

SCIENCE

25 March 1966

Vol. 151, No. 3717

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE



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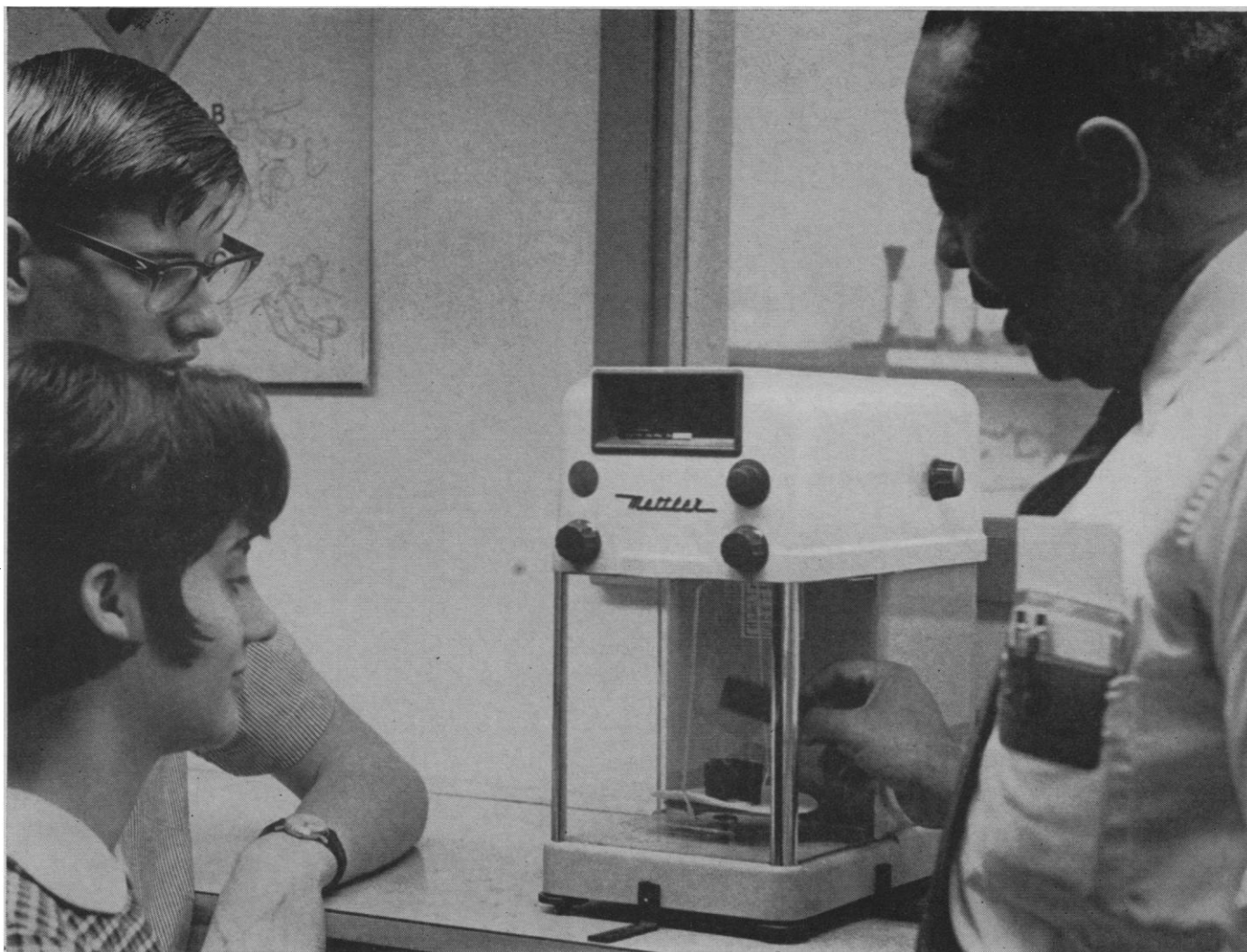
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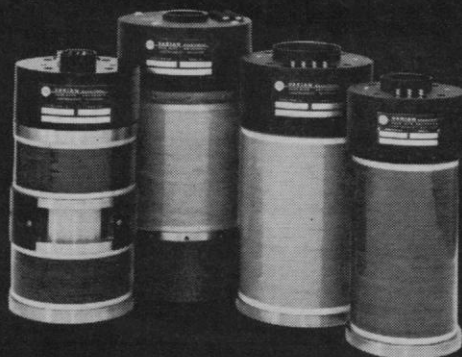
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COVER

Weddell seal (*Leptonychotes weddelli*) in ice hole near U.S. Antarctic base at McMurdo Sound. Investigations of the seal's diving capacities and behavior reveal that its deepest dive was 600 meters and its longest submergence was 43 minutes 20 seconds. See page 1553. [Gerald L. Kooyman, University of Arizona]

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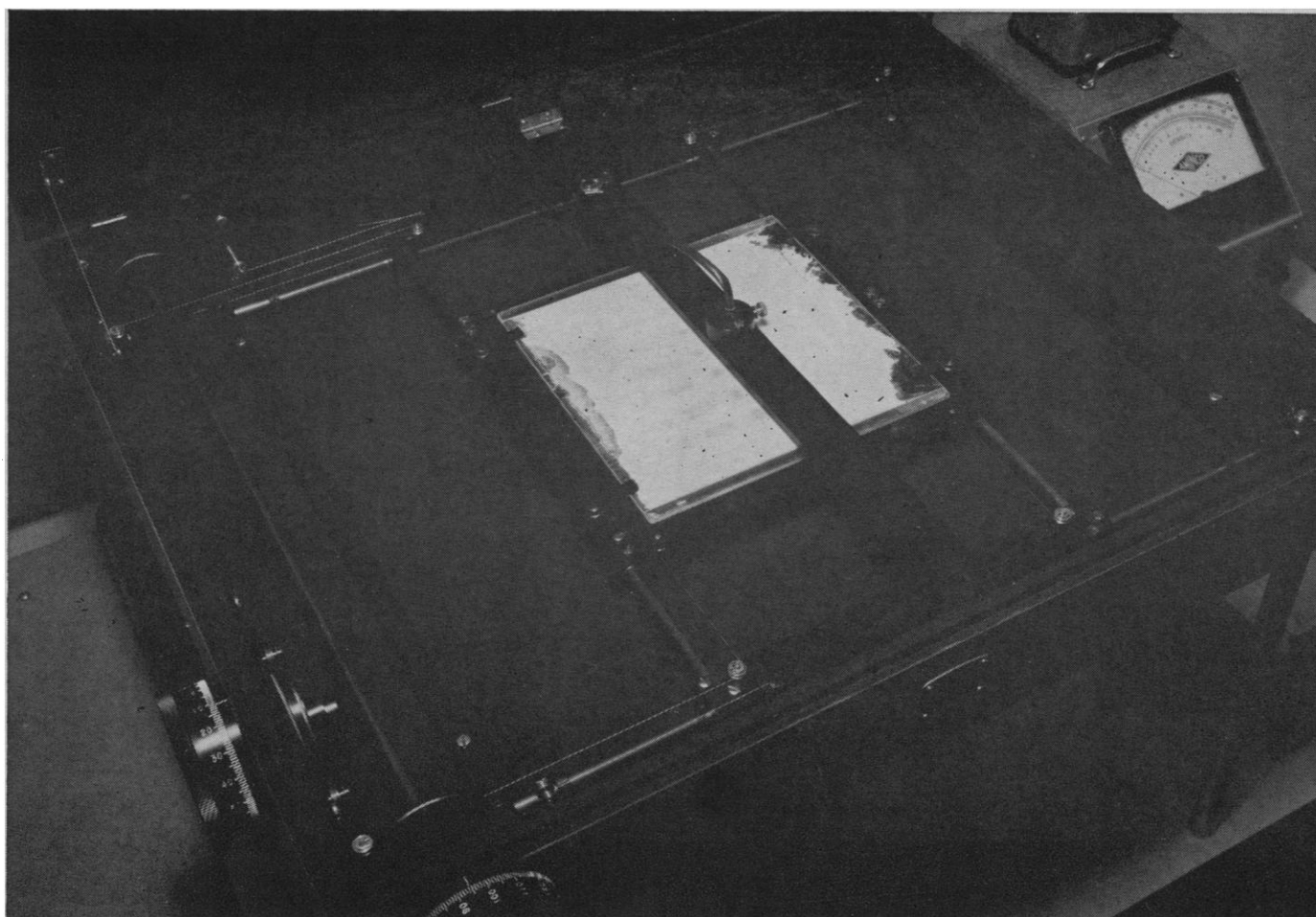
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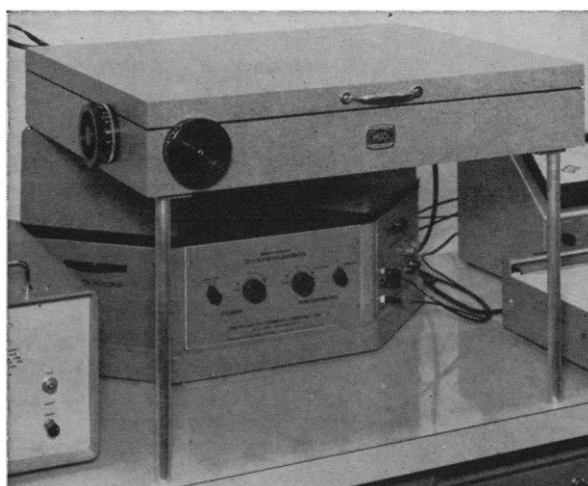
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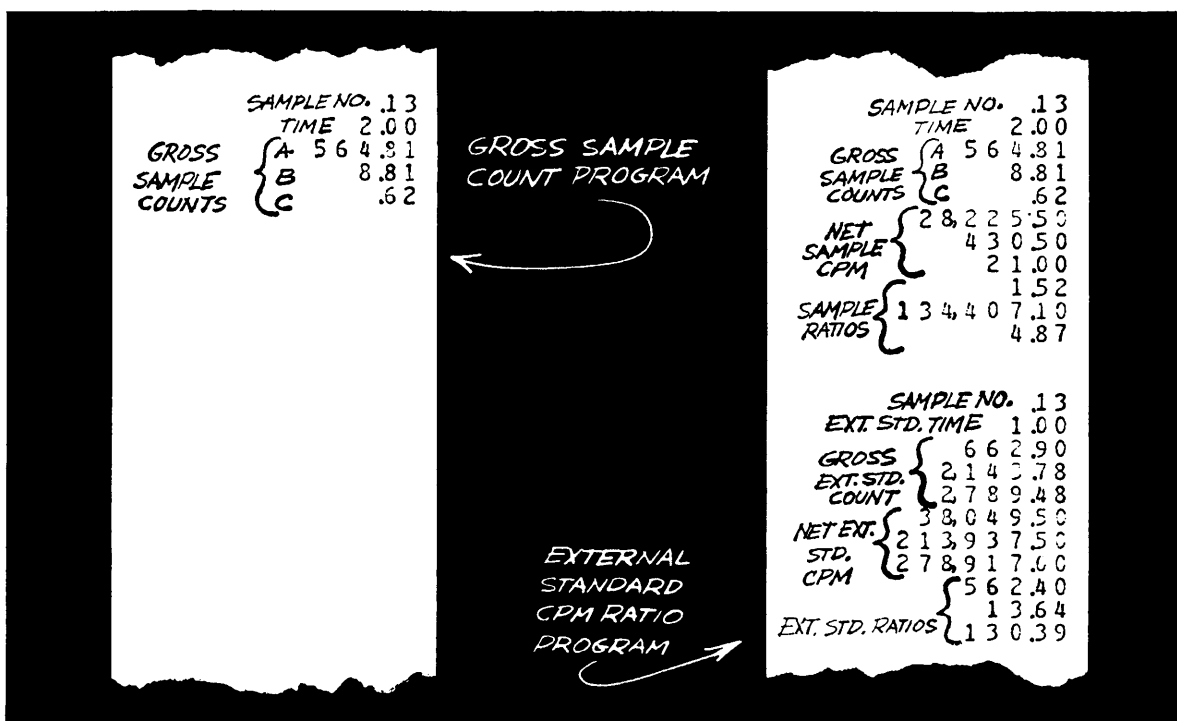
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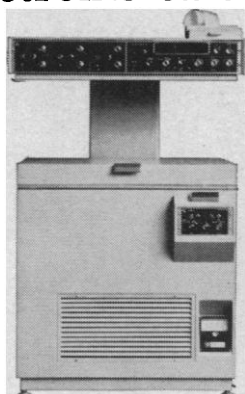
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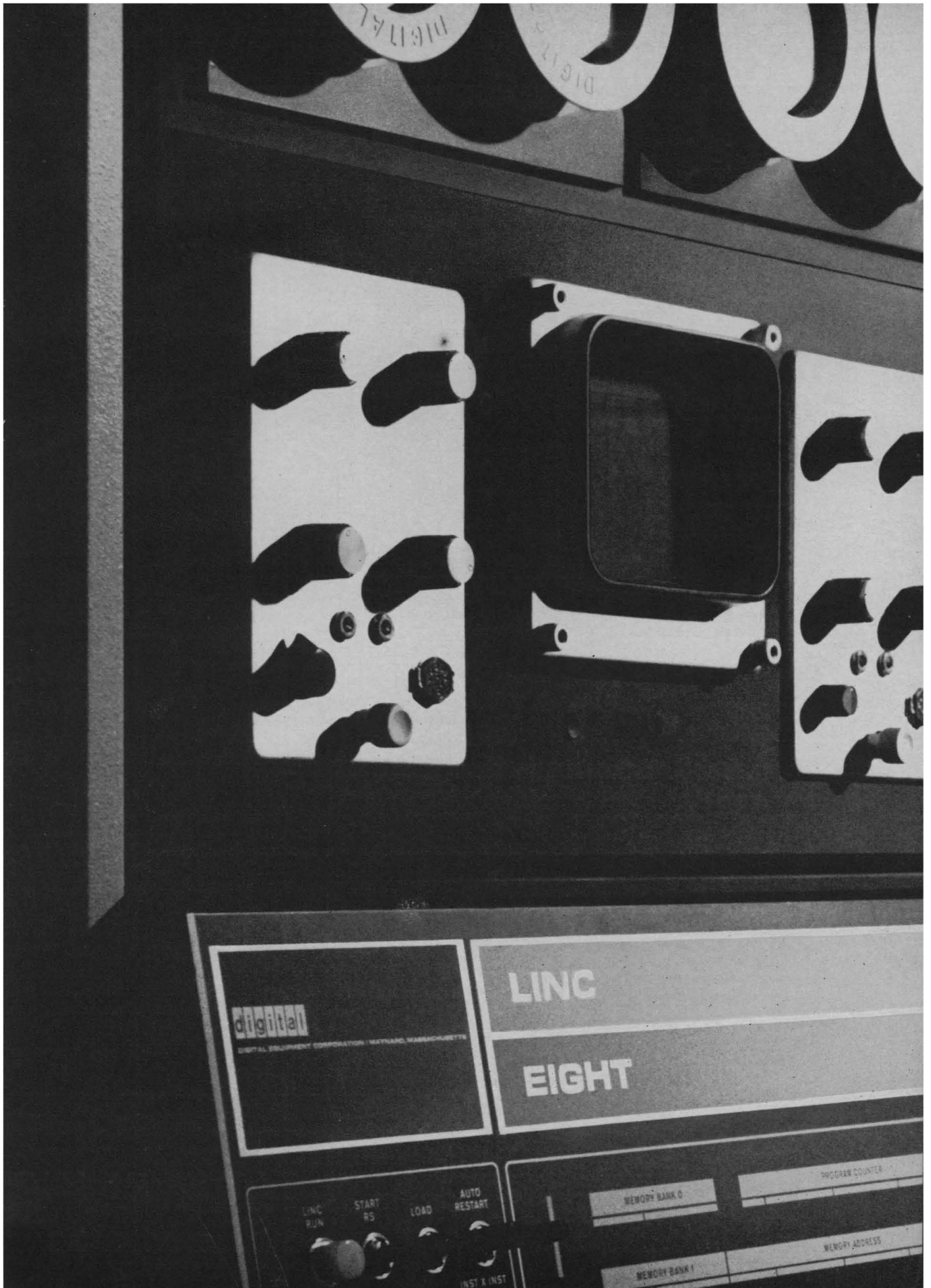
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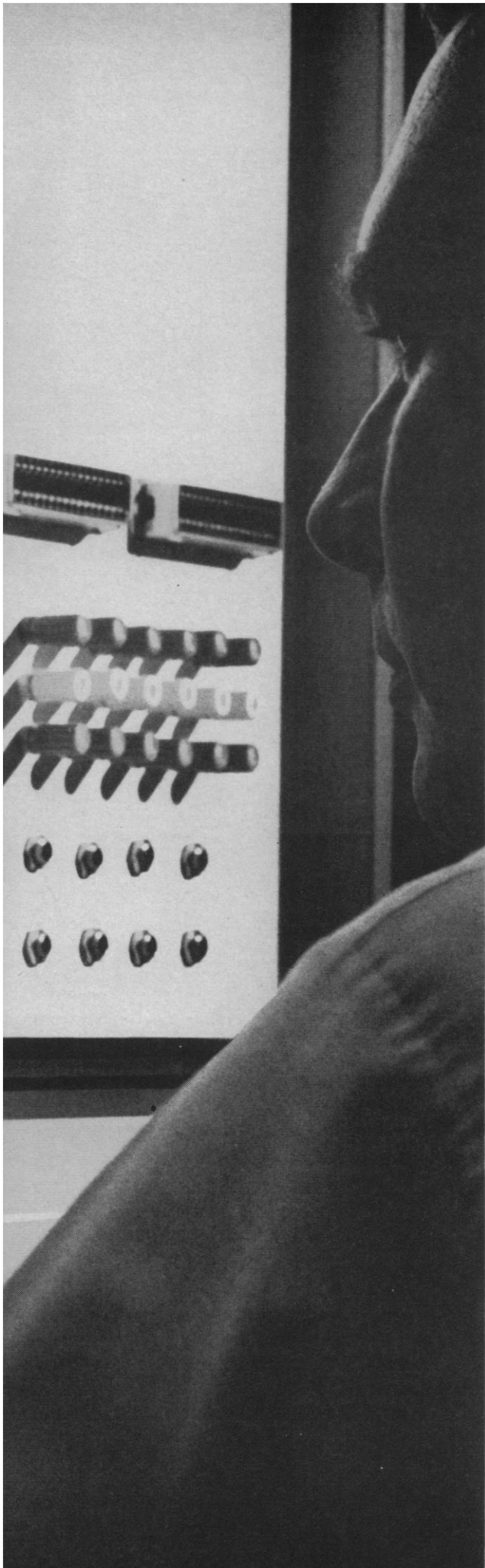
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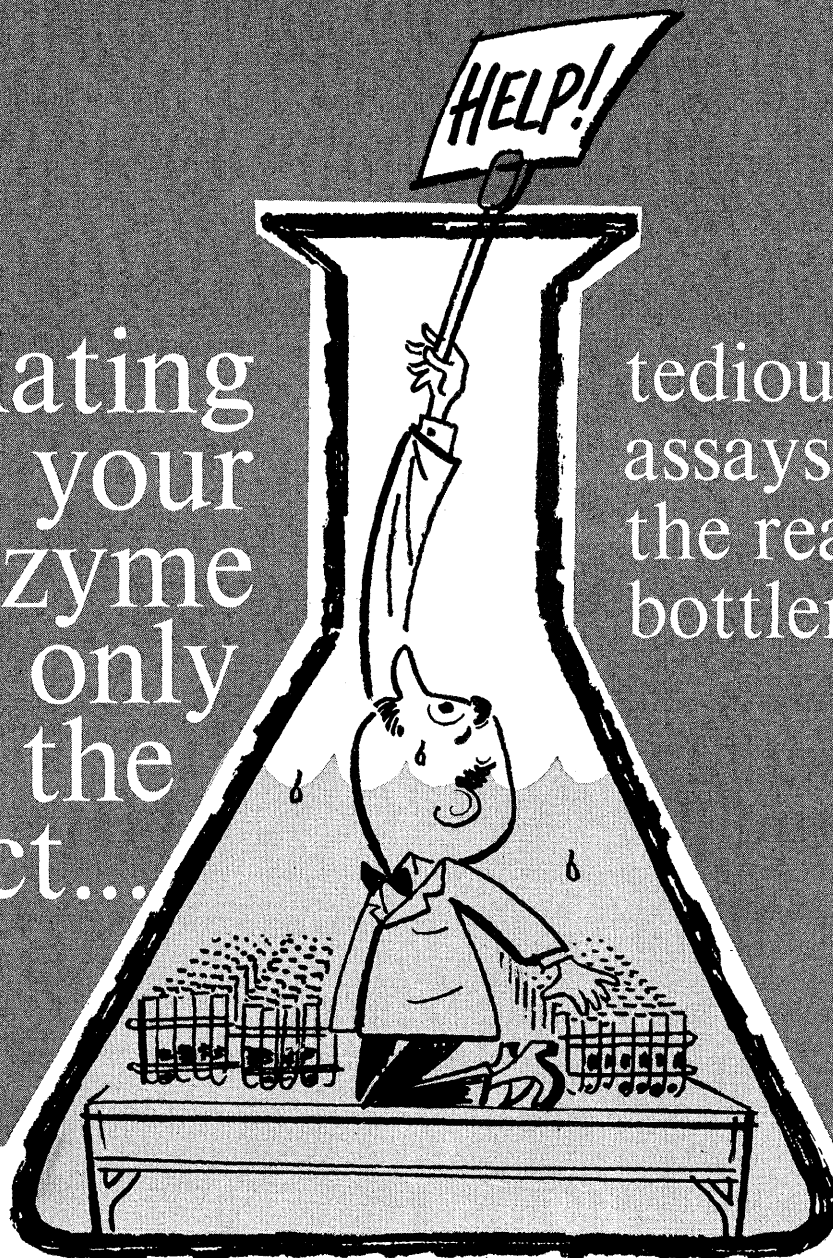
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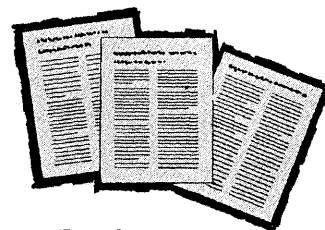
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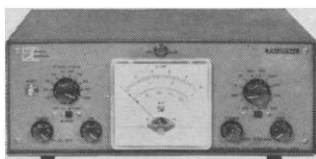
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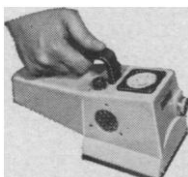
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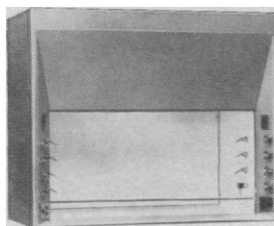
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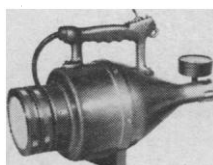
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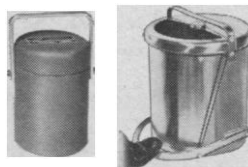
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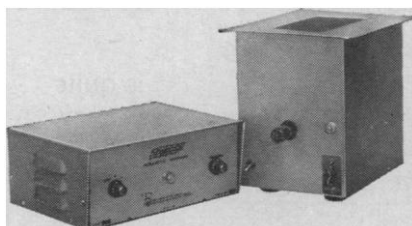


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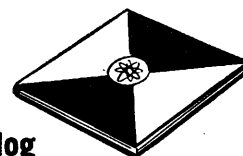


