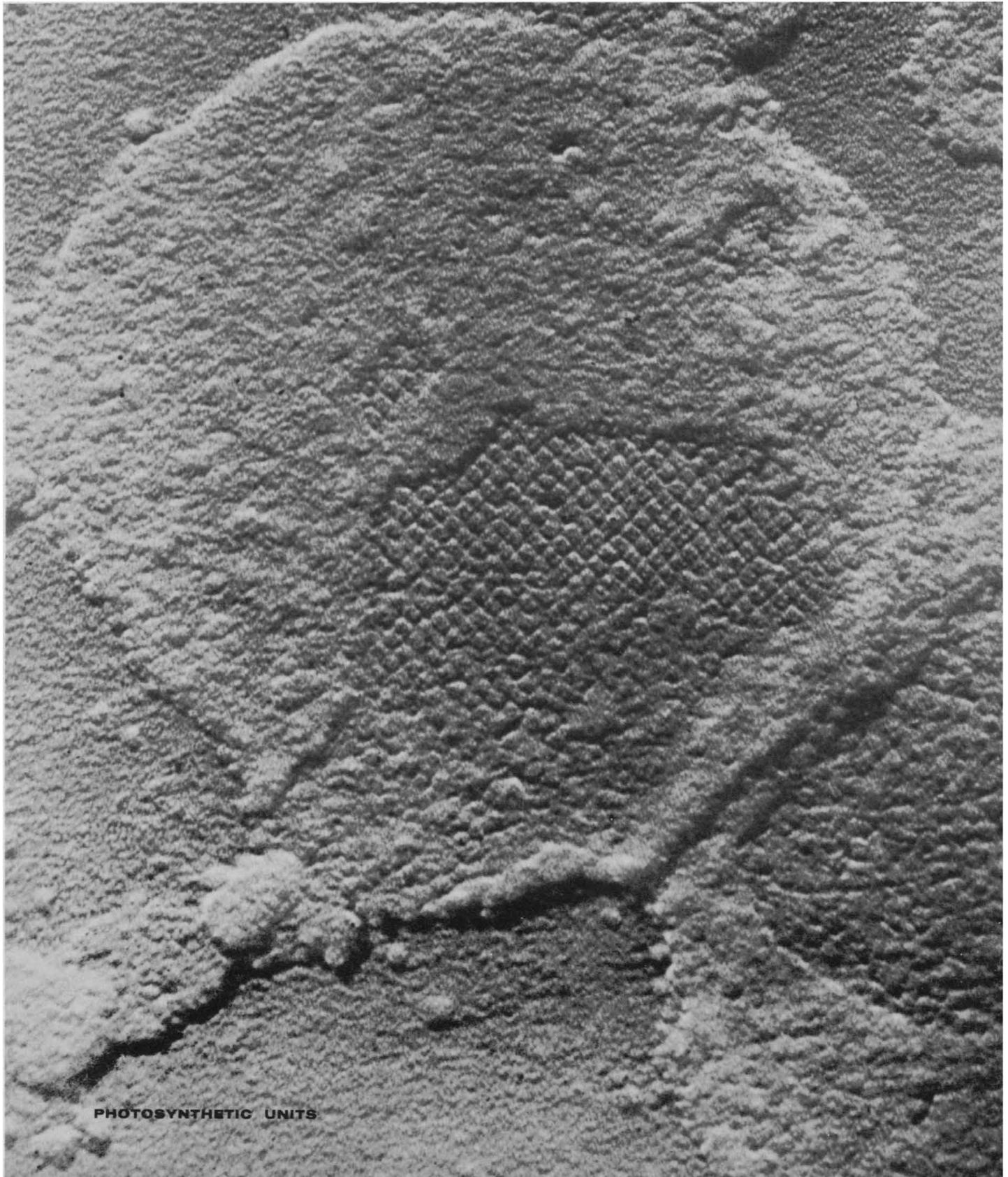


# SCIENCE

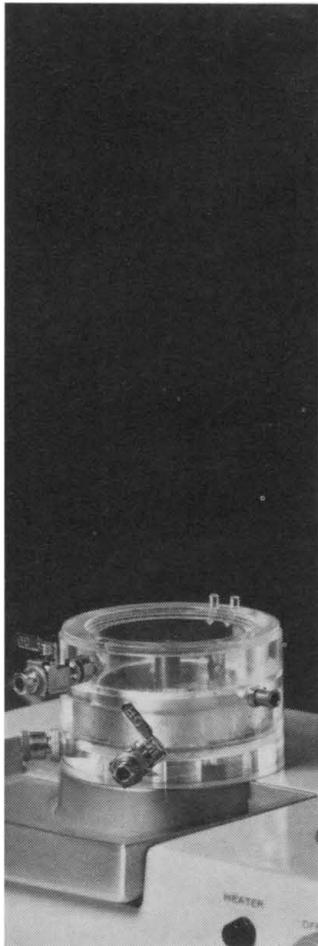
22 May 1964

Vol. 144, No. 3621

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE



PHOTOSYNTHETIC UNITS



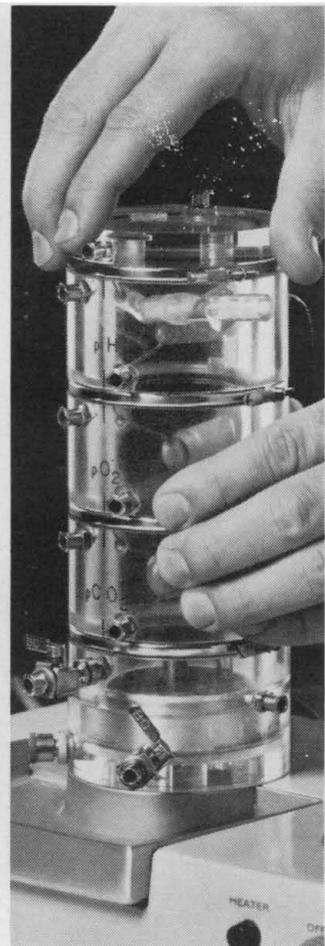
To a constant temperature water bath



... add a pCO<sub>2</sub> module



... a pO<sub>2</sub> module



... then a pH module

## HOW'S THAT FOR VERSATILITY IN A BLOOD GAS CUVETTE!

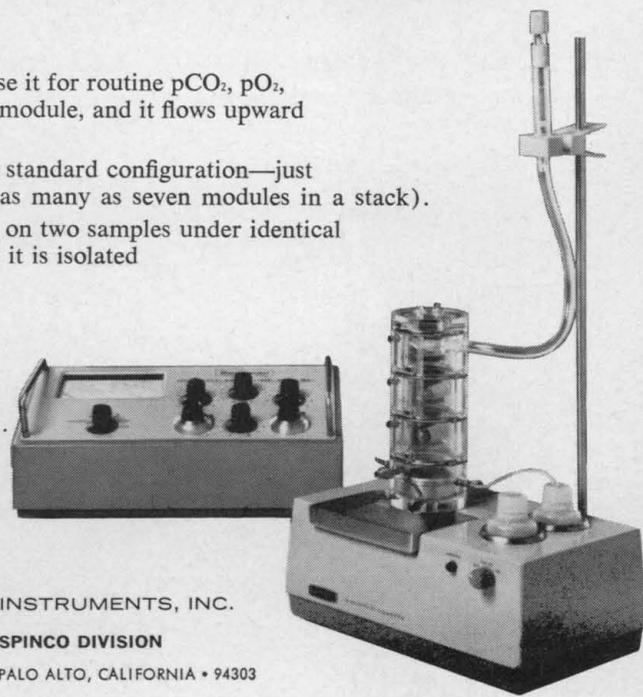
Above you see our new Modular Cuvette just as you would use it for routine pCO<sub>2</sub>, pO<sub>2</sub>, and pH measurements. Now inject a sample into the bottom module, and it flows upward to be measured simultaneously in all three modules.

But research needs vary, and there's no need to stay with the standard configuration—just rearrange modules, or add as many as you wish (we've had as many as seven modules in a stack).

Perhaps for a particular study you want to compare readings on two samples under identical conditions. Simple again—give any module a slight turn and it is isolated from the others for individual sampling.

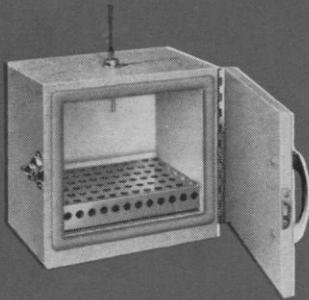
Happily, the performance of our Modular Cuvette is as impressive as its versatility. Precise temperature control to  $\pm 0.1^\circ\text{C}$  is maintained by constant temperature water circulating through the centers of all modules. Sample size is small—less than a third of a cc fills all three standard modules.

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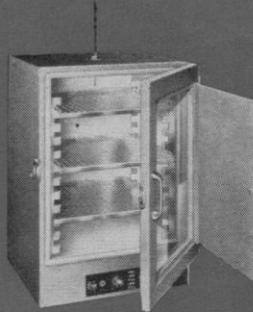
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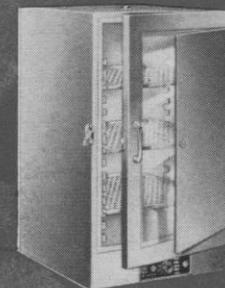
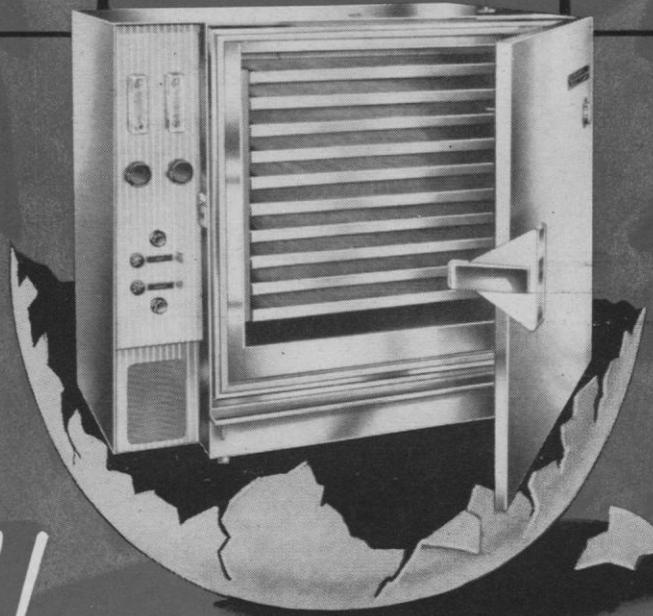


