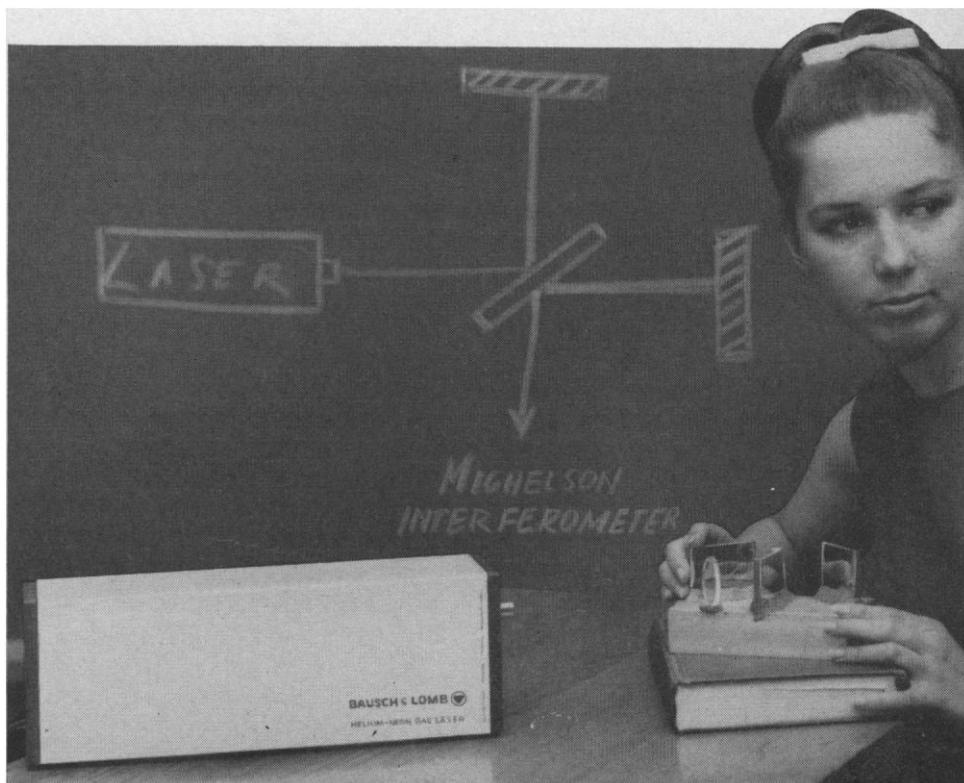
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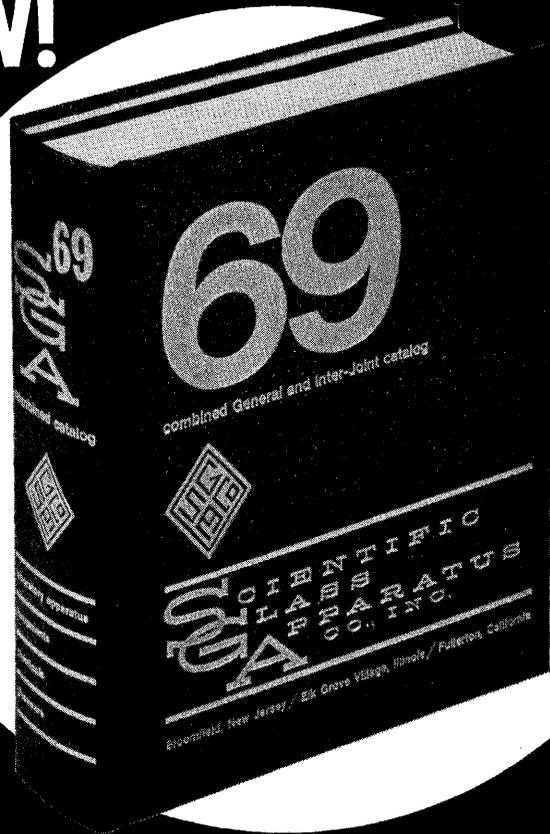
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growth must be controlled by high death rates or by low birth rates. The National Academy of Sciences in its report *The Growth of World Population* concluded, "Other than the search for lasting peace, no problem is more urgent" (3).

KARL SAX

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References

1. G. Hardin, *Science*, 162, 1243 (1968); D. G. Aldrich, Jr., *ibid.*, p. 1309.
2. *United Nations Demographic Yearbook 1968* (Statistical Office of the Economic and Social Affairs Dept. of the United Nations, New York).
3. National Academy of Sciences Committee on Science and Public Policy, NRC Rept. 1091 (Washington, D.C., 1963), p. 2.

Migratory Habits of the Scientific Goose

The rapidly expanding population of the once rare bird, the scientific goose, has increased the importance of attempts to study and interpret the rather exceptional geographic movement patterns of this species. Although permanent nesting areas are found in all habitable regions of the earth, they tend to be concentrated in the vicinity of the major cities. At intervals, which correlate only approximately with seasonal variations, individual birds from widely separated nesting sites simultaneously take flight. They travel, often vast distances, to flocking points where they engage in the "ritual ceremony" or "symposium" which lasts an average of 5 to 7 days, then return to their points of origin. The cycle is repeated again and again, with the only discernible difference being the location of the flocking point.

The assumption that this migratory behavior is related primarily to breeding may be rejected on the grounds that the males greatly outnumber the females; moreover, the frequency of participation appears to accelerate with age, so that the oldest birds (easily distinguishable by their bedraggled feathers and drooping tails) are in almost constant flight. Any alternative hypothesis to explain this mysterious evolutionary adaptation must account for the events of the "ritual ceremony." During this activity the individuals, one by one, take a position facing the others and cackle loudly in turn. Analysis of these sounds has demonstrated characteristic cackling patterns for each individual, the only variation being the addition of

a few novel sounds at the end and the omission of a like number at the beginning of each presentation. Also to be explained are the recent experiments which have shown that the prime characteristic of the migrating individuals is their high position in the pecking order of their home flocks. Moreover, their departure signals a marked relaxation of flock activities as well as an exceptional degree of disorganized and chaotic behavior in the remaining members. In certain respects this overall behavior pattern suggests a form of racial suicide consequent upon the recent extremely rapid rise in the population.

In order to discuss these problems, a Congress on the Migratory Habits of the Scientific Goose has been organized and will be held either on the French Riviera or the island of Tahiti in the fall of 1969.

RONALD G. HARVEY

Ben May Laboratory for Cancer Research, University of Chicago, Chicago, Illinois 60637

Proposed American Society for Neurochemistry

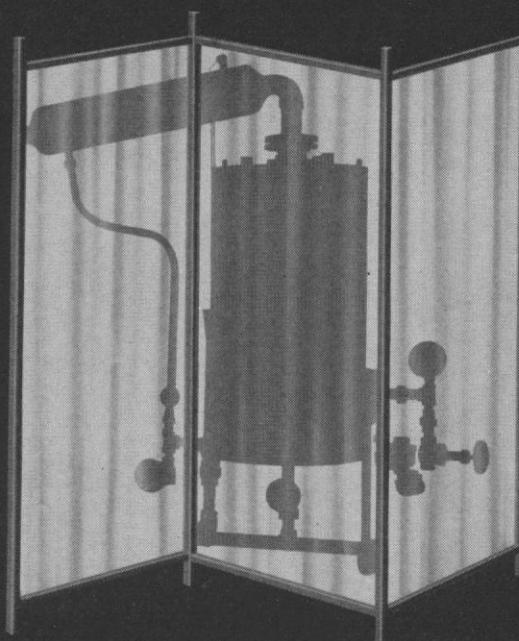
A number of American scientists in the area of neurochemistry have expressed an interest in forming a national scientific society. As a temporary measure, the American members of the International Society for Neurochemistry have selected an organizing committee for the purpose of taking the preliminary steps required in setting up such a society. Anyone actively working in the field of neurochemistry and interested in participating in the work of the founding group is invited to communicate with one of the members of the organizing committee: B. W. Agranoff (Ann Arbor, Michigan), S. S. Kety (Boston, Massachusetts), A. Lajtha (New York City), F. LeBaron (Albuquerque, New Mexico), H. R. Mahler (Bloomington, Indiana), G. M. McKhann (Baltimore, Maryland), E. Roberts (Duarte, California), W. W. Tourtellotte (Ann Arbor, Michigan), D. B. Tower (Bethesda, Maryland), and F. Wolfgram (Los Angeles, California); or with the provisional secretary: J. Folch-Pi, McLean Hospital, Belmont, Massachusetts 02178.

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EDITORIAL CORRESPONDENCE: 1515 Massachusetts Ave., NW, Washington, D.C. 20005. Phone: 202-387-7171. Cable: Advancesci, Washington. Copies of "Instructions for Contributors" can be obtained from the editorial office. See also page 1709, *Science*, 29 December 1967. ADVERTISING CORRESPONDENCE: Rm. 1740, 11 W. 42 St., New York, N.Y. 10036. Phone: 212-PE-6-1858.**AAAS Meetings: A Progress Report**

For well over a hundred years the Meetings of the AAAS have reflected the subtle changes and major shifts in the scientific enterprise of the United States. Their history records the bold innovations of the latter half of the 19th century, when research establishments were proposed that still serve today; the enormous growth in size and complexity of the separate branches of science; and the gradual drift into specialization. Of late, they show the beginning of a new phase: the move away from excessive fragmentation and unconcern for unpleasant and unexpected results of technology toward a more lively involvement with the world around.

Much thought has gone recently into redefining the purpose and objective of the Annual Meetings. What can they do effectively? What functions are obsolete because they can be done better elsewhere? Where are the major needs and payoffs? No simple "either-or" answer appeared. However, a number of guiding principles emerged which have already been given practical expression on a scale such that their impact is becoming apparent.

A decided shift is taking place toward framing questions that deal with the consequences of science and technology. Through panel discussions, general symposia, reviews, and lectures, wide-ranging series of subjects are being presented for consideration by a concerned audience. Massive use of "live" television is making a substantial part of the proceedings available to people who have not heretofore considered themselves invited and welcome.