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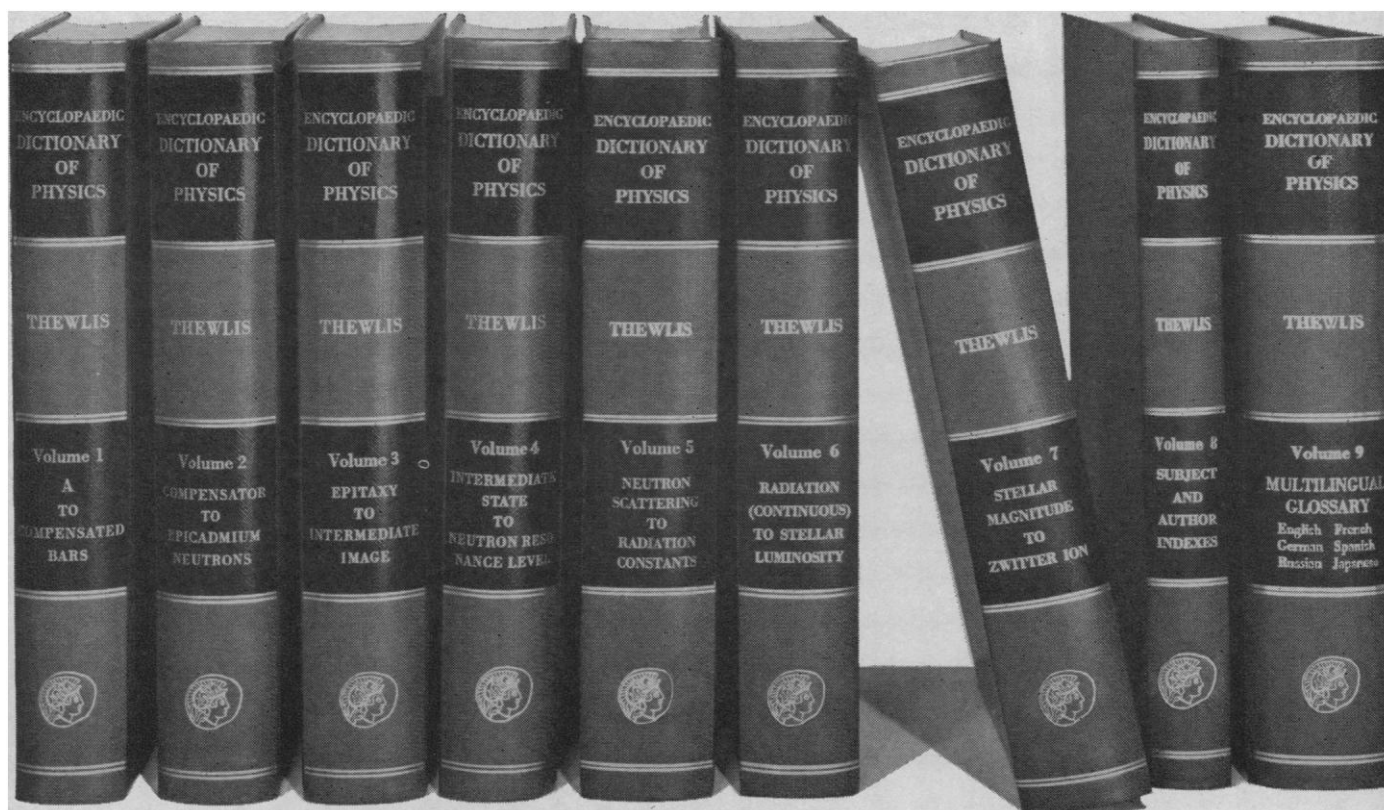
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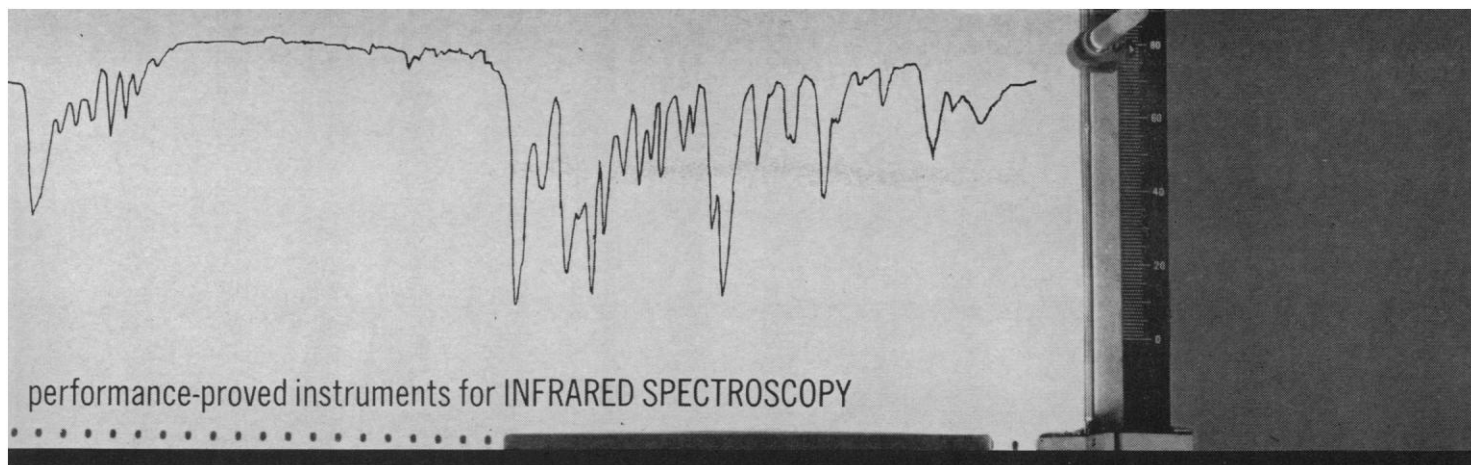
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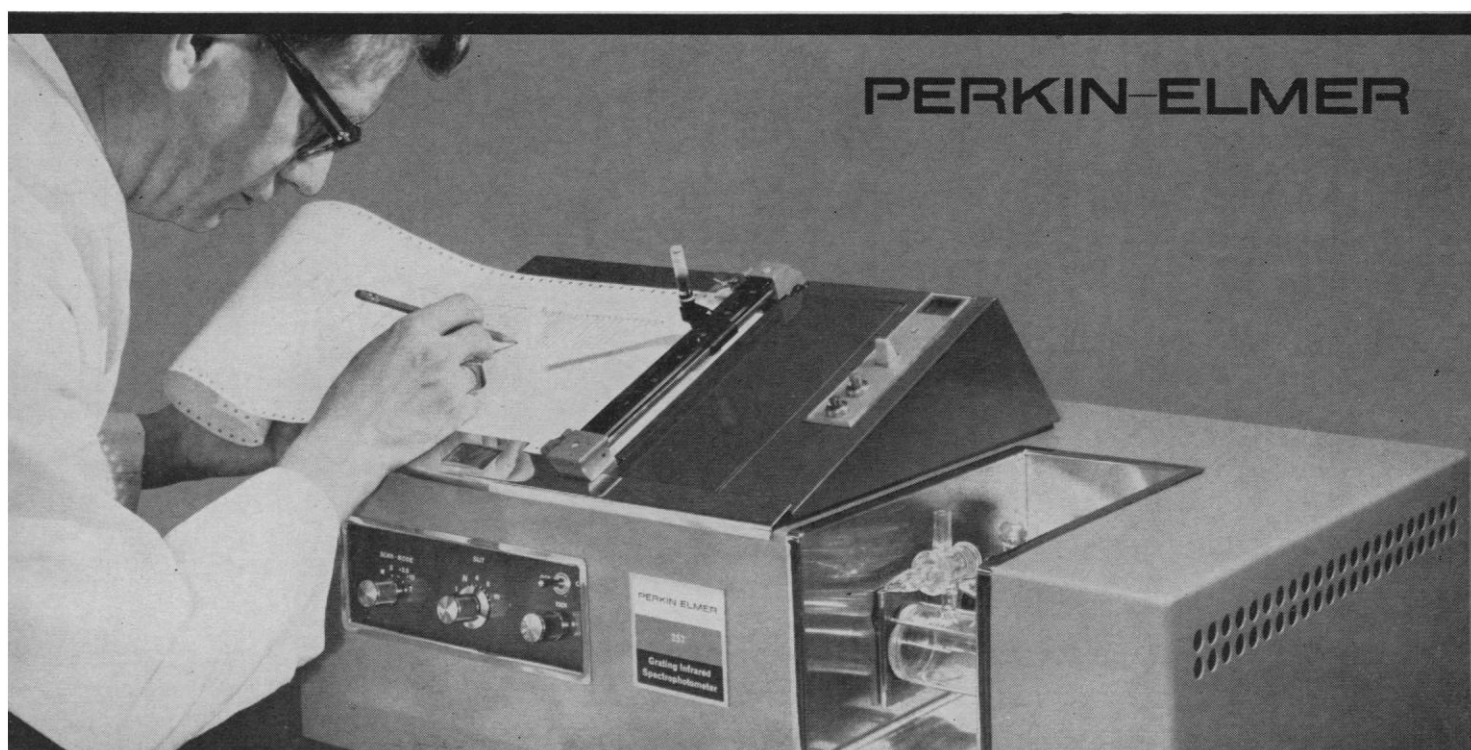
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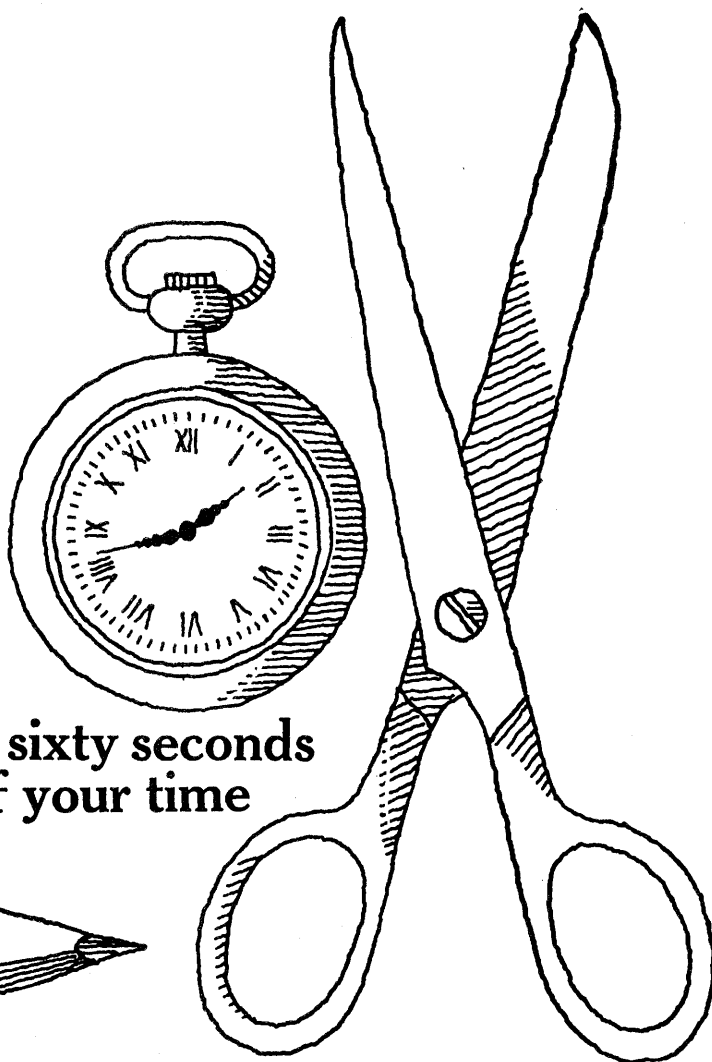
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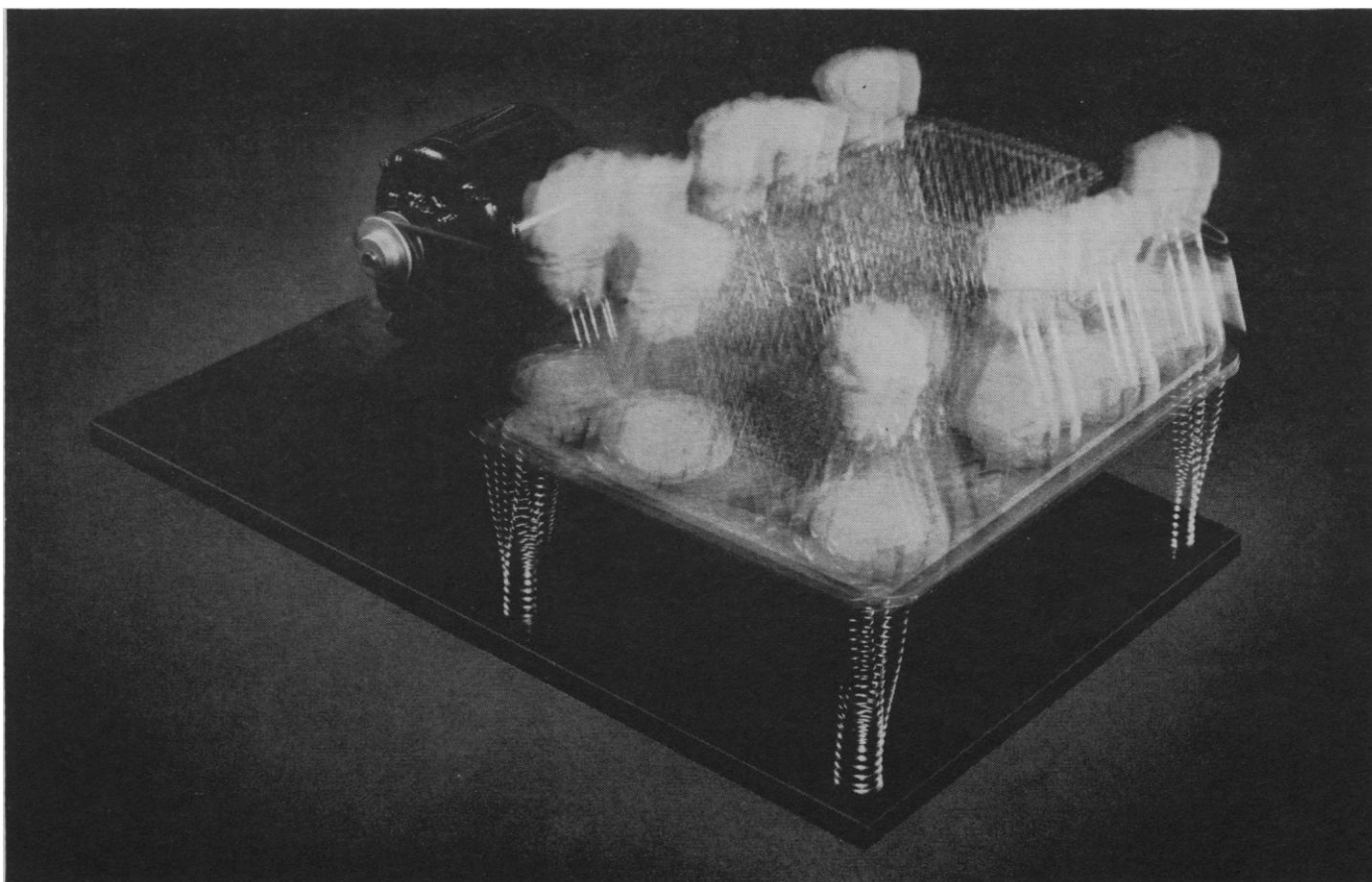
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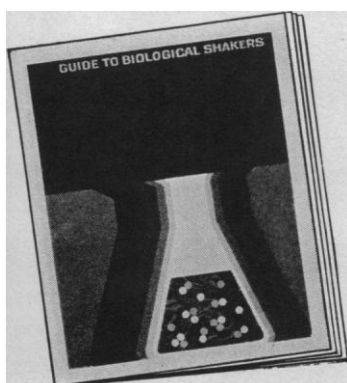


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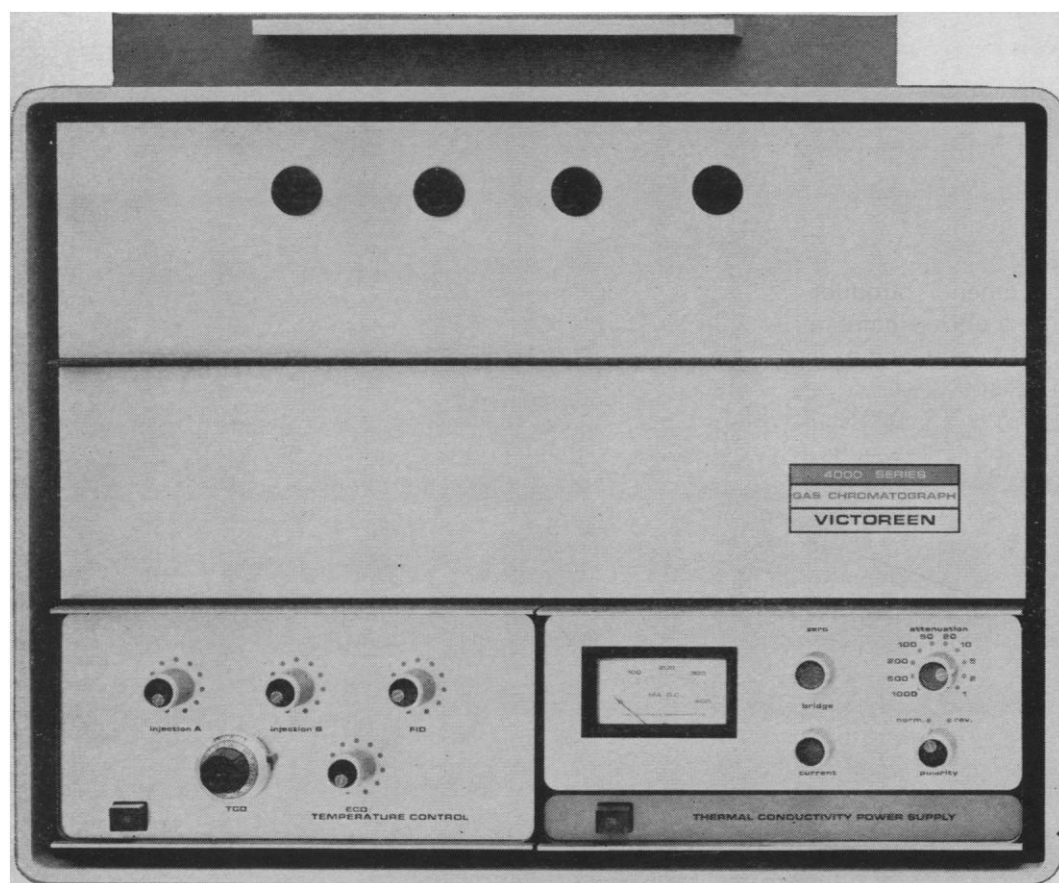
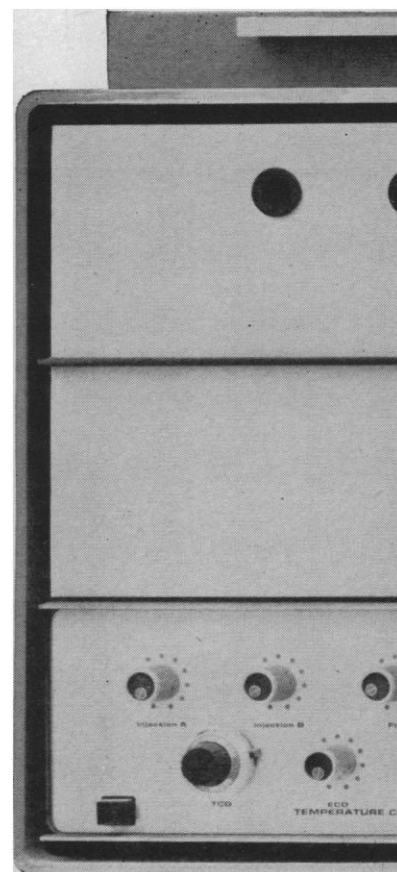
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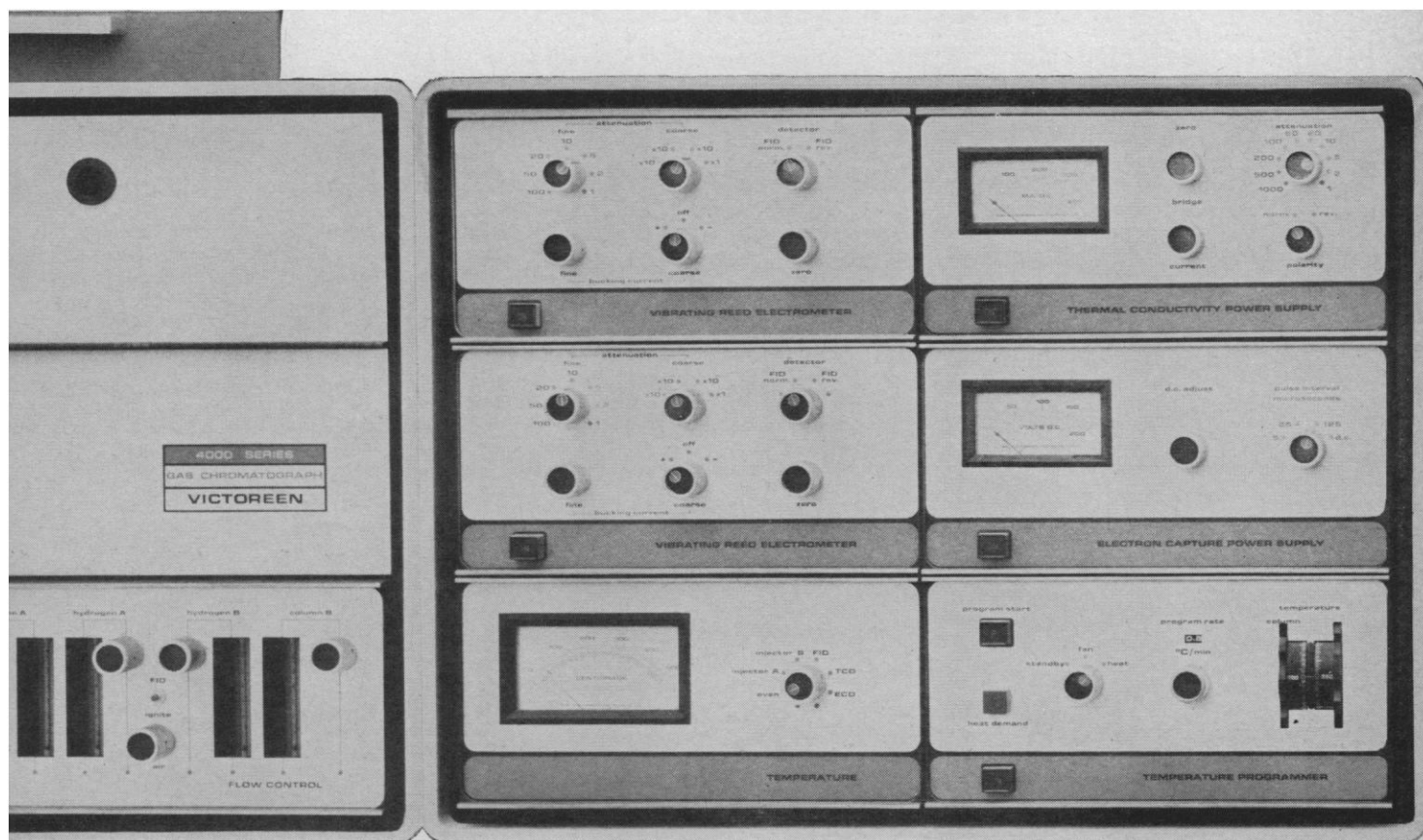
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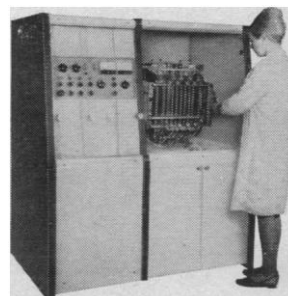


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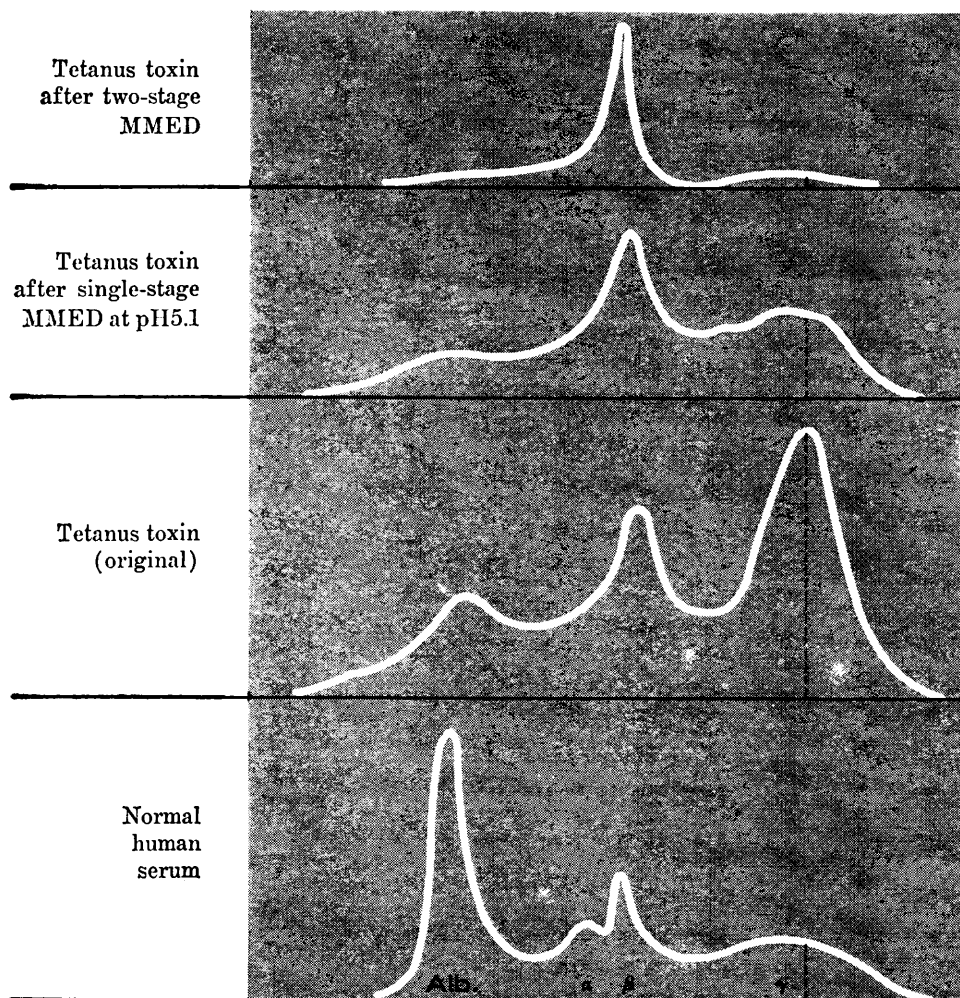
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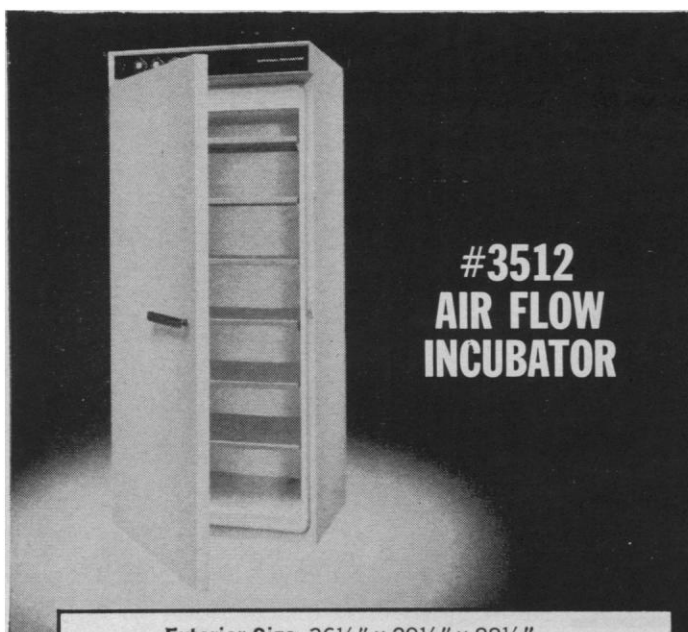
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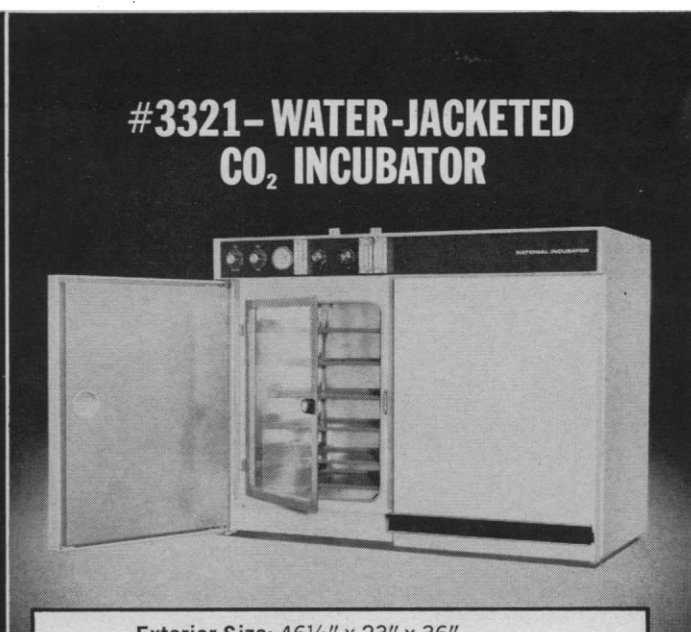
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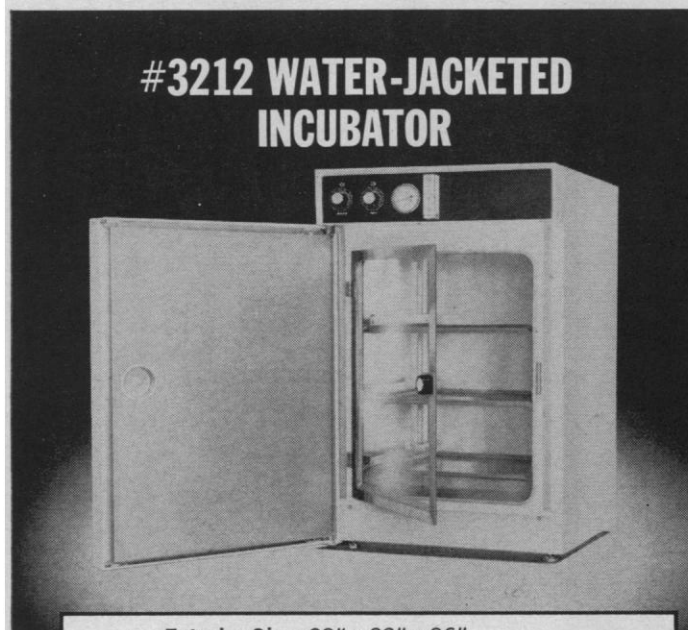
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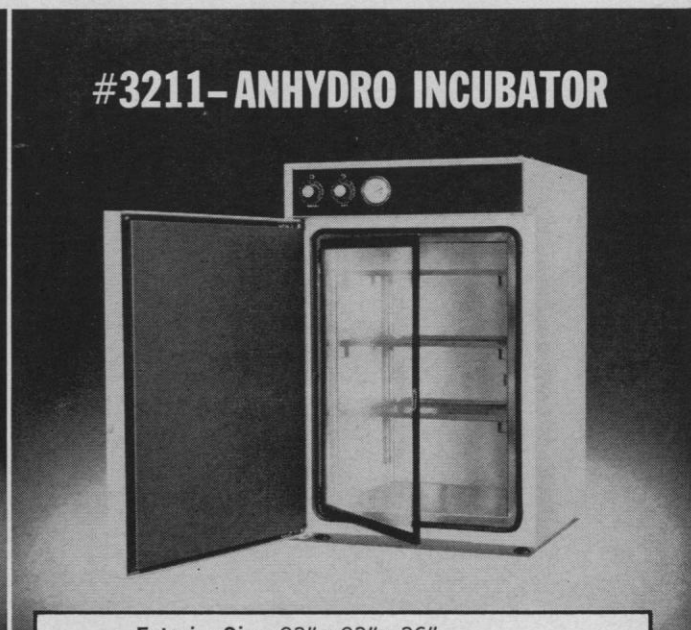
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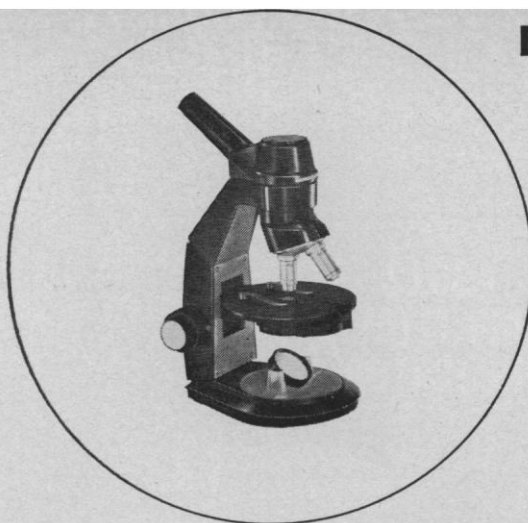
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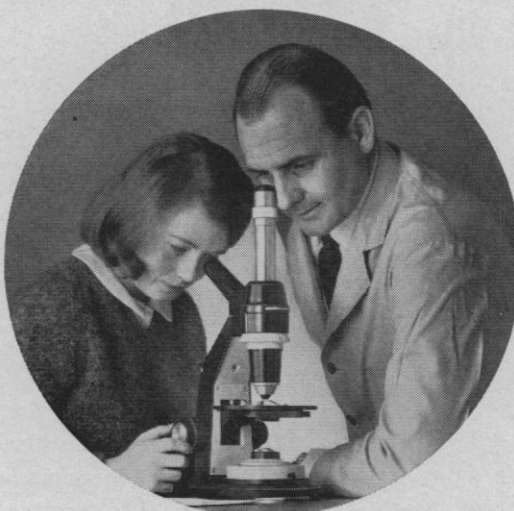
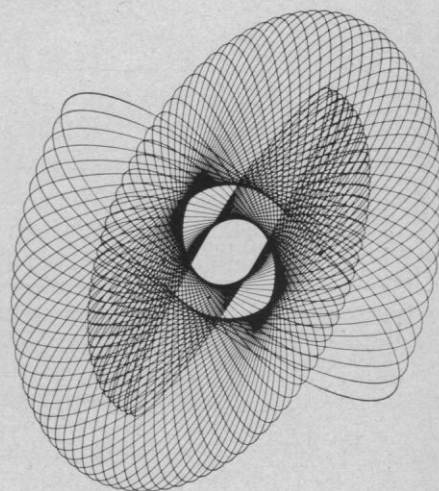
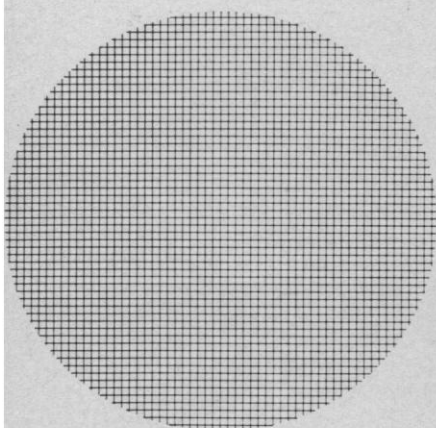
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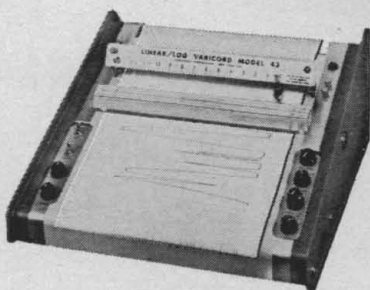
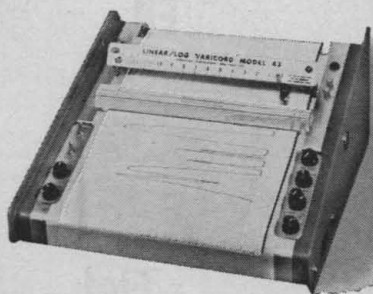


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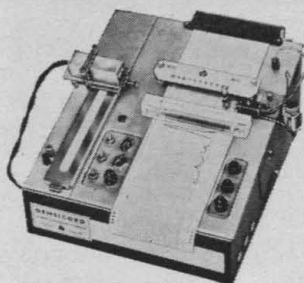
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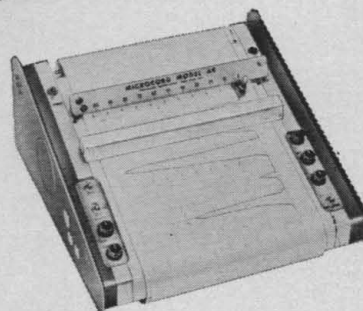
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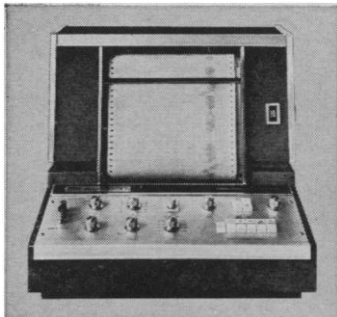
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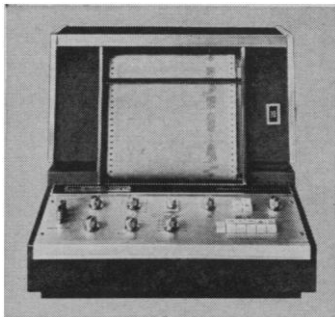
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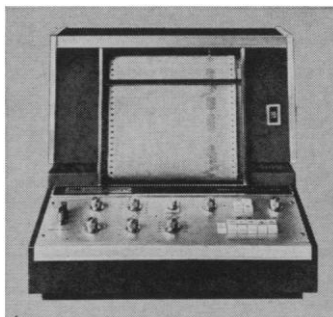
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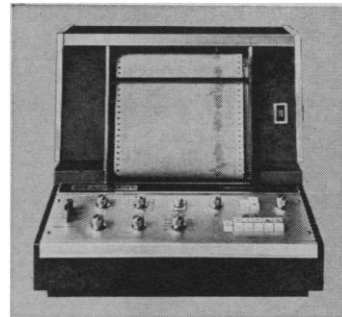
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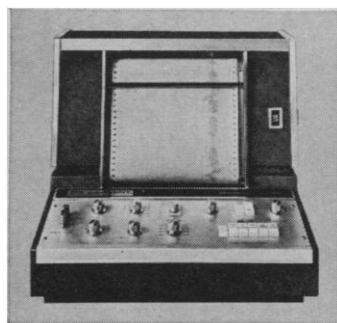
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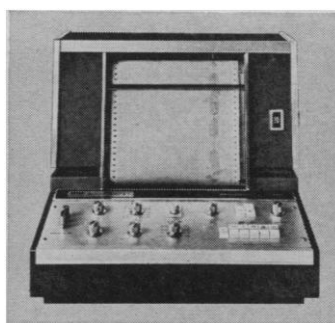
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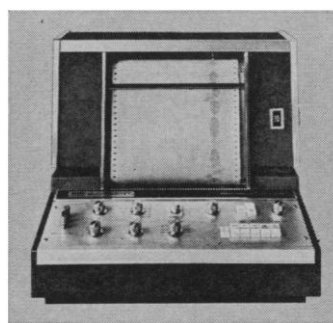
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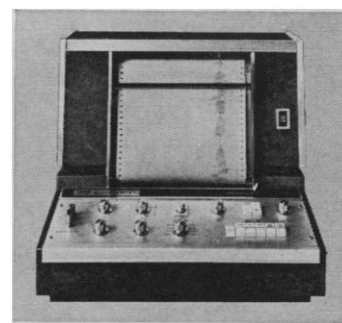
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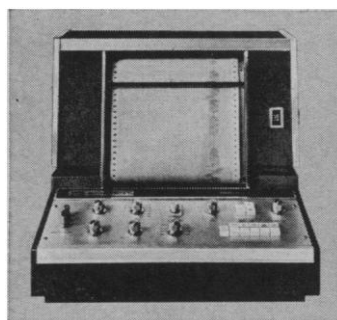
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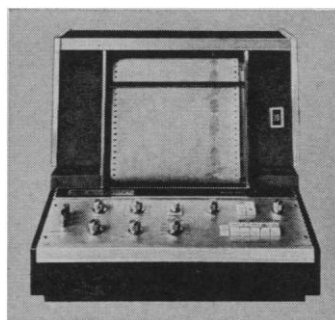


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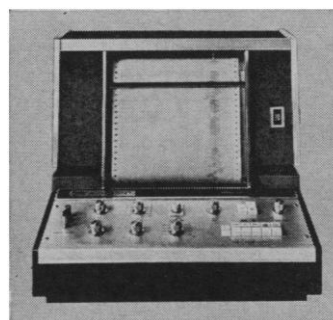
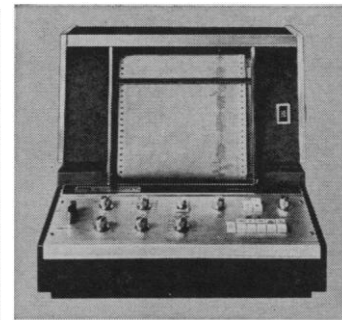


CHART TAKE-UP: automatic, if opted, by motor with preset torque—or by-pass for free end chart tear off.