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<b>LETTERS</b>	Research on Social Changes: <i>A. Campbell, G. C. Homans, P. H. Rossi, G. Nettler, K. H. Harper</i> ; Coauthorship: Too Much Laissez Faire: <i>R. H. Orr</i> and <i>C. Lamanna</i> ; Polonium-210 and Bladder Cancer: <i>H. Eisler</i> ; Safeguarding the Biologic Record: <i>R. H. Bormann</i> and <i>B. H. Banta</i> ; Cuba: <i>E. Rabinowitch</i> ; Civil Defense: Bias in Congressional Hearings: <i>T. Robinson</i> ; Educational Testing: <i>R. Walker</i> ; Humanoids and Proteinoids: <i>S. W. Fox</i> ..... 951
<b>EDITORIAL</b>	Science and the General Welfare in a Democracy ..... 957
<b>ARTICLES</b>	A Molecular Approach in the Systematics of Higher Organisms: <i>B. H. Hoyer, B. J. McCarthy, E. T. Bolton</i> ..... 959 Optical Studies at High Pressures: <i>L. S. Whatley, et al.</i> ..... 968 Science and Federal Programs: The Continuing Dialogue: <i>J. A. Shannon</i> ..... 976
<b>NEWS AND COMMENT</b>	NSF—Kind Words and a Budget Increase; Engineers—Toward a National Academy; Faculty—Survey of Teaching Areas and Salaries ..... 979 <i>Report from Europe</i> : Particle Accelerators at CERN: <i>V. K. McElheny</i> ; British Physics Journals: <i>A. C. Strickland</i> ..... 983
<b>BOOK REVIEWS</b>	<i>Progress in Oceanography</i> , reviewed by <i>J. P. Tully</i> ; other reviews by <i>J. B. Irwin, D. M. H. Kern, H. M. Mooney, W. R. Reitman, V. W. Meloche</i> ..... 987
<b>REPORTS</b>	Positive-Ion Chemistry: High Yields of Heavy Hydrocarbons from Solid Methane by Ionizing Radiation: <i>D. R. Davis</i> and <i>W. F. Libby</i> ..... 991 Affinity and Phosphorylation Constants for the Inhibition of Esterases by Organophosphates: <i>A. R. Main</i> ..... 992 Distribution of Narrow-Width Magnetic Anomalies in Antarctica: <i>J. C. Behrendt</i> ..... 993 Radiocarbon Dating of Bone and Shell from Their Organic Components: <i>R. Berger, A. G. Horney, W. F. Libby</i> ..... 999 Site of Preference Energy and Selective Uptake of Transition-Metal Ions from a Magma: <i>R. G. Burns</i> and <i>W. S. Fyfe</i> ..... 1001 Oxygen Isotopic Composition of Some Right- and Left-Coiled Foraminifera: <i>A. Longinelli</i> and <i>E. Tongiorgi</i> ..... 1004 Strontium-90 in Plants and Animals of Arctic Alaska, 1959–61: <i>D. G. Watson, W. C. Hanson, J. J. Davis</i> ..... 1005

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<p>Quantasome: Size and Composition: <i>R. B. Park and J. Biggins</i> ..... 1009</p> <p>Synthesis of RNA in vitro Stimulated in Dipteran Salivary Glands by 1,1,3-Tricyano-2-Amino-1-Propene: <i>J. Jacob and J. L. Sirlin</i> ..... 1011</p> <p>Antibody Production by Nonimmune Spleen Cells Incubated with RNA from Immunized Mice: <i>E. P. Cohen and J. J. Parks</i> ..... 1012</p> <p>Haptoglobin Binding Capacity of Certain Abnormal Hemoglobins: <i>R. L. Nagel and H. M. Ranney</i> ..... 1014</p> <p>Iron Absorption: The Effect of an Iron-Deficient Diet: <i>S. Pollack,</i> <i>R. M. Kaufman, W. H. Crosby</i> ..... 1015</p> <p>Rat Electroretinogram: Evidence for Separate Processes Governing b-Wave Latency and Amplitude: <i>R. A. Cone and J. R. Platt</i> ..... 1016</p> <p>Actinomycin D and the Response to Parathyroid Hormone: <i>H. Rasmussen,</i> <i>C. Arnaud, C. Hawker</i> ..... 1019</p> <p>Wheat Gibberellins: <i>J. R. Fleming and J. A. Johnson</i> ..... 1021</p> <p>Interferon Production in Chickens Injected with <i>Brucella abortus</i>: <i>J. S. Youngner and W. R. Stinebring</i> ..... 1022</p> <p>Immuno-osmophoresis, a Rapid and Sensitive Method for Evaluating Viruses: <i>H. W. J. Ragetli and M. Weintraub</i> ..... 1023</p> <p>Emphysema in Lung Macrosections Correlated with Smoking Habits: <i>A. E. Anderson, Jr., et al.</i> ..... 1025</p> <p>Citrate Cleavage Enzyme in Livers of Obese and Nonobese Mice: <i>M. S. Kornacker and J. M. Lowenstein</i> ..... 1027</p> <p>Sterol Induction of Reproduction and Stimulation of Growth of <i>Pythium</i> and <i>Phytophthora</i>: <i>J. W. Hendrix</i> ..... 1028</p> <p><i>Comments on Reports: Heart Rate Reactions and Locus of Stimulation within The Septal Area of the Rat: R. B. Malmo; Universality in the Genetic Code: W. R. Woese, R. T. Hinegardner, J. Engelberg</i> ..... 1029</p>	<p>1009</p> <p>1011</p> <p>1012</p> <p>1014</p> <p>1015</p> <p>1016</p> <p>1019</p> <p>1021</p> <p>1022</p> <p>1023</p> <p>1025</p> <p>1027</p> <p>1028</p> <p>1029</p>
<p><b>ASSOCIATION AFFAIRS</b> Third Montreal Meeting: <i>R. L. Taylor</i> ..... 1032</p> <p style="padding-left: 20px;">Preliminary announcement of programs for the 131st annual meeting, 26-31 December 1964, and call for papers by AAAS sections.</p>	<p>1032</p>
<p><b>MEETINGS</b> Hemophilias: <i>E. Lechler and H. R. Roberts</i>; Marked Molecules: <i>R. F. Nystrom</i>; Ethology: <i>P. Marler</i>; Science Policy: <i>R. H. Bolt</i>; Forthcoming Events ..... 1043</p>	<p>1043</p>
<p><b>DEPARTMENTS</b> New Products ..... 1063</p>	<p>1063</p>

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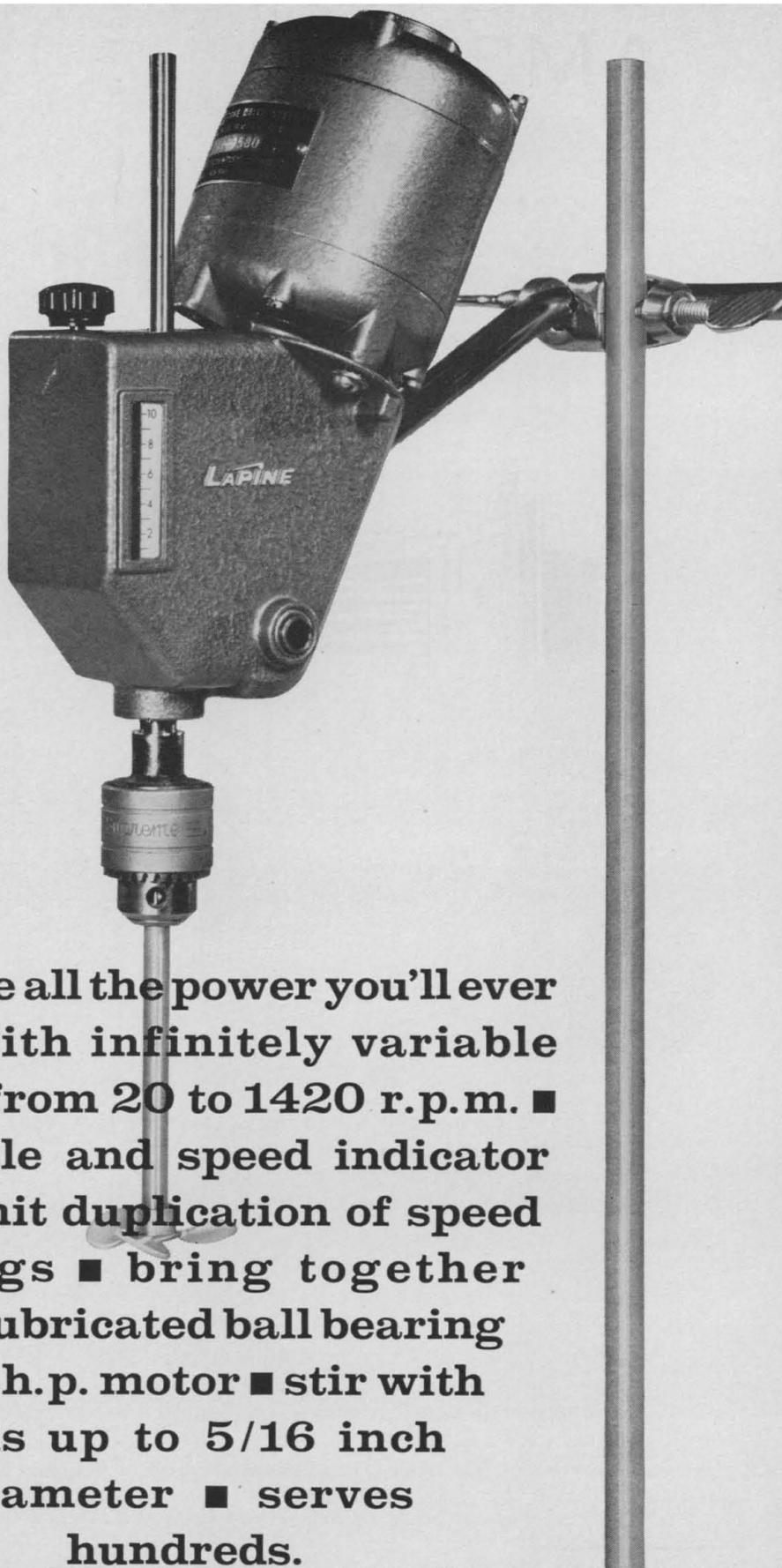
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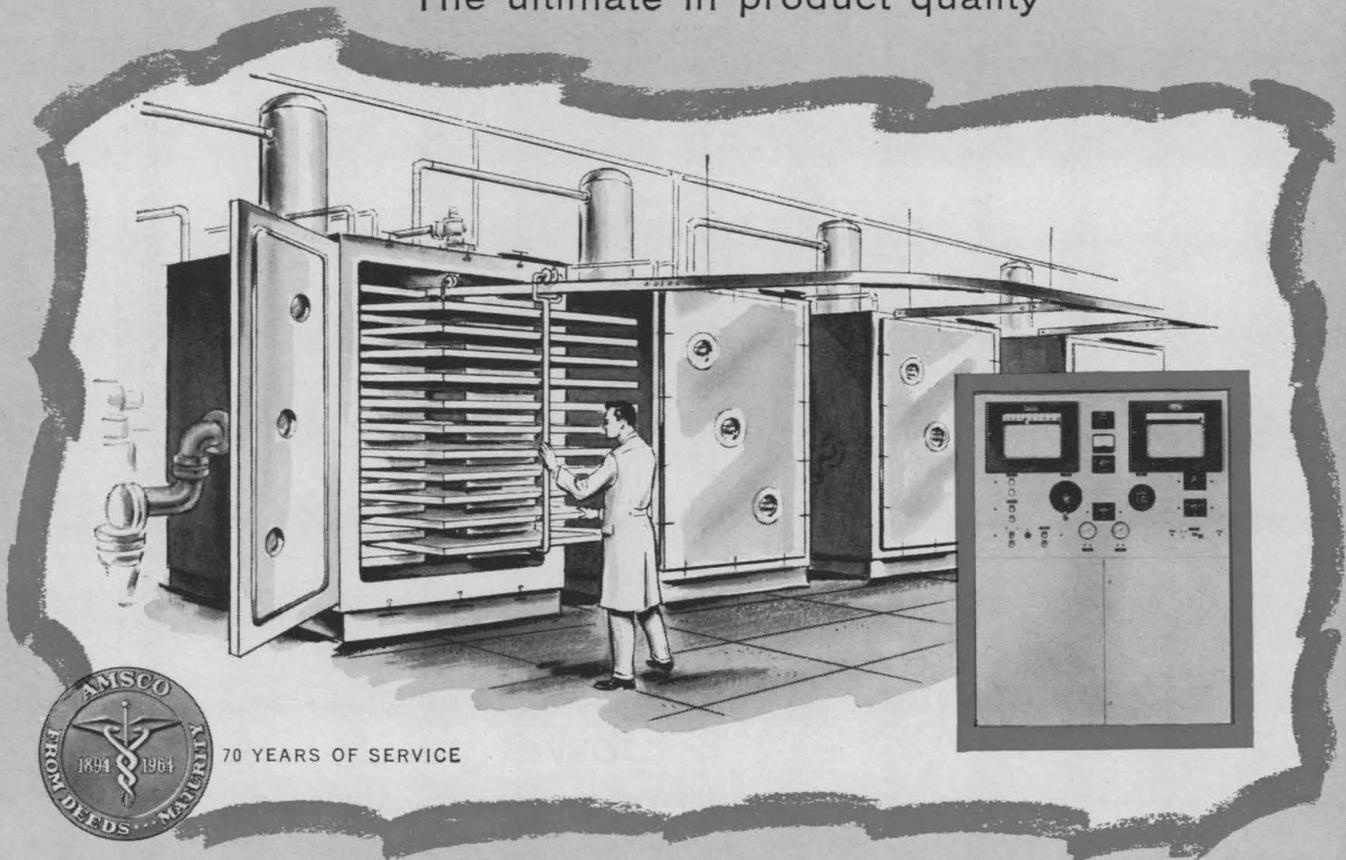
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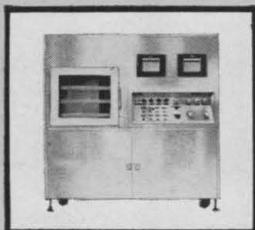
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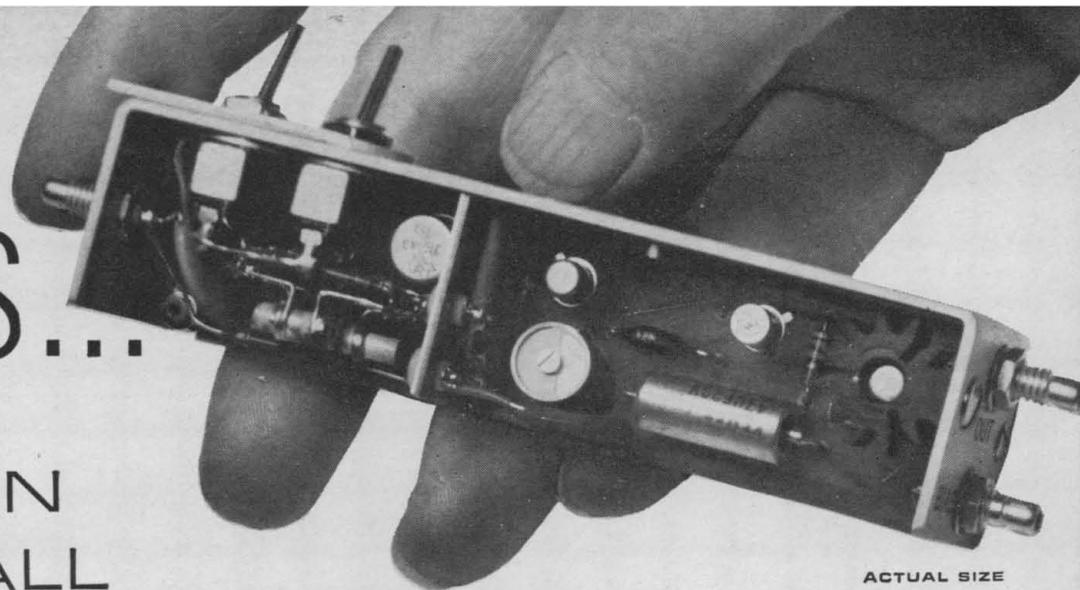