On a more technical level, increasing emphasis is being placed on truly interdisciplinary symposia in which science is advanced through the illumination of topics that will not bend to the attack of a single discipline. Individuals of widely divergent views, including spokesmen for architecture, law, religion, art and the humanities, are often essential participants in this difficult and demanding task.

These two ventures are the growth points of the current enterprise. Their addition to the more traditional undertakings makes it important that consideration be given to the size of the Meetings, so that they are neither so large as to lose the human scale nor so small as to be dull; it demands careful choice of topics that are neither so general as to disappoint the specialist nor so fragmented as to repel the general audience. Time and space must be found for celebrating historical anniversaries and their results, for reviewing the accomplishments of large national research undertakings, for inspecting the interactions between science and other human activities, for reinstating demonstration lectures and instructive science exhibits.

Two additional ideas are being explored. Detlev Bronk, in 1967, revived the long-neglected concept of an "Open City," where a close bond is established between city and participants through tours, open houses, exhibits, and plays. This was tried and found workable. Athelstan Spilhaus, president-elect of the AAAS, wants attention given to the "non-Meeting" aspects that would permit participation without the need for physical presence. New tools of communication, assisted by the links between the AAAS and regional groups that are attuned to new responsibilities, should make this possible. By television or radio, programs can be made available to diverse local audiences and discussed by many more people than could comfortably be accommodated at the Meeting. Both proposals require the support of people with ideas and with funds. Both will be pursued intensively.

—WALTER G. BERL, *Editor, AAAS Meetings*

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Calendar of Events

National Meetings

March

7-11. **Nuclear Medicine**, Miami Beach, Fla. (J. Oswald, P.O. Box 8105, Coral Gables, Fla. 33124)

9-11. **American Assoc. of Pathologists and Bacteriologists**, San Francisco, Calif. (K. M. Brinkhous, Dept. of Pathology, Univ. of North Carolina School of Medicine, Chapel Hill 27514)

9-14. **American Soc. of Photogrammetry**, Washington, D.C. (G. L. Loelkes, 8608 Cherry Valley Lane, Alexandria, Va. 22309)

10-12. **Flight Test, Simulation, and Support Conf., 3rd.**, Houston, Tex. (J. C. McLane, Jr., Structures and Mechanics Div., Engineering and Development Directorate, NASA Manned Spacecraft Center, Houston 77058)

10-12. **Society of Toxicology**, Williamsburg, Va. (J. F. Borzelleca, Dept. of Pharmacology, Medical College of Virginia, Richmond 23219)

10-13. **Conference on Electric Fields in the Magnetosphere**, Houston, Tex. (J. W. Freeman, Jr., Dept. of Space Science, Rice Univ., P.O. Box 1892, Houston 77001)

10-13. **American Nuclear Soc.**, Idaho Falls, Idaho. (J. E. Kunze, General Electric Co., P.O. Box 2147, Idaho Falls 83401)

10-14. **National Assoc. of Corrosion Engineers**, 25th, Houston, Tex. (Publication Director, 980 M & M Bldg., No. 1, Main St., Houston)

11-14. **Optical Soc. of America**, San Diego, Calif. (M. E. Warga, The Society, 2100 Pennsylvania Ave., NW, Washington, D.C. 20037)

13-14. **Symposium on Automated, High-Resolution Analyses in the Clinical Lab.**, Oak Ridge, Tenn. (Oak Ridge Natl. Lab., P.O. Box X, Oak Ridge 37830)

13-14. **Microscopy Symp.**, 6th, New Orleans, La. (M. L. Zimny, Dept. of Anatomy, Louisiana State Univ. Medical School, 1542 Tulane Ave., New Orleans 70112)

13-15. **Conference on Nuclear Isospin**, 2nd, Asilomar, Calif. (S. D. Bloom, Lawrence Radiation Lab., P.O. Box 808, Livermore, Calif. 94550)

14-15. **American Burn Assoc.**, Atlanta, Ga. (J. A. Boswick, Cook County Hospital, 1835 W. Harrison, Chicago, Ill. 60612)

14-15. **Cell Biology-Biophysics**, Chicago, Ill. (J. S. Gross, Dept. of Life Sciences, Indiana State Univ., Terre Haute 47809)

15-19. **American Acad. of Allergy**, Bal Harbour, Fla. (J. O. Kelly, 756 N. Milwaukee St., Milwaukee, Wis. 53202)

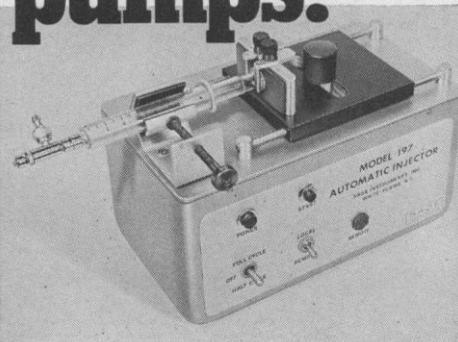
16-20. **American Inst. of Chemical Engineers**, 64th, New Orleans, La. (R. M. Persell, U.S. Dept. of Agriculture, Southern Utilization R&D Div., Box 19687, New Orleans 70119)

16-20. **American Soc. of Mechanical Engineers**, Cleveland, Ohio. (The Society, 345 E. 47 St., New York 10017)

17. **Chemiluminescence Conf.**, Desert Hot Springs, Calif. (H. W. Schneider, Box 433, North Palm Springs, Calif.)

17-19. **Physical Electronics Conf.**, 29th, New Haven, Conn. (T. E. Fischer, Dept.

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of Engineering and Applied Science, Hammond Lab., Yale Univ., 14 Mansfield St., New Haven 06520)

17-19. Space Congr., 6th, Cocoa Beach, Fla. (G. Meguiar, P.O. Box 1333, Cocoa Beach 32931)

18-19. Central States Section of the Combustion Inst., Minneapolis, Minn. (B. Schukraft, Inst. of Gas Technology, 3424 S. State St., Chicago, Ill. 60616)

18-20. National Federation of Science Abstracting and Indexing Services, Raleigh, N.C. (S. Keenan, NFSAIS, 2102 Arch St., Philadelphia, Pa. 19103)

19. Man and His Urban Environment, Cincinnati, Ohio. (E. C. Foulkes, Dept. of Environmental Health, Kettering Lab., Univ. of Cincinnati College of Medicine, Cincinnati 45219)

20. Biomedical Engineering, Cincinnati, Ohio. (D. Hershey, Dept. of Chemical Engineering, Univ. of Cincinnati, Cincinnati)

20-22. American Acad. of Facial Plastic and Reconstructive Surgery, New Orleans, La. (J. R. Anderson, 111 Tulane Ave., New Orleans 70112)

23-29. American Crystallographic Assoc., Seattle, Wash. (W. L. Kehl, Gulf Research and Development Co., P.O. Box 2038, Pittsburgh, Pa. 15230)

24-25. Basis of Decision, Brooklyn, N.Y. (C. McC. Brooks, Downstate Medical Center, State Univ. of New York, 450 Clark Ave., Brooklyn 11203)

24-25. Laser Safety Conf. and Workshops, 2nd, Cincinnati, Ohio. (L. Goldman, Laser Lab., Children's Hospital Research Foundation of the Medical Center of the Univ. of Cincinnati, Cincinnati)

24-27. American Physical Soc., Philadelphia, Pa. (W. W. Havens, Jr., The Society, 335 E. 45 St., New York 10017)

24-28. Desalination: Methods and Applications, Berkeley, Calif. (Continuing Education in Engineering, Univ. Extension, Univ. of California, 2223 Fulton St., Berkeley 94720)

25-27. American Laryngological, Rhinological and Otolological Soc., Inc., New Orleans, La. (V. R. Alfaro, 917 20th St., NW, Washington, D.C. 20006)

26-28. National Business Aircraft Mfg. and Engineering Display, Wichita, Kan. (A. J. Favata, SAE Headquarters, 2 Pennsylvania Plaza, New York 10001)

26-28. Symposium on the Engineering Aspects of Magnetohydrodynamics, 10th, Cambridge, Mass. (J. Klepeis, Arrangements Committee, Avco Everett Research Lab., 2385 Revere Beach Parkway, Everett, Mass. 02149)

26-28. George H. Hudson Symp., 4th, Plattsburgh, N.Y. (M. H. Tourin, State Univ. College of Arts and Sciences, Plattsburgh 12901)

27. Biochemistry, Assay and Nutritional Value of Vitamin E, Rosemont, Ill. (W. Davin, Dawes Labs., Inc., 450 State St., Chicago Heights, Ill. 60411)

27-28. Technical Writing Inst., Lubbock, Tex. (M. Miles, Technical Writing Inst., Dept. of English, Texas Technological College, Lubbock 79409)

27-29. Geological Soc. of America, South-Central Section, Lawrence, Kans., "Basement Rocks of the Mid-Continent" and "Paleo-Environmental Implications of Palynology." (W. M. Merrill, Dept. of Geology, Univ. of Kansas, Lawrence 66044)

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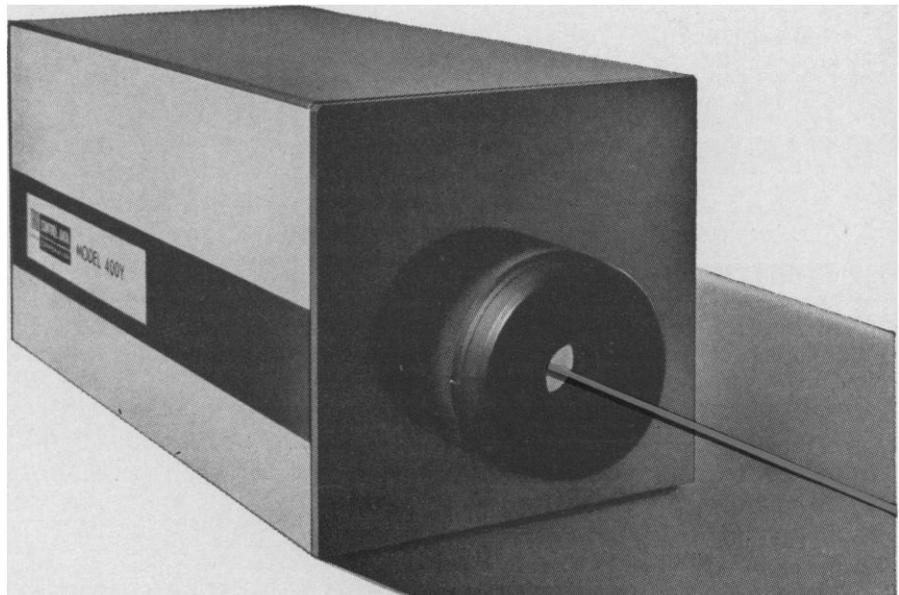
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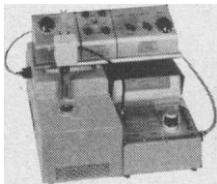
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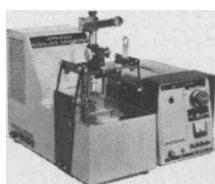
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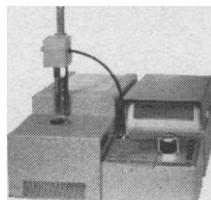
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28-29. American **Otological** Soc., Inc., New Orleans, La. (W. H. Bradley, 1100 E. Genesee St., Syracuse, N.Y.)