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

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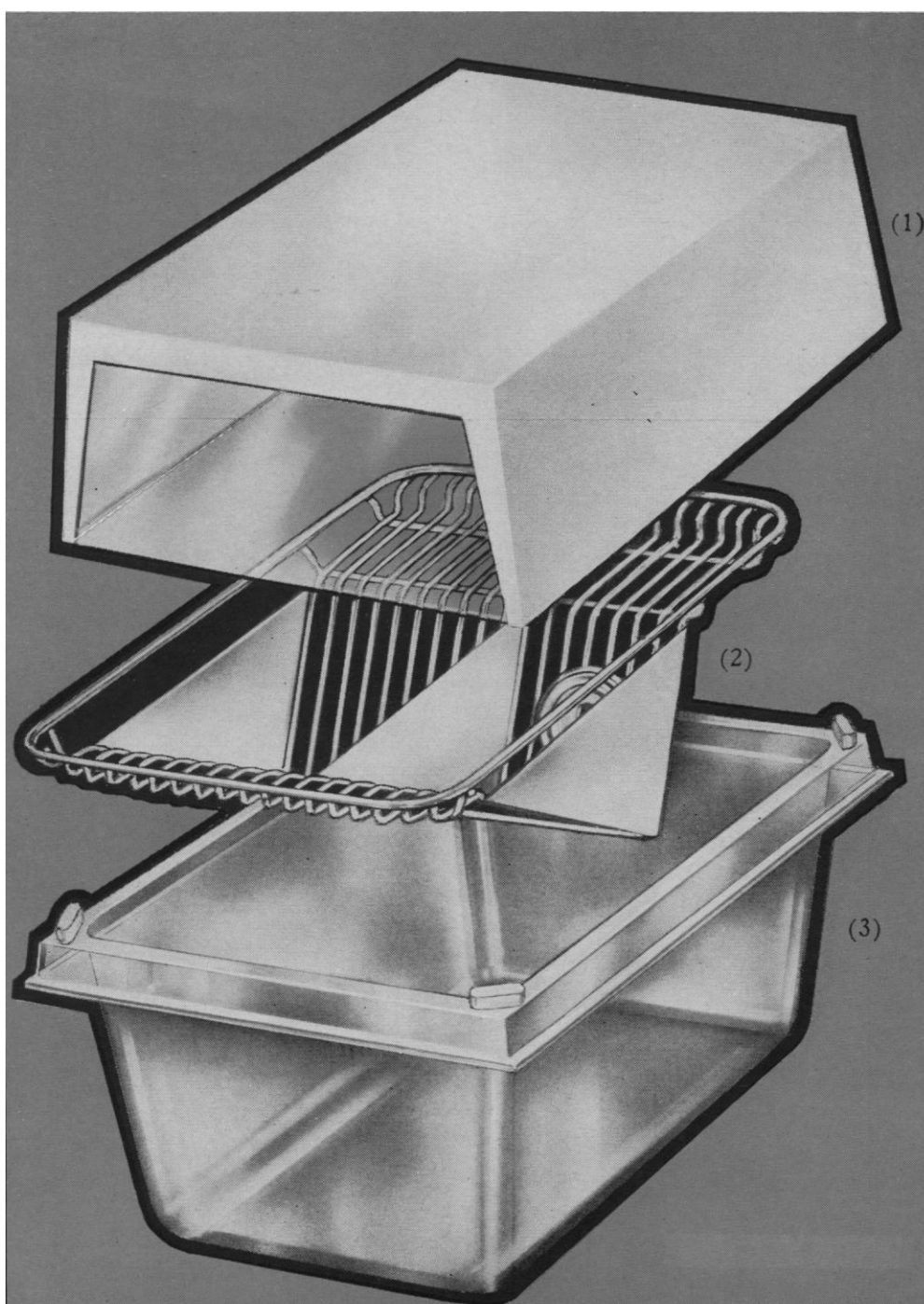
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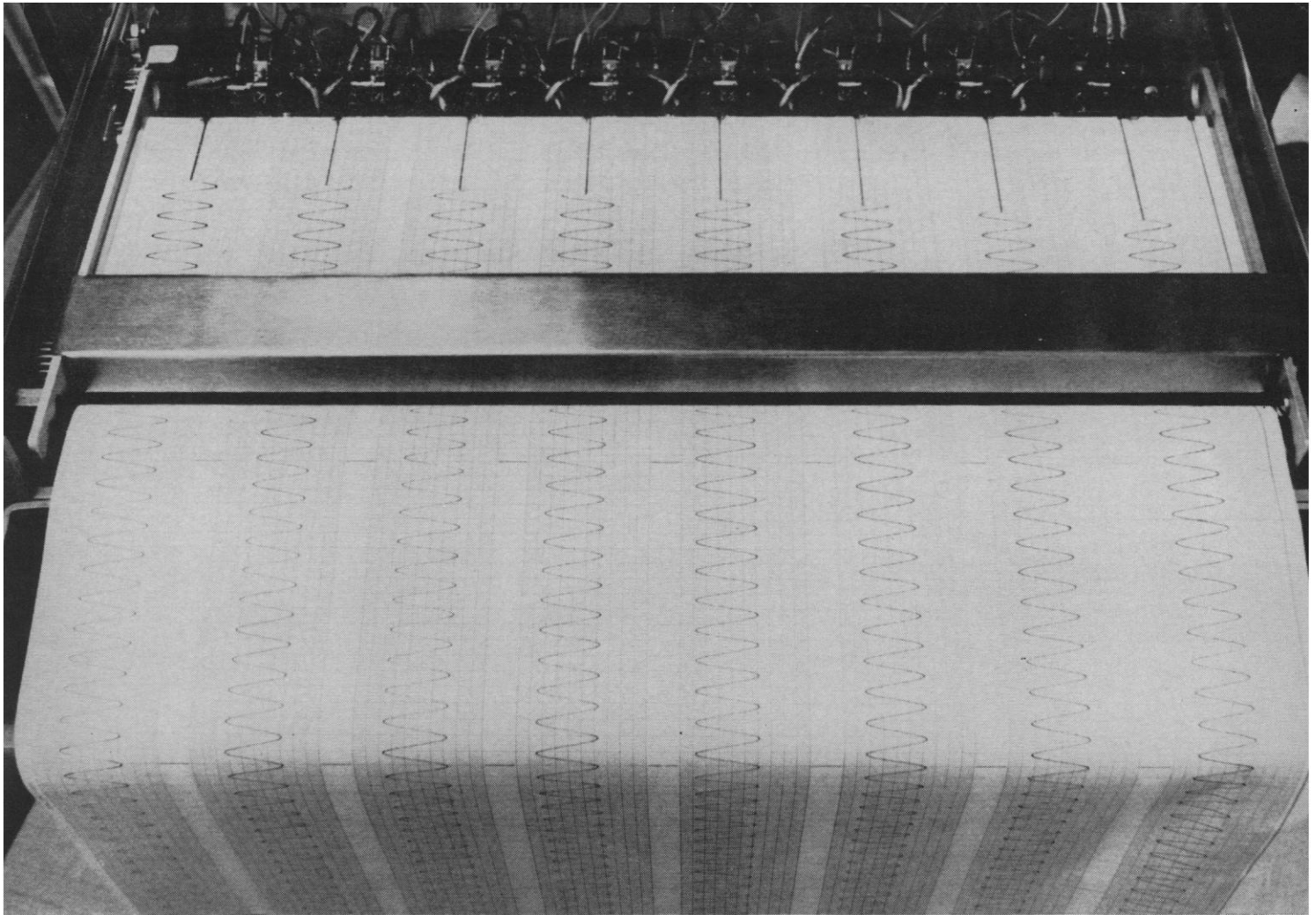


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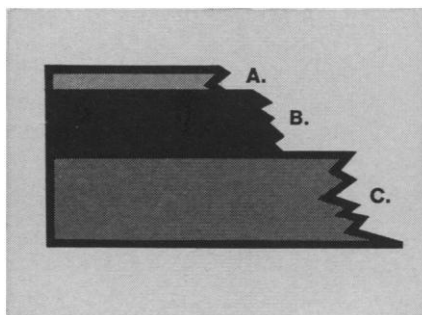


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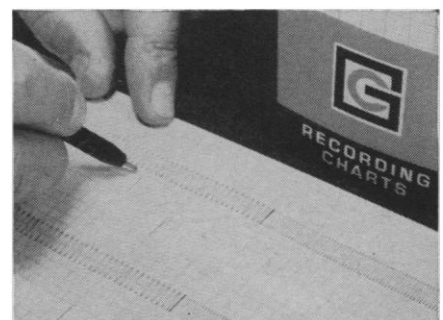
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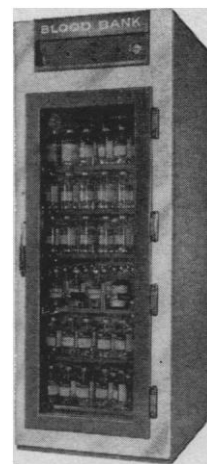
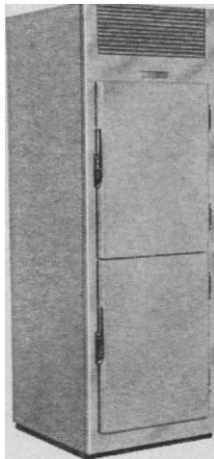
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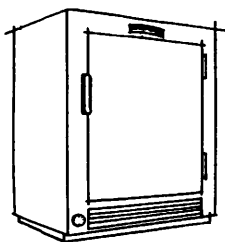
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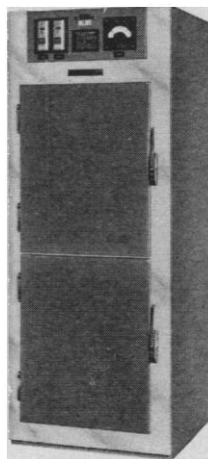


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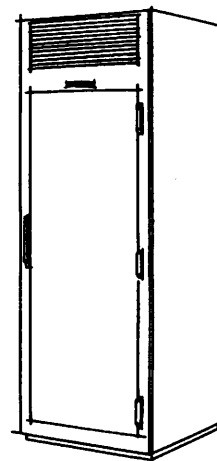


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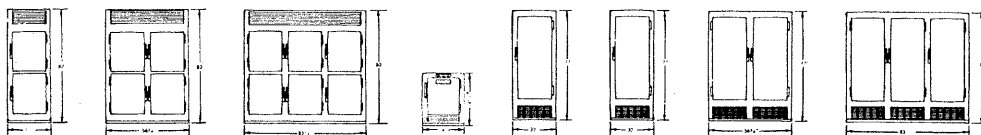
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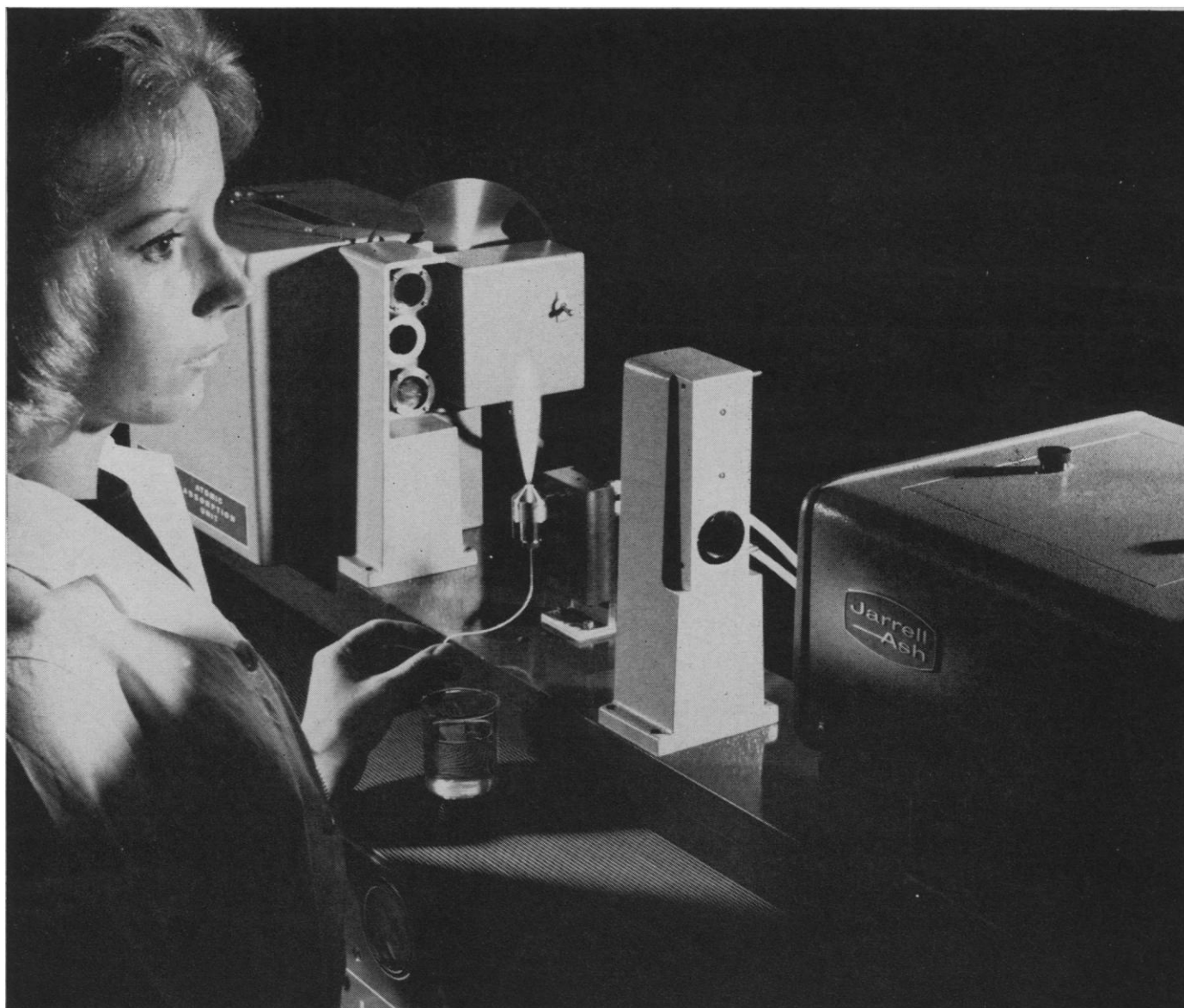
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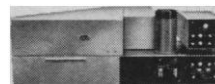
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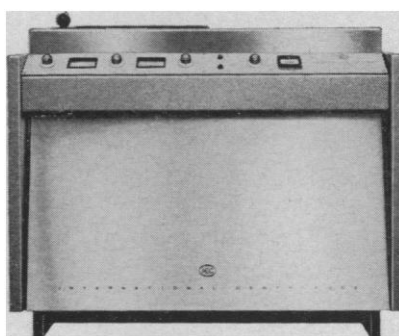
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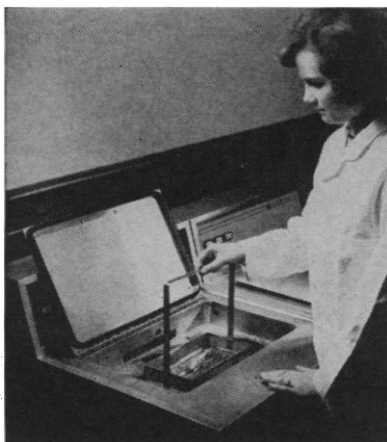
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ACCUDATA 108 AC AMPLIFIER

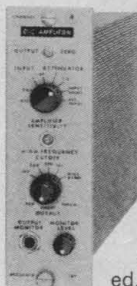
Providing amplification of low-level signals such as ECG, EEG, EMG, and PCG, this battery-powered, wideband differential unit offers high input impedance and low noise level. It features 6 low frequency cutoff filters, square wave calibrator at six voltages, and an ECG lead selector switch. Extremely versatile, the 108 adapts to various measurements simply by changing the sensor, and when used with the companion Accudata 109, serves as a preamplifier for parameters requiring high-frequency recording.



ACCUDATA 109 DC AMPLIFIER

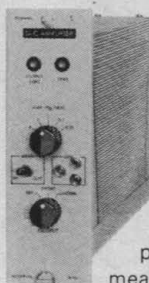
A direct coupled, wideband, medium-

gain differential amplifier featuring 4 high-frequency cutoff filters. The 109 will drive fluid-damped galvanometers and other floating or grounded recording or display devices. Its power source can be used as a supply for a single strain gage such as the Satham P23Db pressure transducer, and when a gage control unit is added, the result is complete signal conditioning for an amplified blood pressure channel.



ACCUDATA M104 DC AMPLIFIER

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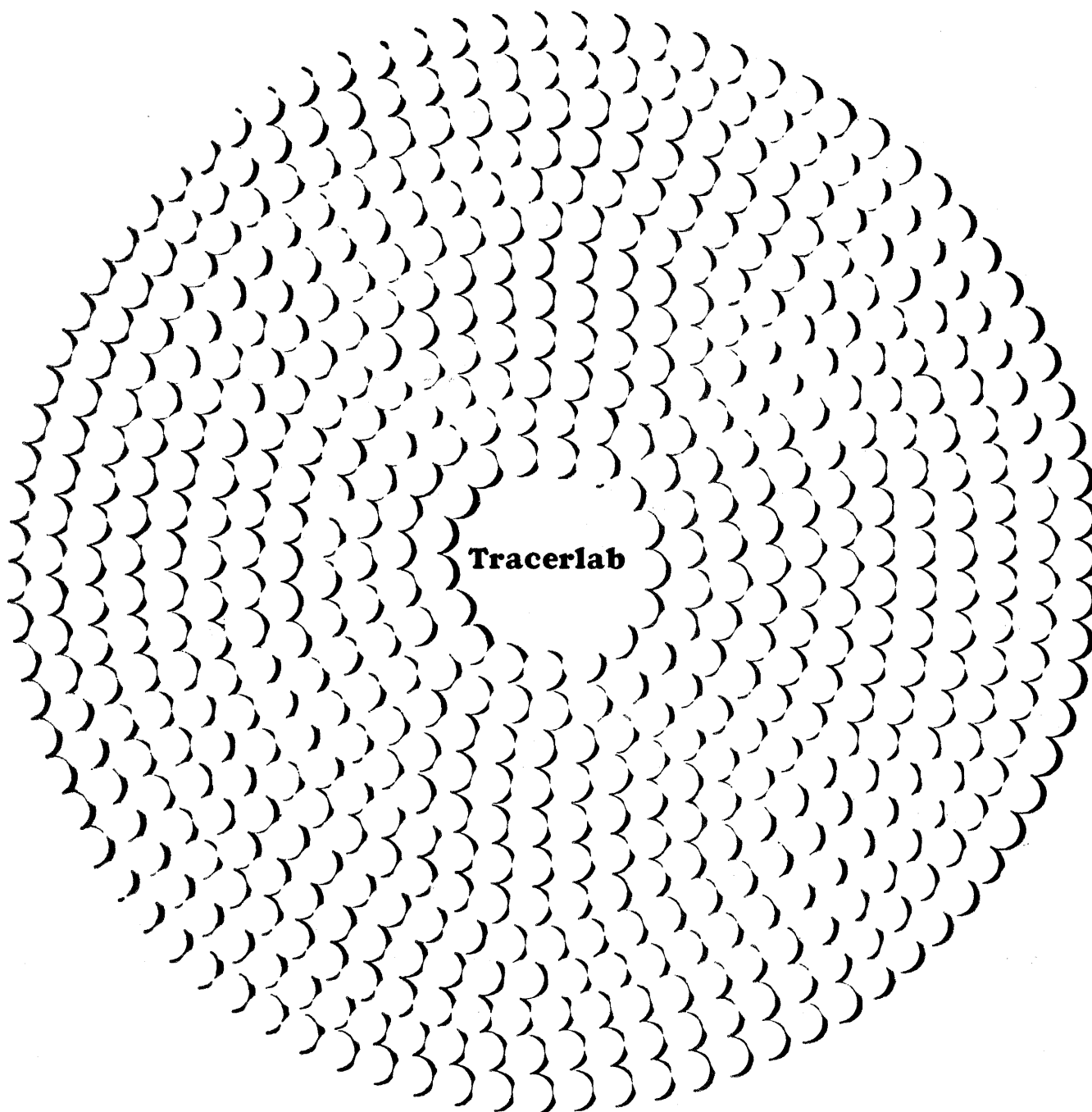
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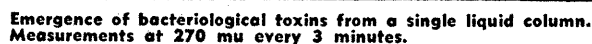
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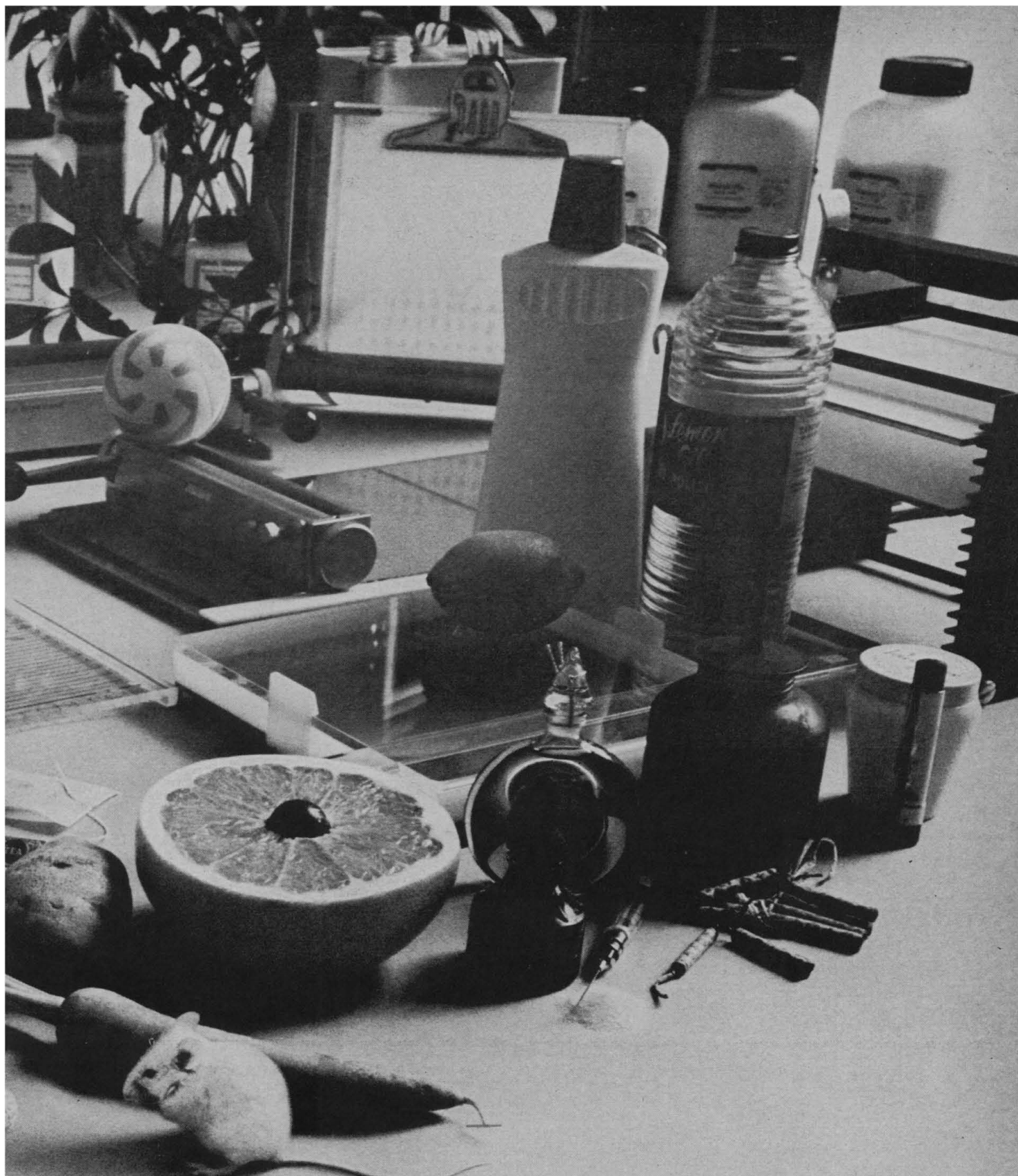
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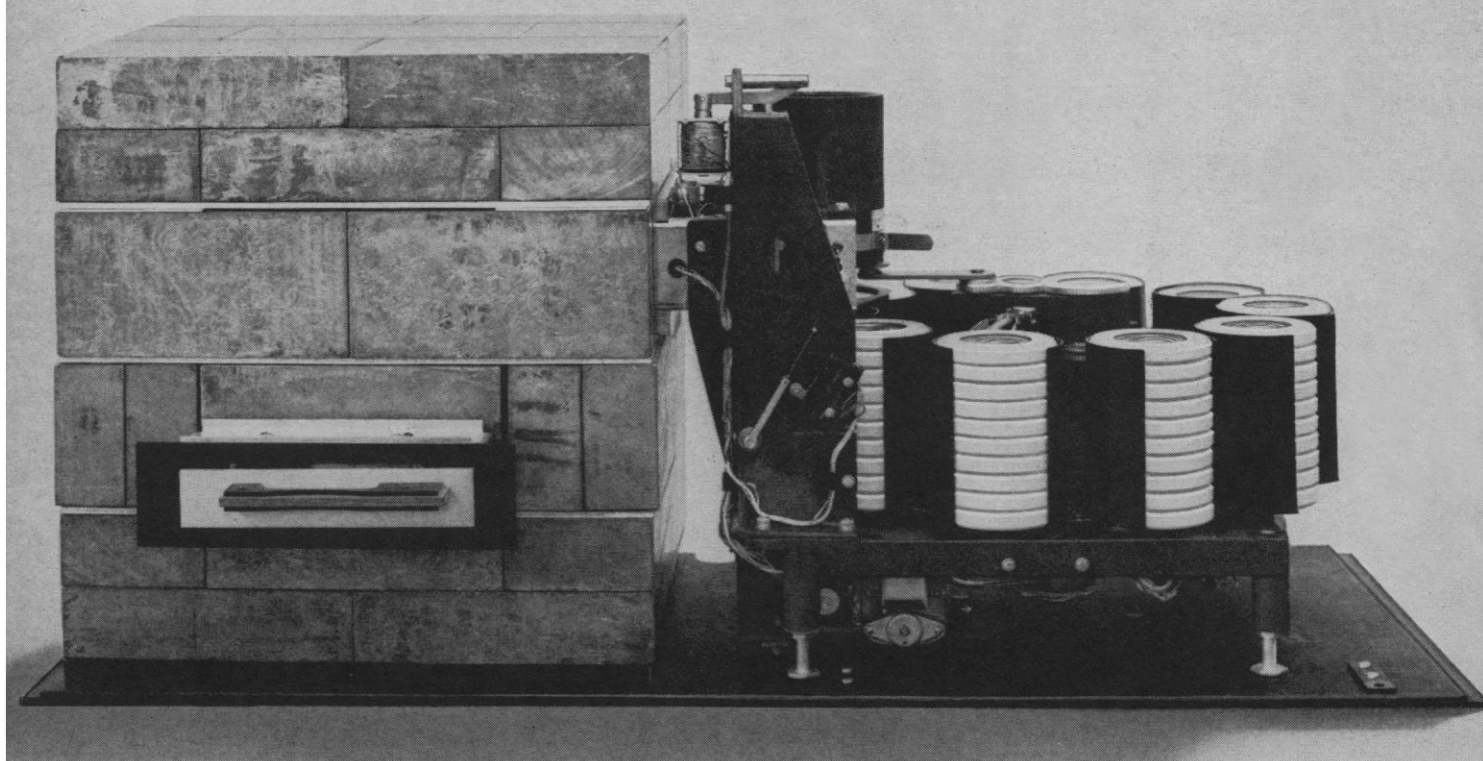
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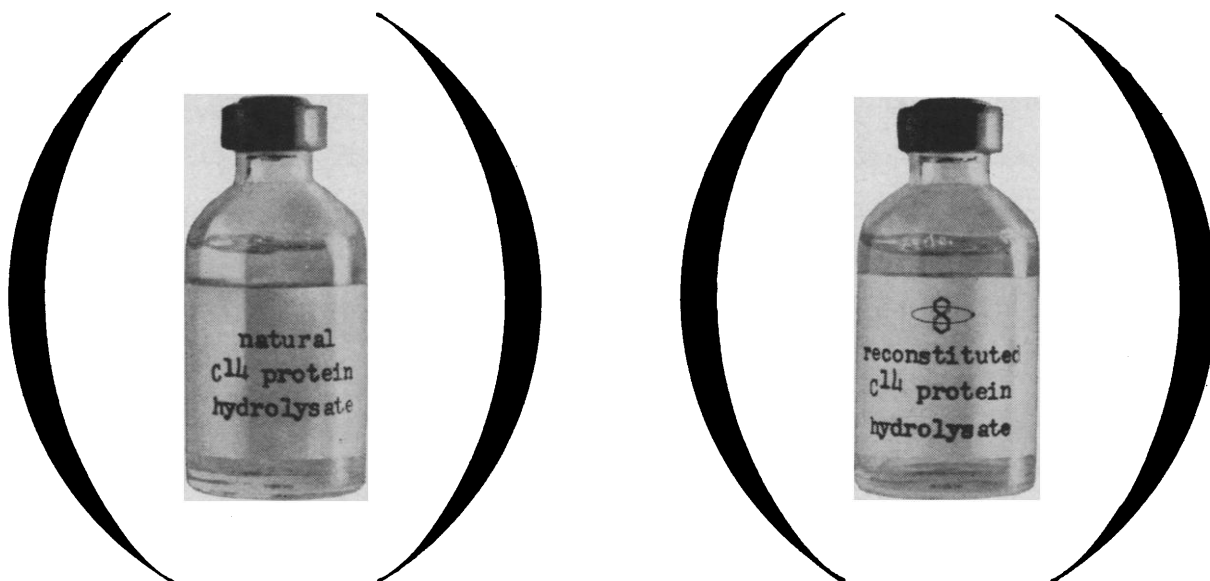
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Is ersatz ever better?