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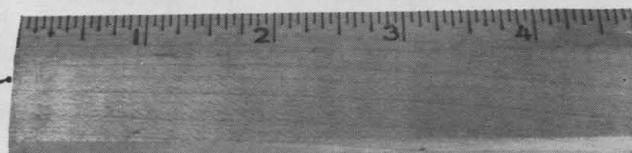
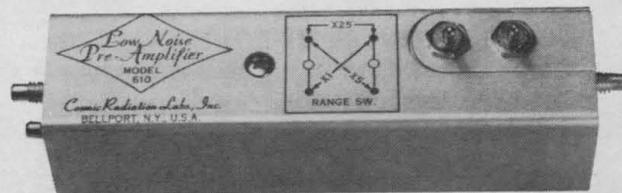
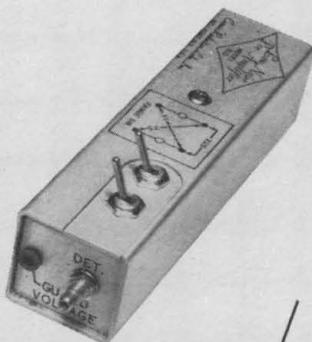
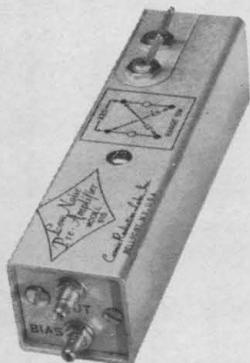
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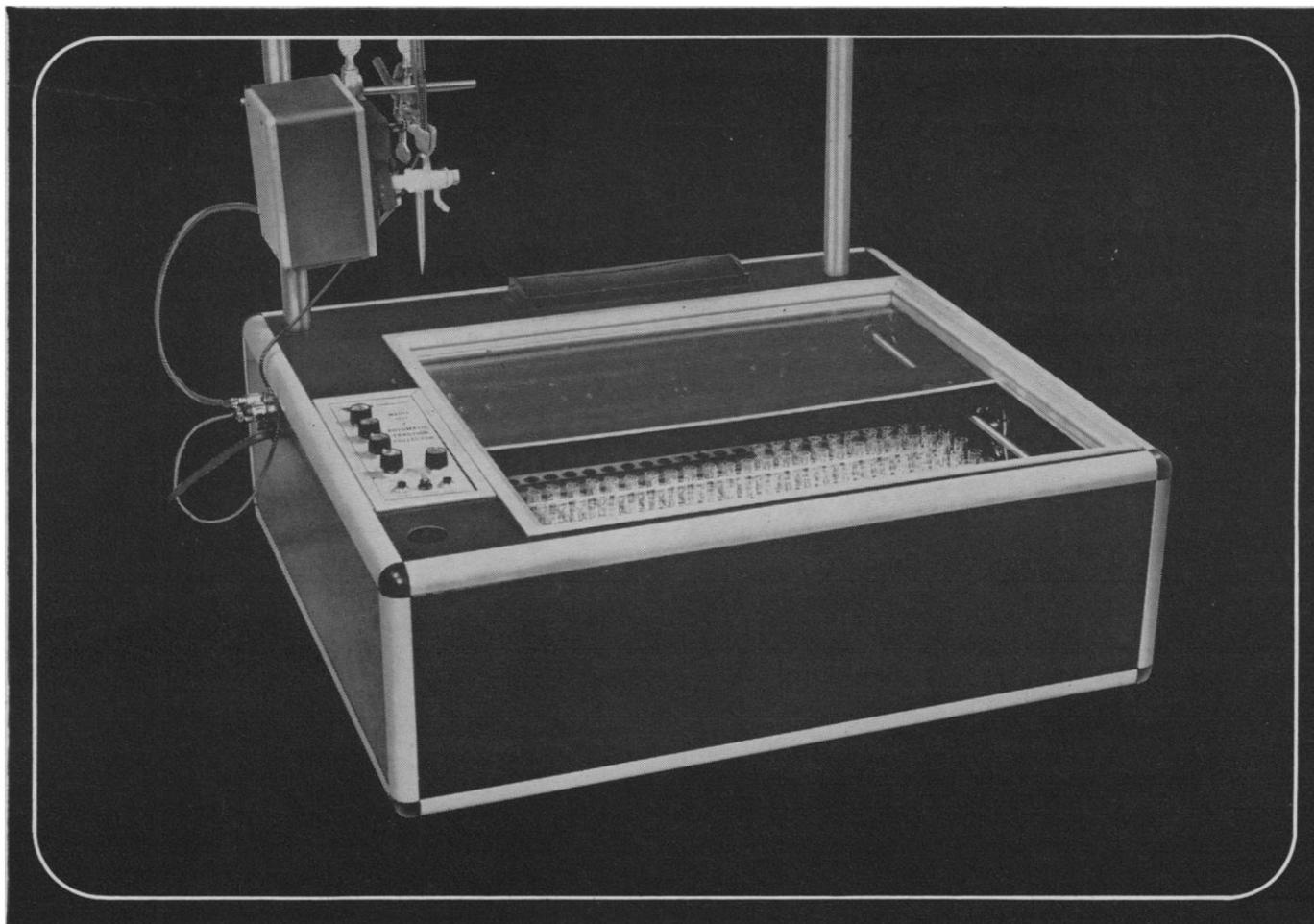
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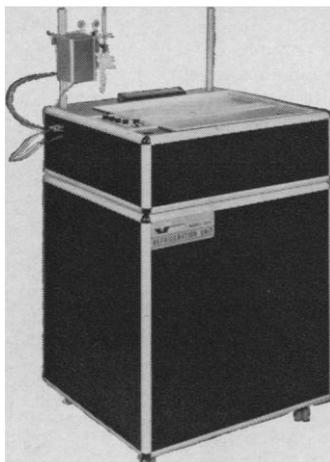
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## **new** automatic fraction collector

Vanguard's Model 1011 Automatic Fraction Collector provides the investigator with far greater reliability plus ease of operation plus extremely large test tube capacity—and at a price that makes this instrument available to every laboratory. Here are a few of the features that make Model 1011 Automatic Fraction Collector a remarkable instrument: ■ Space-saving design—Model 1011 measures only 29" wide, 8" high, and 26" deep ■ 400 test tube capacity—tubes contained in eight independently removable stainless steel trays (each tray holds 50 standard size test tubes of 13mm., 15mm., 16mm., or



**Model 1011 Fraction Collector may be used with the new Model 1012 Refrigeration Unit. This accessory transforms Model 1011 into a DRY Refrigerated Fraction Collector. Model 1012 measures only 29" wide, 29" high, 26" deep, and is thermostatically controlled.**

18mm.) ■ Three sturdy 4-foot stainless steel support tubes in triangular configuration for rigidity ■ Time, Drop and Volumetric capability are all standard at no extra cost ■ Solid state electronics ■ Sliding, clear glass Dust Cover protects test tubes from external contamination ■ No siphons needed with unit.

For complete specifications on the Model 1011 Automatic Fraction Collector and the Model 1012 Refrigeration Unit (shown at left), send for new informative brochure. For immediate information and/or a quotation, call your nearest Vanguard office.



**Designers and Manufacturers of Precision Instrumentation for Research • P. O. Box 244, LaGrange, Illinois 60526, FL 2-1600**  
 New York, 103 Park Ave., Suite 1204, TN 7-1998 • Boston, 1156 Broadway, Somerville, 491-4589  
 San Francisco, 115 New Montgomery St., EX 2-0511 • Baltimore, 217 North Calvert St., 727-3666  
 Houston, 1213 Capitol Ave., CA 5-5757 • Los Angeles, 9460 Wilshire Blvd., Suite 414, Beverly Hills, 275-3567

*The Problems of  
Precise Measurements of  
Signal Waveforms in Noise*

## **NONE OF THE "SIGNAL AVERAGING" DEVICES NOW AVAILABLE REALLY AVERAGE SIGNALS**

**EXCEPT NORTHERN SCIENTIFIC'S  
NS-513 DIGITAL MEMORY OSCILLOSCOPE**

**W**hat these non-averaging "signal averagers" really do is add the recurrent waveforms. It is up to the customer to do the last tedious step, determine the number of signals that were totalled, and divide data points of interest by that number, if he wants absolute rather than relative values.

So urgent is the need to measure recurrent signals obscured by noise, nobody has complained very much.

But in Northern Scientific's Model NS-513 Digital Memory Oscilloscope, the recorded and displayed data have the dimension volts, not volt-seconds. A reading of 892 means 892 millivolts, and doesn't keep increasing in magnitude as more signals occur.