28-30. American **Psychosomatic** Soc., Inc., 26th, Cincinnati, Ohio. (H. Weiner, 265 Nassau Rd., Roosevelt, N.Y. 11575)

28-2. Seminar of the American **Cancer Soc. for Science Writers**, 11th, New Orleans, La. (J. Clark, American Cancer Soc., 219 E. 42 St., New York 10017)

30-2. American **Orthopsychiatric** Assoc., New York, N.Y. (M. F. Langer, Room 1313, 1790 Broadway, New York 10019)

31. American **Astronomical** Soc., Honolulu, Hawaii. (G. C. McVittie, Univ. of Illinois Observatory, Urbana 61801)

31-2. **Advances in Water Quality Improvement—Physical and Chemical Processes**, Austin, Tex. (Center for Research in Water Resources, Univ. of Texas, Rt. 4, Box 189, Austin 78757)

31-2. **Metals Engineering** Conf., Washington, D.C. (R. J. Cepluch, Hartford Steam Boiler Inspection and Insurance Co., 56 Prospect St., Hartford, Conn. 06102)

31-2. **Education for the Peaceful Uses of Nuclear Explosives**, Tucson, Ariz. (L. E. Weaver, Dept. of Nuclear Engineering, Univ. of Arizona, Tucson 85721)

31-2. American Assoc. of **Thoracic Surgery**, San Francisco, Calif. (T. B. Ferguson, Suite 311, 7730 Carondelet Ave., St. Louis, Mo. 63110)

April

1. Arkansas Acad. of **Science**, Fayetteville, Ark. (G. E. Templeton, Dept. of Plant Pathology, Univ. of Arkansas, Fayetteville 72701)

1-2. **Advanced Techniques in Real-Time Simulation**, Philadelphia, Pa. (University City Science Center, Science Center Bldg. No. 1, 3401 Market St., Philadelphia 19104)

1-3. **Numerical Control** Soc., 6th, Cincinnati, Ohio. (P. Senkiw, Advanced Computer Systems, Inc., 2185 S. Dixie Ave., Dayton, Ohio 45409)

1-4. American Assoc. of **Anatomists**, Boston, Mass. (R. T. Woodburne, Dept. of Anatomy, Univ. of Michigan, East Medical Bldg., Ann Arbor 48104)

2. **Oral Cancer Symp.**, 7th, Poughkeepsie, N.Y. (Sister M. A. Elizabeth, Poughkeepsie, N. Y.)

2-4. **Picture Bandwidth Compression**, Cambridge, Mass. (E. E. Witchi, Boston Section, IEEE, 31 Channing St., Newton, Mass. 02158)

3-4. American Soc. for **Engineering Education**, Fayetteville, Ark. (E. H. Wright, The Society, 2100 Pennsylvania Ave., NW, Washington, D.C. 20037)

3-5. Southern Soc. for **Philosophy and Psychology**, Miami, Fla. (D. Browning, Dept. of Philosophy, Univ. of Miami, Coral Gables, Fla.)

3-5. National Conf. on **Schizophrenia**, Topeka, Kan. (Dept. of Education, Menninger Foundation, Box 829, Topeka 66601)

7-9. **Operations Research** Seminar, Cleveland, Ohio. (Office of Public Relations, Case Western Reserve Univ., University Circle, Cleveland 44106)

7-11. **Public Health Aspects of Peaceful Uses of Nuclear Explosives**, Las Vegas, Nev. (Symp. Committee, Southwestern

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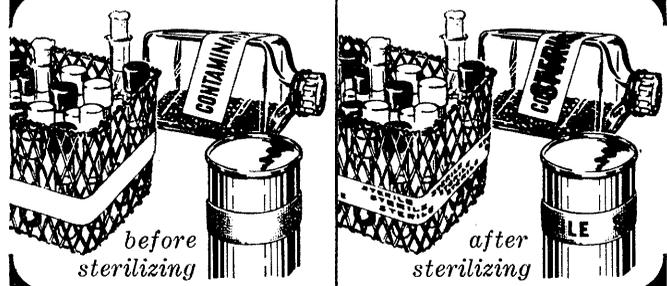
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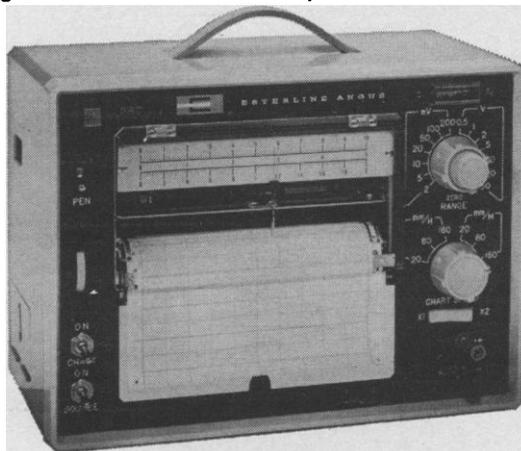
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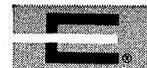
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8-9. **High Performance Composites**, 4th symp., St. Louis, Mo. (G. L. Esterson, Box 1048, Washington Univ., St. Louis 63130)

8-11. **Acoustical Soc. of America**, 71st, Philadelphia, Pa. (B. Goodfriend, 335 E. 45 St., New York 10017)

9-10. **American Assoc. of Planned Parenthood Physicians**, 7th, San Francisco, Calif. (G. C. Denniston, The Association, 515 Madison Ave., New York 10022)

9-11. **Textile Research Inst.**, 39th, New York, N.Y. (P.O. Box 625, Princeton, N.J.)

9-12. **Geological Soc. of America**, southeastern section, Columbia, S.C. (D. J. Colquhoun, Dept. of Geology, Univ. of South Carolina, Columbia 29208)

10. **Health Conf. on Diet, Exercise, and Cardiovascular Disease**, Philadelphia, Pa. (R. L. Kunes, Heart Assoc. of Southeastern Pennsylvania, 318 S. 19 St., Philadelphia)

10-12. **Population Assoc. of America**, Atlantic City, N.J. (A. L. Ferriss, Russell Sage Foundation, 1755 Massachusetts Ave., NW, Washington, D.C. 20036)

10-16. **American Leprosy Missions**, 10th PHS seminar, Carville, La. (American Leprosy Missions, 297 Park Ave. South, New York 10010)

11-12. **American Soc. for Engineering Education** (North Central Section mtg.), Windsor, Ont., Canada. (E. H. Wright, The Society, 2100 Pennsylvania Ave., NW, Washington, D.C. 20037)

12. **New Jersey Acad. of Science**, East Orange. (F. F. Katz, Seton Hall Univ., South Orange, N.J. 07079)

12-16. **American Soc. of Abdominal Surgeons**, Las Vegas, Nev. (B. F. Alfano, 675 Main St., Melrose, Mass. 02176)

12-13. **National Guild of Catholic Psychiatrists**, Washington, D.C. (P. A. Santucci, 4962 Hampden Lane, Bethesda, Md. 20014)

12-13. **Histochemical Soc.**, 20th, Atlantic City, N.J. (G. M. Lehrer, Div. of Neurochemistry, Mount Sinai Medical School, 11 E. 100 St., New York 10029)

13-16. **Plant Engineering and Maintenance**, 12th conf., Pittsburgh, Pa. (B. J. Cross, Lederle Labs., Pearl River, N.Y. 10965)

13-17. **American Assoc. of Cereal Chemists**, 54th, Chicago, Ill. (R. Tarleton, 1955 University Ave., St. Paul, Minn. 55104)

13-17. **Pacific Coast Oto-Ophthalmological Soc.**, San Francisco, Calif. (F. A. Sooy, Dept. of Otolaryngology, Univ. of California Medical Center, San Francisco 94122)

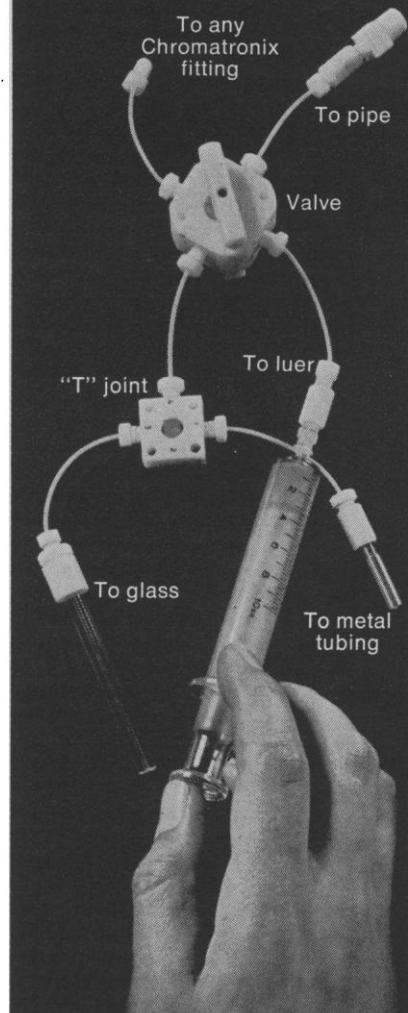
13-18. **American Socs. for Experimental Biology**, Atlantic City, N.J. (J. F. A. McManus, FASEB, 9650 Rockville Pike, Bethesda, Md. 20014)