(Or: is it excessively presumptuous to claim—as we do herein—that our new reconstituted C¹⁴ protein hydrolysate is always all ways better for protein labeling than a natural C¹⁴ protein hydrolysate?)

The problem with using a natural yeast or algal C¹⁴ protein hydrolysate for protein labeling is that you *start* your work with numerous and varied unneeded unknowns since the natural hydrolysate is relatively crude and may contain as much as 30-40% of non-amino acid material. And who needs such gratuitous complications?

The uncertainty that comes from undefined and unwanted contaminants can now be avoided by using our new reconstituted C¹⁴ protein hydrolysate which consists of C¹⁴ amino acids (and C¹⁴ amino acids *only*.) This product is exclusive with us. At least for the nonce.

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Two things can now be said about this reconstituted protein hydrolysate: (1) it has a 100% biosynthetically-prepared L-amino acid composition, and (2) all of the amino acids are uniformly C¹⁴ labeled. Or, more simply: this mixture is free of any non-amino acid material, hot or cold, and all of the amino acids are hot.

If you reached this point assuming that the extra processing, the extra purity, the extra convenience to you, is going to cost you extra—forget it. It won't. Rather surprisingly, 100 μ C of this C¹⁴ reconstituted protein hydrolysate costs only \$35. 500 μ C is \$170. 1 mc runs \$320. And 2 mc a mere

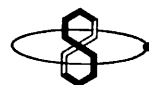
\$600. (For a pleasant surprise, compare these prices with what you now pay for the crude natural product.) Also, please note that you get a Product Analysis Report with every shipment with the specific activity of each of the component amino acids. The other specifications for this product look like this:

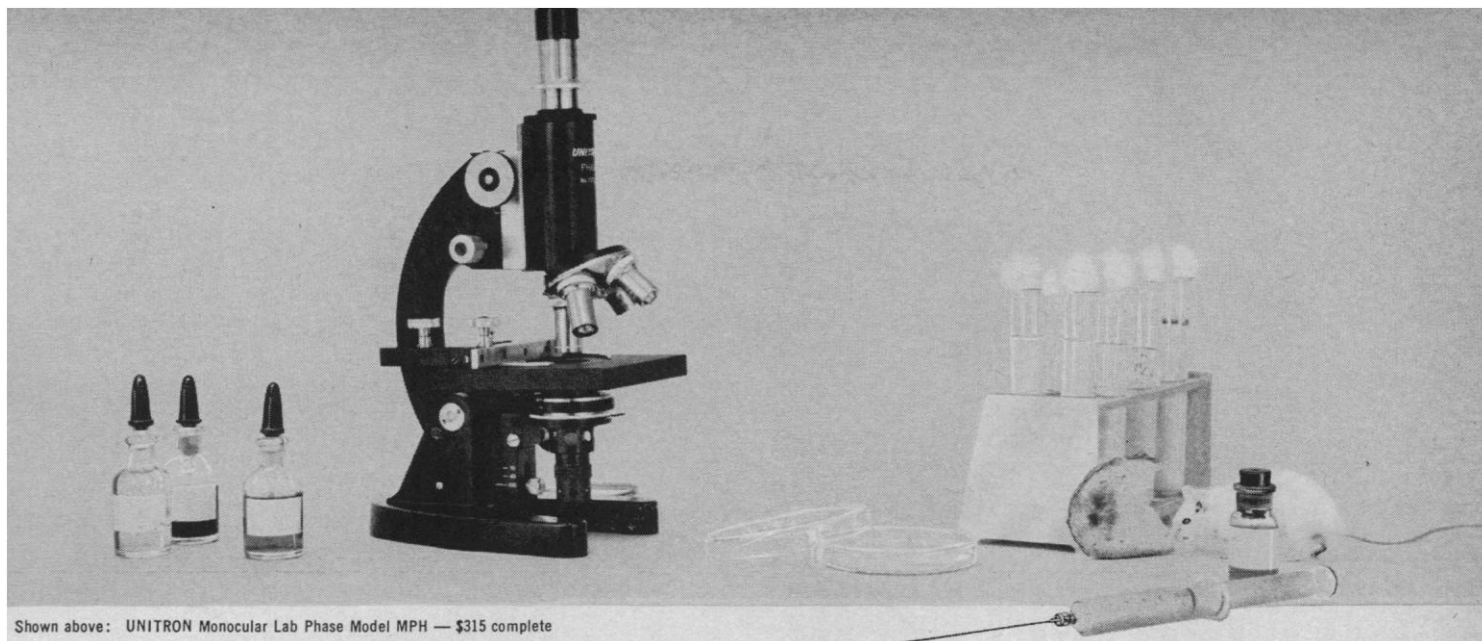
	sp. act. mc/mmole	μ C/mc of mix.		sp. act. mc/mmole	μ C/mc of mix.
L-Ala-C ¹⁴	> 70	80	L-Phe-C ¹⁴	> 168	80
L-Arg-C ¹⁴	> 130	50	L-Pro-C ¹⁴	> 110	50
L-Asp-C ¹⁴	> 110	125	L-Ser-C ¹⁴	> 85	80
L-Glu-C ¹⁴	> 165	125	L-Thr-C ¹⁴	> 100	80
L-Ileu-C ¹⁴	> 110	100	L-Tyr-C ¹⁴	> 150	80
L-Leu-C ¹⁴	> 130	50	L-Val-C ¹⁴	> 100	50
L-Lys-C ¹⁴	> 180	50			

mixture of purified L-amino acids is in 0.01 N HCl/ 100 μ C vials contain 100 μ C/ml / all other vials contain 1 mc/ml

One interesting final point: we also have a mixture that is comparable in essentially every respect to the reconstituted protein hydrolysate shown above but with only these four C¹⁴ essential amino acids: arginine, leucine, lysine, valine, and with total activity divided equally among these. This too is new. We call it our C¹⁴ L-Amino Acid Protein Labeling Mixture (catalog no. 3122-06). It, and the reconstituted protein hydrolysate (catalog no. 3122-08), are immediately available to you from stock. Write, or call us collect at 914-359-2700. Ask for Maryann.

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Some lab microscopes can also be used for *darkfield*.

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Until now, no lab microscope has provided all 3 for the price of 1.

UNITRON's MPH does. The 3 most important techniques of microscopy are built-in, yet the MPH costs less than many single-purpose microscopes.

That's not all. UNITRON's MPH gives you more than just the advantages of 3 specialized microscopes. It unites them in "Continuous-Transition Microscopy." With a turn of the condenser knob, you change from *brightfield* to *darkfield* to *phase contrast*, all in rapid succession. Operation is so easy, it's almost automatic. There are no accessories to attach and no time-consuming adjustments to make. Everything has been factory-centered for you. Even the light source is built-in and permanently aligned.

Have cost and complexity kept you in the dark about phase? If so, you're in for a treat. UNITRON phase contrast will impress you all the more if you've tried to study *unstained, living* material with ordinary brightfield microscopes. There's no need to close the iris to pinhole size, reducing resolution and detail. Gone are those ghostly artificial images.

UNITRON Phase Contrast provides optical staining. You get the benefits of chemical staining, without the time-consuming preparation. And what's more, you see material *alive* with vivid contrast and pin-point detail. With phase, even your stained slides show unsuspected details. All this, without any special effort.

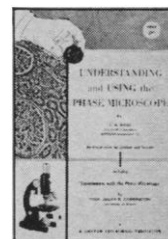
There's more. UNITRON's built-in illuminator provides five intensities . . . more than enough to meet your visual and photographic needs. Even the eyepieces are special . . . the widefield type for comfortable viewing.

And now, the moment of truth. The price. Only \$315 for UNITRON's Monocular Laboratory Phase Model MPH . . . less than you pay for many ordinary brightfield lab microscopes. The Binocular Model BPH, with several additional features of its own, costs only \$527.

UNITRON prices include everything but the specimens. In addition to all the special features of our phase models, you'll find everything else you expect in a good lab microscope. Four achromatic objectives (including high-power oil-immersion), mechanical stage, focusable substage condenser with iris diaphragm and filter system, fitted cabinet, etc. These, and all the other features we've described, are standard equipment with UNITRON. *There are no hidden extras to buy*

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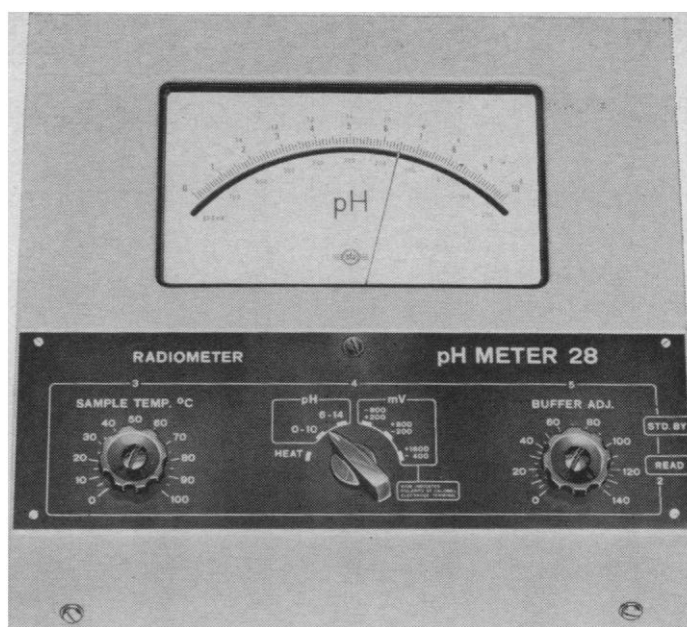
Teachers will be interested to learn that UNITRON even offers *student phase models* for as little as \$99. To introduce phase to the student lab, and to other areas where it has been a stranger, UNITRON has published a fully illustrated 64-page booklet, *Understanding and Using the Phase Microscope*. The text includes a special chapter of experiments written by Professor Julian D. Corrington of the University of Miami. Other subjects are covered, including the optical theory of microscopes in general. The booklet normally sells for \$1.00 but we will be glad to send a free copy to any interested teacher or researcher



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pH Measurement



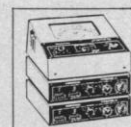
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The location of organic compounds by structural and atomic characteristics takes time. That's why J. T. Baker's BATCH Directory program was undertaken to help you solve this problem for the more than 5,000 organic compounds now in J. T. Baker's Laboratory chemicals line.

What is a BATCH Directory? A BATCH Directory is a listing of chemical compounds according to an easily mastered structural-atomic code, the BATCH Number. The J. T. Baker BATCH Directory lists the BATCH Number, commodity name, and commodity number for J. T. Baker's offerings. This Directory program provides valuable working aids to those interested in organic synthesis or medicinal chemistry—including technologists and chemistry-oriented purchasing agents.

What is a BATCH Number? A BATCH Number is a 5-digit code that classifies a compound of carbon according to the following number measures. It works like this:

The B-digit (B = Basis or Benzene ring number) relates to the nature (and number) of rings present.

The A-digit (A = Atomic class) is assigned according to the nature (and number) of atoms present other than carbon and hydrogen.

The T-digit (T = Total hetero-atom count) relates to the total number of atoms present other than carbon and hydrogen.

The C-digit (C = Carbon-atom count) is the units value of the number of carbon atoms in the empirical formula.

The H-digit (H = Hydrogen-

atom count) is derived from the number of hydrogen atoms in the empirical formula.

You'll find the scheme for assigning a BATCH Number in the Introduction to the J. T. Baker BATCH Directory and also in J. T. Baker Laboratory Chemicals Catalog 660 just released.

What can the J. T. Baker BATCH Directory program do for you? With a few minutes spent in mastering the assignment of a BATCH Number, you can have the J. T. Baker BATCH Directory work for you. For example, from the more than 5,000 compounds of carbon in J. T. Baker's Catalog 660 you can establish 1) what members of a class of structures are offered, 2) what substitution products of a structure are offered, and 3) what isomers or homologs of a structure are offered. This Directory can also assist in establishing the commodity name and number for a compound where a systematic name has not been devised or where only a partial structure is at hand.




An "extra" in the J. T. Baker BATCH Directory Program. With the aid of other tools in the J. T. Baker system of chemical information management, three special BATCH Directories have just been prepared and released. These cover compounds of each of the halogens, hydroxy compounds, and

cyclic nitrogen compounds. These special Directories will aid you in "screening" compounds in these important classes for use in your projects and applications.

J. T. Baker Laboratory Chemicals Catalog 660. Since J. T. Baker BATCH Directories provide both the commodity number and name, they are best used in conjunction with J. T. Baker Laboratory Chemicals Catalog 660 just mailed to all on our catalog lists. This 260-page catalog gives you full information on prices, package sizes, grades, and specifications for the almost 6,000 laboratory chemicals offered, including listings for 'Baker Analyzed' Reagents and organic laboratory chemicals.

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special BATCH Directories on halogen, hydroxy, and cyclic nitrogen compounds, and 3) J. T. Baker Laboratory Chemicals Catalog 660.

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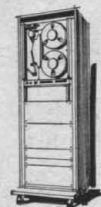
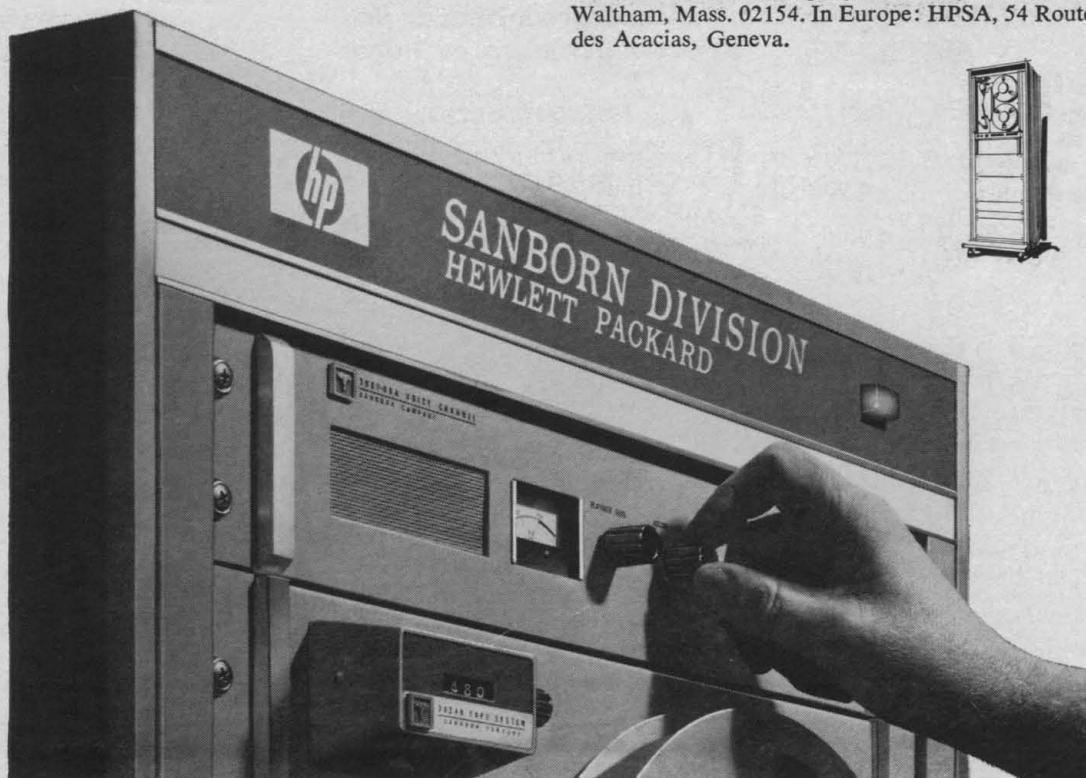
... with the unique precision and economy of a Sanborn tape system

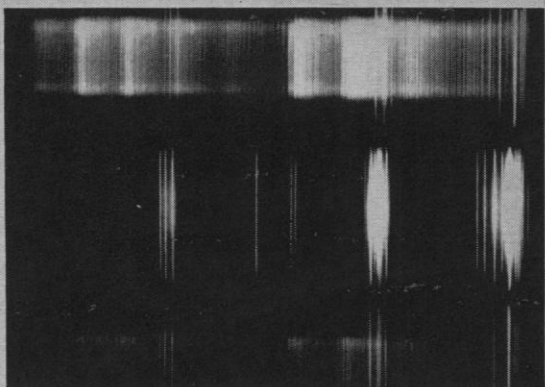
Accurately preserve up to 14 physiologic variables precisely as they occurred during the original research investigation, surgical procedure or monitoring period — over a time span as long as 6½ hours — together with a spoken commentary of significant events, all on a single, easily-stored reel of one-inch wide magnetic recording tape. Then “re-create” the data in their original form at any later time for analysis or teaching of the inter-relationship of physiologic conditions, or detailed study of the effects of drugs or experimental investigative procedures. “Playback” may be on an oscillographic recording system, large-screen oscilloscope, computer or other readout device, with the original time scale compressed or expanded for quick-scanning of long procedures, or detailed study of brief or high frequency phenomena.

Add to these basic advantages the distinctive capabilities provided by Sanborn 3900-Series systems: complete IRIG-instrumentation class performance and compatibility (allows your tapes to be played on similar systems and vice-versa) . . . bandwidths to 250,000 Hz (direct), 20,000 Hz (FM) . . . lower cost-per-channel than many comparable systems, resulting from simplified transport design and the need to purchase *only* the plug-in circuit

cards needed for desired recording modes and tape speeds . . . easy, straightforward operation by laboratory personnel, through snap-on reel loading, logically-grouped front panel controls, straight-through tape path without complex threading, maintenance requiring only occasional cleaning of the tape path, no capstan or pulley changes for tape speed changes, quick location of desired tape segment with built-in footage counter accurate to 99.95%. Extremely low flutter allows you to see signal variations of 100:1 and better.

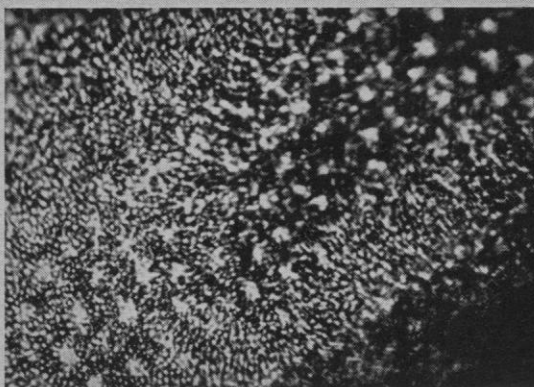
Systems available with 7 or 14 channels plus voice channel; 6 electrically-selected speeds (1-7/8 to 60 ips); plug-in circuit cards for Direct, FM and Pulse recording and reproducing modes. Optional additions include tape loop adapter, remote control unit, non-standard tape speed plug-ins, packaging in separate portable cases for transport and electronics. As an example of the economy of these true instrumentation-performance Series 3900B tape recording systems, a complete 0-10kHz 7-channel system equipped for FM recording/reproducing at two speeds, with voice channel amplifier and microphone, costs \$8,710.00 (f.o.b. Waltham, Mass., Continental U.S.). Complete technical data and specifications available from Hewlett-Packard/Sanborn field engineering offices, or write Sanborn Division, Hewlett-Packard Company, 175 Wyman Street, Waltham, Mass. 02154. In Europe: HPSA, 54 Route des Acacias, Geneva.



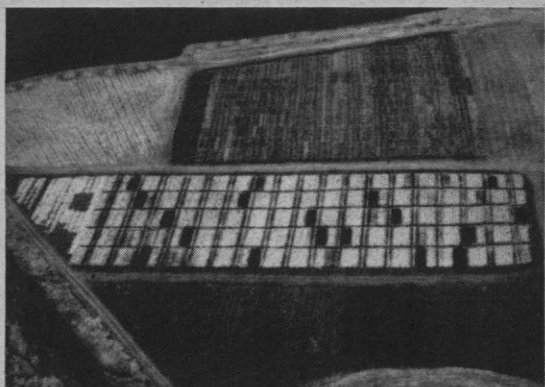


Picture made by Dr. T. Wentink, Jr., Avco/RAD.

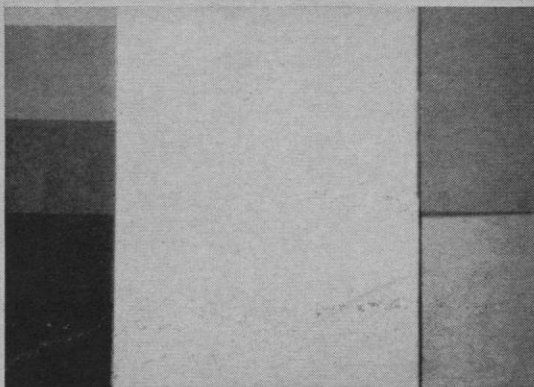
A



B



C



D

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Polaroid's latest film brings you information from the infrared in 15 seconds.

It's called Polaroid Type 413 Land Infrared Film. Its spectral sensitivity extends from the visible into the infrared beyond 9000Å, peaking at 8400Å. Its development time is 15 seconds.

Being able to see your infrared pictures on the spot has important advantages. You can go ahead with testing or experimentation uninterrupted. If you need a record of spectrographic data, for example, you've got it then and there. **Picture A**—arc emission spectra, 6000Å-8800Å—is an example of the sharp, detailed record you get after a 15-second pause in operations. (Top and bottom records are CN spectra, middle record is a copper spectrum.)

Also, if your picture requires special or elaborate equipment, Type 413 film saves you the risk of having to set it up twice. **Picture B**, for example, a microspectrograph of the cones of the retina, required the use of infrared lighting because visible light causes bleaching of the pigments. The scientist who

took it saw his results immediately and knew he had a perfect picture while his set-up was still intact.

While on-the-spot recording is the most important advantage of this remarkable new film, it isn't the only one. Type 413 film is also three times as sensitive as conventional infrared films. Its A.S.A. equivalent speed is 800 without filters. Since this permits faster shutter speeds and smaller lens apertures, the film is ideal for applications like aerial photography. In **Picture C**—an aerial shot of a potato field used for plant pathology testing—you can see how clearly the film was able to record the fungus-infected areas (dark rectangles) using an extremely fast exposure setting. Shot was made at f/32 and 1/300th of a second.

And Type 413 film is as easy to use as any other Polaroid Land film. It can be used in almost all standard Polaroid Land cameras and camera backs using Series 40 film and the procedure is the same. Just snap the pic-

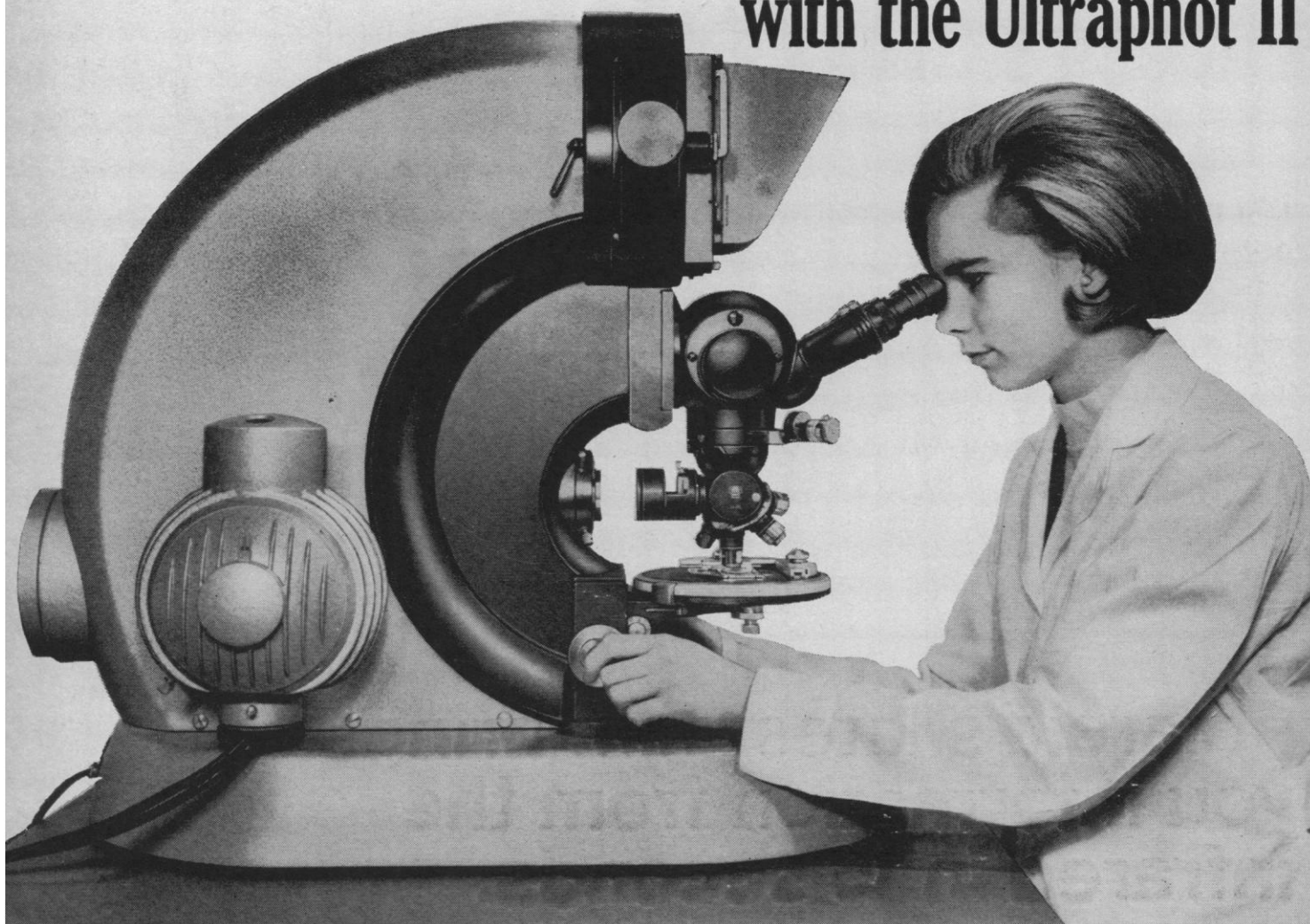
ture, pull the tab, and peel off the finished print in 15 seconds. Because it's as simple as that to use, the film will enable technicians and other personnel who may not be trained photographers to take perfect infrared pictures whenever they're needed. **Picture D**, for example, a record of the infrared reflectance of concrete curing compounds, is a type of photograph often called for in materials testing—and any Sunday photographer could have filled in and done the job.

Because of these advantages, Type 413 film will have wide use in almost every field of industrial and scientific photography. In laser research, spectrographic analysis, specialized industrial photography where heat is a factor, plant pathology, general medical research—wherever there is a need to investigate the infrared.

If you would like to know more about our latest film, write to: Sales Department, Polaroid Corporation, Cambridge, Mass. 02139.

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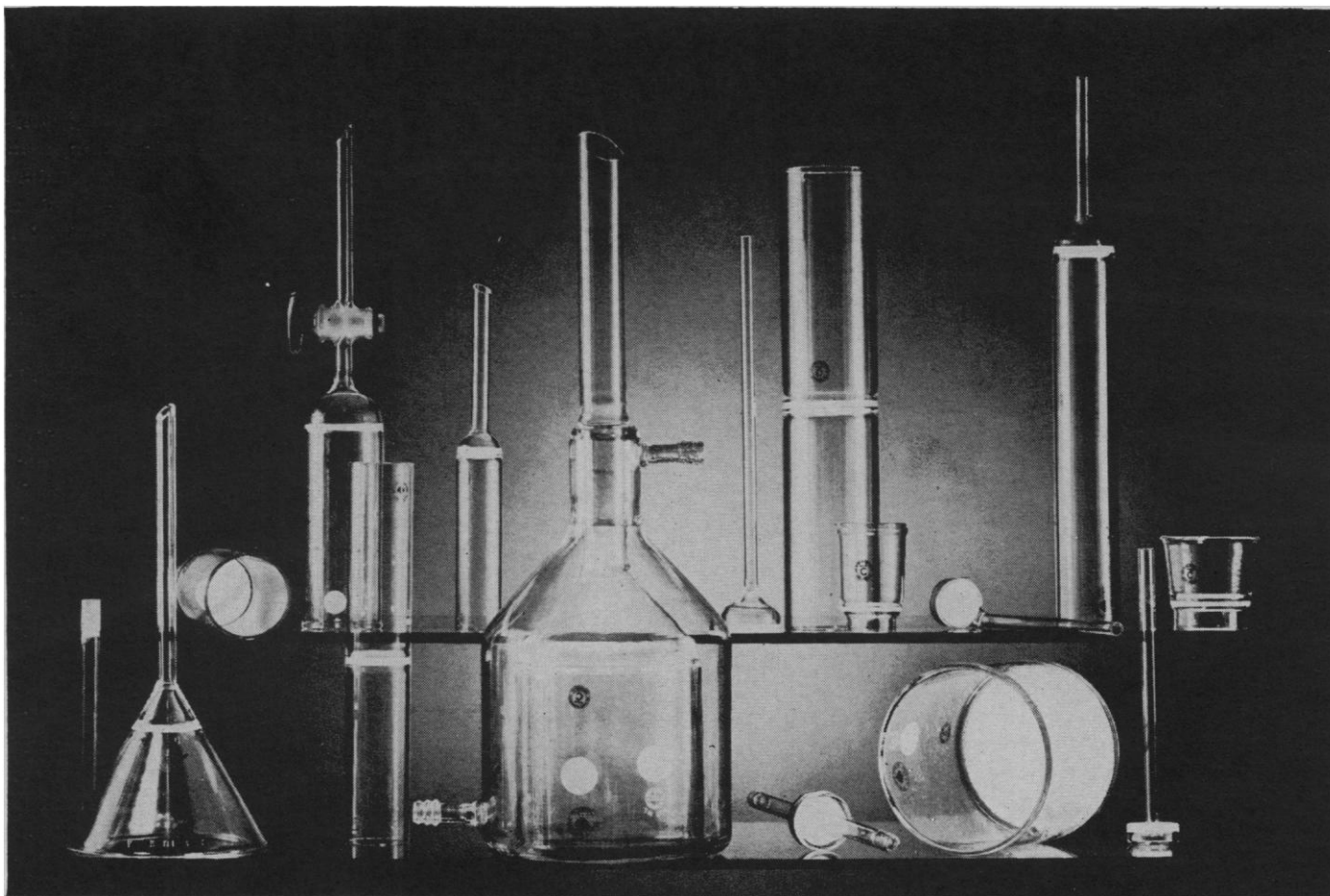
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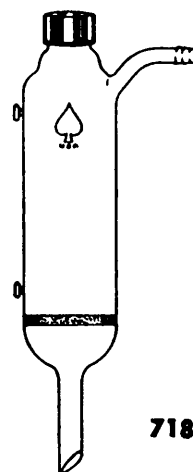
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First, the instrument in question. It's the MS-10 — a small, accurate mass spectrometer for qualitative and quantitative analysis of gases. And despite its low basic cost (only \$5,290 if you'd rather buy than rent), the instrument's level of performance and accuracy doesn't have to apologize to anyone. This is a true *analytical* mass spectrometer. It is the most easily operated mass spectrometer with procedures that are quickly understood, learned and remembered. You really don't need a specialist in mass spectrometry to use this instrument. Also, the MS-10 withstands any amount of inexpert handling; it is virtually impossible to damage. (Else why would we rent them?)