In this instrument each of the 512 data points approaches its final value in almost exactly the way a heavily damped galvanometer approaches its final value, in the case of measuring a d. c. voltage. As in the case of the damped galvanometer, voltage excursions due to noise have only the slightest effect on the position of the galvanometer, even if the noise spikes have much greater amplitude than the signal. By very close analogy, the recorded data points in the Northern Scientific instrument approach final values at rates determined by the operator-selected time constant, which can be as short as two seconds or as long as several hours.

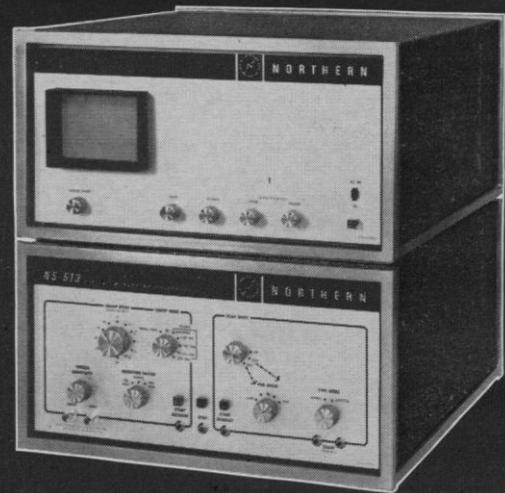
The entire waveform, as recorded, is heavily damped and after reaching its near-final value, is almost unaffected by even a large number of persistently incorrect input signals. The operator may, of course, use a short time constant initially to obtain a quick approximation.

A few outstanding features of the NS-513 follows: Delivers direct voltage readings, not readings which depend upon sweep speeds and the number of signals averaged. No more growing, moving displayed waveforms, no more ambiguities... Provides 0.1% accuracy... Uses all silicon semiconductors... Has built-in typewriter controls... Provides point by point, or subtotal, digital readout for easy integration... Has reversible sweep... Has trigger circuits that respond to external trigger pulses or prominent signal features.

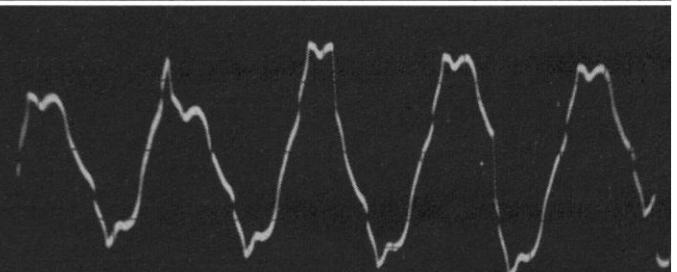
For further information, write for our new brochure, price and delivery information, or phone (608/238-4741).



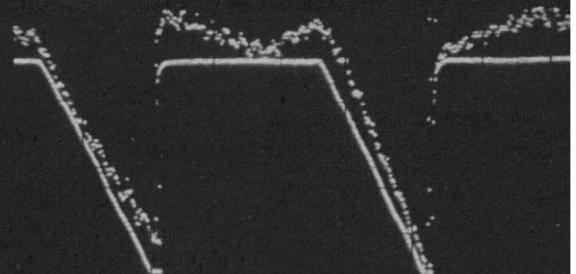
**NORTHERN  
SCIENTIFIC/INC.**  
P.O. 5247 MADISON, WISCONSIN 53705



NOISY SIGNALS now clearly seen in a truly easy and excitingly new way... with the NS-513 Digital Memory Oscilloscope (above).



Noise and signal, as seen by standard oscilloscope at input to Model NS-513 Digital Memory Oscilloscope.



A quick measurement with a short time constant produces a reasonable first approximation, as shown by the jagged line of this multiple exposure photograph. Switching to a more appropriate time constant and measuring for several minutes produced the more accurate final waveform shown superimposed.



A complex waveform indicating the time resolution available with 512 coordinate points.



# AUTOMATED ELEMENTAL ANALYZERS for direct oxygen; for carbon-hydrogen

## For Direct Oxygen Determination

The Coleman Model 36 Oxygen Analyzer is an automated combustion instrument for the direct determination of oxygen content in liquid and solid materials. Direct determination provides results which are independent of the errors associated with determination by difference.

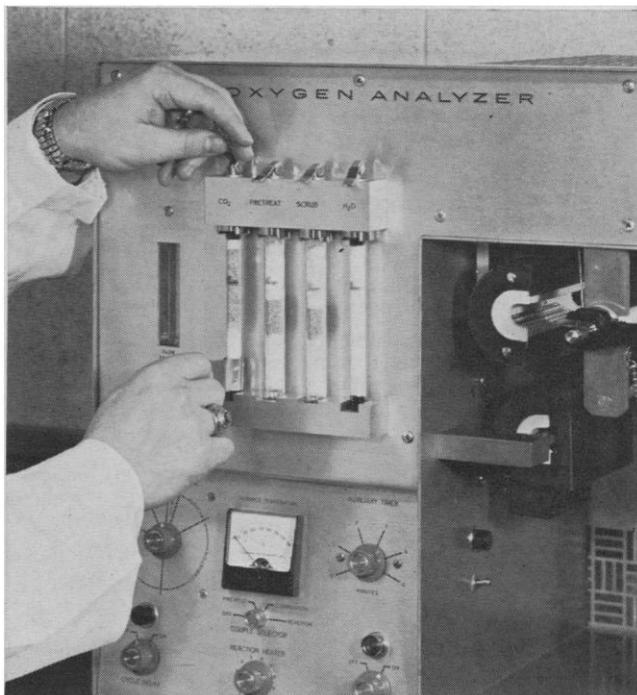
The instrument automatically performs a modified version of the Unterzaucher method for direct oxygen. The use of a special platinized carbon catalyst permits conducting the procedure at 180° C. below the conventional procedure; this improves reproducibility and lengthens component life.

Automatic operation—performing repetitive operations in exactly the same manner, delivers data faster, easier and with considerably more precision than manual methods.

The instrument is ideal for applications in pharmaceutical, rubber, plastics, organics and petroleum research and control laboratories as well as in academic research.

Condensed Specifications:
Sample . . . any material that pyrolyzes at temperatures up to 900° C.
Sample size . . . from 2 to 30 milligrams.
Operating cycle . . . 21 minutes.
Accuracy . . . results correspond to theory $\pm 0.3\%$ oxygen.
Readout . . . gravimetric.

Ask for Bulletin SB-292



## For Carbon-Hydrogen Analysis

An instrument for the laboratory determination of carbon and hydrogen, the Coleman Model 33 automatically performs the accepted Pregl method. It provides great advances in speed, precision, and convenience over the manual method by exactly reproducing the essential conditions of the analysis.

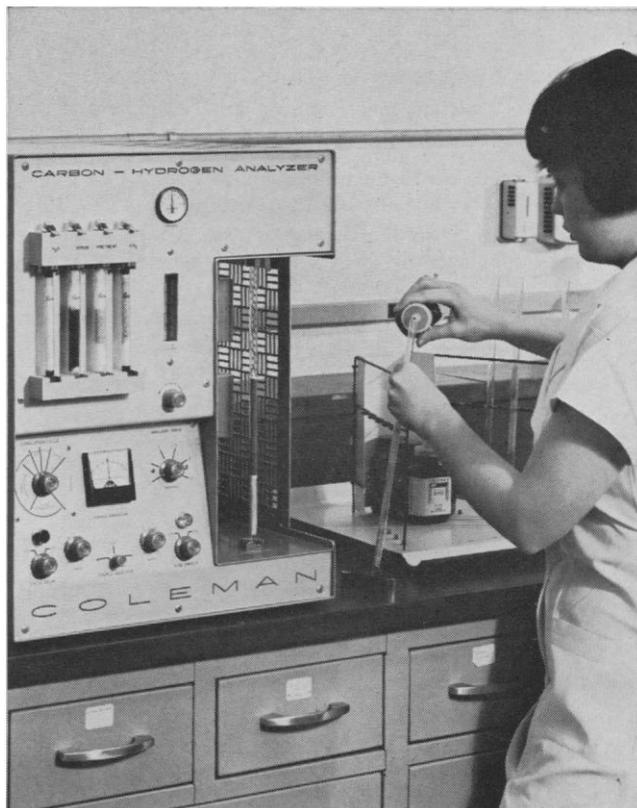
In operation, the instrument burns a micro sample in an atmosphere of high-purity oxygen, separating the sample into its elemental constituents. Hydrogen is converted to water; carbon is converted to carbon dioxide. These compounds are absorbed in separate absorption tubes and the values easily calculated after differential weighing of the absorption tubes.

The instrument makes complete determinations of carbon and hydrogen within an 8-minute operating cycle. Routine analyses can be completed at the rate of 4 to 5 per hour.

The Coleman Model 33 is valuable in research and product control laboratories is working with a wide variety of materials including pharmaceuticals, petroleum, heavy chemicals, plastics and organics.

Condensed Specifications:
Sample . . . any material that pyrolyzes at temperatures up to 1000° C.
Sample size . . . 2 to 50 milligrams.
Operating cycle . . . 8 minutes.
Accuracy . . . results correspond to theory $\pm 0.2\%$ carbon, $\pm 0.2\%$ hydrogen.
Readout . . . gravimetric.

Ask for Bulletin SB-273



COLEMAN INSTRUMENTS CORPORATION • MAYWOOD, ILLINOIS 60154



# AUTOMATED NITROGEN ANALYZERS for micro samples; for larger samples

## For Micro Samples

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

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

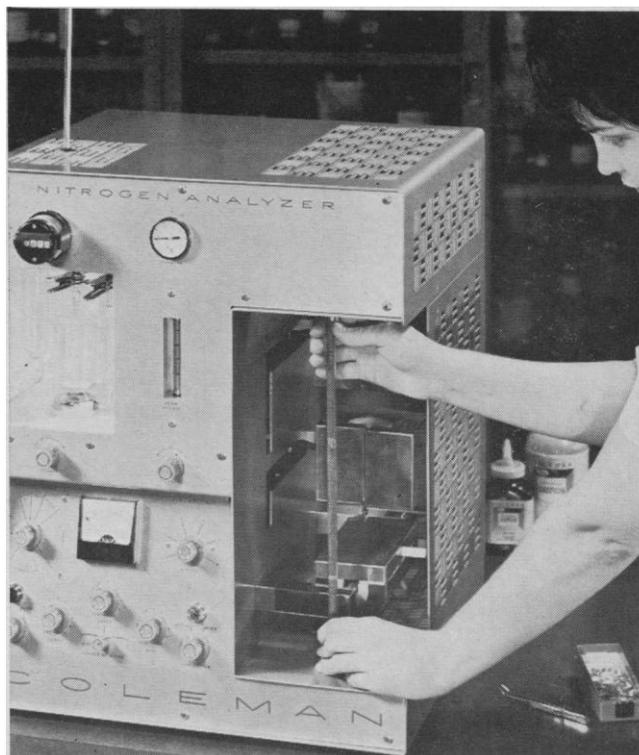
A special extraction technique, announced in a recent issue of ANALYTICAL CHEMISTRY, permits the instrument to be used for trace analysis with materials containing as little as 20 ppm nitrogen.

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

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

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

Ask for Bulletin SB-291



## For Larger Samples

Specially designed to meet requirements of materials that require extensive sample preparation before a representative sample can be obtained, the Coleman Model 29A accepts samples up to 50 milligrams. Even larger samples of inorganic materials are analyzed without difficulty.