13-18. **American Soc. for Experimental Pathology**, Atlantic City, N.J. (R. E. Knott, 9650 Rockville Pike, Bethesda, Md. 20014)

13-18. **American Inst. of Nutrition**, Atlantic City, N.J. (J. Waddell, 9650 Rockville Pike, Bethesda, Md. 20014)

13-18. **American Soc. for Pharmacology and Experimental Therapeutics, Inc.**, Atlantic City, N.J. (E. B. Cook, Executive Officer, The Society, 9650 Rockville Pike, Bethesda, Md. 20014)

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14-16. American Inst. of Mining, Metallurgical and Petroleum Engineers, Inc., 52nd, Toronto, Ont., Canada. (The Society, 345 E. 47 St., New York 10017)

14-16. Structures, Structural Dynamics, and Materials Conf., 10th, New Orleans, La. (A. H. Hausrath, Bldg. 520, Room 144, TRW Systems, P.O. Box 1310, Norton AFB, Calif. 92402)

14-17. American Cleft Palate Assoc., Houston, Tex. (K. R. Bzoch, Dept. of Communicative Disorders, Univ. of Florida, Gainesville 32601)

14-17. American Assoc. of Petroleum Geologists, 54th, Dallas, Tex. (The Association, Box 979, Tulsa, Okla.)

14-18. American Soc. of Biological Chemists, Inc., Atlantic City, N.J. (Executive Officer, The Society, 9650 Rockville Pike, Bethesda, Md. 20014)

14-18. American Assoc. of Immunologists, Atlantic City, N.J. (Secretary-Treasurer, The Association, 9650 Rockville Pike, Bethesda, Md. 20014)

16-18. American Soc. of Neuroradiology, Cleveland, Ohio. (A. E. Zimmer, Danbury Hospital, Danbury, Conn. 06810)

14-18. American Physiological Soc., Atlantic City, N.J. (R. G. Daggs, The Society, 9650 Rockville Pike, Bethesda, Md. 20014)

14-18. Federation of American Socs. for Experimental Biology, 53rd, Atlantic City, N.J. (Convention Manager, 9650 Rockville Pike, Bethesda, Md. 20014)

15. Labeling of Blood Typing Sera, New York, N.Y. (A. S. Wiener, Office of the Chief Medical Examiner of New York City, 520 First Ave., New York 10016)

16-17. American Inst. of Aeronautics and Astronautics (structural dynamics and aeroelasticity conf.), New Orleans, La. (H. Runyan, Dynamics Loads Div., NASA Langley Research Center, Langley Field, Va. 23365)

16-18. Institute of Electrical and Electronics Engineers (geoscience electronics symp.), Washington, D.C. (M. E. Ringenbach, Equipment Development Lab., Room 201, Gramax Bldg., 8060 13 St., Silver Spring, Md. 20901)

16-18. American Soc. for Engineering Education, southeastern section mtg., Coral Gables, Fla. (E. H. Wright, The Society, 2100 Pennsylvania Ave., NW, Washington, D.C. 20037)

16-26. Solid State Chemistry Advanced Study Inst., Scottsdale, Ariz. (L. Eyring and M. O'Keefe, Dept. of Chemistry, Arizona State University, Tempe 85281)

17-18. Fiber Soc., Raleigh, N.C. (L. Rebenfeld, Box 625, Princeton, N.J.)

17-18. American Assoc. of Railway Surgeons, Chicago, Ill. (C. Y. Werelius, 5800 Stony Island Ave., Chicago 60637)

17-19. Orthopaedic Symp., 5th, Houston, Tex. (W. M. Granberry, 6624 Fannin St., Houston 77025)

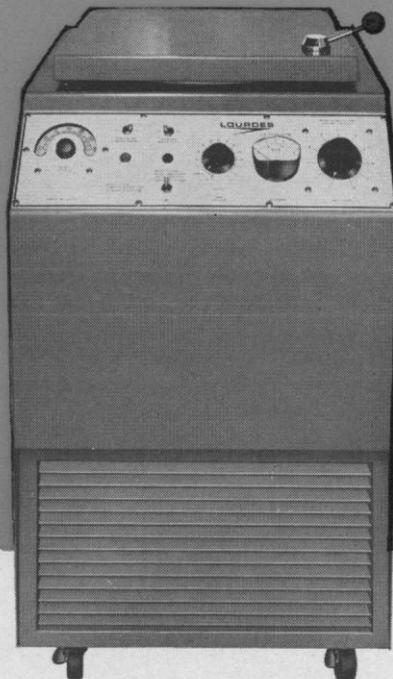
17-19. Association of Southeastern Biologists, Memphis, Tenn. (C. D. Brown, Memphis State Univ., Memphis)

17-20. Southwestern Assoc. of Naturalists, Tempe, Ariz. (M. J. Fouquette, Jr., Dept. of Zoology, Arizona State Univ., Tempe 85281)

17-22. American Dermatological Assoc., Inc., Scottsdale, Ariz. (R. R. Kierland, % Mayo Clinic, Rochester, Minn. 55901)

18-19. Iowa Acad. of Sciences, Cedar

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Falls, Iowa. (R. Hanson, Dept. of Science, Univ. of Northern Iowa, Cedar Falls 50613)

18-20. American Soc. of **Internal Medicine**, Chicago, Ill. (A. V. Whitehall, 3410 Geary Blvd., San Francisco, Calif. 94118)

20-23. Institute of **Environmental Sciences**, 15th, Anaheim, Calif. (Technical Program Committee, The Institute, 940 E. Northwest Highway, Mount Prospect, Ill. 60056)

20-23. West Virginia Acad. of **Ophthalmology and Otolaryngology**, Greenbrier. (J. E. Blaydes, Jr., 107 Federal St., Bluefield, W.Va.)

20-23. Assoc. for **Research in Ophthalmology**, Sarasota, Fla. (H. E. Kaufman, Office of Secretary-Treasurer, Dept. of Ophthalmology, Univ. of Florida Medical College, Gainesville 32601)

20-24. American **Oil Chemists' Soc.**, San Francisco, Calif. (C. H. Hauber, The Society, 35 E. Wacker Drive, Chicago, Ill. 60601)

20-25. Society of **Motion Picture and Television Engineers**, 105th, Miami Beach, Fla. (Executive Secretary, 9 E. 41 St., New York 10017)

21-22. American Soc. for **Artificial Internal Organs**, Atlantic City, N.J. (E. F. Bernstein, Dept. of Surgery, Univ. of Minnesota Medical School, Minneapolis 55455)

21-22. **Temperature Measurements Soc.**, 6th, Hawthorne, Calif. (C. L. Vaughn, Paper Selection Committee, % The Society, P.O. Box 156, Palos Verdes Estates, Calif. 90274)

21-23. **Effective Use of Computers in the Nuclear Industry**, Knoxville, Tenn. (B. F. Maskewitz, Oak Ridge Natl. Lab., P.O. Box X, Oak Ridge, Tenn. 37830)

21-24. American **Industrial Health Conf.**, Houston, Tex. (American Industrial Health Conf., 55 E. Washington St., Chicago, Ill. 60602)

21-25. **Astrodynamics and Related Planetary Sciences**, Washington, D.C. (J. W. Siry, NASA Goddard Space Flight Center, Code 550, Greenbelt, Md. 20771)

21-25. American College of **Physicians**, 50th, Chicago, Ill. (E. C. Rosenow, Jr., 4200 Pine St., Philadelphia, Pa.)

21-25. **Solid State Chemistry Conf.**, 2nd, Scottsdale, Ariz. (L. Eyring and M. O'Keeffe, Dept. of Chemistry, Arizona State University, Tempe 85281)

21-26. American Acad. of **Neurology**, Washington, D.C. (S. A. Nelson, 4005 W. 65 St., Minneapolis, Minn. 55435)

22-23. National **Relay Conf.**, 17th, Stillwater, Okla. (D. D. Lingelbach, School of Electrical Engineering, Oklahoma State Univ., Stillwater 74074)

22-24. **Telemetry Conf.**, Washington, D.C. (R. W. Rochelle, NASA Goddard Space Flight Center, Code 710, Greenbelt, Md. 20771)

22-25. American College **Health Assoc.**, Oklahoma City, Okla. (J. W. Dilley, 2807 Central Ave., Evanston, Ill. 60201)

22-25. National **Pollution Conf.**, Houston, Tex. (The Conference, 4710 Greeley St., Houston 77006)

23-24. **Electric Process Heating in Industry**, Inst. of Electrical and Electronics Engineers, Philadelphia, Pa. (G. Bobart, Westinghouse Electric Corp., Box 300, Sykesville, Md. 21784)

23-25. Institute of **Electrical and Electronics Engineers Conv.**, San Antonio, Tex. (W. H. Hartwig, Dept. of Electrical Engineering, Engineering Science Bldg.