The MS-10 was initially introduced in 1960 by AEI (the world leader in mass spectrometry). Since then, hundreds have gone into service throughout the world and, quite literally, there are now more MS-10's being used than any other mass spectrometer. By far. As a result, the MS-10 has been applied to more end uses than any other piece of equipment. The implication of this: the chances are good that, whatever your application,

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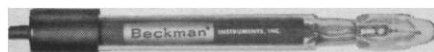
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ing to pay the additional cost of dual brakes. In my opinion the difference in cost would be so small that buyers wouldn't feel it. (The American Motors design consists of a simple mechanical separation in the master cylinder between the flow of rear-wheel brake fluid and the front-wheel brakes.) The industry has been busy selling a "new" brake innovation, disc brakes. The disc-brake patent is more than 40 years old and is in the public domain. . . .

The automobile industry used to be looked upon as the leader in quality control and reliability. In recent years these have been sacrificed because of higher labor costs . . . and the practice of including an obsolescence factor in design. . . .

ABRAHAM L. KORR

8712 Hickory Drive,
Philadelphia, Pennsylvania

Project Orion

In "Death of a project" [F. J. Dyson, *Science* **149**, 141 (1965)], Project Orion is described as "a project to design a vehicle which would be propelled through space by repeated nuclear explosions occurring at a distance behind it." The author says that "Designs were worked out in detail for vehicles that could carry eight men and a payload of 100 tons on fast trips to Mars and back" after the vehicle had been "lifted into space by Saturn chemical rockets."

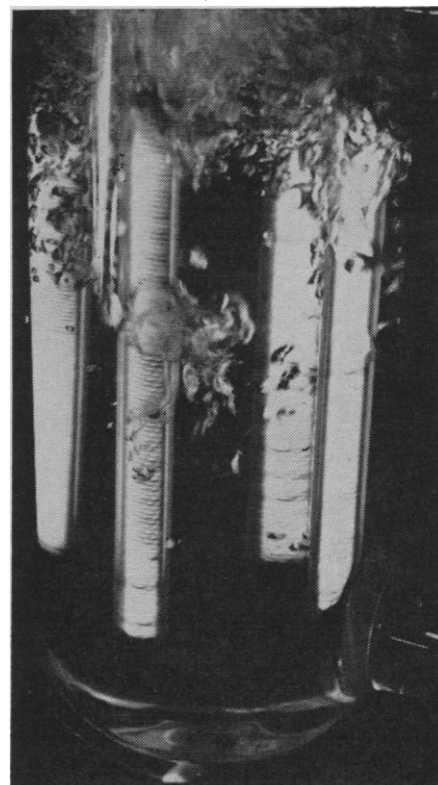
Space travel consists essentially not of being "propelled through space" but of acceleration, followed later by equivalent deceleration. The original acceleration given to the proposed vehicle by the Saturn rockets could, as is now standard practice, be later counteracted by the decelerative effect of returning through the earth's atmosphere. But where is there any discussion of the fact that all of the acceleration added by the *exotic* means of "propulsion" would have to be subtracted later by *conventional* means, since it is quite obvious that the new, exotic means could not be used for deceleration?

Perhaps that is why the project was dropped.

JO FISHER FREEMAN

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SCIENCE, VOL. 151

Woodlands in the Great Plains

Commenting on a report in which P. V. Wells (1) points out that non-riparian woodlands occur on topographic breaks in the Great Plains and suggests fire and other factors to partly account for the grasslands on more level topography, G. Ehrenfried (2) cites an 1860 publication which describes fires caused by Indians as evidently accounting for an extension of the prairies in Canada.

In March 1805, in a letter to his mother, Meriwether Lewis (3) wrote concerning the country along the Missouri River between the Platte River and Ft. Manda, North Dakota:

With respect to this open country, I have been agreeably disappointed. From previous information I had been led to believe that it was barren, sterile and sandy; but, on the contrary, I found it fertile in the extreme, the soil . . . consisting of a fine black loam . . . [with] a luxuriant growth of grass and other vegetable productions, particularly such as are not liable to be much injured, or wholly destroyed by the ravages of the fire. . . . there can exist no other objection to it, except that of the want of timber. . . . This want of timber is by no means attributable to a deficiency in the soil to produce it, but owes its origin to the ravages of the fires, which the natives kindle in these plains at all seasons of the year. The country on both sides of the river, except some of its bottom lands, . . . is one continued open plain, in which no timber is to be seen except a few . . . clumps of trees, which, from their moist situation, or the steep declivities of hills, are sheltered from the effects of fire.

Thus 160 years ago Lewis recognized nonriparian as well as riparian forests in the midst of the grasslands, attributed the treeless condition to man-caused fires, and recognized the fertility of the soil. It was evidently Major Long, after his 1820 expedition, who applied to the Great Plains the name "Great American Desert," which term was subsequently publicized by James Fenimore Cooper in his novel *The Prairie* (1827). From this came the long-held belief in the treelessness of the Great Plains.

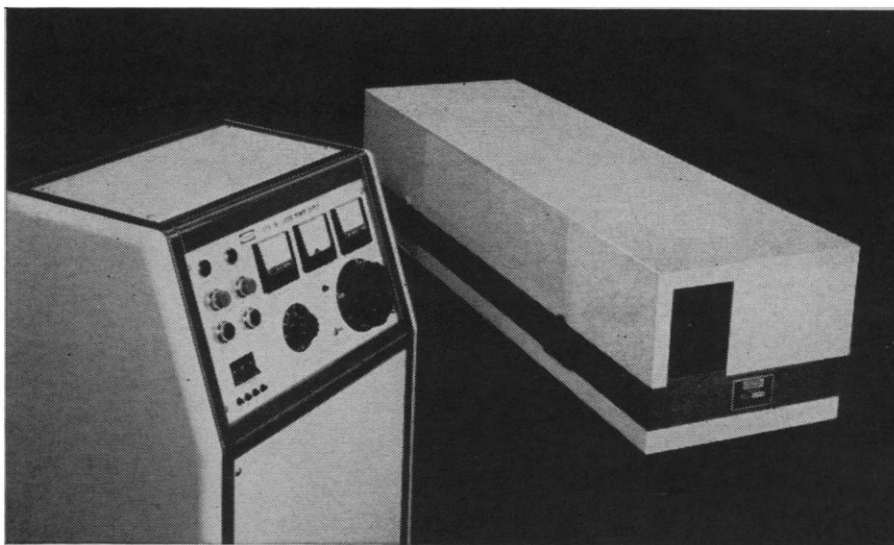
DILWYN J. ROGERS

Department of Biology,
Augustana College,
Sioux Falls, South Dakota

References

1. P. V. Wells, *Science* **148**, 246 (1965).
2. G. Ehrenfried, *ibid.*, p. 1173.
3. R. G. Thwaites, *Original Journals of the Lewis and Clark Expedition* (Dodd, Mead, New York, 1905), vol. 7.

25 MARCH 1966



Holography, Raman spectroscopy, interferometry, light scattering: some current uses of Raytheon's Argon Ion Laser

These are just a few of the current applications of Raytheon's LG12 1-Watt CW Argon Ion Laser, which produces a minimum of six lines in the blue-green spectrum.

Among others: as a light source for the measurement of turbulence effects, and in the development of photoexposing processes. Additional applications—such as optical data processing—are being investigated.

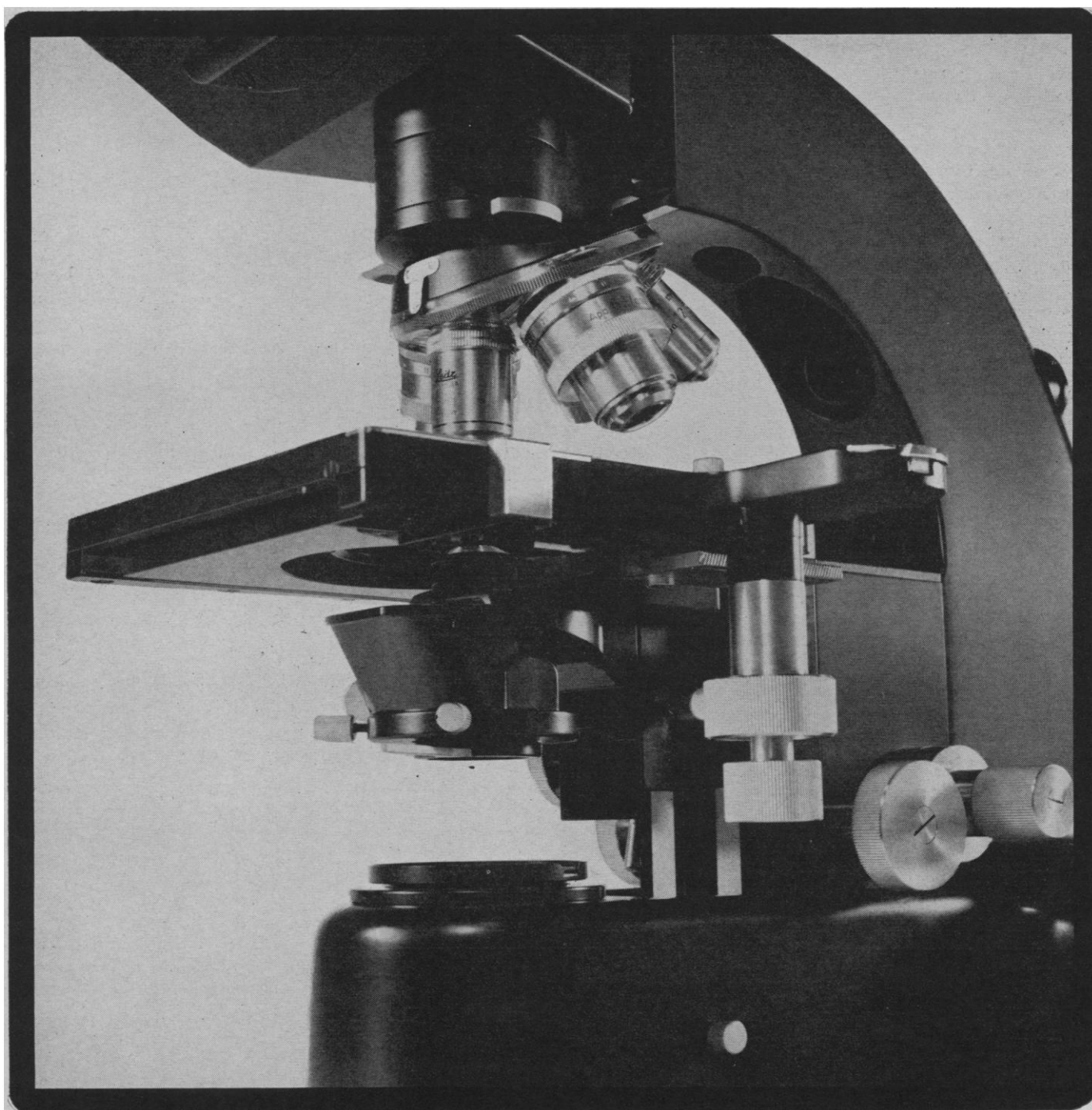
Total output of the LG12 Laser is one watt CW in a diffraction-limited uniphase coherent spheri-

cal wavefront in the TEM₀₀ mode. The LG12 is available for delivery in just 60 days.

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Support of Science in Underdeveloped Countries

There is a proverb to the effect that an alms-giver throws a starving man a fish, whereas a truly charitable man gives him a hook and line. The U.S. foreign aid program is in effect almsgiving. We have not recognized what has to be done to bring prosperity to the underdeveloped nations.

In a recent issue of *Science* (4 February), Homi Bhabha delineated the problem and suggested a means of solving it.

What the developed countries have and the underdeveloped lack is modern science and an economy based on modern technology. The problem of developing the underdeveloped countries is therefore the problem of establishing modern science in them and transforming their economy to one based on modern science and technology.

Bhabha went on to advance the thesis that the problem of establishing science as a live and vital force in a society is an inseparable part of the problem. Bhabha spoke authoritatively, for he was the key man in creating a self-reliant atomic energy industry in India. In 1943 no scientific institution in India had facilities for work in subjects at the frontiers of physics, including nuclear physics. Bhabha persuaded an industrialist, J. R. D. Tata, to establish the Tata Institute of Fundamental Research, which has been a constituent institution of Bombay University from the beginning "and has had close relations with many other universities in India, so that students of many of them have done work for the Ph.D. at the institute." From a small start with a recurring annual budget of \$16,000, the institute grew initially at the rate of 30 percent per year. Its current budget is \$3 million.

Early in its history the institute had a key role in the development of atomic energy.

... groups were established at the institute to design and build all the electronics instrumentation without which atomic energy work is impossible. Thus, the Physics Division and the Electronics Division of the Atomic Energy Establishment at Trombay were both initially housed and built up in the institute. The electronics group of the Atomic Energy Establishment has today a staff of over 1300 people and is the strongest research and development group in electronics in the whole country.

In contrast to the fine performance in atomic energy, where a strong base in fundamental physics existed, Bhabha described the dismal performance of the steel industry. In turn, German, Russian, and British consultants have been called in, but India still does not have the capacity to design and build new steel plants.

... Unless powerful scientific and engineering groups are established during the construction and operation of existing steel plants as a matter of deliberate policy, the dependence on foreign technical assistance will continue, and the steel industry will not reach a stage of technical self-reliance. A similar situation exists in almost every other industry.

Had Bhabha lived and had his influence expanded, many of India's problems might have been solved. Science and technology can expand faster than populations, thus providing time to solve the population problem. Bhabha and the Tata Institute have shown the profound effect of small sums spent wisely in support of fundamental research. If the United States wishes to be a true friend to the underdeveloped countries, it will find means of helping in the establishing and supporting of indigenous fundamental research institutes. Basic research is only one of several important prerequisites to obtaining optimal benefits from science, but competence in research provides a base from which the most complex technology can evolve when governments are alert and stable.

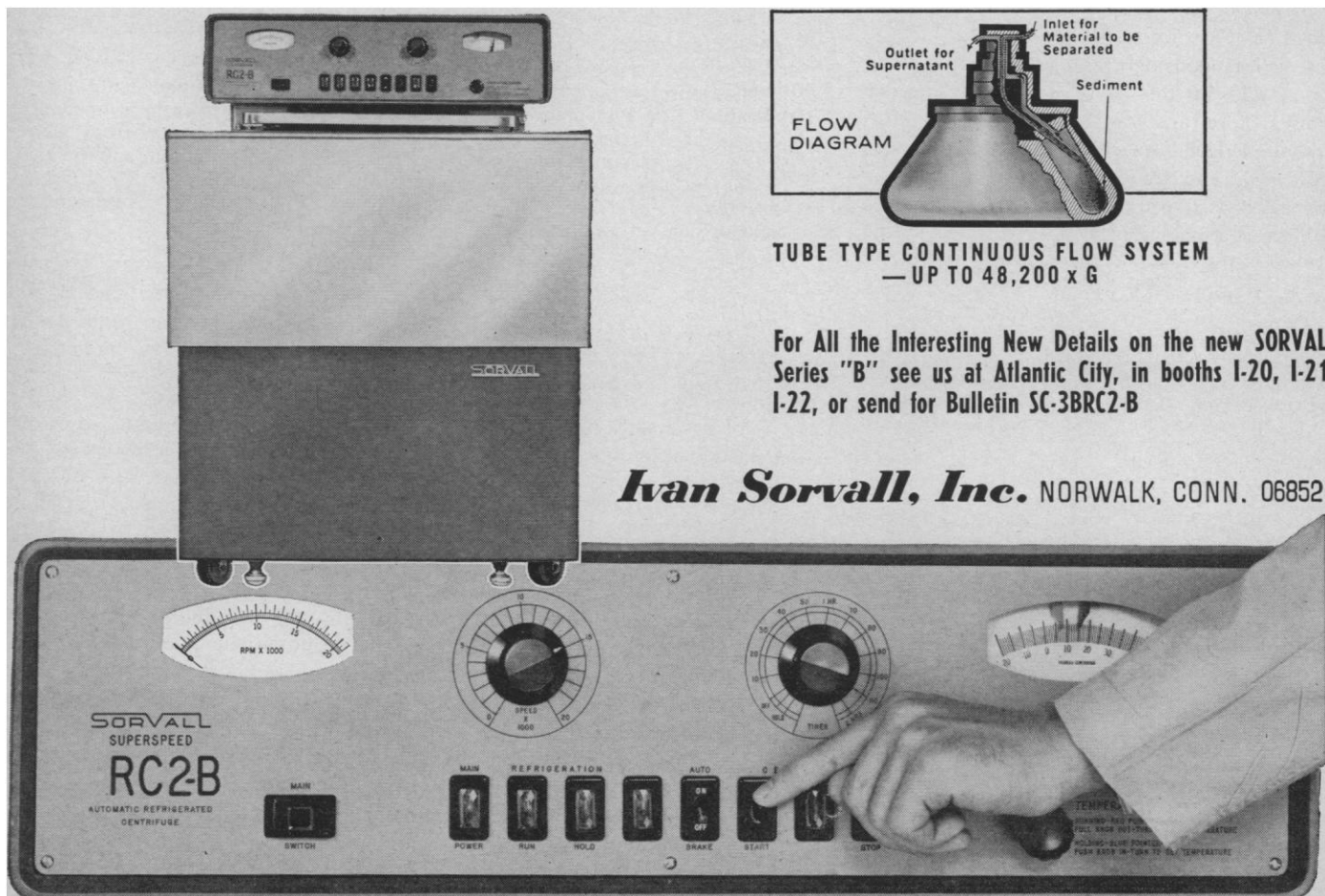
—PHILIP H. ABELSON

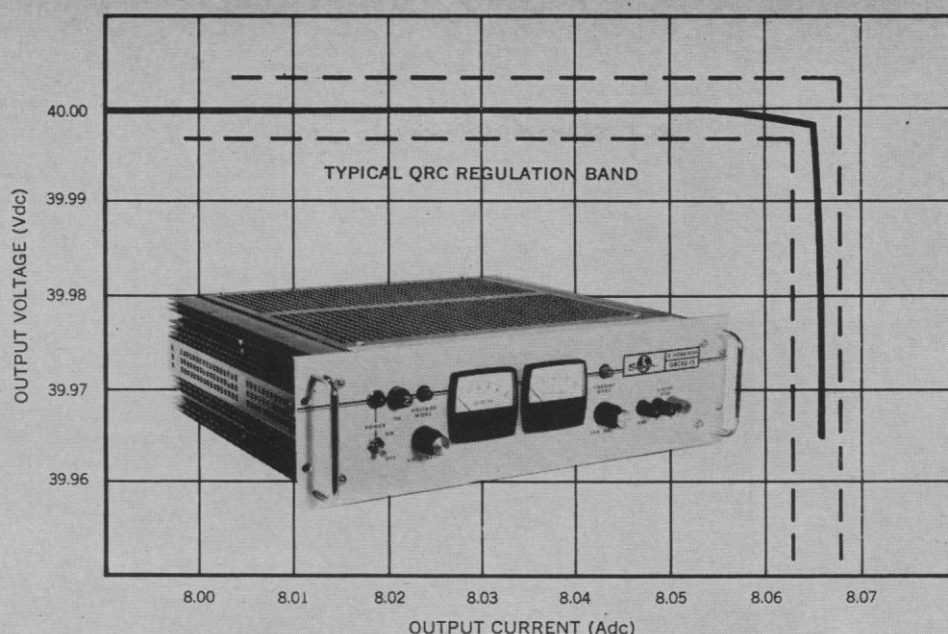
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QRC20-30	0-20	0-30	$\pm .005\%$ or ± 1 mv	1 mv	$\pm .05\%$ or ± 16 ma	8 ma	7	700.00
QRC40-4	0-40	0-4	$\pm .005\%$ or ± 1 mv	1 mv	$\pm .05\%$ or ± 2 ma	1 ma	5¼†	315.00
QRC40-8	0-40	0-8	$\pm .005\%$ or ± 1 mv	1 mv	$\pm .05\%$ or ± 4 ma	2 ma	3½	450.00
QRC40-15	0-40	0-15	$\pm .005\%$ or ± 1 mv	1 mv	$\pm .05\%$ or ± 8 ma	4 ma	5¼	575.00
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Forthcoming Events

April

1-2. Alabama Acad. of Science, Birmingham-Southern College, Birmingham. (W. B. DeVall, Dept. of Forestry, Auburn Univ., Auburn, Ala.)

1-2. Arkansas Acad. of Science, Little Rock. (G. E. Templeton, Univ. of Arkansas, Fayetteville)

1-5. National Science Teachers Assoc., New York, N.Y. (R. H. Carleton, 1201 16th St., NW, Washington, D.C. 20036)

1-7. American Acad. of General Practice, Boston, Mass. (M. F. Cahal, Volker Blvd. at Brookside, Kansas City 12, Mo.)

4-6. Atomic Energy Soc. of Japan, annual mtg., Tokyo. (M. Masamoto, Japan Atomic Energy Research Inst., 1-1, Shibata-mura-cho, Minato-ku, Tokyo)

4-6. Exobiology, conf., Ames Research Center, Moffett Field, Calif. (Letters and Science Extension, Univ. of California, Berkeley 94720)

4-6. American Assoc. of Physical Anthropologists, Berkeley, Calif. (F. E. Johnston, Dept. of Anthropology, Univ. of Pennsylvania, Philadelphia 19104)

4-6. Biomedical Communication, conf., New York, N.Y. (J. Lieberman, Public Health Service Audiovisual Facility, Atlanta, Ga. 30333)

4-7. Federation of European Biochemical Soc., 3rd mtg., Warsaw, Poland. (T. Klopotoski, Polish Biochemical Soc., Freta 16, Warsaw)

4-7. Advances in Water Quality Improvement, conf., Univ. of Texas, Austin. (Special Lecture Series, Engineering Laboratories Bldg. 305, Univ. of Texas, Austin)

4-8. International Biological Program, 2nd general assembly, Paris, France. (F. W. G. Baker, 2 via Sebenico, Rome, Italy)

4-10. Psychology, 10th inter-American congr., Lima, Peru. (Intern. Soc. of Psychology, 2104 Meadowbrook Dr., Austin, Tex.)

5-7. Middle East Neurosurgical Soc., mtg., Jerusalem, Jordan. (F. S. Haddad, Orient Hospital, Beirut, Lebanon)

5-8. American Assoc. of Anatomists, San Francisco, Calif. (R. T. Woodburne, Dept. of Anatomy, Univ. of Michigan, Ann Arbor 48104)

6-7. Phlebology, 6th intern. mtg., Aix-en-Provence, France. (F. Beurier, 94, cours Sextius, Aix-en-Provence)

6-8. Electron and Laser Beam Technology, Univ. of Michigan, Ann Arbor. (G. I. Haddad, Electrical Engineering Dept., Univ. of Michigan, Ann Arbor)

6-8. Recent Advances in Phytochemistry, intern. symp., Univ. of Texas, Austin. (T. J. Mabry, Dept. of Botany, Univ. of Texas, Austin 78712)

6-8. Plant Phenolic Group of North America, 6th annual mtg., Austin, Tex. (V. C. Runeckles, Imperial Tobacco Co., Montreal, P.Q., Canada)

7-8. Histochemical Soc., 17th annual mtg., Atlantic City, N.J. (J. Y. Terner, College of Physicians and Surgeons, Columbia Univ., New York, N.Y. 10032)

7-8. Southern Sociological Soc., annual mtg., New Orleans, La. (J. J. Honigmann, Dept. of Anthropology, Univ. of North Carolina, Chapel Hill)

7-9. Developmental Biology, annual

New England regional conf., Univ. of Connecticut, Storrs. (H. Laufer, Dept. of Zoology, Univ. of Connecticut, Storrs)

7-9. **Developmental Biology**, Northeast regional conf., Univ. of Connecticut, Storrs. (H. Laufer, Dept. of Zoology, Univ. of Connecticut, Storrs 06268)

7-9. Southern Soc. for **Philosophy and Psychology**, New Orleans, La. (G. R. Hawkes, U.S. Army Medical R&D Command, Washington, D.C. 20315)

8-9. American Soc. for **Artificial Internal Organs**, Atlantic City, N.J. (B. K. Kusserow, Dept. of Pathology, Univ. of Vermont College of Medicine, Burlington)

8-9. **Pennsylvania Acad. of Science**, 42nd annual mtg., Lehigh Univ., Bethlehem. (J. J. McDermott, Franklin and Marshall College, Lancaster, Pa. 17604)

8-11. **Animal Toxins**, intern. symp., Atlantic City, N.J. (F. E. Russell, Box 323, Los Angeles County General Hospital, 1200 N. State St., Los Angeles, Calif.)

9. **Paleontological Research Inst.**, semi-annual mtg., Ithaca, N.Y. (The Institution, 109 Dearborn Pl., Ithaca, N.Y. 14850)

10-11. **Microcirculatory Soc.**, 14th conf., Atlantic City, N.J. (H. J. Berman, Dept. of Biology, Boston Univ., Boston, Mass. 02215)

11-13. Institute of **Electrical and Electronics Engineers**, Region 3, conv., Atlanta, Ga. (M. D. Price, Dept. 72-14, Zone 400, Lockheed-Georgia Co., Marietta, Ga.)

11-13. Comparative **Hemoglobin Structure**, intern. symp., Salonika, Greece. (Secretary, P.O. Box 201, Salonika)

11-15. **Aeronomic Studies of Lower Ionosphere**, conf., Ottawa, Ont., Canada. (W. Pfister, Air Force Cambridge Research Laboratories, Upper Atmosphere Physics Laboratory, L. G. Hanscom Field, Bedford, Mass.)

11-15. American Assoc. of **Cereal Chemists**, New York, N.Y. (R. J. Tarleton, The Association, 1955 University Ave., St. Paul, Minn. 55104)

11-16. Federation of American Societies for **Experimental Biology**, 50th annual mtg., Atlantic City, N.J. The following societies will meet in conjunction with the FASEB; information may be obtained from FASEB, 9650 Rockville Pike, Bethesda, Maryland 20014:

American Physiological Society
American Soc. of Biological Chemists
American Soc. for Pharmacology and Experimental Therapeutics
American Soc. for Experimental Pathology

American Inst. of Nutrition
American Assoc. of Immunologists

12-13. Frontiers in **Food Research**, symp., Cornell Univ., Ithaca, N.Y. (W. F. Shipe, Dept. of Dairy and Food Science, Cornell Univ., Ithaca)

12-14. **Generalized Networks**, intern. symp., New York, N.Y. (H. J. Carlin, Polytechnic Inst. of Brooklyn, 333 Jay St., Brooklyn, N.Y. 11201)

12-14. **Remote Sensing of Environment**, 4th symp., Univ. of Michigan, Ann Arbor. (Extension Service, Conference Dept., Univ. of Michigan, Ann Arbor 48104)

12-15. **Quantum Electronics**, intern. conf., Phoenix, Ariz. (J. P. Gordon, Bell Telephone Laboratories, Murray Hill, N.J.)

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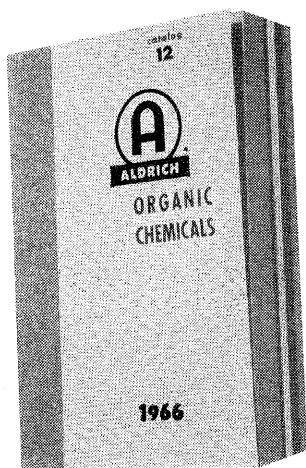
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12-16. Society for Applied Mathematics and Mechanics, annual scientific mtg., Darmstadt, Germany. (F. Reutter, Gesellschaft für Angewandte Mathematik und Mechanik, Templergraben 55, 51, Aachen, Germany)

12-29. Soil Conservation, 1st Pan American Congr., São Paulo, Brazil. (J. Abramides Neto, avda. Francisco Matarazzo 455, Caixa Postal 8366, São Paulo)

13-15. Institute of Environmental Sciences, 12th annual tech. mtg. and equipment exp., San Diego, Calif. (The Institute, 34 S. Main St., Mount Prospect, Ill.)

13-15. Use of X-Rays in Medicine and Industry, public health conf., Univ. of Miami, Coral Gables, Fla. (M. Dauer, Div. of Radiological Physics, Jackson Memorial Hospital, Univ. of Miami, Miami, Fla.)

13-16. Geological Soc. of America, southeast section, Univ. of Georgia, Athens. (L. D. Ramspott, Dept. of Geology, Univ. of Georgia, Athens 30601)

13-16. American Orthopsychiatric Assoc., 43rd annual mtg., San Francisco, Calif. (M. F. Langer, The Association, 1790 Broadway, New York 10019)

13-16. National Soc. for Programmed Instruction, natl. conv., St. Louis, Mo. (M. Arky, 714 Kingsland, University City, Mo. 63130)

13-16. American Radium Soc., annual mtg., Phoenix, Ariz. (J. L. Pool, Memorial Soc., 444 E. 68 St., New York 10021)

13-16. National Council of Teachers of Mathematics, 44th annual mtg., New York, N.Y. (J. D. Gates, 1201 16th St., NW, Washington, D.C. 20036)

14-15. British Biophysical Soc., spring mtg., Oxford, England. (D. Noble, Balliol College, Oxford)

14-15. Molecular Interactions and the Crystallography of Ceramics, Univ. of Nottingham, Nottingham, England. (S. C. Wallwork, Dept. of Chemistry, Univ. of Nottingham, University Park, Nottingham)

14-16. Association of Southeastern Biologists, Raleigh, N.C. (M. Y. Menzel, Dept. of Biological Sciences, Florida State Univ., Tallahassee)

14-16. American Cleft Palate Assoc., Mexico City, Mexico. (C. G. Wells, Parker Hall, Univ. of Missouri, Columbia)

14-16. Eastern Psychological Assoc., New York, N.Y. (M. A. Iverson, Queens College, Flushing, N.Y. 11367)

14-17. American Assoc. of Endodontists, 23rd annual mtg., San Francisco, Calif. (J. F. Bucher, 6828 Winterberry Lane, Bethesda, Md. 20034)

14-19. American Dermatological Assoc., Hot Springs, Va. (R. R. Kierland, Mayo Clinic, Rochester, Minn.)