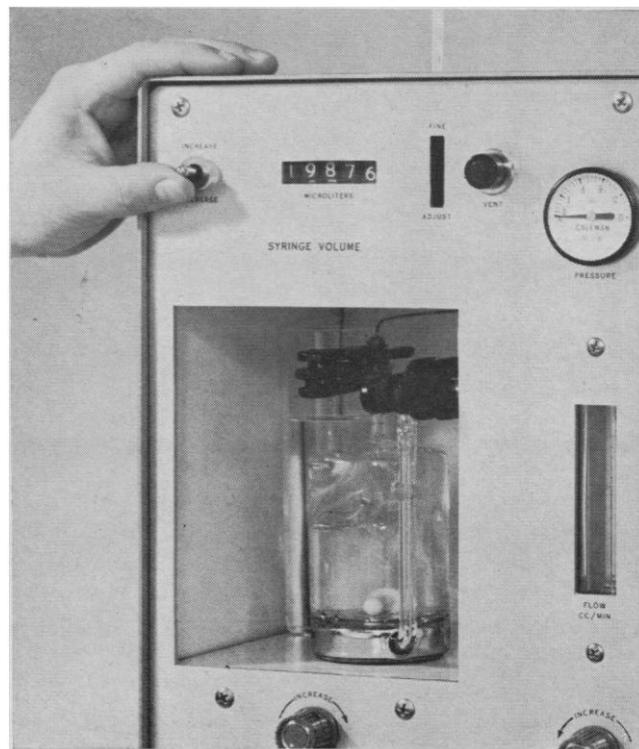
The instrument is finding wide application in laboratories working with such diverse materials as foods, feeds, grains, soils, fertilizers, milk products, and biological materials.

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

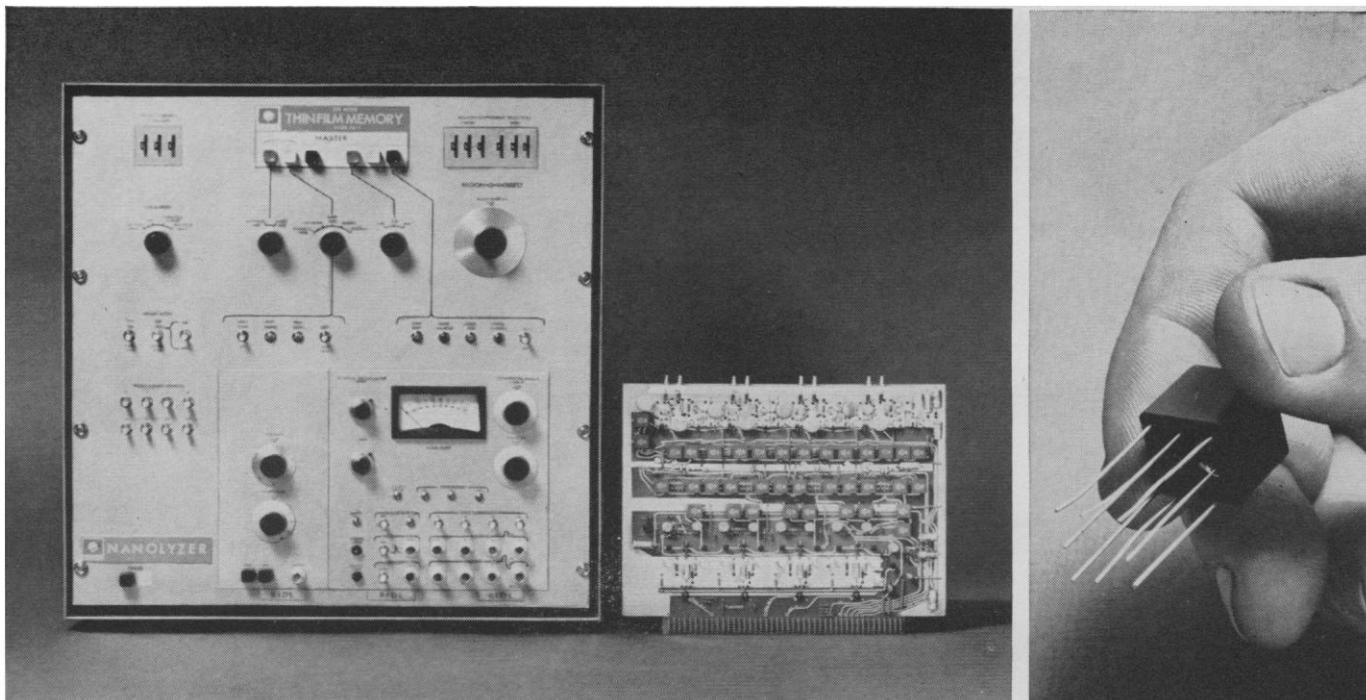
The Model 29A minimizes the work formerly required in preparing samples of non-homogeneous materials for microanalysis.

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

Ask for Bulletin SB-291



COLEMAN INSTRUMENTS CORPORATION • MAYWOOD, ILLINOIS 60154



The Nanolyzer is modular in design and construction. It uses printed circuit boards with functional logic groups on separate boards (illustrated with the Nanolyzer at left) The computer circuits use all-silicon transistor Snap-Logic elements (illustrated at right) to assure matched circuit components during servicing and replacement.

## THE NEW RIDL NANOLYZER\* OPENS TOTALLY NEW AREAS OF INVESTIGATION

The new RIDL Nanolyzer\* is an important advance in multi-channel pulse height analyzer design. It has removed the instrumentation limits, imposed by presently available analyzers, on new areas of investigation in high energy physics, fast radio-chemistry and like applications.

The principal advantage of the Nanolyzer is its ability to collect and handle more data per unit time with an unprecedented degree of accuracy. It accepts, analyzes, stores and displays data seven to fifty times faster than conventional analyzers. Central to this ability is the utilization of a 100 megacycle ADC providing a 10 nanosecond/channel address rate, Snap-Logic silicon elements and a thin-film memory plane.

In addition to the obvious advantage of high speed data acquisition for applications where high counting rates or very short counting times are encountered, the Nanolyzer effects im-

portant economies of time and cost in less demanding uses. Its data handling speed permits more efficient use of accelerator facilities, and results in more accurate data.

Important and unique features of the Nanolyzer follow:

**THIN-FILM MEMORY:** Memory cycle time of  $0.6 \mu$  sec. does not contribute to system dead time because of parallel data transfer from ADC. Capacity  $10^5$  or  $10^6$  counts for each of the 256 channels.

**ANALOG TO DIGITAL CONVERTER:** 100 megacycle crystal controlled, synchronized ramp start/stop, zero cross-over timed amplitude analysis, differential linearity of 2%, dynamic range 376 channels with digitally selected zero suppression of up to 120 channels without pulse distortion.

**INPUT CIRCUITS:** Double delay-line shaped pulses for rapid system recovery. Selective analysis only of pulses satisfying following criteria: delayed coincidence/anti-coincidence gate timed thru internal ANTI-WALK® Discriminator, unique pile-up rejection circuit, and upper/lower discriminators. Built-in four-channel mixer for one, two or four data inputs into one, two or four sub-groups without external logic.

**OPERATING MODES:** Six electronically interlocked push switches control all input/output functions. Add or subtract from PHA storage. Remote operating capability. Automatic preset live-

time or clock-time, or preset count operation in any selected channel. Entire memory or any selected part useable during data storage or display. Region-O-Interest\* control for selective readout of entire memory, halves, quadrants or between digitally selected upper and lower channel limits. Readouts through magnetic tape, parallel printers, punch tape, IBM typewriter and live external display.

**CONSTRUCTION:** Modular construction, plug-in printed circuit boards, all-silicon transistor Snap-Logic\* elements. Solid state throughout, functional and simple to use controls.

Would you like to know more about this remarkable Nanolyzer? We will be happy to send you more information and complete specifications. After critical evaluation, we believe that you will agree that the development of the Nanolyzer is one of the most significant advancements in multi-channel analyzer technology in recent years. Please write for literature.

NUC: R-4-229

\*Trademark of RIDL



### RIDL

A DIVISION OF NUCLEAR-CHICAGO CORPORATION  
4501 West North Ave., Melrose Park, Illinois 60160

SCIENCE, VOL. 144

new PICKER **2** in **1**  
**SPECTRO/DIFFRACTOMETER**  
*x-ray emission / x-ray diffraction*

**always ready for either technique**  
**two permanently mounted x-ray tubes preclude changeover downtime**

**use this tube for fluorescence analysis**

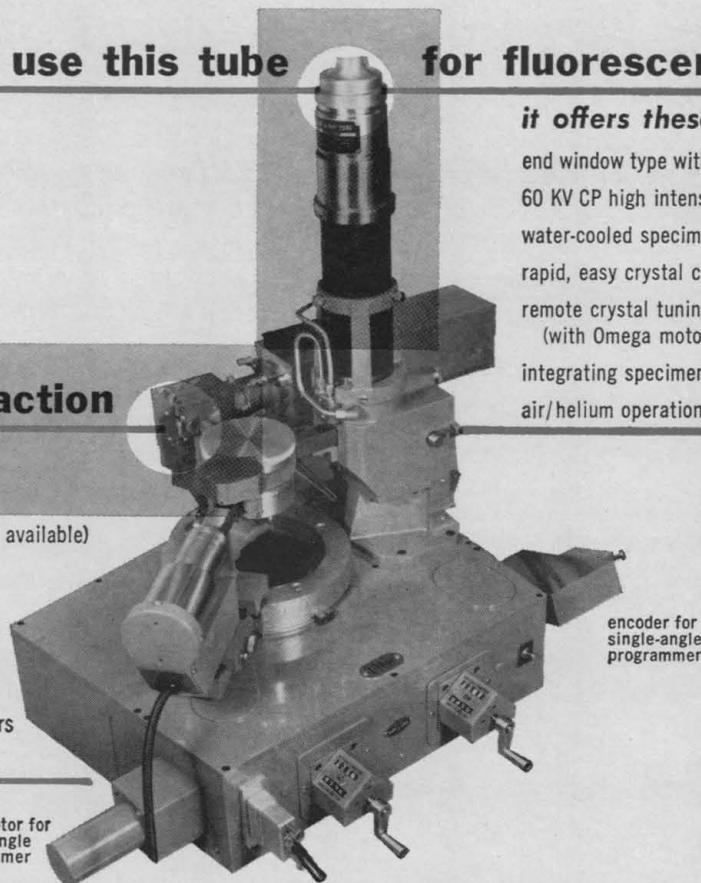
*it offers these advantages*

- end window type with W, Mo, Cr, or Pt target
- 60 KV CP high intensity radiation
- water-cooled specimen chamber
- rapid, easy crystal changing
- remote crystal tuning (with Omega motor)
- integrating specimen spinner
- air/helium operation (10 second flush)

**this for x-ray diffraction**

*it offers these advantages*

- constant potential operation
- variety of focal spots (.4, .75 and 1.5 mm available)
- both Omega and 2-Theta scanning
- electrically operated shutters
- take-off angle easily adjustable (without disturbing beam alignment)
- track-mounted specimen and detector supports
- complete set of slits or pinhole collimators



The Picker Two-in-One SPECTRODIFFRACTOMETER provides uniquely versatile technical resources for a minimal outlay. It will find particular welcome in the laboratory where both diffraction and emission analyses may be required on the same specimen: one can follow the other by simple switchover (no need to interchange and/or align components). The instrument's instant readiness to tackle either job commends it to the small laboratory where scant space or stringent budget permits investment in only one goniometer.

To get the detailed story of these remarkable instrumental advances, call any local Picker representative or write PICKER X-RAY CORPORATION, WHITE PLAINS, N.Y.

**another advance ...**

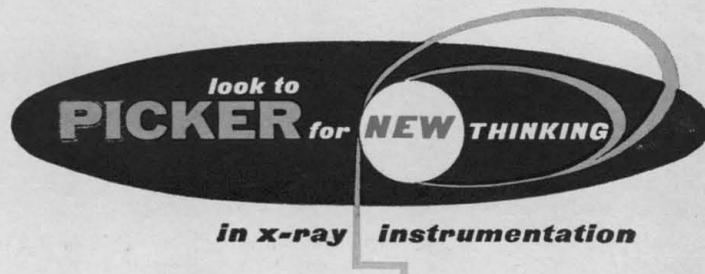
**automatic single-angle programming**

The attachments seen jutting from the diffractometer base in the picture above are the slew motor and encoder for the Picker Single-Angle Programmer.