439, University of Texas, Austin 78712)

23-25. **Nondestructive Evaluation of Components and Materials in Aerospace, Weapons Systems, and Nuclear Applications**, San Antonio, Tex. (C. E. Lautzenheiser, Southwest Research Inst., 8500 Culebra Rd., San Antonio 78228)

24-26. American Acad. of **Physical Medicine and Rehabilitation**, Chicago, Ill. (C. C. Herold, 30 N. Michigan Ave., Chicago 60602)

24-26. New York **Roentgen Soc.**, New York, N.Y. (S. H. Madell, 1 E. 82 St., New York 10028)

24-26. Illinois State Acad. of **Science**, Decatur, Ill. (K. Harmet, Dept. of Biology, Northern Illinois Univ., DeKalb 60115)

24-26. Ohio Acad. of **Science**, Delaware. (J. H. Melvin, Ohio Acad. of Science, 505 King Ave., Columbus 43210)

24-26. Annual **Wildflower Pilgrimage**, 19th, Gatlinburg, Tenn. (Gatlinburg Chamber of Commerce, Box 527, Gatlinburg, Tenn. 37738 or E. E. C. Clebsch, Dept. of Botany, Univ. of Tennessee, Knoxville 37916)

24-27. Association of **Clinical Scientists**, Mobile, Ala. (R. P. MacFate, 125 N. Rutledge St., Pentwater, Mich. 49449)

25-26. American Soc. for **Engineering Education**, Rocky Mountain Section mtg., Logan, Utah. (E. H. Wright, The Society, 2100 Pennsylvania Ave., NW, Washington, D.C. 20037)

25-26. American Society of **Group Psychotherapy and Psychodrama**, New York, N.Y. (A. Manzoello, P.O. Box 311, Beacon, N.Y. 12508)

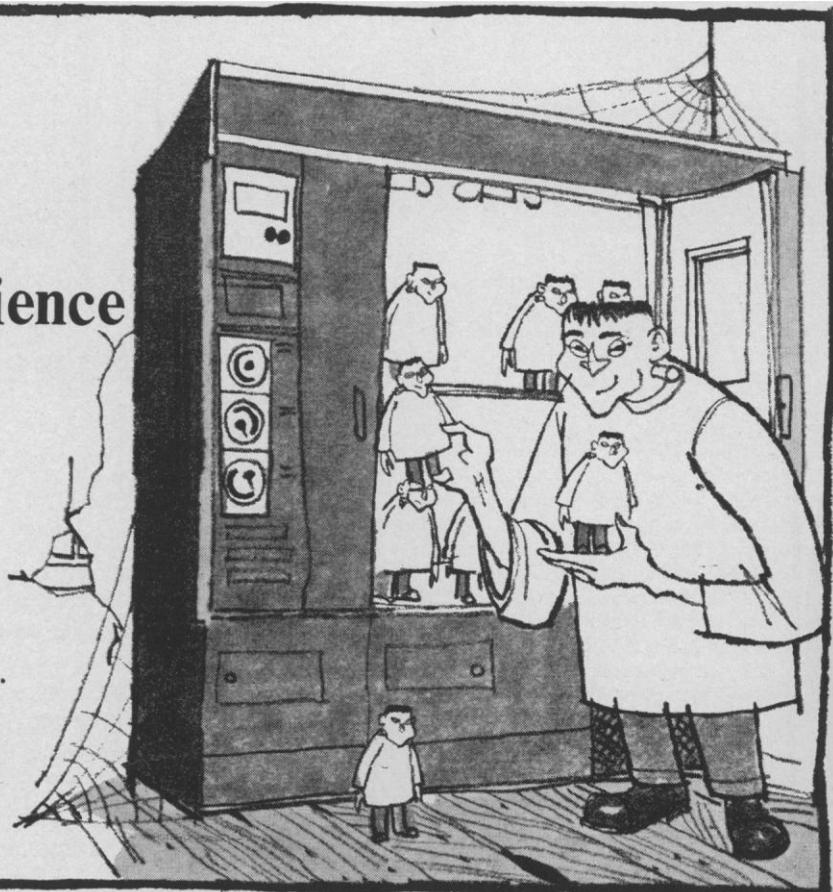
25-26. Nebraska Acad. of **Science**, Lincoln. (C. B. Schultz, 101 Morrill Hall,

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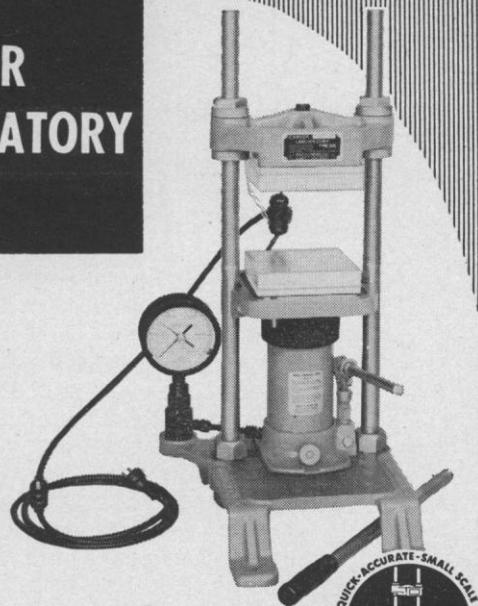
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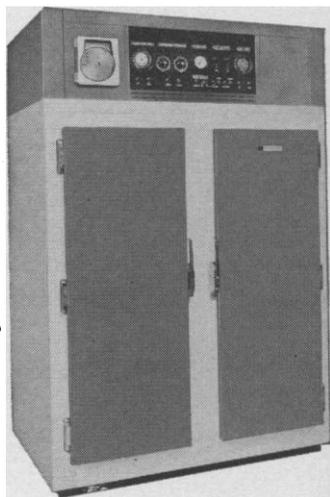


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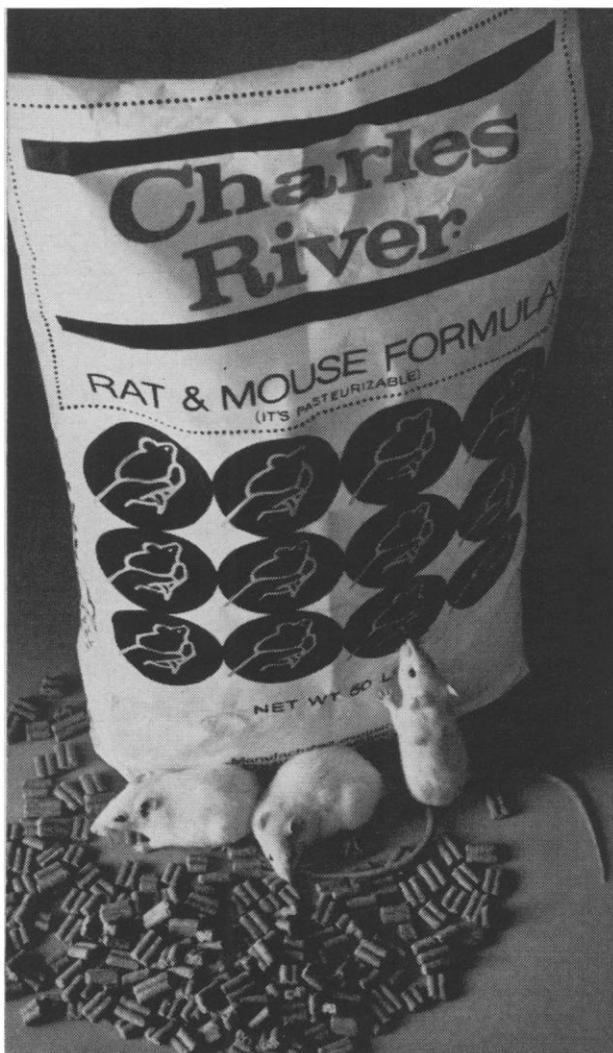
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University Museum, Univ. of Nebraska, Lincoln 68508)

25-26. South Dakota Acad. of Science, Vermillion. (T. Van Bruggen, Dept. of Botany, Univ. of South Dakota, Vermillion 57069)

26. American Soc. for Engineering Education, Illinois-Indiana Section Mtg., Terre Haute, Ind. (E. H. Wright, The Society, 2100 Pennsylvania Ave., NW, Washington, D.C. 20037)

26-27. Eye Bank Assoc of America, New Orleans, La. (W. Clark, 211 S. Saratoga St., New Orleans 70112)

27-30. American Soc. of Maxillofacial Surgeons, San Francisco, Calif. (D. Goulian, Jr., 116 E. 68 St., New York 10021)

27-30. Southwestern and Rocky Mountain Div. of AAAS, Colorado Springs, Colo. (M. G. Anderson, Dept. of Biology, New Mexico State Univ., Las Cruces 88001)

28. National Cystic Fibrosis Research Foundation, Atlantic City, N.J. (W. H. Boyer, 202 E. 44 St., New York 10017)

28-29. Photo-Optical Techniques in Simulators, South Fallsburgh, N.Y. (Photo-Optical Techniques in Simulators Seminar Committee, % SPIE Natl. Office, P.O. Box 288, Redondo Beach, Calif. 90277)

28-30. American Inst. of Aeronautics and Astronautics, Cincinnati, Ohio. (J. Lukasiewicz, ARO, Inc., Arnold Engineering Development Center, Arnold Air Force Station, Tenn. 37389)

International and Foreign Meetings

March

20-23. International Assoc. for Dental Research, 47th, Houston, Tex. (A. D. Frechette, 211 E. Chicago Ave., Chicago, Ill. 60611)

24-27. International Convention of Inst. of Electrical and Electronics Engineers, New York, N.Y. (The Convention, 345 E. 47 St., New York 10017)

25-28. Autoclaved Building Products, 2nd intern. symp., Hanover, Germany. (Secretary, Second Intern. Symp. 1969, "Haus der Kalksandstein-industrie." Postfach 66, 3 Hanover-Herrenhausen)

25-28. Liquefied Natural Gas, London, England. (Conference Dept., Inst. of Mechanical Engineers, 1 Birdcage Walk, Westminster, London, S.W.1)

27-28. International Congr. for Heating, Ventilating, Air Conditioning, 19th, Frankfurt am Main, Germany. (S. Ausschuss, Kongress für Heizung, Lüftung, Klimatechnik, Kongressbüro, Königstr. 5, 4 Düsseldorf 1, Germany)

31-4. International Symp. on Concrete Bridge Design, 2nd, Chicago, Ill. (American Concrete Inst., P.O. Box 4754, Redford Sta., 22400 W. Seven Mile Rd., Detroit, Mich. 48219)

April

7-11. Federation of European Biochemical Societies, 6th, Madrid, Spain. (Secretariat, Centro de Investigaciones Biológicas, Velazquez, 144, Madrid 6)

8-11. International Symp. on Laboratory Animals, Washington, D.C. (B. F. Hill, Charles River Breeding Labs., Inc., Wilmington, Mass.)