14-20. Geodetical Measuring Technique and Instruments, conf., Budapest, Hungary. (F. Raum, Preparatory Committee of the Conference, Technika Haza, Szabadsag ter 17, Budapest 5)

15-16. Iowa Acad. of Science, Pella. (G. W. Peglar, Dept. of Mathematics, Iowa State Univ., Ames)

15-16. Montana Acad. of Sciences, Missoula. (L. H. Harvey, Univ. of Montana, Missoula 59801)

15-17. American Soc. of Internal Medicine, New York, N.Y. (A. O. Whitehall, 3410 Geary Blvd., San Francisco, Calif.)

16-18. Lateral Line Detectors, intern. conf., New York, N.Y. (P. H. Cahn, Stern College, Yeshiva Univ., 253 Lexington Ave., New York 10016)

17-20. Electron and Ion Beam Science and Technology, 2nd intern. conf., American Inst. of Mining, Metallurgical, and Petroleum Engineers, New York, N.Y. (H. N. Appleton, 345 E. 47 St., New York 10017)

18-19. American Otological Soc., San Juan, P.R. (W. H. Bradley, 1100 E. Genesee St., Syracuse, N.Y.)

18-20. Thermodynamics of Ceramic Systems, mtg., London, England. (J. P. Roberts, British Ceramics Soc., Houldsworth School of Applied Science, Univ. of Leeds, Leeds 2, England)

18-20. Technical Microbiology, symp., Berlin, Germany. (S. Windisch, Inst. für Gärungsgewerbe, Seestrass, 13, 1 Berlin 65)

18-20. Structures and Materials, 7th conf., Cocoa Beach, Fla. (R. W. Leonard, NASA-Langley Research Center, Mail Stop 188C, Langley Station, Hampton, Va.)

18-21. Aerospace Medical Assoc., 37th annual scientific mtg., Las Vegas, Nev. (C. A. Berry, Chief of Center Medical Programs, NASA-Manned Spacecraft Center, Houston, Tex. 77058)

18-21. International Scientific Radio Union, U.S. natl. committee, mtg., Washington, D.C. (USNC-URSI, 2101 Constitution Ave, NW, Washington, D.C.)

18-21. Tectonic Levels in the Earth's Crust, intern. symp., Neuchatel, Switzerland. (J.-P. Schaer, Dept. of Geology, University, 11 rue Emile Argand, 200 Neuchatel)

18-22. American Assoc. of Corrosion Engineers, 22nd annual mtg., Miami Beach, Fla. (N. E. Hamner, The Association, 980 M&M Bldg., Houston, Tex.)

18-22. Applications of Liquid Fuels, conf., Torquay, England. (Inst. of Fuel, 18 Devonshire St., Portland Pl., London, W.1, England)

18-22. American College of Physicians, New York, N.Y. (E. C. Rosenow, Jr., 4200 Pine St., Philadelphia 4, Pa.)

19-22. American Geophysical Union, 47th annual mtg., Washington, D.C. (W. E. Smith, AGU, 1145 19th St., NW, Washington, 20036)

18-23. International Soc. for Photogrammetry, technical commissions, Munich, Germany. (G. Krauss, Deutsche Gesellschaft für Photogrammetrie, Waase-mstr. 19-21, Bad Godesberg, Germany)

19-21. Frequency Control, 20th annual symp., U.S. Army Electronics Command, Atlantic City, N.J. [Director, Electronics Components Laboratory, U.S. Army Electronics Command, Attn: AMSEL-KT-ST (M. F. Timm), Fort Monmouth, N.J. 07703]

19-22. Microwave Communications, 3rd colloquium, Budapest, Hungary. (Valko Peterne, Szabadsag ter 17, Budapest)

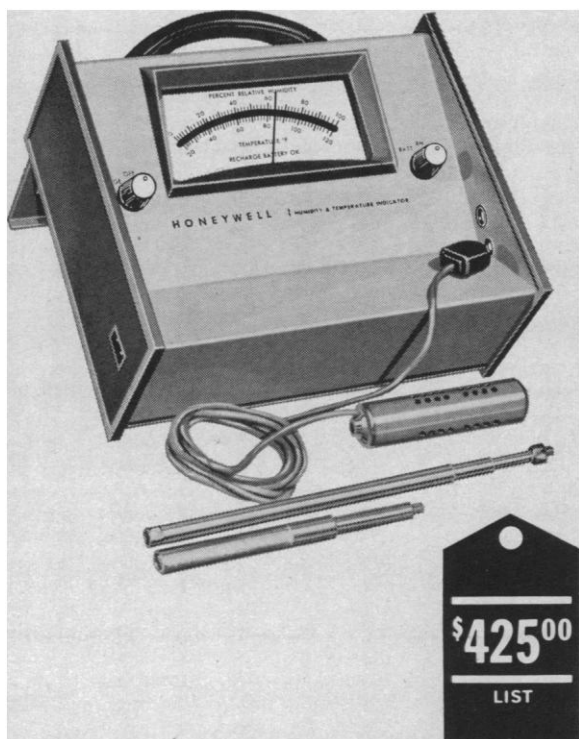
19-23. Scientific and Technical Books and Journals, 2nd intern. exhibition, Paris, France. (F. Retailiau, Intern. Exhibition of Scientific and Technical Books and Journals, 117 Blvd. St. Germain, Paris 6)

20-22. Institute of Electrical and Electronics Engineers, southwestern conf., Dallas, Tex. (R. Carrel, Collins Radio Co., Dallas 75207)

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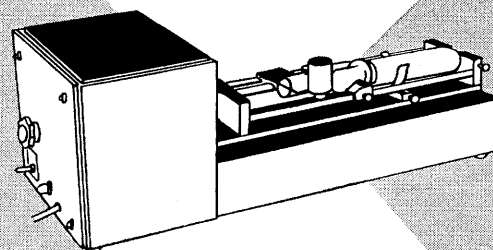
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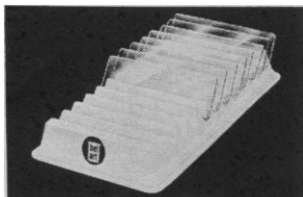
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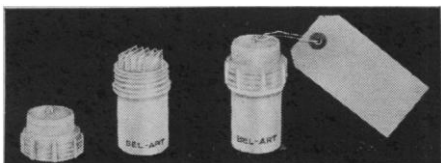
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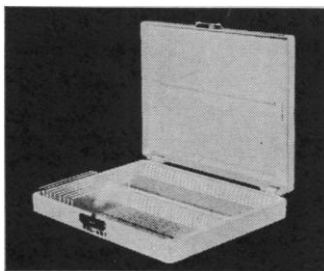
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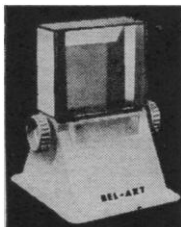
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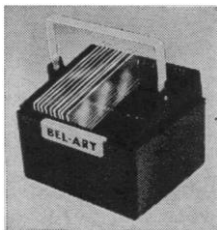
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20-22. American Laryngological, Rhinological, and Otolological Assoc., San Juan, P.R. (V. R. Alfaro, 917 20th St., NW, Washington, D.C. 20006)

20-22. Magnetics, 4th intern. conf. (INTERMAG), Stuttgart, Germany. (E. W. Pugh, I.B.M. Corp., 1000 Westchester Ave., White Plains, N.Y.)

20-23. Application of Physicochemical Methods in Chemical Analysis, conf., Budapest, Hungary. (M. K. Egyesülete, Szabadsag ter 17, Budapest 5)

20-23. Solar Energy Soc., 2nd annual mtg., Boston, Mass. (F. Edlin, Solar Energy Soc., Arizona State Univ., Tempe 85281)

21-22. Space Navigation, natl. mtg., Boston, Mass. (E. S. Keats, Westinghouse Electric Corp., Box 1897, Baltimore, Md. 21203)

21-23. Ohio Acad. of Science, 75th annual mtg., Columbus. (J. H. Melvin, 505 King Ave., Columbus 43201)

21-23. Southwestern Psychological Assoc., 13th annual conv., Arlington, Tex. (C. Cleland, 2104 Meadowbrook Dr., Austin, Tex.)

21-23. West Virginia Acad. of Science, Institute, W. Va. (J. B. Hickman, West Virginia Univ., Morgantown 26506)

22. Computer Aided Basic Research, symp., Hoboken, N.J. (I. Flores, Electrical Engineering Dept., Stevens Inst., Hoboken 07030)

22. Illinois Acad. of Science, Illinois State Univ., Normal. (N. D. Levine, Univ. of Illinois, Urbana)

22-23. National Council of Teachers of Mathematics, Greeley, Colo. (J. D. Gates, 1201 16th St., NW, Washington, D.C. 20036)

23-24. American Laryngological Assoc., San Juan, P.R. (L. Richards, 12 Clovelly Rd., Wellesley Hills, Mass.)

24. Society for Clinical Ecology, 1st annual mtg., Chicago, Ill. (T. G. Randolph, Human Ecology Research Foundation, 720 N. Michigan Ave., Chicago 11, Ill.)

24-26. American Assoc. of Colleges of Pharmacy, Dallas, Tex. (C. W. Bliven, 1507 M St., NW, Washington, D.C. 20005)

24-27. American Soc. of Abdominal Surgeons, Chicago, Ill. (B. F. Alfano, 663 Main St., Melrose 76, Mass.)

24-27. American Oil Chemists' Soc., Los Angeles, Calif. (C. H. Hauber, The Society, 35 E. Wacker Dr., Chicago, Ill. 60601)

24-28. Infectious Pathology, 4th intern. congr., Stuttgart, Germany. (G. Hoffman, Hugstetterstr. 55, 78 Friburg im Briesgau, Germany)

24-29. American College of Allergists, 22nd annual congr., Chicago, Ill. (J. D. Gillespie, 2141 14th St., Boulder, Colo.)

24-29. American Soc. of Hospital Pharmacists, annual mtg., Dallas, Tex. (J. A. Oddis, 2215 Constitution Ave., NW, Washington, D.C. 20037)

24-29. American Pharmaceutical Assoc., Dallas, Tex. (W. S. Apple, 2215 Constitution Ave., NW, Washington, D.C. 20037)

25-27. Antidepressant Drugs, symp., Milan, Italy. (S. Garattini, Inst. di Ricerca Farmacologica "Mario Nègri," Via Eritrea, 62, Milan)

25-27. National Acad. of Sciences, 103rd annual mtg., Washington, D.C.

(Home Secretary, NAS, 2101 Constitution Ave., NW, Washington, D.C. 20418)

25-27. American Acad. of Pediatrics, Montreal, P.Q., Canada. (E. H. Christopherson, 1801 Hinman Ave., Evanston, Ill. 60204)

25-27. Academy of Religion and Mental Health, annual mtg., Chicago, Ill. (G. C. Anderson, 16 E. 34 St., New York, N.Y.)

25-28. Society of Economic Paleontologists and Mineralogists, St. Louis, Mo. (R. Tener, The Society, Box 979, Tulsa, Okla. 74101)

25-28. American Assoc. of Petroleum Geologists, St. Louis, Mo. (N. C. Smith, Box 979, Tulsa, Okla.)

25-28. Improving Effectiveness in Research and Development Administration, 11th annual inst., American Univ., Washington, D.C. (P. W. Howerton, Center for Technology and Administration, American Univ., 2000 G St., NW, Washington, D.C. 20006)

25-29. Radioecological Concentration Processes, intern. symp., Stockholm, Sweden. (Inst. of Radiophysics, Stockholm 60)

25-30. American Acad. of Neurology, Philadelphia, Pa. (T. D. Swedien, 7100 France Ave., Minneapolis, Minn.)

25-7. Psychotherapy, 16th Lindauer week, Lindauer, Germany. (H. Stolze, Adalbert-Stifterstr. 31, 8 München 27, Germany)

26. National Cystic Fibrosis Research Foundation, Atlantic City, N.J. (The Foundation, Medical Dept., 521 Fifth Ave., New York, N.Y. 10017)

26-27. Electromagnetic Relays, 14th annual natl. conf., Oklahoma State Univ., Stillwater. (D. D. Lingelbach, Dept. of Electrical Engineering, Oklahoma State Univ., Stillwater 74075)

26-28. Joint Computer Conf., Boston, Mass. (J. L. Mitchell, P.O. Box 460, Lexington, Mass. 02173)

26-28. Institute of Electrical and Electronics Engineers, region 6, annual conf., Tucson, Ariz. (L. P. Huelsman, Dept. of Electrical Engineering, Univ. of Arizona, Tucson 85721)

26-28. National Acad. of Engineering, 2nd annual mtg., Washington, D.C. (Secretary, NAE, 2101 Constitution Ave., NW, Washington, D.C. 20418)

27-29. Institute of Mathematical Statistics, Upton, L.I., N.Y. (G. E. Nicholson, Jr., Univ. of North Carolina, Chapel Hill)

27-29. American Pediatric Soc., Atlantic City, N.J. (C. D. Cook, 333 Cedar St., New Haven, Conn. 06510)

27-1. Technical Union of Italian Pharmacists, 9th natl. congr., Naples, Italy. (UTI. Far. Secretariat, Via Balbi 29/4, Genoa)

28-29. Electrical Conduction Properties of Polymers, symp., Pasadena, Calif. (A. Rembaum, Jet Propulsion Laboratory, California Inst. of Technology, 4800 Oak Grove Dr., Pasadena)

28-30. Central States Anthropological Soc., annual mtg., St. Louis, Mo. (G. H. Fathauer, Dept. of Sociology and Anthropology, Miami Univ., Oxford, Ohio 45056)

28-30. Wildflower Pilgrimage, 16th annual, Gatlinburg, Tenn., and Great Smoky Mountain Natl. Park. (A. J. Sharp, Dept. of Botany, Univ. of Tennessee, Knoxville)

29-30. Georgia Acad. of Science, Geor-

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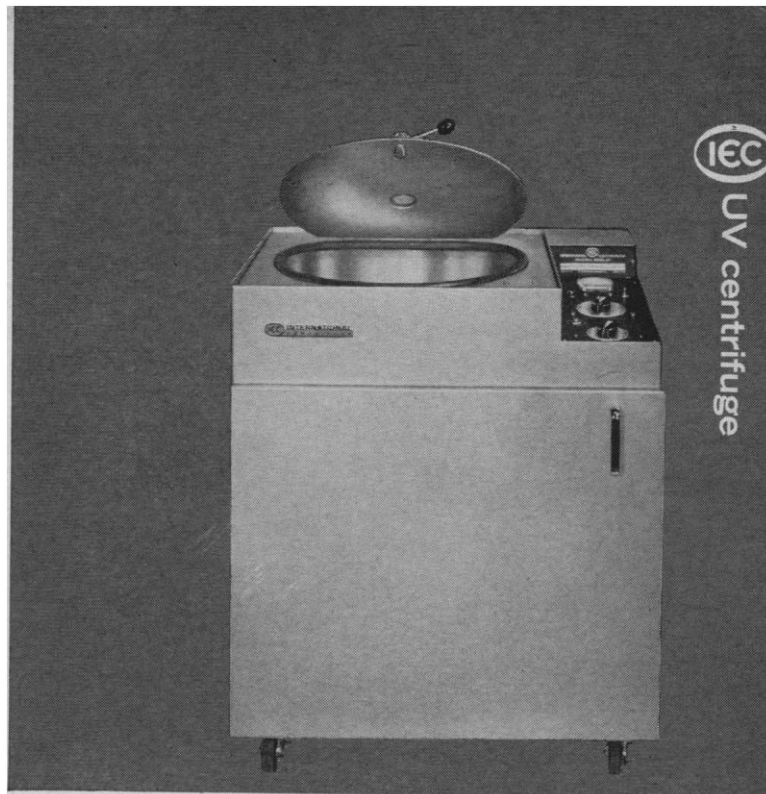
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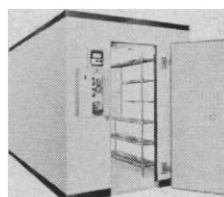
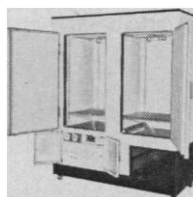
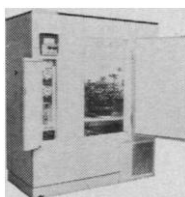
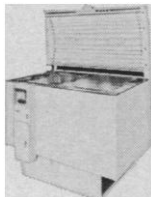
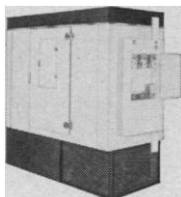
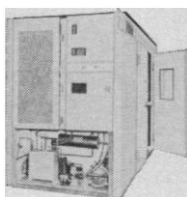
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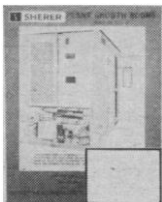
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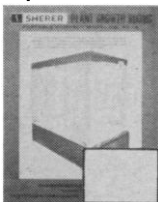
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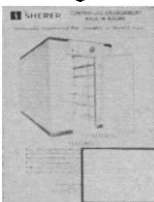
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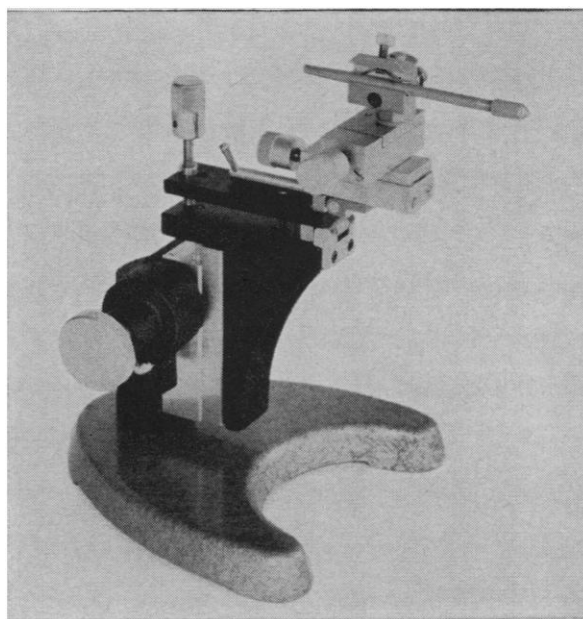
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29-30. **Mississippi Acad. of Sciences**, Mississippi State Univ., State College. (C. Q. Sheeley, Box 574, State College 39762)

29-30. **Population Assoc. of America**, New York, N.Y. (A. S. Lunde, Natl. Center for Health Statistics, U.S. Public Health Service, Washington, D.C. 20201)

29-30. **American Assoc. of University Professors**, Atlanta, Ga. (W. P. Fidler, The Association, 1785 Massachusetts Ave., NW, Washington, D.C.)

29-1. **Association of Clinical Scientists**, Chicago, Ill. (R. P. MacFate, 300 N. State St., Chicago, Ill. 60610)

29-1. **American Soc. for the Study of Sterility**, Chicago, Ill. (H. H. Thomas, 944 S. 18 St., Birmingham, Ala.)

May

1. **American Federation for Clinical Research**, Atlantic City, N.J. (J. F. Bryan, 2000 P St., NW, Washington, D.C. 20036)

1-4. **AAAS**, Southwestern and Rocky Mountain Div., Las Cruces, N.M. (M. G. Anderson, P.O. Box AF, University Park, N.M. 88070)

1-4. **American Soc. for Clinical Investigation**, Atlantic City, N.J. (G. W. Liddle, School of Medicine, Vanderbilt Univ., Nashville, Tenn.)

1-4. **American College of Obstetricians and Gynecologists**, Chicago, Ill. (R. A. Kimbrough, 79 W. Monroe, Chicago 60603)

1-5. **American Soc. for Microbiology**, annual mtg., Los Angeles, Calif. (R. W. Sarber, The Society, 115 Huron View Blvd., Ann Arbor, Mich. 48103)

1-6. **Electrochemical Soc.**, annual spring mtg., Cleveland, Ohio. (The Society, 30 E. 42 St., New York 10017)

1-6. **International College of Surgeons**, North American Federation, congr., Houston, Tex. (S. E. Henwood, 1516 Lake Shore Dr., Chicago, Ill. 60610)

2-3. **Canadian Aeronautics and Space Inst.**, annual mtg., Ottawa, Ontario. (The Institute, 77 Metcalfe St., Ottawa 4)

2-3. **Bioengineering**, 3rd annual Rocky Mountain symp., University of Colorado, Boulder. (J. C. Daniel, Dept. of Biology, Univ. of Colorado, Boulder 80304)

2-3. **American Inst. of Mining, Metallurgical, and Petroleum Engineers**, Inst. of Petroleum Engineers, Wichita Falls, Tex. (Executive Secretary, 345 E. 47 St., New York 10017)

2-4. **Council of Biology Editors**, Univ. of Notre Dame, Notre Dame, Ind. (R. E. Gordon, Dept. of Biology, Univ. of Notre Dame, Notre Dame)

2-4. **Communications Satellite Systems**, conf., American Inst. of Aeronautics and Astronautics, Washington, D.C. (W. J. Brunke, AIAA, 1290 Sixth Ave., New York 10019)

2-5. **Isochronous Cyclotrons**, intern. conf., Gatlinburg, Tenn. (R. S. Livingston, Oak Ridge Natl. Laboratory, P.O. Box X, Oak Ridge, Tenn. 27831)

2-7. **International Inst. of Optics**, conf., Paris, France. (Conference Secretariat, Inst. for Optics, 3, blvd. Pasteur, Paris 15)

3-5. **British Joint Computer Conf.**, Eastbourne, England. (Secretariat, Inst. of



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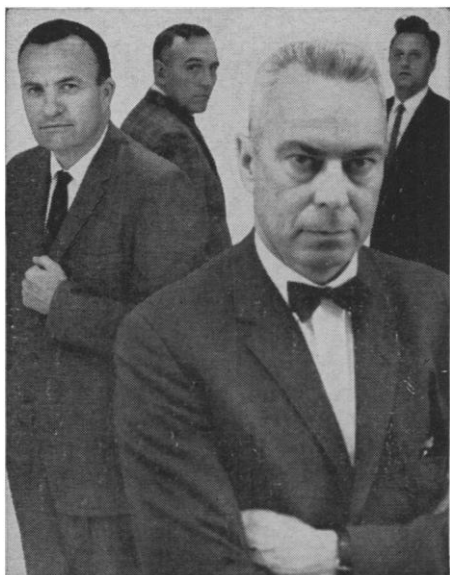
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3-5. **Industrial Waste**, 21st conf., Purdue Univ., Lafayette, Ind. (D. E. Bloodgood, School of Civil Engineering, Purdue Univ., Lafayette 47907)

3-6. American Chemical Soc., Div. of **Rubber Chemistry**, San Francisco, Calif. (G. N. Vacca, Bell Telephone Laboratories, Murray Hill, N.J.)

3-8. Mechanism of Action of **Fungicides and Antibiotics**, intern. symp., Biological Soc. of the GDR, Reinhardsbrunn, East Germany. (H. Lyr, Inst. für Forstwissenschaften, Alfred-Möllerstr., 13 Eberswalde die Berlin)

4. Society for **Analytical Chemistry**, mtg., Bristol, England. (The Society, 14 Belgrave Sq., London, England)

4-6. **Genetics** Soc. of Canada, 11th annual mtg., Banff, Alberta. (C. O. Person, Dept. of Genetics, Univ. of Alberta, Edmonton, Canada)

4-6. Society for Experimental **Stress Analysis**, spring mtg., Detroit, Mich. (B. E. Rossi, 21 Bridge Sq., Westport, Conn. 06882)

4-7. **Virginia Acad. of Science**, Madison College, Harrisonburg. (R. C. Berry, Virginia Acad. of Science, P.O. Box 8203, Richmond 23226)

4-8. **Laboratory Medicine**, 12th congr., Bad Kissengen, West Germany. (W. Altbath, Katharinengasse 3, 87 Würzburg, Germany)

4-11. **Instability Phenomena in Galaxies**, symp., Armenian SSR. (A. N. Hakopian, Acad. of Sciences of the Armenian SSR, Erevan)

5-6. **Human Factors in Electronics**, 7th symp., Minneapolis, Minn. (C. A. Baker, Honeywell, Inc., 2700 Ridgeway Rd., Minneapolis)

5-6. **Rabies**, natl. symp., Atlanta, Ga. (J. R. Ray, American Veterinary Medical Assoc., Chicago, Ill.)

5-6. **Strontium Metabolism**, intern. symp., Annan, Scotland. (J. H. Martin, United Kingdom Atomic Energy Agency, Chapelcross Works, Annan, Dumfriesshire, Scotland)

5-7. Society for American **Archaeology**, 31st annual mtg., Univ. of Nevada, Reno. (D. D. Fowler, Dept. of Anthropology, Univ. of Nevada, Reno 89507)

5-7. New Jersey Soc. of **Professional Engineers**, 42nd annual conf. and exhibition, Atlantic City. (K. G. Stanley, The Society, 495 West State St., Trenton 08618)

5-7. **Midwestern Psychological Assoc.**, Chicago, Ill. (F. A. Mote, Psychology Dept., Univ. of Wisconsin, Madison)

5-8. **Protides of the Biological Fluids**, 14th annual colloquium, Bruges, Belgium. (P.O. Box 71, Bruges)

6-7. **North Dakota Acad. of Science**, North Dakota State Univ., Fargo. (B. G. Gustafson, Univ. of North Dakota, Grand Forks)

6-8. Society for Applied **Anthropology**, 25th annual mtg., Milwaukee, Wis. (The Society, Rand Hall, Cornell Univ., Ithaca, N.Y.)

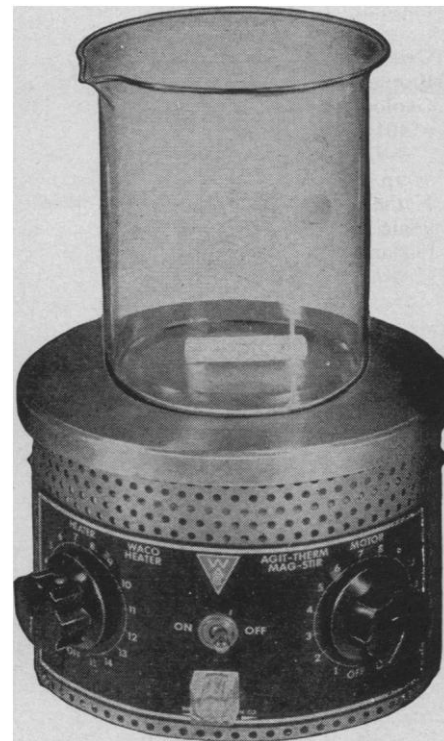
6-8. **Wisconsin Acad. of Sciences, Arts, and Letters**, Lawrence Univ., Appleton, Wis. (D. J. Behling, 720 Wisconsin Ave., Milwaukee 53202)

6-9. American **Psychoanalytic Assoc.**,



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7-8. Academy of **Psychoanalysis**, Atlantic City, N.J. (A. H. Rifkin, 125 E. 65 St., New York 10021)

7-12. American **Ceramic Soc.**, 68th annual mtg., Washington, D.C. (The Society, 4055 N. High St., Columbus, Ohio 43214)

8-10. Society of the **Plastics Industry**, Canadian section, 24th annual mtg., Montreal, P.Q. (The Society, 250 Park Ave., New York 10017)

8-11. **Administrative Management Soc.**, 47th intern. conf., Boston, Mass. (W. H. Latham, Willow Grove, Pa. 19090)

8-12. Association of American State **Geologists**, annual mtg., Univ. of Indiana, Bloomington. (W. C. Hayes, Missouri Geological Survey, P.O. Box 250, Rolla 65401)

8-12. **Organic Sulphur Compounds**, symp., Univ. of Groningen, Groningen, Netherlands. (M. J. Janssen, Dept. of Organic Chemistry, Univ. of Groningen, Groningen)

8-15. **Stereochemistry**, conf., Bürgenstock, Switzerland. (D. Arigoni, Dept. of Organic Chemistry, Univ. of Zurich, Zurich, Switzerland)

9-10. **Circuit Theory**, 9th midwestern symp., Oklahoma State Univ., Stillwater. (D. R. Wilson, School of Electrical Engineering, Oklahoma State Univ., Stillwater 74045)

9-11. Nuclear Applications of **Non-Fissile Ceramics**, conf., Washington, D.C. (A. Boltax, Westinghouse Astronuclear Laboratory, P.O. Box 10864, Pittsburgh, Pa. 15236)

9-11. Numerical Solution of **Nonlinear Differential Equations**, symp., Madison, Wis. (D. Greenspan, Mathematics Research Center, U.S. Army, Univ. of Wisconsin, Madison 53706)

9-12. **Cell Nucleus Functions and Radio-Sensitivity**, symp., Rijswijk, Netherlands. (H. M. Klouwen, Radiobiological Inst., Organization for Health Research, T.N.O., 151 Lang Kleigweg, Rijswijk)

9-12. **Standards Laboratory** conf., Natl. Bureau of Standards, Gaithersburg, Md. (W. R. Tilley, NBS, Washington, D.C. 20234)

9-13. Society of **Photographic Scientists and Engineers**, annual conf., San Francisco, Calif. (J. B. Bell, 1525 Tennessee St., San Francisco, Calif.)

9-13. American **Psychiatric Assoc.**, annual mtg., Atlantic City, N.J. (P. Woodward, 1700 18th St., NW, Washington, D.C. 20009)

9-14. **Condensation Nuclei**, 6th intern. symp., Albany, N.Y. (D. G. Barry, Atmospheric Sciences Research Center, State Univ. of New York, P.O. Box 7185, Albany 12224)

10-12. **Telemetering**, natl. conf., Boston, Mass. (F. Nieman, NASA Electronics Research Center, 575 Technology Sq., Cambridge, Mass. 02139)

10-14. American Assoc. of **Mental Deficiency**, Chicago, Ill. (G. E. Milligan, 1601 Broad St., Columbus, Ohio)

10-19. Committee on **Space Research**, 9th plenary mtg., Vienna, Austria. (COSPAR, 55, blvd. Malesherbes, Paris 8, France)

11. **Electroluminescence and Semiconductor Lasers**, seminar, Stevens Inst. of

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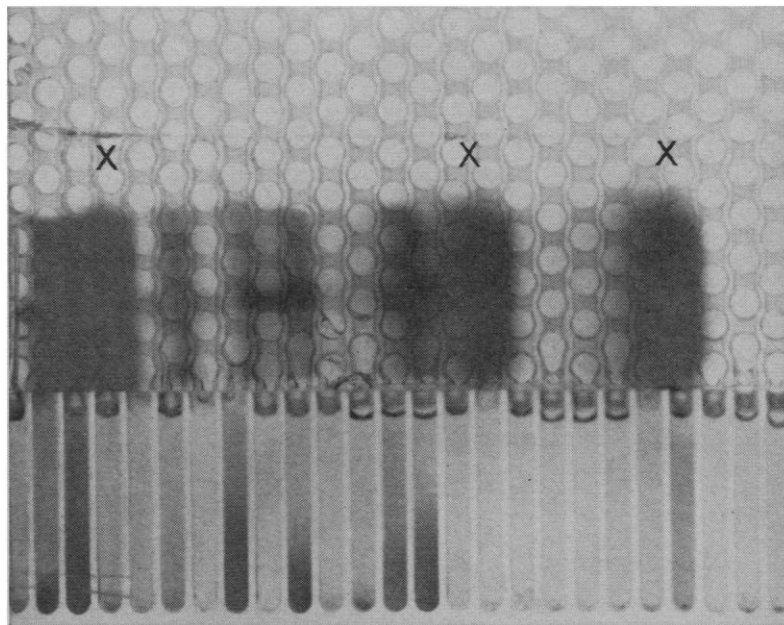
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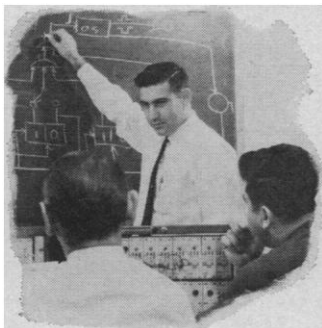
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Technology, Hoboken, N.J. (G. J. Herskowitz, Dept. of Electrical Engineering, Stevens Inst. of Technology, Hoboken, N.J. 07030)

11-13. **Analysis Instrumentation**, 12th natl. symp., Houston, Tex. (G. I. Doering, Industrial Nucleonics Corp., 650 Ackerman Rd., Columbus, Ohio 43202)

11-13. **American Inst. of Chemists**, 43rd annual mtg., New Orleans, La. (C. L. Hoffpauir, Southern Regional Research Laboratory, New Orleans 70119)

11-13. **Industrial Research Inst.**, spring mtg., Buck Hill Falls, Pa. (The Institute, 100 Park Ave., New York 10017)

11-13. **Military Oceanography**, 3rd U.S. Navy symp., San Diego, Calif. (Office of the Oceanographer of the Navy, Washington, D.C.)