The programmer will automatically analyze

- up to 10 elements by x-ray emission techniques
- or up to 5 pairs of Bragg angles by diffraction

Operating unattended, it can save countless manhours in situations where much sequential work is to be done.



# Electrically switched three-speed chart drive Full-range attenuation Elimination of undesirable A.C. signals...

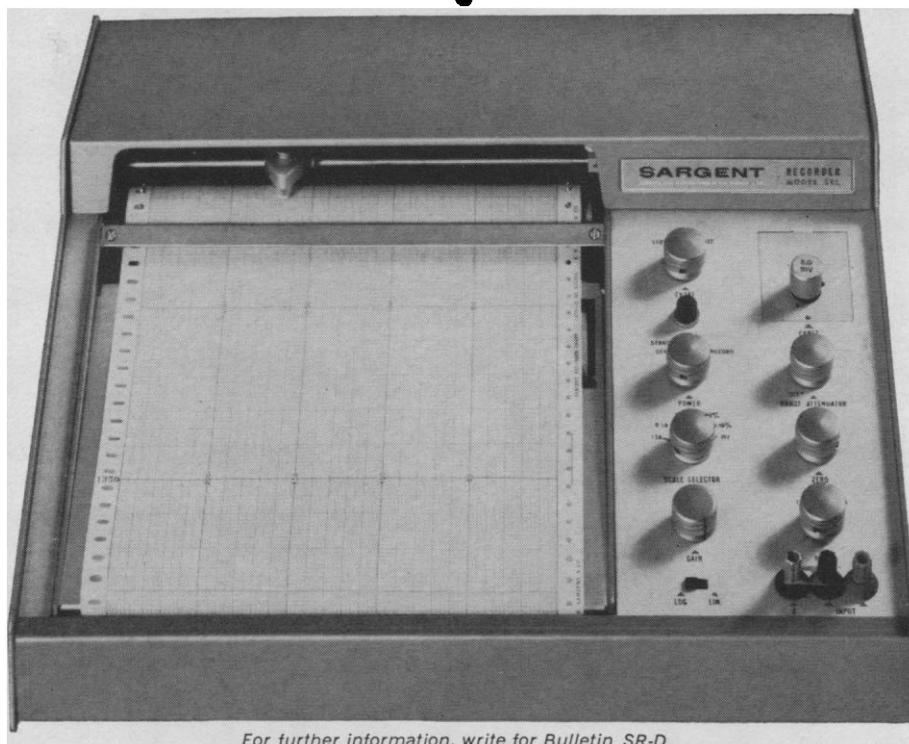
## ***Give new versatility to Sargent SR Recorders***

(Models SR, SR-GC, SRL)

Electrical switching mechanism provides instantaneous change to any of three different chart speeds during recording. System eliminates conventional gear shifting lag and time error. Range attenuator control, in conjunction with various accessory range plugs, provides contin-

uous full-scale range adjustment from 0.4 to 125 mv. Four-position filter control filters out A.C. signals (as from gas chromatographs) that may be superimposed on D.C. voltage being measured. Also eliminates unwanted switching mechanism impulses.

*PLUS... 250mm chart ■ Four microvolts/mm sensitivity ■ 1/4% accuracy ■ One-second balancing speed ■ High source-resistance tolerance ■ Interchangeable ranges: 125 mv range built in, plug-in resistors provide seven additional ranges ■ 12 stock chart speeds available for use in three-speed chart drive system ■ Zero displacement ■ Ideal visual work presentation*



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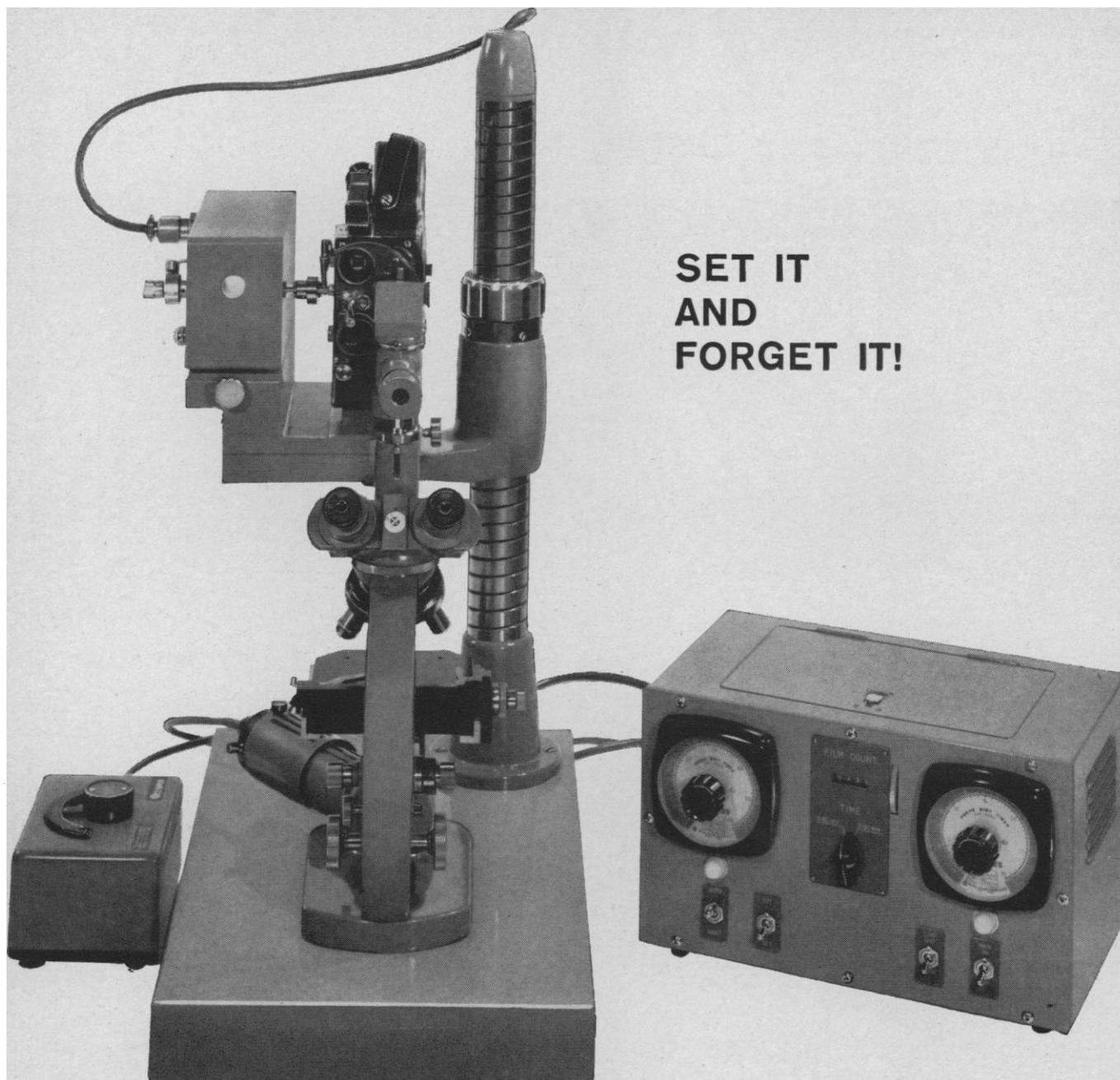


COAT BY PAULINE TRIGERE. HAT BY ADOLFO. CALCULATOR BY MONROE. PHOTOGRAPHED AT THE GUGGENHEIM MUSEUM BY HIRO.

**Breathtaking!** Beautiful though it is, there's far more than meets the eye to this new Monroe-Matic® calculator. For underneath its strikingly contemporary facade are the workings of the fastest, simplest, most automatic standard calculator ever devised. Yet it's

priced comparably to those far less accomplished machines it has outmoded. As your local Monroe representative will be pleased to demonstrate. Call him. Or write us. Monroe Calculating Machine Company, Inc., Orange, New Jersey. **MONROE** 

A DIVISION OF THE BUSINESS MACHINES GROUP OF LITTON INDUSTRIES



**SET IT  
AND  
FORGET IT!**

## **New, Elgeet-Olympus high-precision Micro-Cinematographic Apparatus for time-lapse photography**

Take clear, brilliant 8mm or 16mm movies through a standard microscope. Primarily designed for microscopes having a vertical tube.

The viewer of Model 2600 permits observing the image while shooting the picture, and its auto-timer makes possible slow-speed picture taking. The use of an Elgeet-Olympus Exposure Meter Model EMM-IV is recommended for obtaining the most favorable exposure.

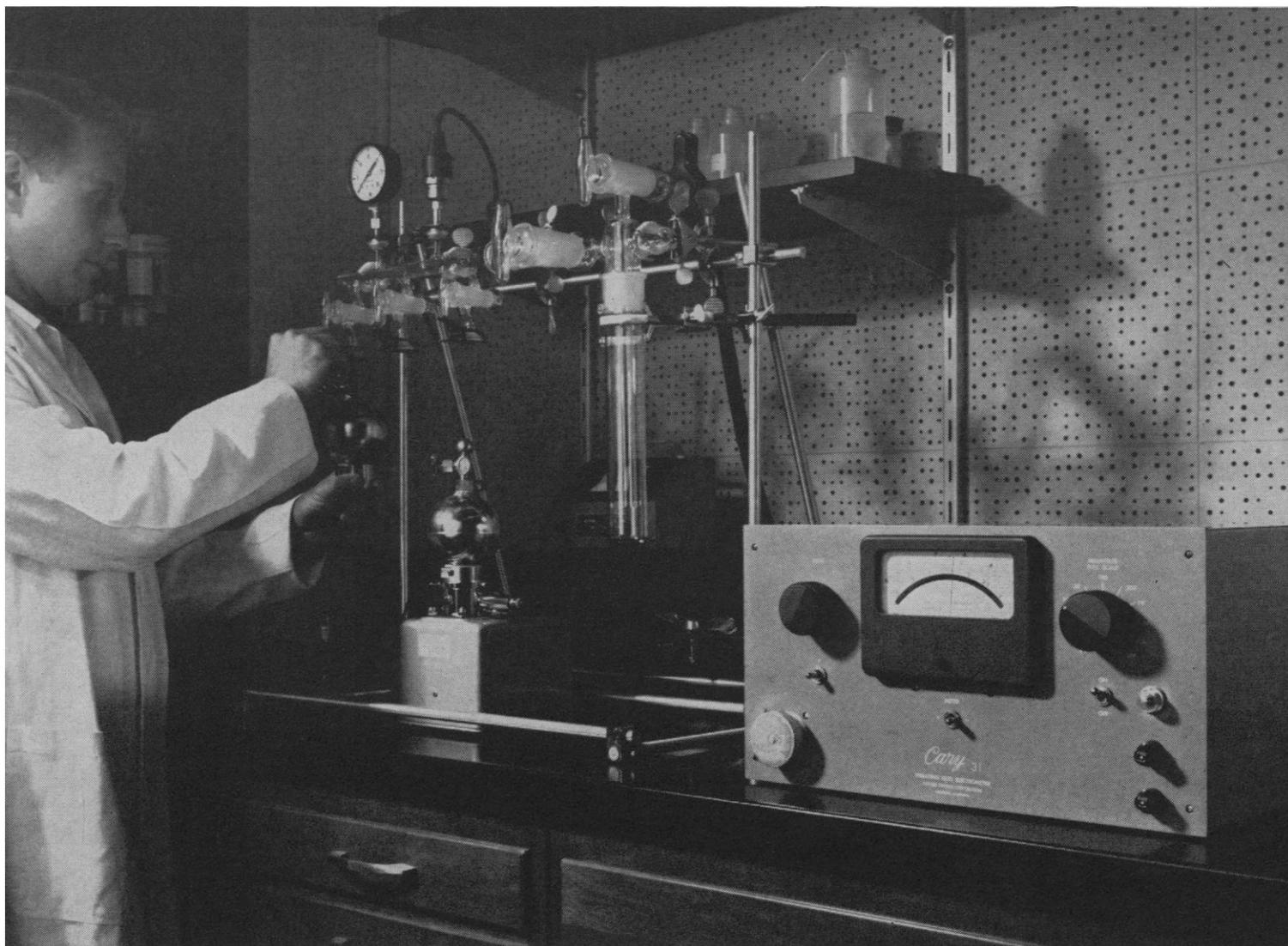
PHOTOGRAPHIC MAGNIFICATION—Any good 16mm or 8mm can be used.  
16mm . . . . . 0.28 times total magnification of microscope.  
8mm . . . . . 0.4 times total magnification of microscope.