9-12. **British Medical Assoc.**, clinical mtg., Valletta, Malta. (British Medical Assoc. House, Tavistock Sq., London, W.C.1, England)

14-17. **Cleft Palate**, intern. Congr., Houston, Tex. (B. J. McWilliams, Cleft Palate Research Center, Univ. of Pittsburgh, 313 Salk Hall, Pittsburgh, Pa. 15213)

15-17. **Civil Engineering Problems of the South Wales Valleys**, Cardiff, England. (Institution of Civil Engineers, Great George St., London, S.W.1, England)

15-18. **International Magnetism Conf.**, Amsterdam, Netherlands. (T. Holtwijk, Philips Research Labs., Eindhoven, Netherlands)

17-18. **British Inst. of Radiology**, London, England. (British Inst. of Radiology, 32 Welbeck St., London, W.1)

19-27. **Yugoslav Seminar and Exhibition of Regulation, Measuring and Automation-Jurema 1969**, 14th, Zagreb. (Jurema, Unska U1, P.O.B. 123, Zagreb)

21-23. **Canadian Inst. of Mining and Metallurgy**, 71st, Montreal, Canada. (Executive Director, The Institute, Suite 906, 1117 St. Catherine St. W., Montreal 2)

21-25. **Switching Techniques for Telecommunication Networks**, London, England. (Conference Dept., Institution of Electrical Engineers, London, W.C.2)

21-26. **Canadian Pulp and Paper Assoc.**, 10th, Vancouver, B.C. (W. K. Voss, Ontario Paper Co. Ltd., Thorold, Ont.)

22-25. **Cotton Textile Research**, 1st intern. symp., Paris, France. (Institut Textile de France, 23 rue des Abondances, 92, Boulogne, France)

22-29. **Hydrology of Deltas**, intern. symp., Bucharest, Rumania. (A. I. Johnson, Water Resources Div., U.S. Geological Survey, Federal Center, Denver, Colo. 80225)

28-2. **Symposium on Radiation-Induced Carcinogenesis**, Athens, Greece. (R. N. Mukherjee, Unit of Radiation Biology, Intern. Atomic Energy Agency, Karntrner Ring 11-13, A-1010 Vienna, Austria)

May

5-8. **Instrumentation in Aerospace Simulation Facilities**, 3rd intern. Congr., Farmingdale, N.Y. (C. R. Spitzer, MS-236, NASA Langley Research Center, Hampton, Va. 23365)

5-8. **International Microwave Symp.**, Dallas, Tex. (J. B. Horton, MS 905, Texas Instrument Co., Box 5012, Dallas 75222)

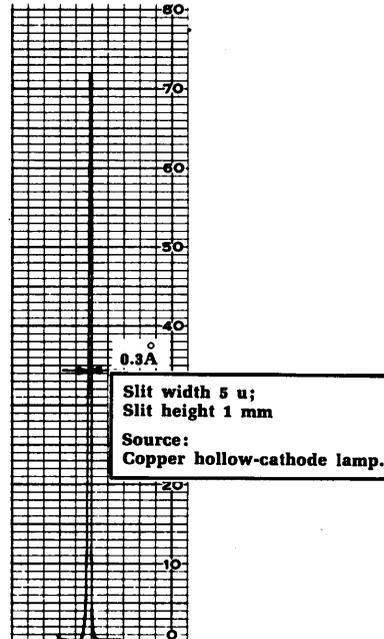
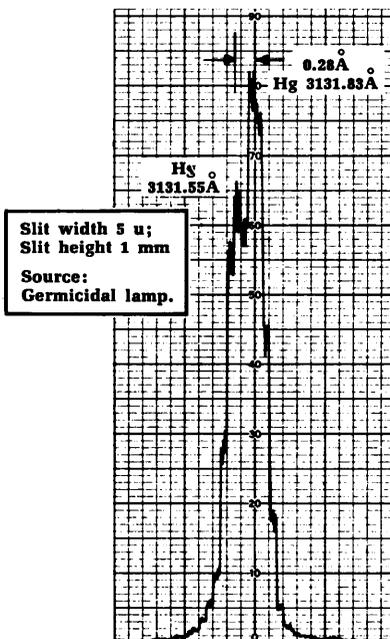
5-9. **Commonwealth Mining and Metallurgical Congr.**, 9th, London, England. (Congress Secretary, Commonwealth Council of Mining and Metallurgical Institutions, 44 Portland Pl., London, W.1, England)

6-8. **Nuclear Electronics Symp.**, Ispra, Italy. (L. Stanchi, C.C.R. Euratom, 21020 Ispra)

6-8. **Power Thyristors and Their Applications**, London, England. (Conference Dept., Institution of Electrical Engineers, Savoy Pl., London, W.C.2, England)

6-8. **Radiosensitizing and Radioprotective Drugs**, 2nd intern. symp., Rome, Italy. (H. Moroson, Sloan-Kettering Inst. for Cancer Research, Donald S. Walker Lab., 145 Boston Post Rd., Rye, N.Y.)

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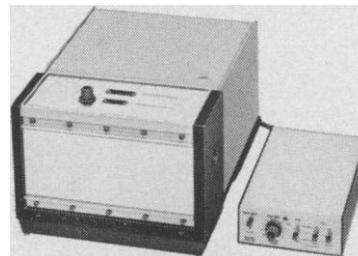
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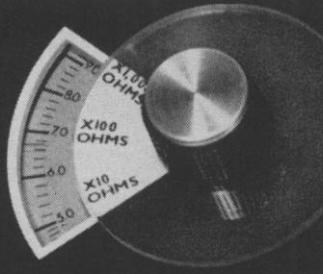
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6-9. **Fluid Sealing**, 4th intern. conf., Philadelphia, Pa. (J. J. Sherlock, Midwest Aero Industries, Inc., P.O. Box 536, Oak Ridge Sta., 4834 Delemere Ave., Royal Oak, Mich. 48073)

7-9. **International Joint Conf. on Artificial Intelligence**, Washington, D.C. (D. E. Walker, Mitre Corp., Bedford, Mass. 01730)

10-11. **International Soc. for the Study of Social and Behavioral Sciences**, Princeton, N.J. (J. Jaynes, Dept. of Psychology, Princeton Univ., Princeton 08540)

11-18. **International Exhibition on Diagnostics**, Munich, Germany. (Munchener Messe-und Ausstellungs-Gesellschaft MBH, Theresienhohe 13, 8 Munich 12)

15-18. **International Revolving-Shutter Products Fair**, Stuttgart, Germany. (Stuttgarter Ausstellungs GMBH, Postfach 990, 700 Stuttgart 1)

26-30. **Spectroscopy**, 15th intern. colloquium, Madrid, Spain. (Secretary, XV Colloquium Spectroscopium Internationale, Serrano 119, Madrid-6)

27-31. **International Assoc. of Thalassotherapy**, 14th, Eforie Nord, Roumania (Prof. Biculescu, Strada Transilvaniei 47, Bucharest, Roumania)

27-1. **German Congr. for Medical Continuation Studies**, 18th, Berlin. (Kongressgesellschaft fur Artliche Fortbildung, Klingsortstr. 21, Berlin 41)

28-7. **Pro Aqua Congr.**, 4th, Basel, Switzerland. (O. Jaag, % Secretariat Pro Aqua, Basel 21)

29-3. **International Assoc. for Accident and Traffic Medicine**, 3rd, New York, N.Y. (M. Helpert, % Office of Chief Medical Examiner, 520 First Ave., New York 10016)

29-19. **General Assembly of Pan-American Inst. of Geography and History**, Washington, D.C. (C. A. Forray Rojas, Ex-Arzobispado 29, Mexico, D.F. Mexico)

June

1-12. **Symposium on Non-Destructive Testing of Concrete and Timber**, London, England. (Institution of Civil Engineers, Great George St., London, S.W.1)

2-6. **International Symp. on Yeasts**, Delft and The Hague, Netherlands. (L. Rodrigues de Miranda, Organizing Committee, Julianalaan 67A, Delft)

3-13. **International Conf. on Arid Lands in a Changing World**, Tucson, Ariz. (International Arid Lands Conf., % Dept. of Geochronology, Univ. of Arizona, Tucson 85721)

4-6. **Automated Analysis**, intern. congr., Chicago, Ill. (J. E. Golin, Technicon Corp., Ardsley, N.Y. 10502)

4-7. **Union of Textile Chemists and Colorists**, 21st congr., Baden-Baden, Germany. (Rohrbacherstr. 78, Heidelberg, Germany)

5. **European Federation of Intern. College of Surgeons**, London, England. (F. P. Fitzgerald, 129 Harley St., London, W.1)

5-7. **Mineralogical Assoc. of Canada**, Montreal, P.Q. (J. Beland, Dept. of Geology, Univ. of Montreal, Montreal)

5-11. **Forensic Sciences**, 5th intern., Toronto, Ont., Canada. (L. Ball, Center of Forensic Sciences, Dept. of Attorney General, 8 Jarvis Street, Toronto 2)

6-9. **Canadian Pediatric Soc.**, Montreal,

P.Q. (J. H. V., Marchessault, 14 Green Ave., St. Lambert, Quebec City, P.Q.)

8-14. **Canadian Medical Assoc.**, 102nd, Toronto, Ont., Canada. (The Association, 170 St. George Street, Toronto, Canada)

9-11. **International Communications Conf.**, Boulder, Colo. (M. Nesenbergs, Environmental Science Services Administration, Inst. for Telecommunication Sciences, R614, Boulder 80302)

9-12. **International Food Congr. and Exhibition**, 7th, Madrid, Spain. (L. Naranon, % Federacion Nacional de Almacenistas de Alimentacion, Paseo del Prado 18-20, Planta 11, Madrid)

9-13. **Clean Air Congr. and Exhibition**, Dusseldorf, Germany. (V. Deutscher, Postfach 1139, 4 Dusseldorf 1)

9-14. **Canadian Assoc. of Pathologists**, Toronto, Ont., Canada. (D. W. Penner, Winnipeg General Hospital, Winnipeg 3, Manitoba)

10-20. **International Marine and Shipping Conf.**, London, England. (Inst. of Marine Engineers, 76 Mark Lane, London, E.C.3)

11-13. **Canadian Federation of Biological Societies** (Canadian Physiological Soc., Pharmacological Soc. of Canada, Canadian Assoc. of Anatomists, Canadian Biochemical Soc.), 12th, Univ. of Alberta, Edmonton. (A. H. Neufeld, Univ. of Western Ontario, London, Ont., Canada)

11-14. **Canadian Psychiatric Assoc.**, 19th, Toronto, Ont. (W. A. Blair, 225 Lisgar St., Ottawa, Ont.)