11-14. **American Assoc. for the History of Medicine**, Rochester, Minn. (J. B. Blake, Natl. Library of Medicine, Bethesda, Md.)

11-14. **Society for Industrial and Applied Mathematics**, natl. mtg., Univ. of Iowa, Iowa City. (J. B. Rosser, Mathematics Research Center, Univ. of Wisconsin, Madison)

11-14. **Society of Technical Writers and Publishers**, 13th annual mtg., Fort Worth, Tex. (N. J. Kennedy, Box 3706, Columbus, Ohio 43214)

11-21. **Photographic Systems for Engineers**, seminar, San Francisco, Calif. (J. B. Bell, 1525 Tennessee St., San Francisco)

12-13. **Information Retrieval**, 3rd natl. colloquium, Univ. of Pennsylvania, Philadelphia. (A. W. Speakman, E. I. DuPont de Nemours & Co., Wilmington, Del. 19898)

12-14. **Diabetology**, 7th annual mtg., Paris, France. (M. Rathery, Hotel-Dieu, 1, pl. du Parvis-Notre Dame, Paris 4)

12-14. **Czechoslovak Soc. of Urology**, congr., Brno. (M. Jerabek, Clinique Urologique, 53, Pekarska, Brno)

13. **Desert Environment**, mtg., Fullerton Junior College, Fullerton, Calif. (M. D. Brown, Div. of Life Sciences, Fullerton Junior College, Fullerton)

14. **Reliability**, 7th annual West Coast symp., Univ. of Southern California, Los Angeles. (R. J. Guarino, TRW Systems, One Space Park, Redondo Beach, Calif.)

15-18. **American Inst. of Chemical Engineers**, 59th annual mtg., Columbus, Ohio. (The Institute, 345 E. 47 St., New York 10017)

15-18. **Kinetics and Catalysis**, intern. symp., Columbus, Ohio. (P. B. Weisz, Socony Mobil Research and Development Labs., Paulsboro, N.J. 08066)

15-19. **Radiation Chemistry**, 2nd symp., Tihany, Hungary. (A. Somogyi, Research Inst. for the Plastics Industry, Hungaria krt. 114, Budapest 14, Hungary)

15-21. **Dynamic Role of Molecular Constituents in Plant-Parasite Interaction**, U.S.-Japan seminar, Gamagori, Japan. (C. J. Mirocha, Dept. of Plant Pathology and Physiology, Univ. of Minnesota, St. Paul)

16-17. **Plant Growth**, conf., New York, N.Y. (J. F. Frederick, Dodge Chemical Co., Research Labs., 3425 Boston Rd., Bronx, N.Y. 10469)

16-18. **Aerospace Electronics**, 18th natl. conf., Dayton, Ohio. (J. M. Mayer, 4525

Fernbrook St., Kettering, Ohio 45440)

16-18. **Society of German Engineers**, conf., Berlin. (The Society, Postfach 10 250, 4 Düsseldorf 10, Germany)

16-18. **Institute of Electrical and Electronics Engineers, Group on Microwave Theory and Technique**, symp., Palo Alto, Calif. (L. Young, Stanford Research Inst., Menlo Park, Calif. 94025)

16-18. **Power Instrumentation**, 9th natl. symp., Detroit, Mich. (R. C. Austin, Detroit Edison Co., 2000 Second Ave., Detroit 48226)

16-18. **American Assoc. for Thoracic Surgery**, Vancouver, B.C., Canada. (A. Henvey, 311 Carondelet Bldg., 7730 Carondelet Ave., St. Louis, Mo.)

16-19. **Biomedical Sciences Instrumentation**, 4th natl. symp., Anaheim, Calif. (T. B. Weber, Beckman Instruments, Inc., 2500 Harbor Blvd., Fullerton, Calif.)

16-20. **American Soc. of Civil Engineers**, Denver, Colo. (W. H. Wisley, 345 E. 47 St., New York, N.Y. 10017)

16-20. **Disposal of Radioactive Wastes into the Seas, Oceans, and Surface Waters**, symp., Intern. Atomic Energy Agency, Vienna, Austria. (IAEA, 11 Kärntnering, Vienna 1)

16-20. **American Industrial Hygiene Assoc.**, Pittsburgh, Pa. (A. D. Hosey, 1014 Broadway, Cincinnati, Ohio 45202)

16-20. **Water Resources Engineering**, conf., American Soc. of Civil Engineers, Denver, Colo. (W. H. Wisley, The Society, 345 E. 47 St., New York 10017)

17-19. **Fast Breeder Reactors**, intern. conf., London, England. (H. C. Dunn, British Nuclear Energy Soc., Risley, Warrington, Lancashire, England)

18-20. **Operations Research Soc. of America**, 29th natl. mtg., Santa Monica, Calif. (J. E. Walsh, System Development Corp., 2500 Colorado Ave., Santa Monica 90406)

18-25. **Warm-Water Pond Fish Culture**, world symp., U.N. Food and Agriculture Organization, Rome, Italy. (T. V. R. Pillay, FAO, Via delle Terme di Caracalla, Rome)

19-20. **Membrane Processes for Industry**, symp., Southern Research Inst., Birmingham, Ala. (J. H. Strickland, SRI, 2000 Ninth Ave. S., Birmingham 35205)

19-21. **Organogenesis**, regional conf., Soc. for Developmental Biology, Ames, Iowa. (J. M. Arnold, Dept. of Biochemistry and Biophysics, Iowa State Univ., Ames 50010)

19-22. **Exfoliative Cytology**, intern. congr., Rio de Janeiro, Brazil. (E. von Haam, Ohio State Univ., Columbus)

19-22. **German Bunsen Soc. for Physical Chemistry**, 65th general assembly, Freudenstadt. (The Society, Varrentrappstr. 40-42, 6 Frankfurt am Main, West Germany)

20-21. **Surface Physics**, 4th symp., Washington State Univ., Pullman. (E. E. Donaldson, Dept. of Physics, Washington State Univ., Pullman 99163)

20-22. **Royal Astronomical Soc. of Canada**, general assembly, Univ. of Manitoba, Winnipeg. (R. J. Lockhart, Dept. of Mathematics, Univ. of Manitoba, Winnipeg)

20-22. **Society for Experimental Medicine of the German Democratic Republic**, 3rd general conf., Leipzig, East Germany. (Secretariat, The Society, Friedrichstr. 129,

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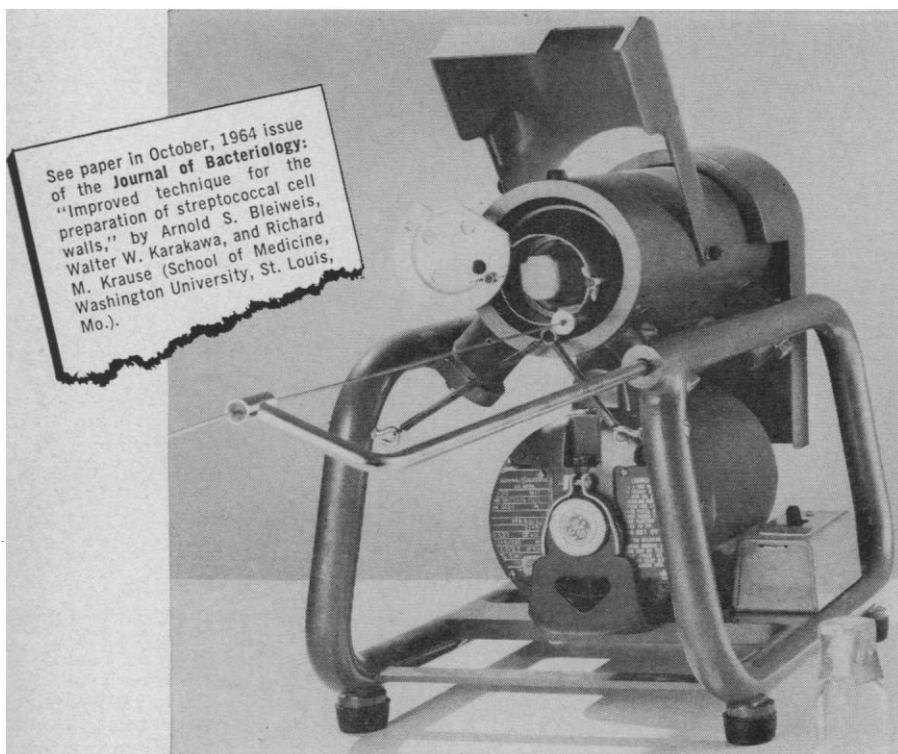
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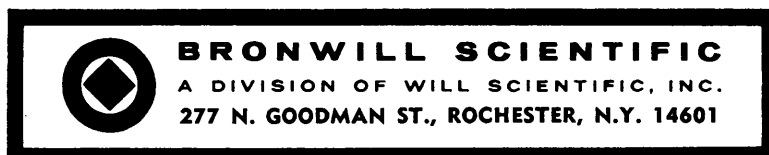
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21. **Southern Calif. Acad. of Sciences**, annual mtg., California State College, San Diego. (C. Rozaire, The Academy, Los Angeles Museum, Exposition Park, Los Angeles, Calif.)

22-26. **Institute of Food Technologists**, 26th annual mtg., Portland, Ore. (C. L. Willey, 176 W. Adams St., Chicago, Ill. 60603)

22-26. **American Orthopedic Assoc.**, Colorado Springs, Colo. (S. W. Banks, 29 E. Madison St., Chicago, Ill.)

23-24. **High Temperature Reactors** and the Dragon Project, symp., London, England. (Secretary, British Nuclear Energy Soc., Inst. of Civil Engineers, 1-7 Great George St., London S.W.1)

23-25. **American Astronautical Soc.**, 12th annual mtg., Los Angeles and Anaheim, Calif. (L. Larmore, Douglas Aircraft, 3000 Ocean Park Blvd., Santa Monica, Calif.)

23-25. **Chemical and Petroleum Instrumentation**, 7th natl. symp., San Francisco, Calif. (J. T. Ward, E. I. duPont de Nemours & Co., Wilmington, Del. 19898)

23-25. **Dynamics of Chemical Reactions**, intern. symp., Padua, Italy. (Direzione Istituto di Impianti Chimici, Univ. degli Studi, Padua)

23-26. **Association for Research into Periodontal Disease**, 18th mtg., West Berlin, Germany. (M. J. Matthey, 2 rue Bartholini, Geneva, Switzerland)

23-26. **Spaceflight**, 6th European symp., Brighton, England. (British Interplanetary Soc., 12 Bessborough Gardens, S.W., London, S.W.1, England)

23-28. **International Assoc. for the Study of the Bronchi**, 16th congr., Athens, Greece. (The Association, 189 Blvd. St.-Germain, Paris 7, France)

23-28. **Hormonal Steroids**, intern. congr., Milan, Italy. (L. Martini, Inst. di Farmacologia, Via Andrea del Sarto 21, Milan)

24-26. **Solid Propulsion**, conf., Chicago, Ill. (Chemical Propulsion Information Agency, 8621 Georgia Ave., Silver Spring, Md.)

24-26. **Ultrasonic Testing of Materials**, 2nd intern. symp., Berlin, Germany. (Kammer der Technik FV "Maschinenbau", Clara-Zetkinstr. 115-117, 108 Berlin)

25. **American Soc. for Gastrointestinal Endoscopy**, Chicago, Ill. (B. H. Sullivan, Jr., 2020 E. 93 St., Cleveland, Ohio 44106)

25-27. **Society of Radiographers**, 20th annual conf., Brighton, England. (The Society, 32 Welbeck St., London, W.1, England)

25-27. **Sulfamic Acid and Its Electro-metallurgical Applications**, symp., Milan, Italy. (R. Piontelli, Laboratorio de Elettrochimica, Clinica-Fisica e Metallurgia del Politecnico de Milano, 32 Piazza Leonardo da Vinci, Milan)

26-27. **Fiber Soc.**, spring mtg., Williamsburg, Va. (L. Rebenfeld, The Society, Textile Research Inst., P.O. Box 625, Princeton, N.J.)

26-28. **American Assoc. for Cancer Research**, annual mtg., Denver, Colo. (H. J. Creech, 7701 Burholme Ave., Philadelphia, Pa. 19111)

26-28. **American Gastroenterological Assoc.**, Chicago, Ill. (D. Cayer, 2240 Cloverdale Ave., Winston-Salem, N.C.)

NEW BOOKS

(Continued from page 1523)

John W. Gofman, Eds. Academic Press, New York, 1965. 432 pp. Illus. \$15.50. Six papers: "The effects of ionizing radiation on the nervous system" by H. Gangloff and O. Hug; "Use of short-lived nuclides in medical research" by Rune Söremark; "Biological effects of laser radiation" by Samuel Fine and Edmund Klein; "Tracer techniques for the study of bone metabolism in man" by Göran C. H. Bauer; "Elastic reservoir theories of the human circulation with applications to clinical medicine and to computer analysis of the circulation" by Freeman W. Cope; and "Implantable cardiac pacemakers" by George J. Haupt and Newton C. Birkhead.

Advances in Cancer Research. vol. 9. Alexander Haddow and Sidney Weinhouse, Eds. Academic Press, New York, 1965. 440 pp. Illus. \$16. Five papers: "Urinary enzymes and their diagnostic value in human cancer" by Richard Stambaugh and Sidney Weinhouse; "The relation of the immune reaction to cancer" by Louis V. Caso; "Amino acid transport in tumor cells" by R. M. Johnstone and P. G. Scholefield; "Studies on the development, biochemistry, and biology of experimental hepatomas" by Harold P. Morris; and "Biochemistry of normal and leukemic leucocytes, thrombocytes, and bone marrow cells" by I. F. Seitz.

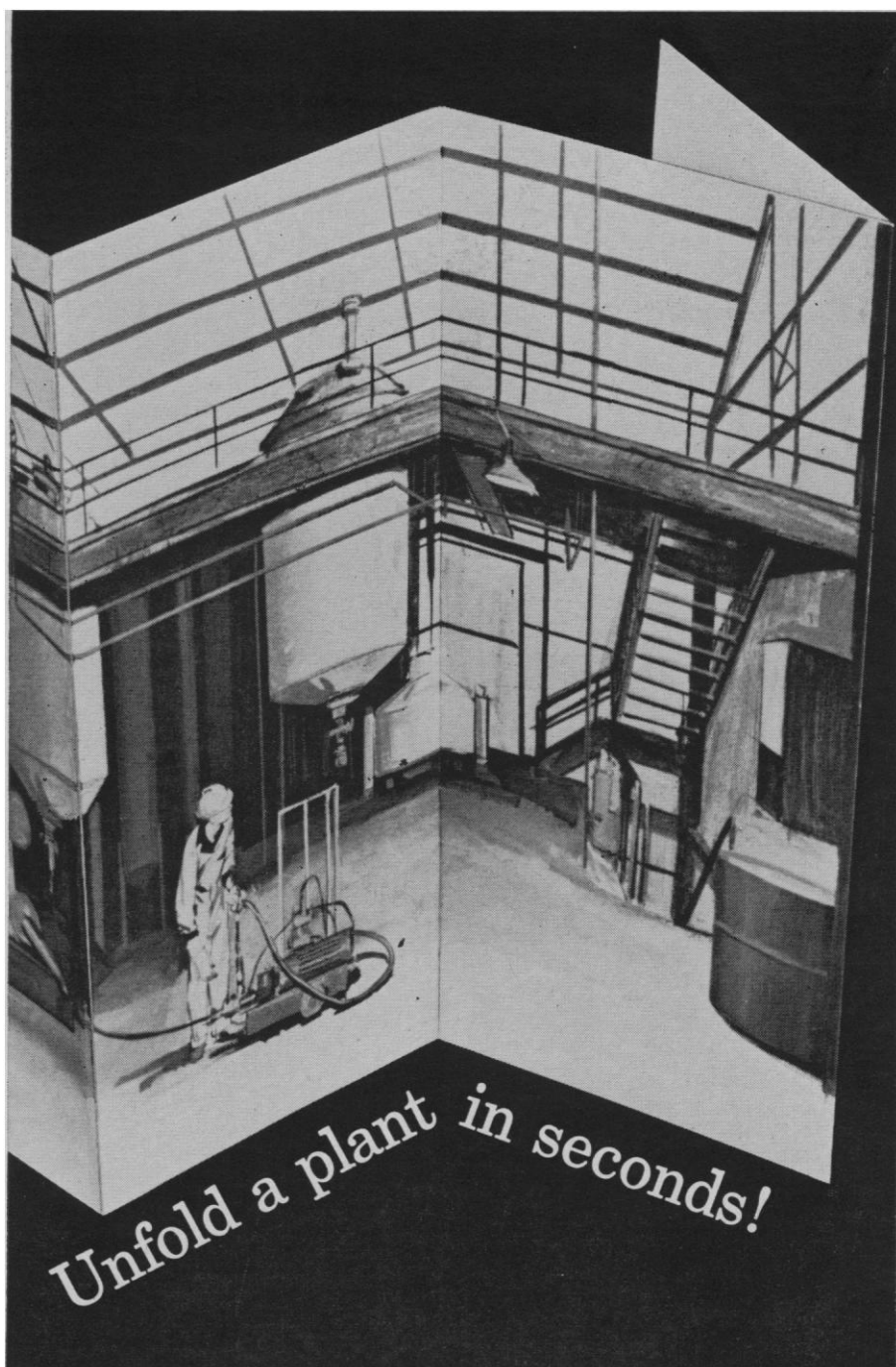
Advances in Food Research. vol. 14. C. O. Chichester, E. M. Mrak, and G. F. Stewart, Eds. Academic Press, New York, 1965. 472 pp. Illus. \$16. Five papers: "Techniques for sensory evaluation of food odors" by Herbert Stone, Rose Marie Pangborn, and C. S. Ough; "Methods of meat texture measurement viewed from the background of factors affecting tenderness" by Alina Surmacka Szczesniak and Kathryn Weiss Torgeson; "Chemistry of nonenzymic Browning II" by T. M. Reynolds; "Unimolecular thermal transformations of organic compounds under food processing conditions" by Jack W. Ralls; and "Theory and practice of hard-surface cleaning" by Walter G. Jennings.

Advances in Genetics. vol. 13. E. W. Caspari and J. M. Thoday, Eds. Academic Press, New York, 1965. 388 pp. Illus. \$15. Seven papers: "Cytoplasmic pollen sterility in corn" by Donald N. Duvick; "Genetic variation in chromosome pairing" by Ralph Riley and C. N. Law; "Evolutionary significance of phenotypic plasticity in plants" by A. D. Bradshaw; "The premeiotic stages of spermatogenesis" by Aloha Hannah-Alava; "The function of the y-chromosome in man, animals, and plants" by K. R. Dronamraju; "Mammalian pigment genetics" by Morris Foster; and "The complex locus R in *Mormoniella vitripennis* (Walker)" by Anna R. Whiting.

An Atlas of Fine Structure: The Cell, Its Organelles and Inclusions. Don W. Fawcett. Saunders, Philadelphia, 1966. 456 pp. Illus. \$11.

Changing Human Behavior. John Mann. Scribner, New York, 1965. 249 pp. \$5.95.

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eases. Charles M. Nice. Thomas, Springfield, Ill., 1966. 215 pp. Illus. \$10.75.

Computers in Biomedical Research. vol. 2. Ralph W. Stacy and Bruce D. Waxman, Eds. Academic Press, New York, 1965. 383 pp. Illus. \$14. Fourteen papers: "Analog-digital conversion systems" by Josiah Macy, Jr.; "A description of the LINC" by W. A. Clark and C. E. Molnar; "Special purpose digital computers in biology" by Jerome R. Cox, Jr.; "A special purpose analog computer for biochemical research" by Joseph J. Higgins; "Systems programs to accommodate biomedical research" by Robert H. Brunelle; "Programs as theories of higher mental processes" by Allen Newell and Herbert A. Simon; "Compartmental analysis in kinetics" by Mones Berman; "Simulation of ecological systems" by David Garfinkel; "Computer simulation of atrial fibrillation" by Gordon K. Moe; "Some computer techniques of value for study of circulation" by Homer R. Warner; "Computations of respiratory mechanical parameters" by Ralph W. Stacy and Richard M. Peters; "Hospital automation via computer time-sharing" by Jordan J. Baruch; "Computer analysis of psychopharmacological data" by Roland R. Bonato; and "Computer analysis of psychological and psychiatric data" by Harvey F. Dingman. This volume, as well as volume 1, was reviewed by J. Lederberg in *Science* 150, 1576 (1965).

A Correlative Study Guide for Neuroanatomy. James L. Hall and Albert O. Humbertson, Jr. Harper and Row, New York, 1966. 159 pp. Illus. Paper, \$3.95.

Diagnostic Methods in Clinical Virology. N. R. Grist, Constance A. C. Ross, Eleanor J. Bell, and E. J. Stott. Davis, Philadelphia, 1966. 139 pp. \$5.

Dyshormonal Tumors: The Theory of Prophylaxis and Treatment. Nikolai Ivanovich Lazarev. Translated from the Russian edition (Moscow, 1963) by Basil Haigh. Consultants Bureau, New York, 1966. 146 pp. Illus. Paper, \$17.50.

Flora of Turkey and the East Aegean Islands. vol. 1. P. H. Davis, Ed. Edinburgh Univ. Press, Edinburgh, Scotland; Aldine, Chicago, 1965. 579 pp. Illus. \$27.50.

Fundamentals of Phytomorphology. A. D. J. Meeuse. Ronald, New York, 1966. 243 pp. Illus. \$10.

Genetic Complementation. J. R. S. Fincham. Benjamin, New York, 1966. 157 pp. Illus. \$8.75. Microbial and Molecular Biology Series, edited by Bernard D. Davis.

A Handbook for the Identification of Insects of Medical Importance. John Smart. British Museum (Natural History), London, ed. 4, 1965. 340 pp. Illus. Plates. £3.

A Handbook of Systematic Botany. Subhash Chandra Datta. Asia Publishing House; Taplinger, New York, 1966. 451 pp. Illus. \$9.50.

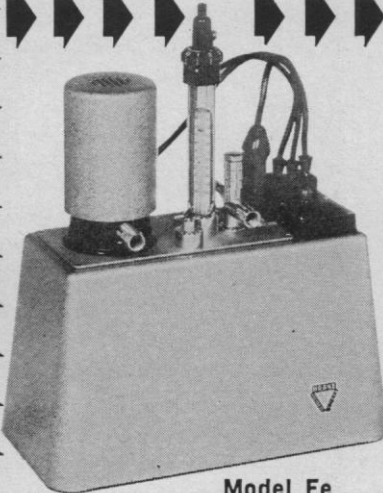
Histology. Roy O. Greep, Ed. McGraw-Hill, New York, ed. 2, 1966. 924 pp. Illus. \$19.50.

Insight vs. Desensitization in Psychotherapy: An Experiment in Anxiety Reduction. Gordon L. Paul. Stanford Univ. Press, Stanford, Calif., 1966. 160 pp. Illus. \$5.

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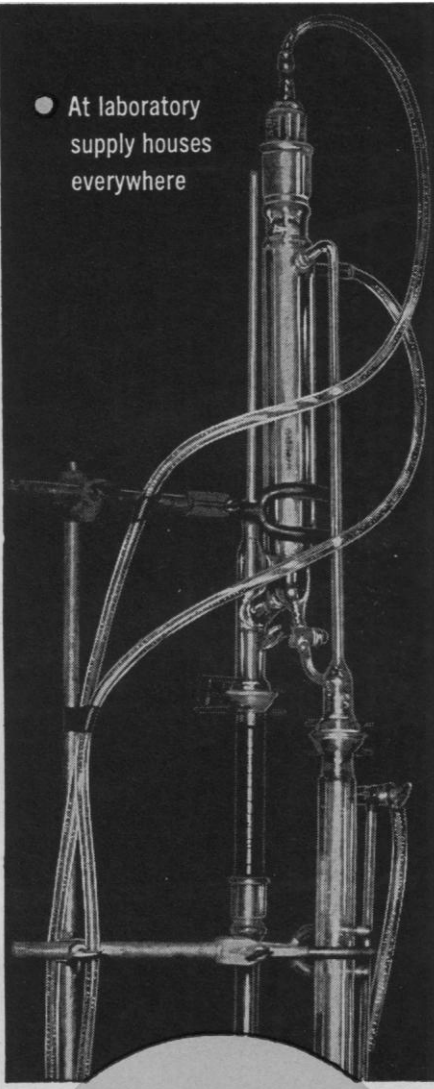
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Integrated Principles of Zoology. Cleveland P. Hickman. Mosby, St. Louis, ed. 3, 1966. 979 pp. Illus. \$8.50.

Ionizing Radiation: Neural Function and Behavior. Donald J. Kimeldorf and Edward L. Hunt. Academic Press, New York, 1965. 343 pp. Illus. \$10. American Inst. of Biological Sciences and U.S. Atomic Energy Commission Monograph Series on Radiation Biology.

Laboratory Manual for Plant Anatomy. Richard A. Popham. Mosby, St. Louis, 1966. 236 pp. Illus. Paper, \$4.95.

Macromolecules and Behavior. John Gaito, Ed. Appleton-Century-Crofts (Meredith), New York, 1966. 207 pp. Illus. \$8. Ten papers: "Macromolecules and the electrical activity of nerve cells" by D. Agin; "Axoplasmic flow in neurons" by Sidney Ochs; "Nucleic acid changes during behavioral events" by Leonid Z. Pevzner; "Brain RNA: Some information on its nature and metabolism as revealed by studies during experimentally induced convulsions and in response to sensory stimulation" by G. P. Talwar, B. K. Goel, S. P. Chopra, and B. D'Monte; "Macromolecules and brain function" by John Gaito; "Autoradiographic examination of behaviorally induced changes in the protein and nucleic acid metabolism of the brain" by J. Altman; "RNA and memory" by D. Ewen Cameron, V. A. Kral, L. Solyom, S. Sved, B. Wainrib, C. Beaulieu, and H. Enesco; "Antibody formation and immunological memory" by Niels K. Jerne; "Molecular biological approaches to the study of memory" by James Bonner; "Some dimensions of remembering: Steps toward a neuropsychological model of memory" by Karl H. Pribram, and an introduction by John Gaito.

Manuel de Biologie Générale, à l'usage des Travaux Pratiques. vol. 1, *La Cellule*. Gauthier-Villars, Paris, 1965. 110 pp. Illus. Paper, F. 22.

Matrix Algebra for the Biological Sciences (Including Applications in Statistics). S. R. Searle. Wiley, New York, 1966. 308 pp. Illus. \$9.95. Series on Quantitative Methods for Biologists and Medical Scientists, edited by Wilfred J. Dixon.

Die menschliche Glatze im Altersformwandel der behaarten Kopfhaut: Morphologische Studie. Klaus Goertler and Peter Gördel. Thieme, Stuttgart, Germany, 1965. 56 pp. Illus. Paper, DM. 23.

Methods of Serological Research. J. B. Kwapinski. Wiley, New York, 1966. 540 pp. Illus. \$18.50.

Processes of Organic Evolution. G. Ledyard Stebbins. Prentice-Hall, Englewood Cliffs, N.J., 1966. 205 pp. Illus. Paper, \$2.50. Concepts of Modern Biology Series, edited by William D. McElroy and Carl P. Swanson.

Prognosis: A Guide to the Study and Practice of Clinical Medicine. Leslie A. Osborn. Thomas, Springfield, Ill., 1965. 296 pp. Illus. \$10.

Programed Genetics. vol. 3, *Extension of the Theory*. Chester A. Lawson and Mary Alice Burmester. Heath, Boston, 1966. 375 pp. Illus. Paper, \$4.95.