A selection of models is available for various cameras and purposes. Components, such as Power Pack, Drive Mechanism and Stand, may also be purchased separately. For full information, write Elgeet Optical Co., Inc., 303 Child Street, Rochester, New York 14611.

***Elgeet***

# CARY MODEL 31 VIBRATING REED ELECTROMETER

with ion chamber...for precise direct measurement of  $C^{14}$  or  $H^3$  in gases



*For details on Cary Model 31 and Ion Chambers send for Data File E-303-54*

**Model 31 detects less than 3 dpm  $C^{14}$ /cc air** with Cary 250-cc ion chamber, provides measurements reproducible to better than 1%, and operates for months with a single calibration. It is ideal for simplifying measurement of either gaseous or combustible non-gaseous radioactive samples. Gaseous samples to 250°C are collected in or passed through the ion chamber for static or continuous flow measurements. Far more precise and sensitive than liquid trapping equipment, a Model 31 with ion chamber costs less than \$2,000.

APPLIED PHYSICS CORPORATION  
2724 SOUTH PECK ROAD · MONROVIA, CALIFORNIA

*Cary*  
INSTRUMENTS

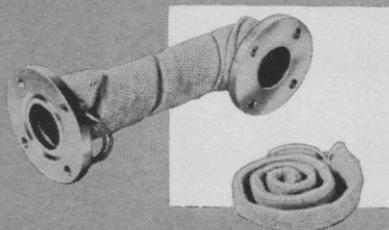
*Vibrating Reed Electrometers & Amplifiers • Raman/UV/IR Recording Spectrophotometers • Spectropolarimeters*

# Electrothermal<sup>®</sup>

THE INTERNATIONALLY RECOGNIZED  
QUALITY NAME

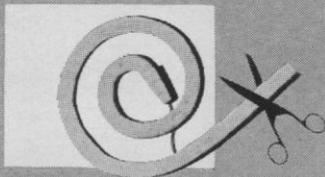
## HEATING TAPES

Unique "wind-on" surface heaters maintain controlled temperatures on complexly contoured surfaces. Rugged, flexible, reusable . . . available in a wide range of types to suit every requirement.



### SERIES HT3 & HT6

Knitted in a variety of standard lengths and widths, HT3 maintains temperatures up to 450°C (842°F) . . . HT6, heavy duty woven tapes.



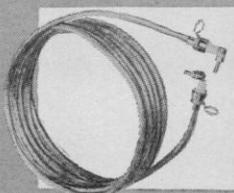
### HEAT-BY-THE-YARD

Dispenser packs of knitted Heating Tapes. You cut the length you need.



### THERMOCORD

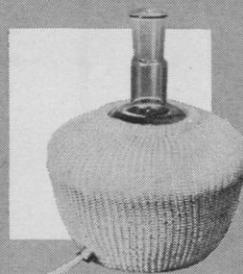
For higher concentration of heat in smaller areas . . . Type 1 glass insulated, Type 2 quartz insulated.



### ARMORED HEATERS

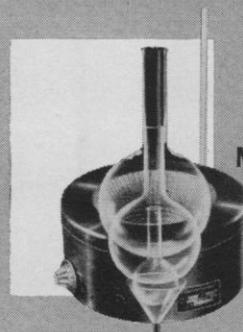
Heavy duty for rapid rate heat transfer up to 800°C (1472°F).

## HEATING MANTLES



SERIES MG

Light, flexible, grounded Electrothermal Heating Mantles feature an ingenious elastic neck opening and adaptability for use on bench or suspended on the flask. Enclosed top minimizes heat loss and yet observation remains unimpaired. Full range of sizes to fit all flasks.



MULTI-MANTLE

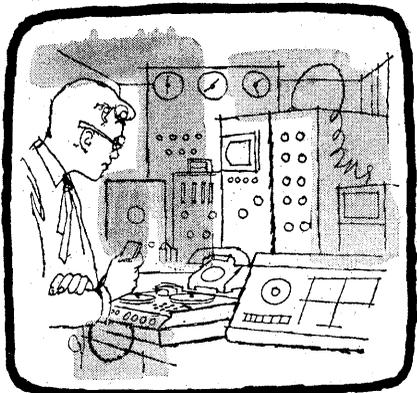
Most practical of all heating mantles where bench space is at a minimum, because MULTI-MANTLE is actually ten heating mantles in one! Safe, efficient heat transfer thanks to the unique Electrothermal knitted flexible conical element.

■ For complete catalog of globally famous Electrothermal laboratory equipment and name of your nearest dealer . . . WRITE . . .

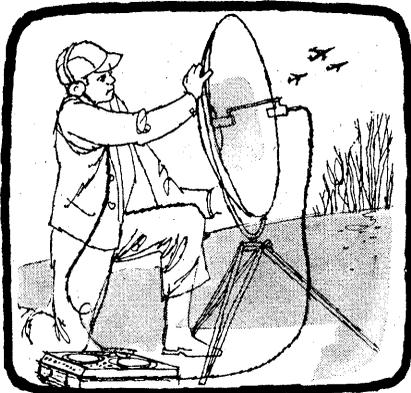
**ELECTROTHERMAL**

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New York, N.Y. 10017

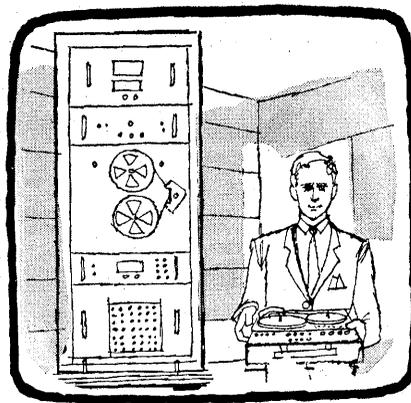
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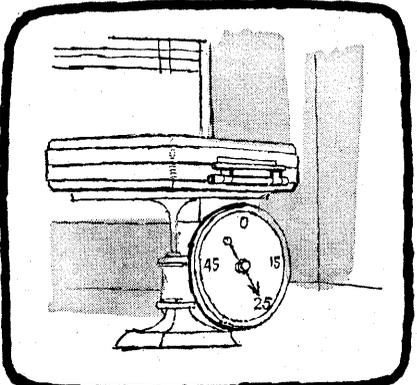
IF YOU ARE RECORDING IN THE LAB...



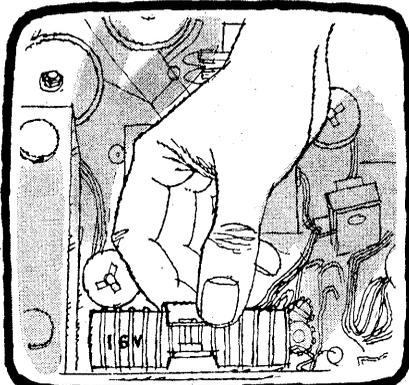
OR IN THE FIELD, YOU CAN NOW...



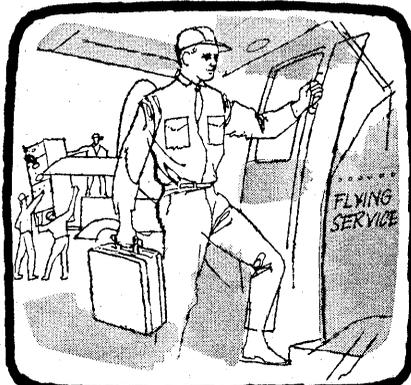
GET PRECISION PERFORMANCE...



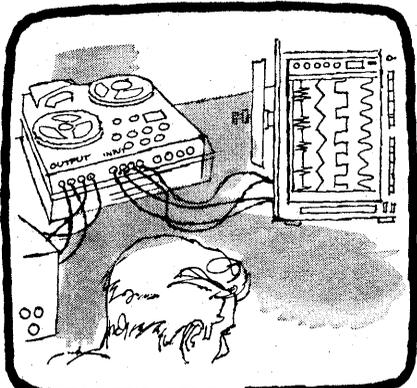
IN A 25-POUND RECORDER/REPRODUCER



THAT IS COMPLETELY SELF-POWERED,



CAN BE HAND-CARRIED ANYWHERE.

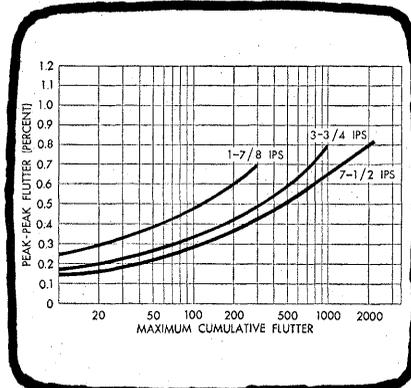


CAN SIMULTANEOUSLY RECORD/REPRODUCE  
4 TRACKS,

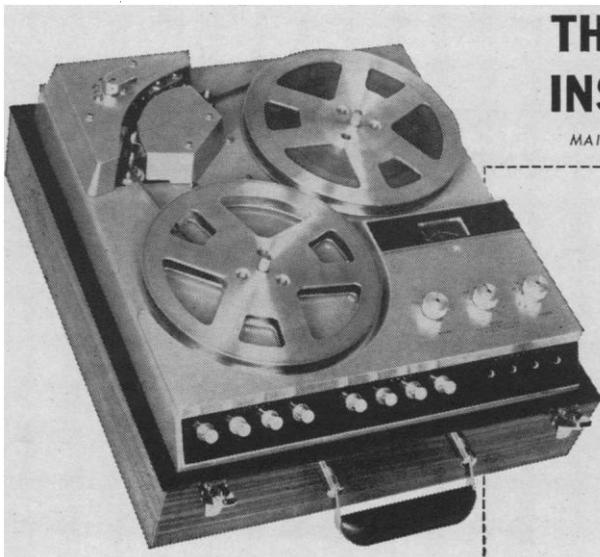
DIRECT SYSTEM	
*Tape Speed	Frequency Response $\pm 3$ db
1 7/8	100-5,000
3 3/4	100-10,000
7 1/2	100-20,000
FM SYSTEM	
Tape Speed	Frequency Response $\pm 1/2$ db
3 3/4	0-1,000
7 1/2	0-2,000

*\*optional speeds available*

FM OR DIRECT,



WITH EXTREMELY LOW FLUTTER



# THE NEW LOCKHEED 411 INSTRUMENTATION RECORDER

MAIL COUPON TODAY FOR FULL INFORMATION OR PHONE 201-549-5000

LOCKHEED ELECTRONICS COMPANY/TAPE PRODUCTS DEPT.,  
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Mr. Bernard Mayer: Send me free product specification folders  
on the Lockheed 411 instrumentation recorder/reproducer.

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S5

# MODEL SF/1

# FLUORISPEC

## FLUORESCENCE SPECTROPHOTOMETER



### NEW

Fluorispec, Baird-Atomic's Model SF-1 Fluorescence Spectrophotometer is a completely new, compact instrument which successfully combines the advantages of spectrophotometry with the inherent sensitivity of fluorescence measurement!