14-20. **Canadian Assoc. of Gastroenterology**, 8th, Toronto, Ont. (The Association, 426 170 St. George St., Toronto 5)

15-18. **Chemical Inst. of Canada**, 19th, Montreal, P.Q. (The Institute, 151 Slater St., Ottawa 4, Ont.)

15-20. **Canadian Anaesthetists Soc.**, 20th, Toronto, Ont. (E. R. Campbell, 178 St. George St., Toronto 5)

15-20. **International Data Processing Conf.**, Montreal, Canada. (M. Rafferty, Data Process Managing Assoc., 505 Busse Highway, Park Ridge, Ill. 60068)

15-22. **World Medical Assoc.**, 23rd, Paris, France. (M. Poumailloux, Domus Medica, 60 Blvd. de Labour-Maubourg, Paris 15)

16-18. **Thermophysics Conf.**, 4th, San Francisco, Calif. (E. R. Streed, Vehicle Systems Design Branch, NASA Ames Research Center, N244-6, Moffett Field, Calif. 94035)

16-21. **Triennial Congr. of Intern. Federation of Automatic Control**, Warsaw, Poland. (Organizing Committee, Ul Czackiego 3/5, P.O. Box 903, Warsaw 1)

16-21. **Sarcoidosis**, 5th intern. conf., Prague, Czechoslovakia. (L. Levinsky, University Clinic for Tuberculosis and Respiratory Diseases, 19 Katerinska, Prague 2)

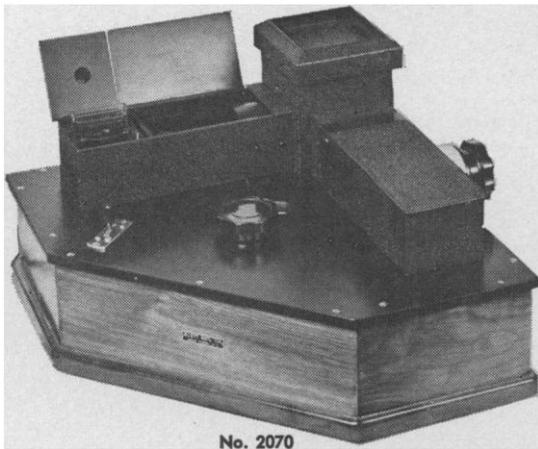
21-29. **Quadrennial Congr. of Intern. Council of Nurses**, Montreal, Canada. (H. M. Nussabaum, P.O. Box 42, 1211 Geneva 20, Switzerland)

22-29. **Application of Mathematics in Engineering**, 5th biennial intern. congr., Weimar, Germany. (H. Matzke, Weimar College of Architecture and Building, Karl-Marx-Platz 2, 53 Weimar)

22-29. **Nephrology**, 4th intern. congr., Stockholm, Sweden. (F. Berglund, Postfach 272, Stockholm 1)

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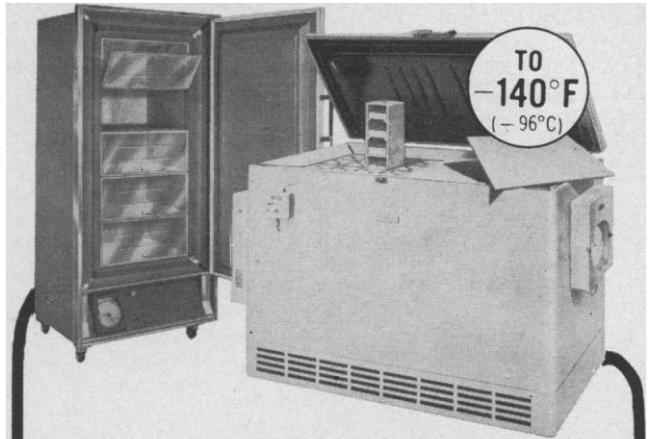
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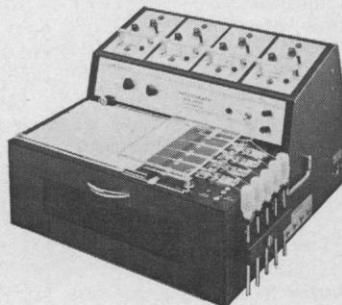
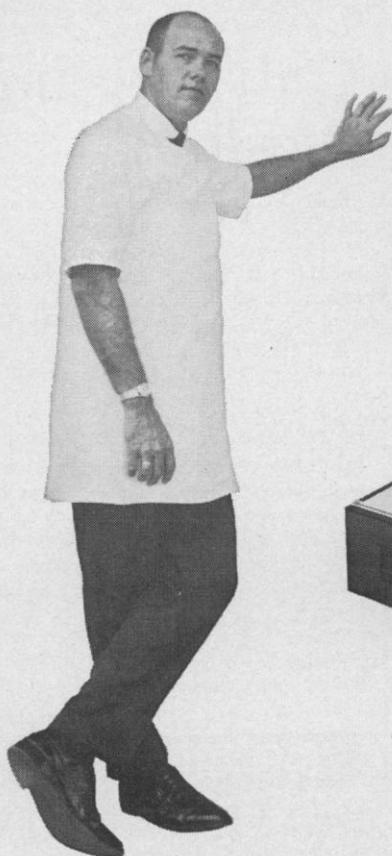
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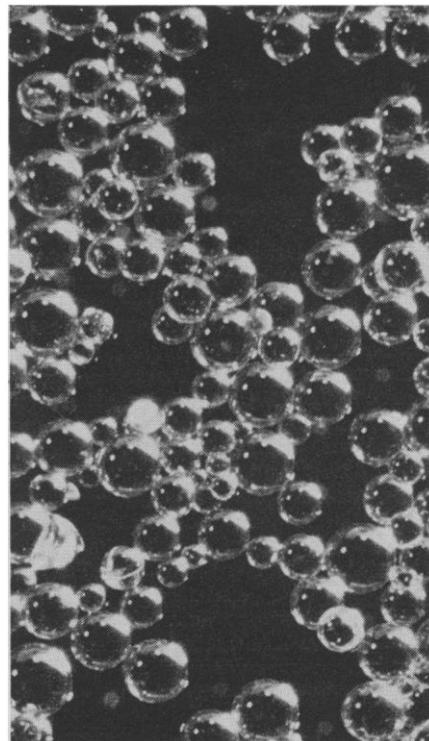
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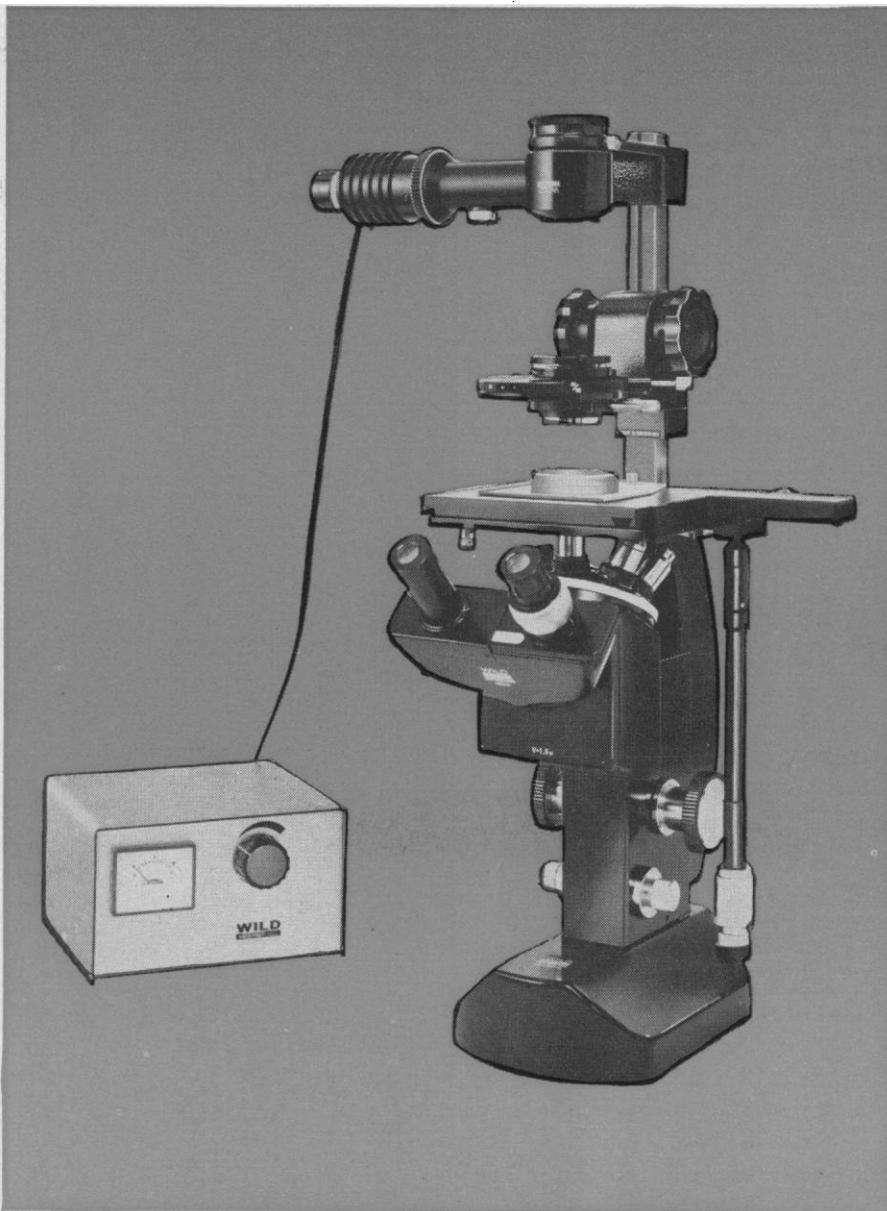
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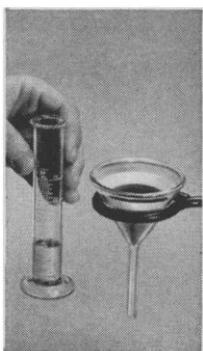
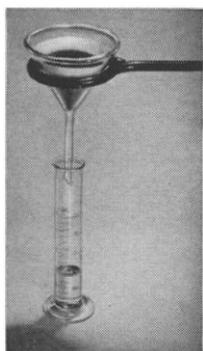
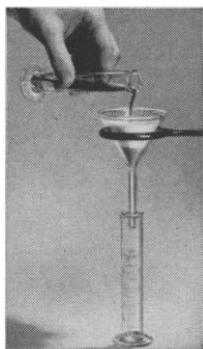
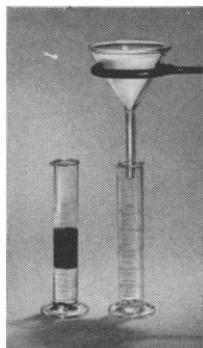
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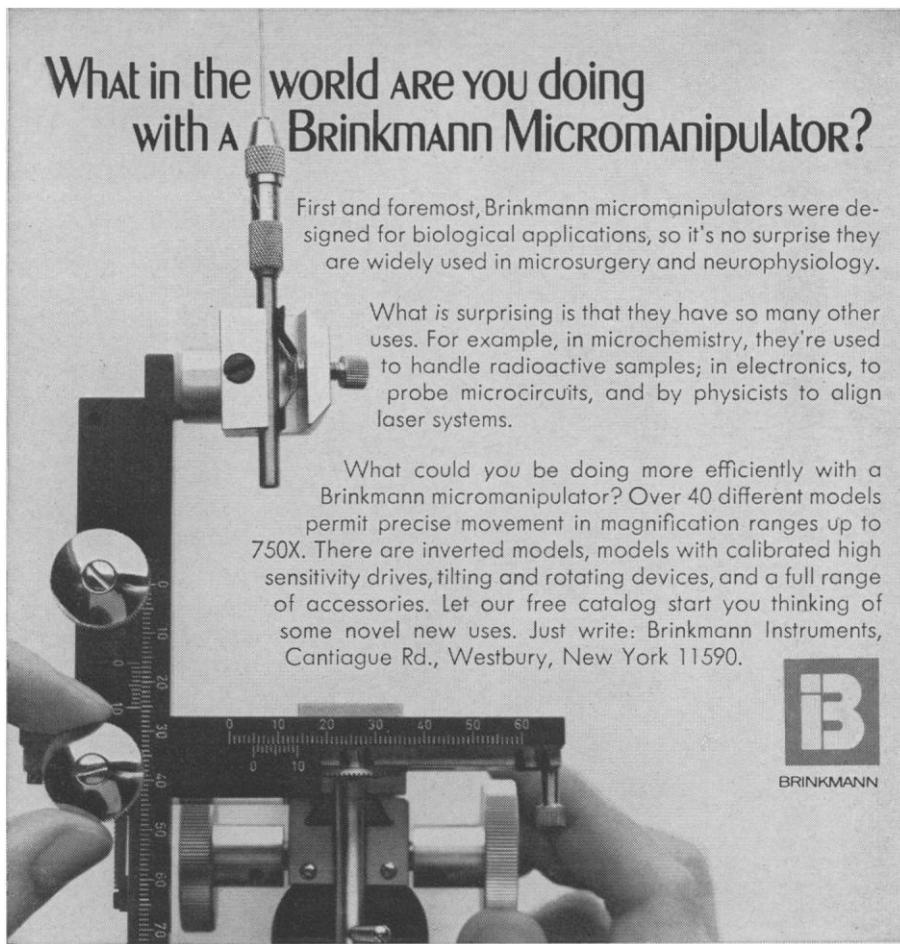
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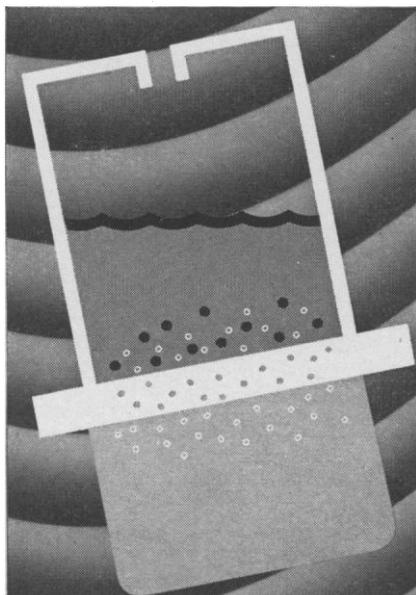
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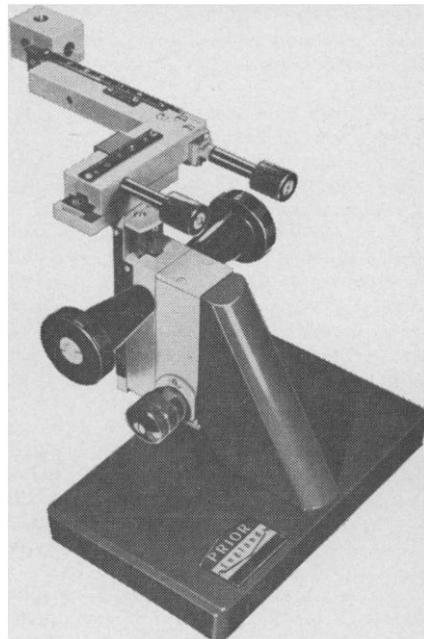
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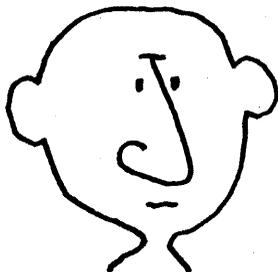
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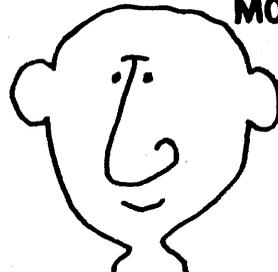
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ON DOING
ALL pH MEASUREMENTS
MYSELF**