Recent Developments in Vision Research. Milton A. Whitcomb, Ed. National Acad. of Sciences-National Re-

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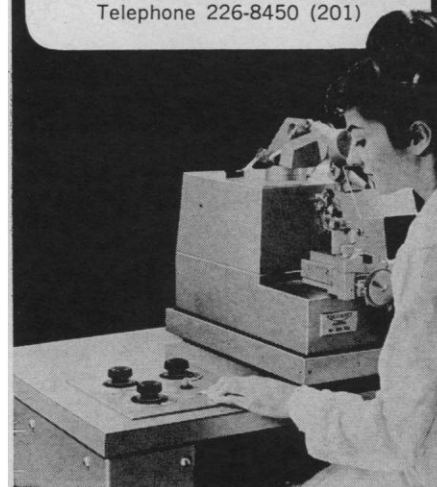
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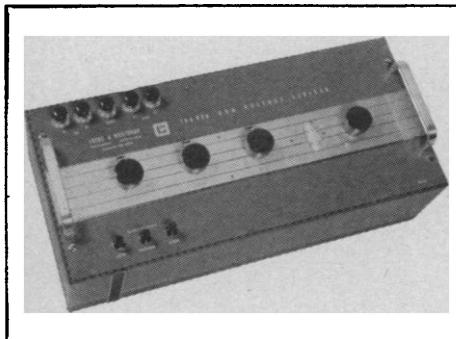
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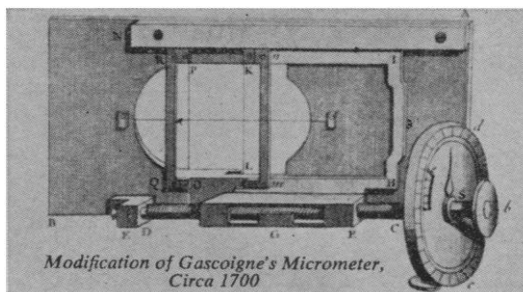
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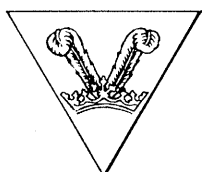
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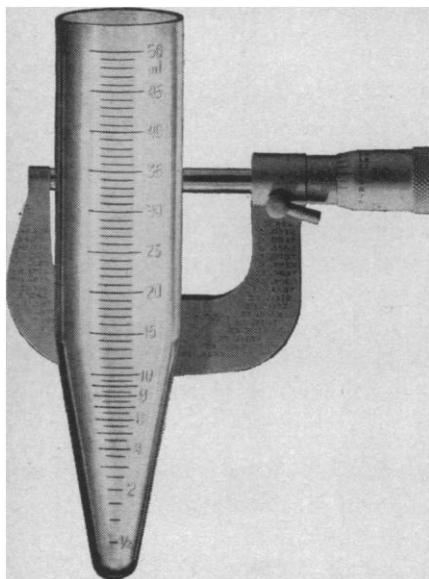
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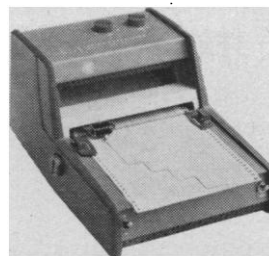
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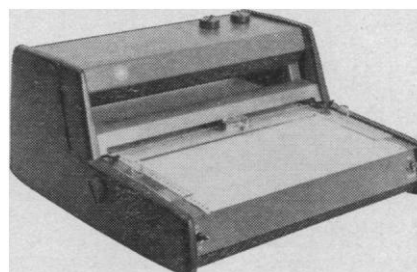


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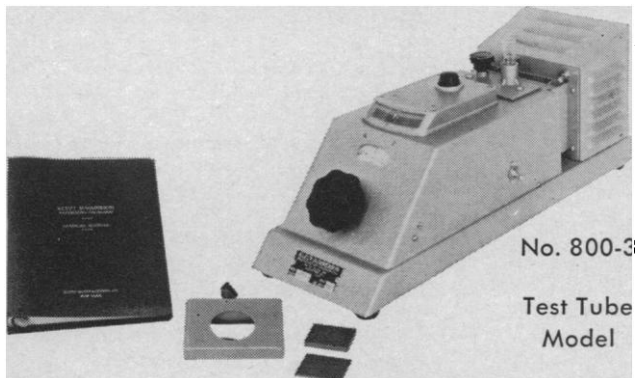
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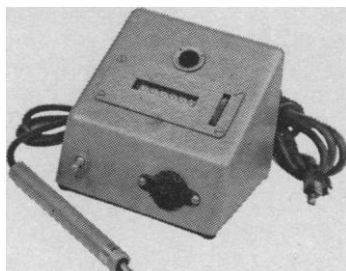
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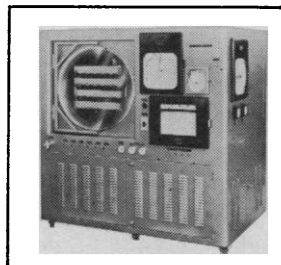
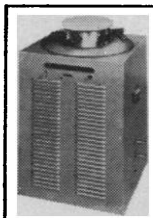
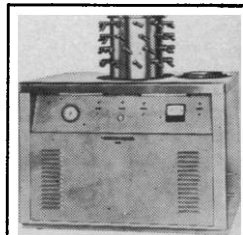
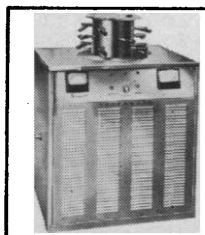
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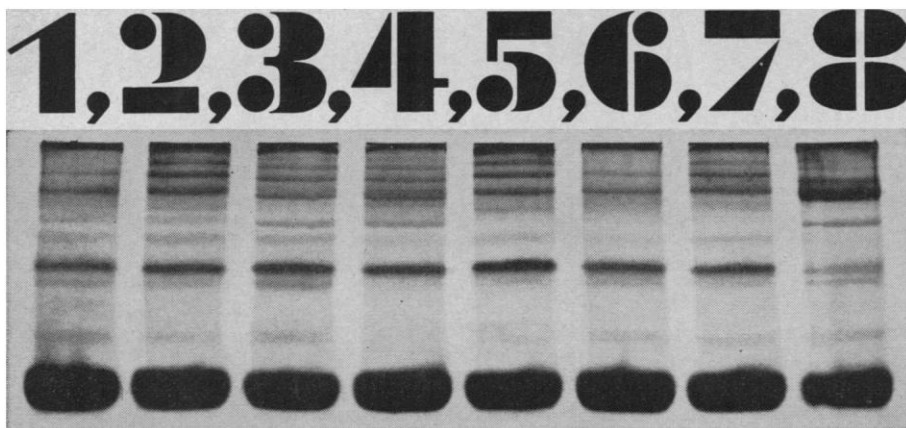
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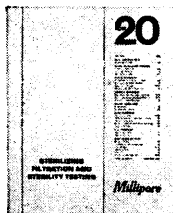
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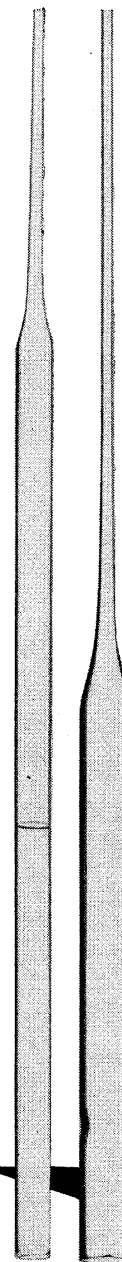
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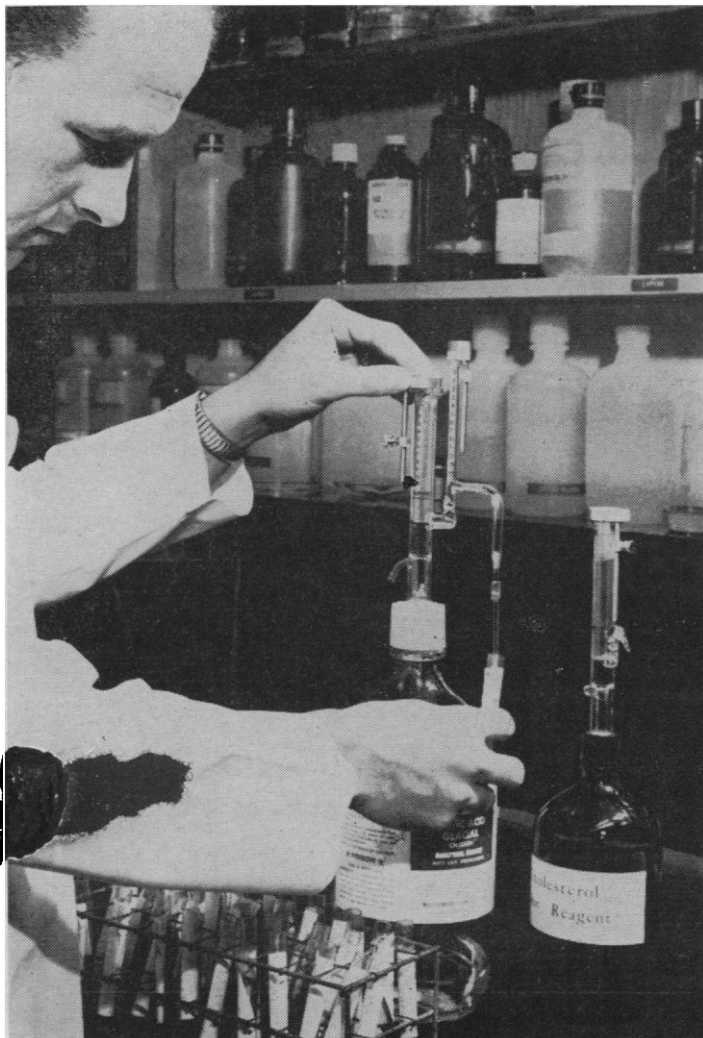
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Boron. vol. 2, *Preparation, Properties, and Applications.* Based on papers presented at the Second International Symposium on Boron (Paris), July 1964. Gerhart K. Gaulé, Ed. Plenum Press, New York, 1965. 361 pp. Illus. \$12.50. Twenty five papers: Preparation, Purification, and Analysis (6 papers); Structure (4 papers); Electronic and Mechanical Properties (13 papers); and Applications (2 papers).

Cerebrospinal Fluid and the Regulation of Ventilation. Proceedings of a symposium (Brooklyn, N.Y.), April 1964. Chandler McC. Brooks, Frederick F. Kao, and Brian B. Lloyd, Eds. Davis, Philadelphia, 1965. 456 pp. Illus. \$16.50. Sixteen papers.

Current Topics in Thyroid Research. Proceedings, Fifth International Thyroid Conference (Rome), May 1965. C. Casano and M. Andreilo, Eds. Academic Press, New York, 1965. 1247 pp. Illus.

Family Structure, Dynamics, and Therapy. A conference (Galveston, Texas), February 1965. Irvin M. Cohen, Ed. American Psychiatric Assoc., Washington, D.C., 1966. 244 pp. Paper, \$4. Twenty-six papers and two discussions given at a conference held under the auspices of the Department of Neurology and Psychiatry, University of Texas Medical Branch and the American Psychiatric Association's Committee on Research.

Flight Test Instrumentation. vol. 3, Proceedings of the Third International Symposium (Cranfield, England), 1964. M. A. Perry, Ed. Pergamon, New York, 1965. 301 pp. Illus. \$15. Fourteen papers.

Homage to Galileo. Papers presented at the Galileo Quadricentennial (Rochester, N.Y.), October 1964. Morton F. Kaplon, Ed. M.I.T. Press, Cambridge, Mass., 1965. 153 pp. \$6. Six papers: "Galileo in the present" by Giorgio de Santillana; "Galileo's influence in modern society" by Gilberto Bernardini; "Galileo's real discoveries in dynamics" by Norwood Russell Hanson; "Galileo on measurement" by Edward W. Strong; "Science and government" by Philip H. Abelson; and "Science and history" by Erich Kahler.

Hormonal Control of Protein Biosynthesis. A symposium (Gatlinburg, Tenn.), April 1965. Oak Ridge Natl. Laboratory, Oak Ridge, Tenn., 1965. 197 pp. Illus. Paper. Thirteen papers given at a conference

sponsored by the Biology Division, Oak Ridge Natl. Laboratory; reprinted from the *Journal of Cellular and Comparative Physiology*.

The Human X-Chromosome. A symposium (Guelph, Ontario), May 1965. Genetics Society of Canada, Ottawa, 1965. 46 pp. Illus. Paper, \$3. Four papers: "Genes on the X-chromosome" by Ruth Sanger; "Cytological aspect of the X-chromosome differentiation in normal and abnormal cells" by Barid M. Mukherjee; "Genetic implications of heteropyknosis of the X-chromosome" by Margaret W. Thompson; and "Identification of the origin of the X-chromosome(s) in sex chromosome aneuploidy" by R. R. Race. Reprinted from the *Canadian Journal of Genetics and Cytology* [7, No. 2 (June 1965)].

Insects in Southern Forests. 14th Annual Symposium. C. B. Marlin, Ed. Louisiana State Univ. Press, Baton Rouge, 1966. 143 pp. Illus. \$4. Twelve papers.

International Telemetering Conference (Washington, D.C.), May 1965. Caler, Sun Valley, Calif., 1965. 814 pp. Illus. \$20. Fifty-seven papers.

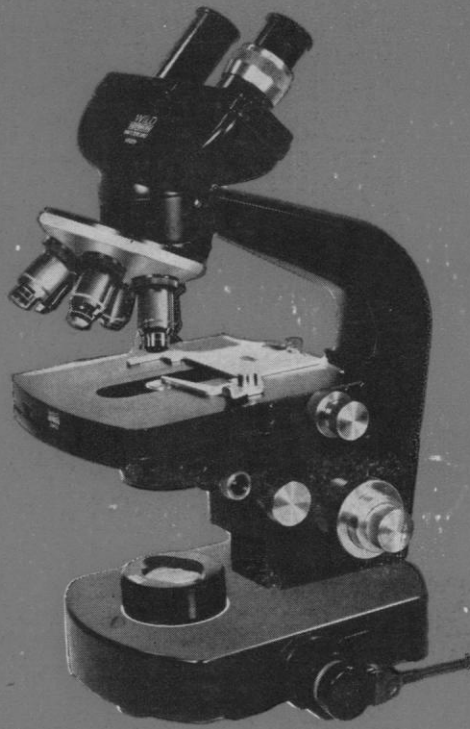
Low Temperature Physics, LT9. pts. A and B. Proceedings of the Ninth International Conference (Columbus, Ohio), August 31-September 4, 1964. J. G. Daunt, D. O. Edwards, F. J. Milford, and M. Yaqub, Eds. Plenum Press, New York, 1965. pt. A, 640 pp.; pt. B, 655 pp. Illus. \$19.50 each; \$35 set; 273 papers.

Mental Retardation in Canada. Proceedings, Federal-Provincial Conference (Ottawa), October 1964. Harvey W. Adams, Ed. Department of Natl. Health and Welfare, Ottawa, 1965. 313 pp. Paper, \$3. Includes papers from the five plenary sessions and the four group discussions. Available in French or English.

Non-Equilibrium Thermodynamics, Variational Techniques, and Stability. A symposium (Chicago), May 1965. Russell J. Donnelly, Robert Herman, and Ilya Prigogine, Eds. Univ. of Chicago Press, Chicago, 1966. 323 pp. Illus. \$10. Seventeen papers and ten discussions.

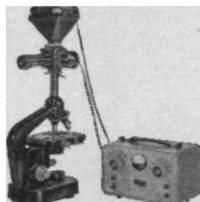
Precipitation from Iron-Base Alloys. Proceedings of a symposium (Cleveland, Ohio), October 1963. Gilbert R. Speich and John B. Clark, Eds. Gordon and Breach, New York, 1966. 420 pp. Illus. Paper, \$8.50; cloth, \$21. Metallurgical Society Conferences, vol. 28; nine papers: "Precipitation from binary substitutional solid solutions of alpha iron" by E. Hornbogen (with discussion by G. R. Speich); "Precipitation from substitutional iron-base austenitic and martensitic solid solutions" by R. F. Decker and S. Floreen (with discussion by R. F. Pitler and L. Habraken); "Quench aging in Fe-Mn-C-N alloys" by J. E. Enrietto, M. G. H. Wells, and E. R. Morgan; "A study of the tempering of steel using transmission electron microscopy" by E. Tekin and P. M. Kelly (with discussion by C. Altstetter, M. G. H. Wells, and E. Smith); "Theory of strengthening due to precipitate phases" by G. S. Ansell; "Interaction of dislocations and precipitates in some iron-base alloys" by A. S. Keh, W. C. Leslie, and D. L. Sponseller; "Dispersion strengthening of iron" by K. M. Zwilsky, R. C. Nelson, and N. J. Grant; "Effect of precipitation on magnetic

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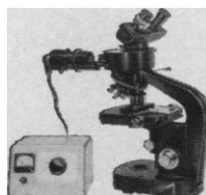


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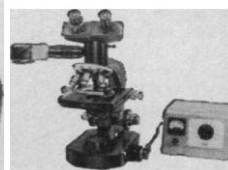
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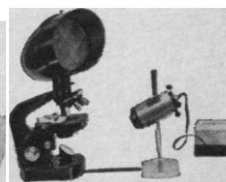
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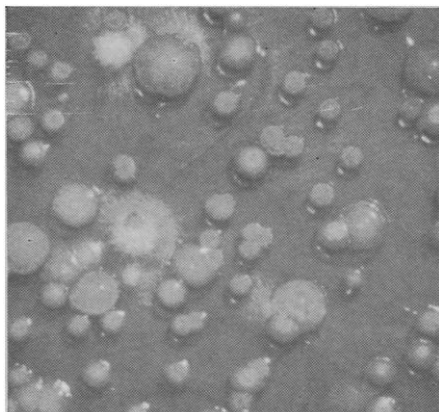
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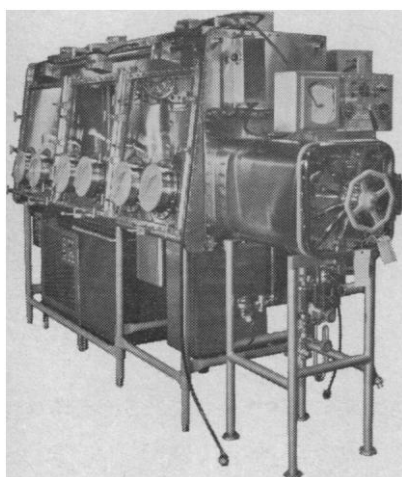
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properties of iron-base alloys" by E. A. Nesbitt and A. J. Williams; and "Precipitation in iron-base alloys—state of the art" by Morris Cohen.

Proceedings, London Mathematical Society: Papers Presented to J. E. Littlewood on His 80th Birthday. vol. 14A, 1965. J. D. Weston, Ed. Oxford Univ. Press, New York, 1966. 320 pp. Illus. \$12.80. Twenty-six papers.

Proceedings of the Natural Rubber Producers' Research Association Jubilee Conference (Cambridge, England), 1964. L. Mullins, Ed. Published for the Natural Rubber Producers' Research Assoc. by Maclaren, London, 1965. 258 pp. Illus. 42s. Sixteen papers: Plenary lectures (3 papers); Symposium on rubber biosynthesis (7 papers); and Symposium on relation between chemical structure and mechanical properties (6 papers).

Proceedings of the Symposium on Bacterial Transformation and Bacteriocinogeny (Budapest), August 1963. vol. 6. B. Györfy, Ed. Akadémiai Kiadó, Budapest, 1966. 167 pp. Illus. \$6. Twenty-two papers: Bacterial Transformation (9 papers); Bacteriocinogeny (6 papers); and DNA specificity and regulation (7 papers).

Radiological Monitoring of the Environment. A symposium (Berkeley, England), October 1963. B. C. Godbold and J. K. Jones, Eds. Pergamon, New York, 1965. 443 pp. Illus. \$15. Thirty-three papers.

VII International Mineral Processing Congress. vol. 1. A symposium (New York), September 1964. Nathaniel Arbiter, Ed. Gordon and Breach, New York, 1965. 623 pp. Illus. \$45. Fifty-five papers on the following topics: Comminution (6 papers); Gravity and Dense Media Separation (6 papers); Chemical Processing (3 papers); Flotation Kinetics (5 papers); Flotation Practice (4 papers); Chemistry of Flotation (7 papers); Surface Chemistry in Mineral Processing (6 papers); Magnetic and Electrical Separation (6 papers); Automation and Control (5 papers); and Symposium on Autogenous Grinding (7 papers).

Surface Interactions Between Metals and Glass. V. I. Arkharov and K. M. Gorbunova, Eds. Translated from the Russian edition (Moscow, 1964). Consultants Bureau, New York, 1966. 171 pp. Illus. Paper, \$25. Twenty-seven papers on topics considered at a conference (May 1963) honoring P. D. Dankov on his 60th birthday.

Symposium on Diffusions in Oceans and Fresh Waters (Palisades, N.Y.), August–September, 1964. Takashi Ichiye, Ed. Lamont Geological Observatory, Columbia University, Palisades, N.Y., 1965. 174 pp. Illus. Paper, \$2. Fourteen papers and five summaries of papers prepared from notes.

The United States and Japan. Twenty-eighth American Assembly (New York), October 1965. Herbert Passin, Ed. Prentice-Hall, Englewood Cliffs, N.J., 1966. 186 pp. Paper. \$1.95. Six papers: "The image" by Edward Seidensticker; "The legacy of the occupation" by Robert E. Ward; "Political relations" by Lawrence Olson; "Political economy" by William W. Lockwood; "The view from Japan" by Kinhide Mushakoji; and "The future" by Herbert Passin.

NEWS AND COMMENT

(Continued from page 1518)

climatological aspects; and recommendations for further research. Sponsors: International Commission on Polar Meteorology, IUGG; Scientific Committee on Antarctic Research; and World Meteorological Organization. Send title and indication of scope of proposed papers to K. Langlo, WMO, 41 Avenue Giuseppe-Motta, 1200, Geneva.

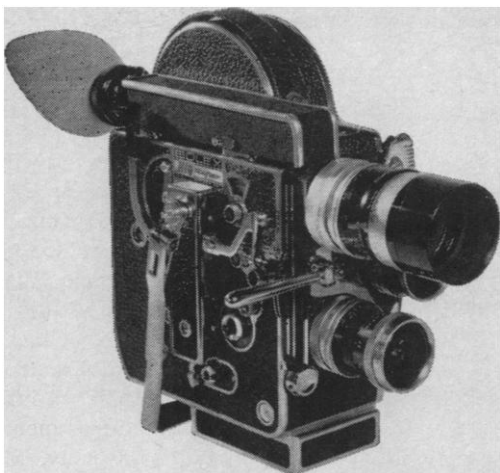
Abstracts: six copies in English; if possible, necessary diagrams; deadline: *1 June*. (Svenn Orvig, Department of Meteorology, McGill University, Montreal, Quebec, Canada)

A symposium on fundamentals of **gas-surface interaction** is scheduled for 14–16 December in San Diego, California. The topics to be covered include the surface and its characteristics; adsorption and reaction of gases on or with surfaces; and scattering processes, including energy and momentum transfer at the gas-surface interface. Emphasis will be on studies involving incident particles which are gaseous neutral species with energies below 10 electron volts, on their interaction with well-defined crystalline, but not necessarily clean, surfaces. Deadlines: declaration of intent to submit a paper, and title: *1 June*; abstracts: *1 September*. (H. Saltsburg, General Dynamics/General Atomic, P.O. Box 608, San Diego, California 92112)

Courses

Applications are being accepted for a course on **marine geology** of the Pacific basin, scheduled for 24–26 June at the University of California, Berkeley. The program is designed to provide postgraduate work in marine geology for earth scientists and people in related fields. Topics to be covered include structure and bathymetry of the Pacific basin, deep-sea sediments, marine sediments off California, marine geochemistry, instrumentation in marine geology, and the federal role in marine geology. The registration fee is \$125; graduate students may apply for a reduced fee of \$60. (R. E. Patterson, Letters and Science Extension, University of California, Berkeley)

The American Association of Immunologists will present a course in **basic immunology**, 25 July to 6 August



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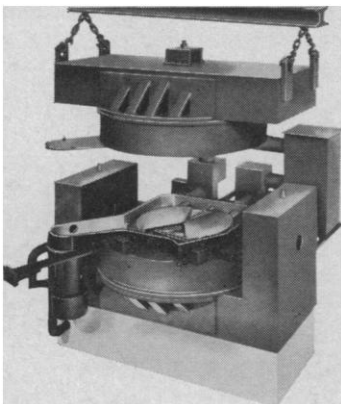
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at Lake Forest College, Lake Forest, Illinois. The course is intended for university instructors and investigators. Enrollment will be limited to 40. Deadline: 1 May. (Sheldon Dray, University of Illinois Medical Center, P.O. Box 6998, Chicago 60680)

Rochester Institute of Technology will offer a course on **statistical techniques in quality control**, 13-22 June. The program is designed to present basic elements of statistics for research and industry. Tuition is \$275.

The course will be followed, 22-30 June, by a program on **design of experiments** for persons who require advanced programs for the more complex problems revolving around industrial experimentation. Tuition will be \$250.

(James Swanton, Extended Services Division, Rochester Institute of Technology, 65 Plymouth Avenue South, Rochester, New York 14608)

A course on **elastomers** will be offered by the institute of polymer science at the University of Akron. Attendance will be limited to 25 scientists and engineers employed in industry and business. A \$175 registration fee is being charged. Registration deadline: 15 May. (Institute of Polymer Science, University of Akron, 302 East Buchtel Avenue, Akron, Ohio 44304)

Publications

The Office of Science and Technology recently published a report listing the **marine science** curricula being offered this year at U.S. universities. For each institution included, the report names the departments that provide instruction in the marine sciences, lists and describes the courses, and indicates the academic degrees that may be earned. It also lists the name, rank, and degree of each faculty member who teaches or supervises student research. Special information on undergraduate curricula and on financial aid are included. (*University Curricula in Oceanography, Academic Year 1965-66*. Interagency Committee on Oceanography, 4th Floor, Bldg. 159E, Washington Navy Yard, Washington, D.C. 20390. ICO Pamphlet No. 23; 116 pages. Free of charge)

A brochure naming the **foreign scholars available under the Fulbright-Hays Act** for employment at U.S. colleges and universities has been pre-

pared by the Committee on the International Exchange of Persons, Conference Board of Associated Research Councils. The persons listed are eligible for U.S. government grants to cover round-trip transportation costs between their home countries and the host institutions, if they obtain teaching or research jobs on American campuses. The booklet provides biographical data on the scholars and describes the procedures for inviting them and the conditions of the appointments. (Grace E. L. Haskins, Committee on International Exchange of Persons, 2101 Constitution Avenue, NW, Washington, D.C.)

A recent NIH publication discusses the increasing importance of voluntary health agencies in **research into national health problems**. More than 50 such organizations, supported by contributions from the public, operate on a nationwide scale. The report analyzes the relationship of their research support to their other major programs and notes how much of the total expenditure is given for research and training in various fields. In 1963, the report says, the total spent for research was \$44 million; for training of research personnel an additional \$4 million was spent. Three agencies supported the largest share (two-thirds): The American Cancer Society, the American Heart Association, and the National Foundation; and each of six other organizations had programs amounting to over \$1 million. (*Voluntary Health Agency Expenditures for Research and Research Training*. For single copies: Research Analysis Branch, NIH, Bethesda, Md. 20014; free of charge. For multiple copies: Superintendent of Documents, Government Printing Office, Washington, D.C. 20402; 20 cents)

The National Science Foundation has issued its annual inventory of the research projects American colleges and universities are conducting on the **impact of science and technology**. The report includes projects on the impact of agricultural technology, decision-making in science and technology, international and foreign studies, and scientific and engineering manpower. Other topics range from patents and trademarks to changing patterns of research administration. (*Current Projects on Economic and Social Implications of Science and Technology, 1964*. Superintendent of Documents, U.S. Government Printing Office, Washington, D.C.; 50 cents)

New Journals

Bibliography of Medical Translations; National Library of Medicine-sponsored journal; originally issued quarterly, semi-monthly as of July 1965. (Superintendent of Documents, Government Printing Office, Washington, 20402. \$4.50 a year)

Current Papers in Physics. Vol. 1, No. 1, January 1966. A. Tybulewicz, Editor. Titles of physics research papers published in about 100 journals. (Institution of Electrical Engineers, Savoy Place, London, W.C.2, England. Semimonthly; surface mail \$5, air-mail \$11, for members of AIP member societies; \$8.50, surface, \$14.50 air, for nonmembers)

Gastroenterology Abstracts and Citations. Vol. 1, No. 1, March 1966. Frank P. Brooks and Edward C. Raffensperger, Editors. Titles of original papers on digestive diseases, published in medical journals throughout the world; abstracts or summaries of some entries. (Communications Office, *Gastroenterology Abstracts and Citations*, National Institute of Arthritis and Metabolic Diseases, NIH, Bethesda, Maryland 20014. Monthly; free of charge)

Metrologia. Intern. journal of scientific metrology; vol. 1, No. 2, April 1965. L. E. Howlett, Editor. Articles in English, French, German, or Spanish; results of research on fundamental measurements in any field of physics. (L. E. Howlett, Division of Applied Physics, National Research Council, Ottawa 2, Ontario, Canada. Quarterly, \$8.50 a year)

Scientists in the News

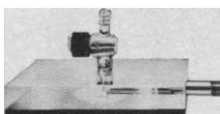
Richard P. Schmidt, chairman of the department of medicine at the University of Florida's college of medicine, has been appointed associate dean of the college and chief of staff of its teaching hospital.

John C. Weaver, vice president for academic affairs and dean of faculties at Ohio State University, will become president of the University of Missouri on 1 August. He will succeed **Elmer Ellis**, who plans to retire.

The following appointments have been announced by the University of Louisville, Louisville, Kentucky:

John A. Dillon, professor and executive officer of the physics department

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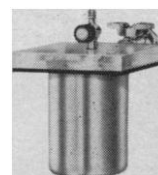
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at Brown University, dean of the graduate school, effective 1 July.

Randolph B. Renda, associate professor of mechanical engineering at the University of Kentucky, head of the Speed scientific school.

Arman F. Frederickson, formerly chairman of the department of earth and planetary sciences at the University of Pittsburgh, has become director of the university's Center for Oceanography.

Merton R. Clarkson has been appointed director of the recently established Bureau of Veterinary Medicine at the Food and Drug Administration. Clarkson retired in 1964 as associate administrator of the USDA's Agricultural Research Service; he is a former president of the American Veterinary Medical Association.

Southern Methodist University's newly established Institute for the Study of Earth and Man will be directed by **William B. Heroy**, who joined the SMU faculty last fall when he retired as board chairman of Geotechnical Corporation, Dallas.

Donald L. Kimmel, chairman of anatomy at Chicago Medical School, has been appointed professor and chairman of the department of anatomy at West Virginia University medical school, effective 1 June.

Leighton E. Cluff, head of the division of allergy and infectious diseases at Johns Hopkins University, has been appointed professor and head of the department of medicine in the University of Florida's college of medicine, effective 1 June.

NASA has named **George J. Howick** director of the Technology Utilization Division, succeeding **Richard L. Leshner**, acting director. He had been manager of industrial technology services at Midwest Research Institute, Kansas City, Mo.

Drexel Institute of Technology has appointed **Bertrand E. Bennison** head of the department of biological sciences. He had been assistant director of research at Ortho Pharmaceutical Corporation.

Harry P. Day, dean of students of Florida State University, has been named director of the recently established New England Regional Center

for Continuing Education, effective 1 May. The center is being built on the campus of the University of New Hampshire.

Recent Deaths

George E. Adams, 91; first dean of the college of agriculture at the University of Rhode Island; 12 March.

Everitt P. Blizard, 49; director of the neutron physics division at Oak Ridge National Laboratory and editor of *Nuclear Science and Engineering*; 22 February.

Marvin S. Burstone, 43; head of the histochemistry section, National Cancer Institute, NIH; 19 February.

Harold J. Grant, Jr., 45; chairman of the entomology department, Academy of Natural Sciences of Philadelphia, and president of the American Entomological Society; 27 February in a swimming accident in Trinidad, where he was taking part in an expedition to collect and observe the ecology of tropical katydids.

Ned Guthrie, 66; professor emeritus of chemistry at Hanover College, Hanover, Indiana; 5 February.

Eino Nelson, 46; chairman of pharmaceuticals, school of pharmacy, State University of New York at Buffalo; 5 January.

Frank H. H. Roberts, Jr., 69; retired director of the Smithsonian Institution's bureau of American ethnology; 23 February.

Leslie Silverman, 51; head of the department of industrial hygiene at Harvard and president-elect of the American Industrial Hygiene Association; 4 March.

Norair M. Sisakyan, 58; chief academic secretary of the Presidium of the Soviet Academy of Sciences and head of the group that directs the life sciences program of the Soviet space effort; 12 March.

Leroy Stockmann, 65; physicist in charge of radon testing in the radiation physics division, radioactivity section, National Bureau of Standards; 4 February.

Ronald Allen Veeder, 59; manager of the development program at Woods Hole Oceanographic Institution; 2 March.

Fritz Zernike, 77; professor and former lecturer on theoretical physics at Groningen State University, Netherlands, and winner of the 1953 Nobel prize in physics, for inventing the phase-contrast microscope; 10 March.