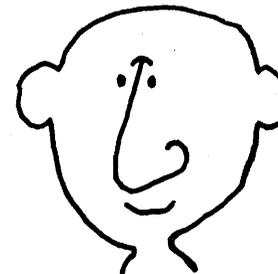
**I WAS RESPONSIBLE
FOR BUDGET AND FIGURED
I'D HOLD ELECTRODE
BREAKAGE DOWN TO ONE A
MONTH**



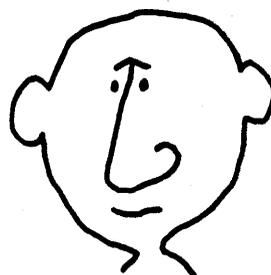
**THEN CORNING
OFFERED A SIX MONTH
ELECTRODE GUARANTEE
AGAINST PRACTICALLY
EVERY-
THING**



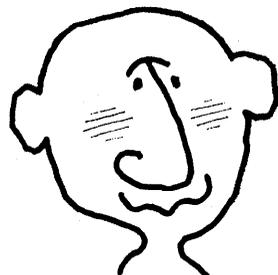
**SO I DECIDED
TO LET EVERYONE
USE THEM AS
HE NEEDED TO--**



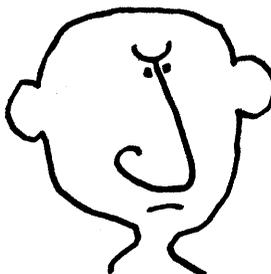
**SO FAR
ONLY ONE'S
BEEN
BROKEN**



**I
DID
THAT**



**AND IF
I CATCH THE GUY
THAT SNICKERED
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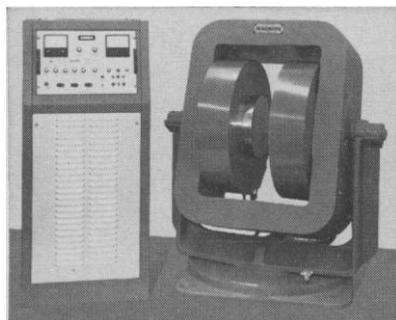
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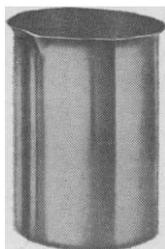



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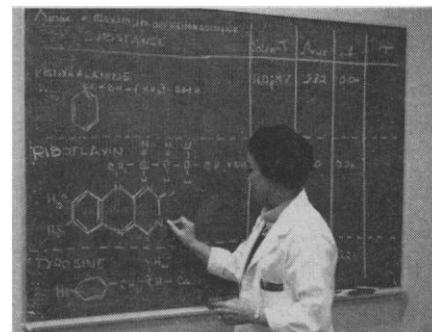
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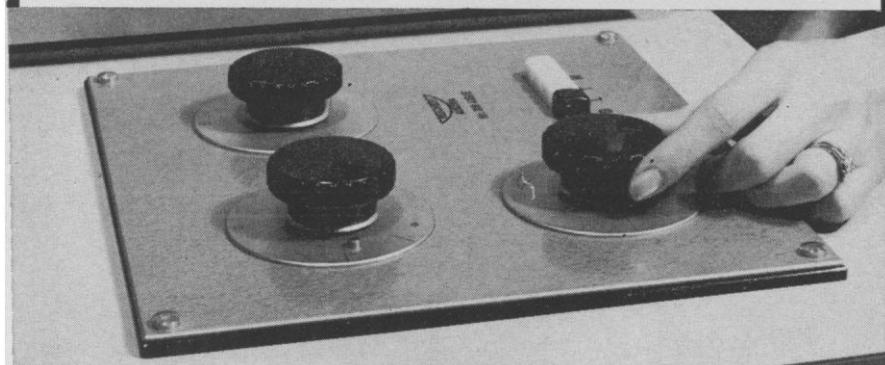
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