### HIGH RESOLUTION

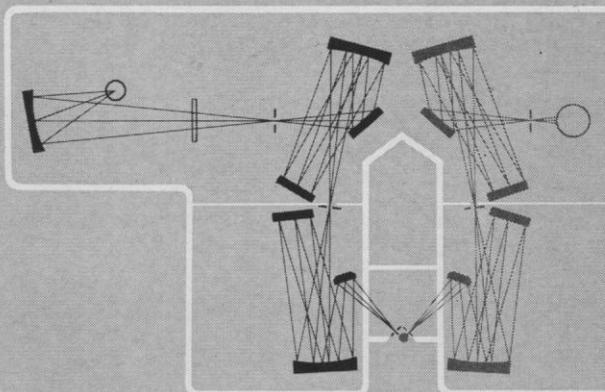
Fluorispec's high resolution and the low-scattered light of its two dual-grating monochromators augments the high specificity of fluorescence assay in identifying unknown compounds!

### WELL-DESIGNED OPTICS

Fluorispec's highest quality optics give reliable, reproducible results. Also featured are automatic/manual scanning and a choice of slit widths!

### ULTRA-HIGH SENSITIVITY

Fluorispec's ultra-high sensitivity permits assay of fluorescent compounds in the parts-per-billion range!



### TWO DOUBLE MONOCHROMATORS

Fluorispec's two dual-grating monochromators provide low-scattered light, high dispersion, and excellent sensitivity. The first double monochromator provides excitation energy, and an identical double monochromator is used for observation of fluorescent spectra.

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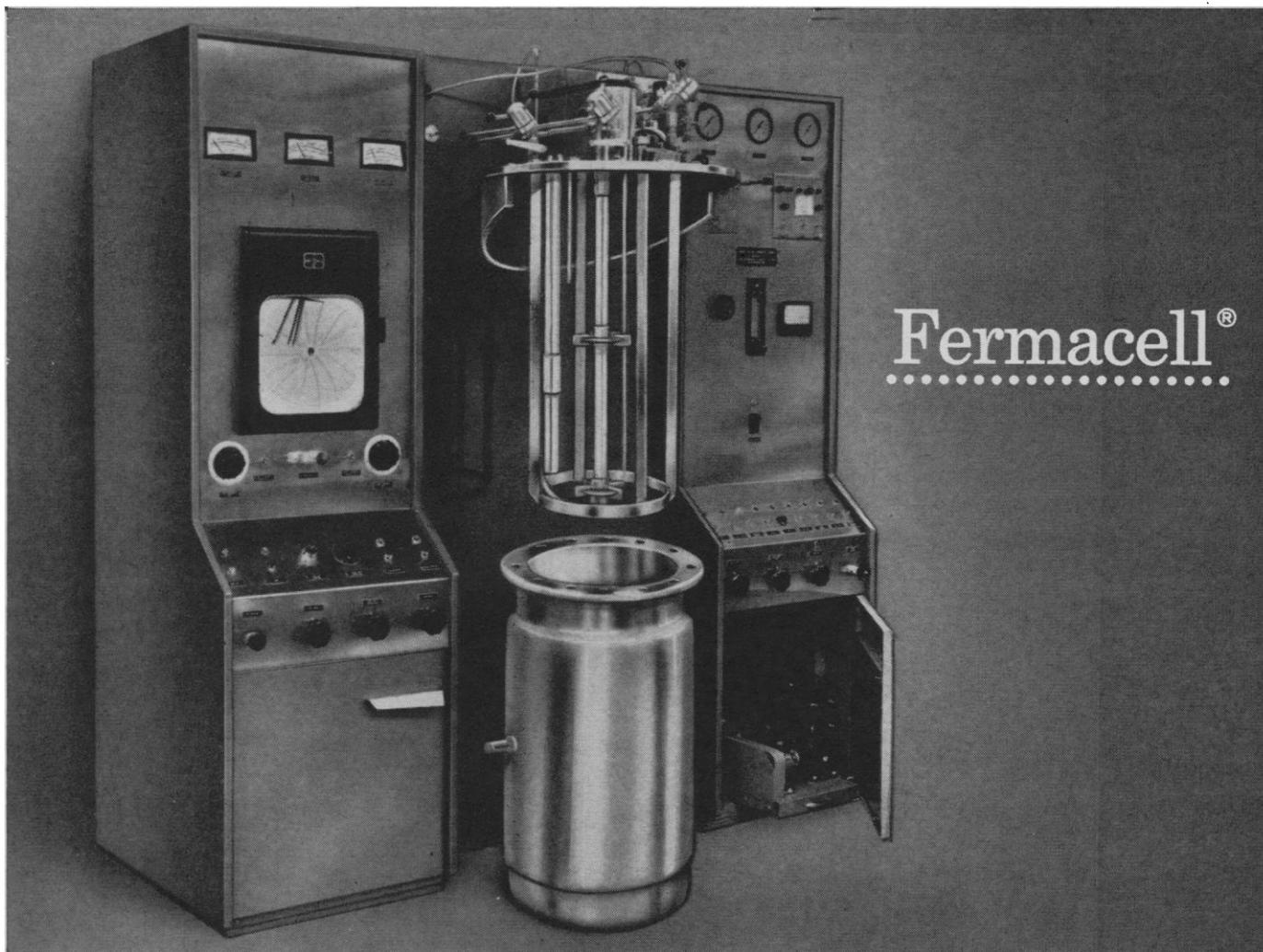


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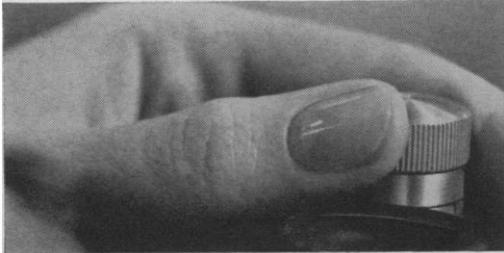
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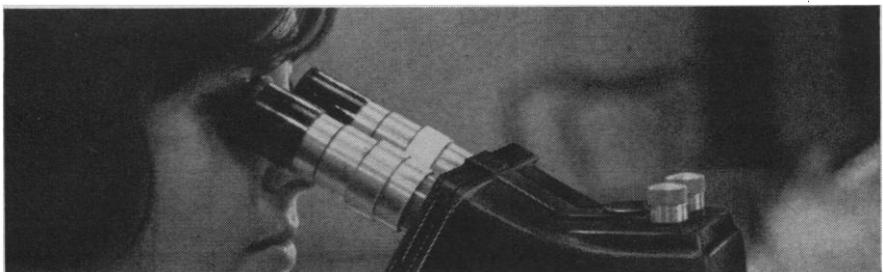
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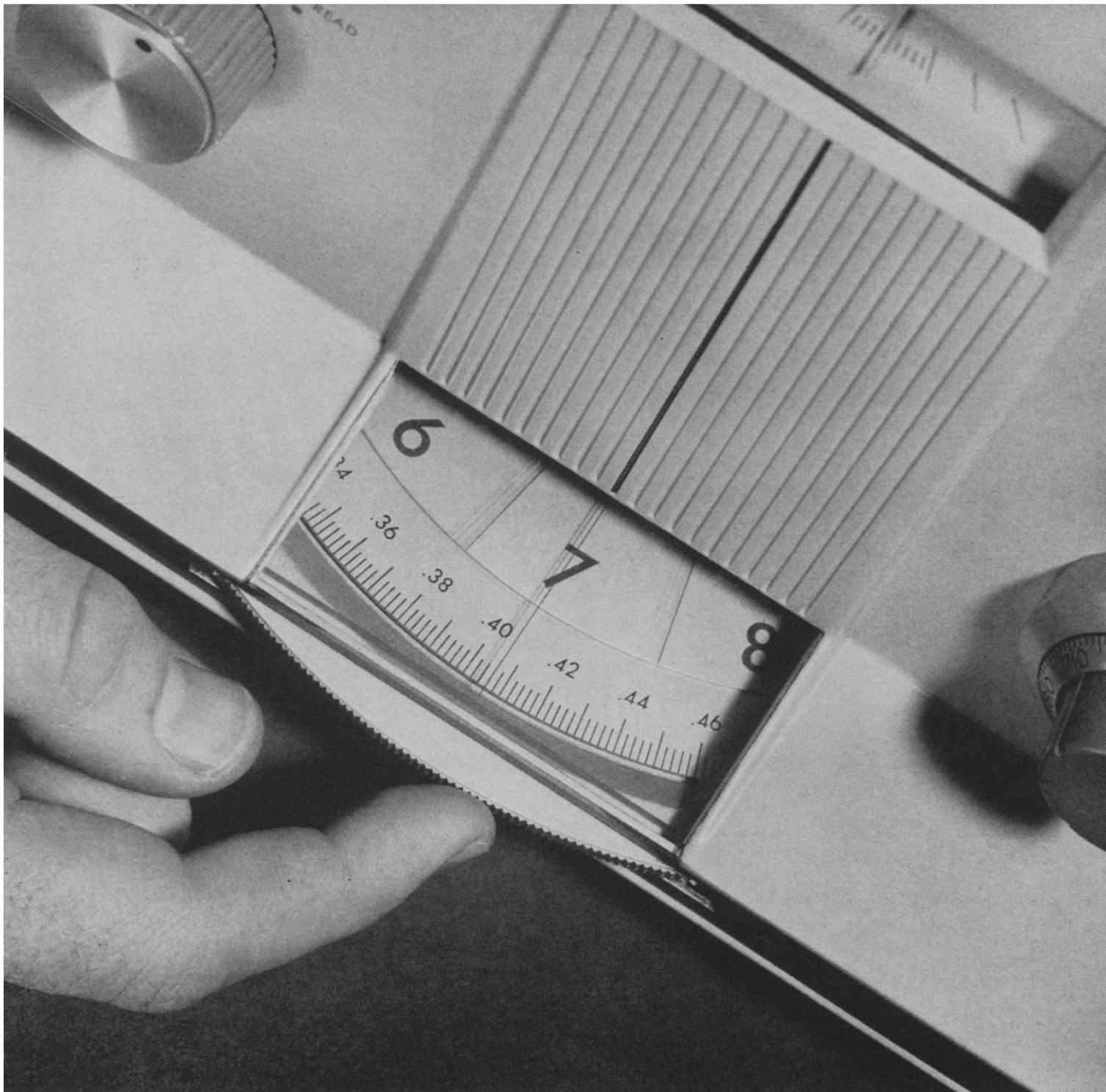


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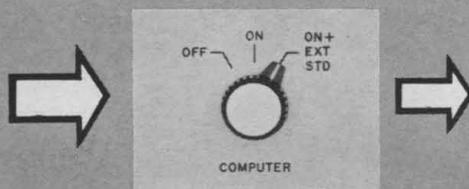
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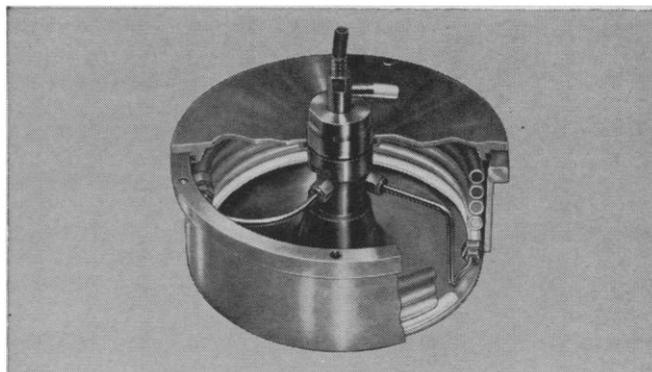
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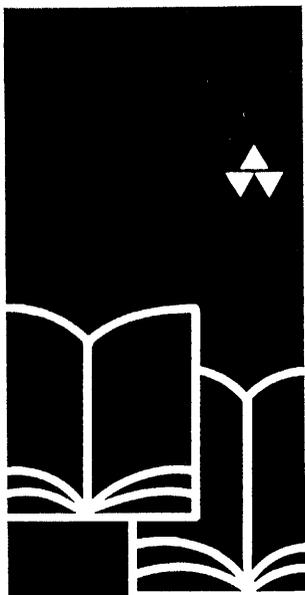
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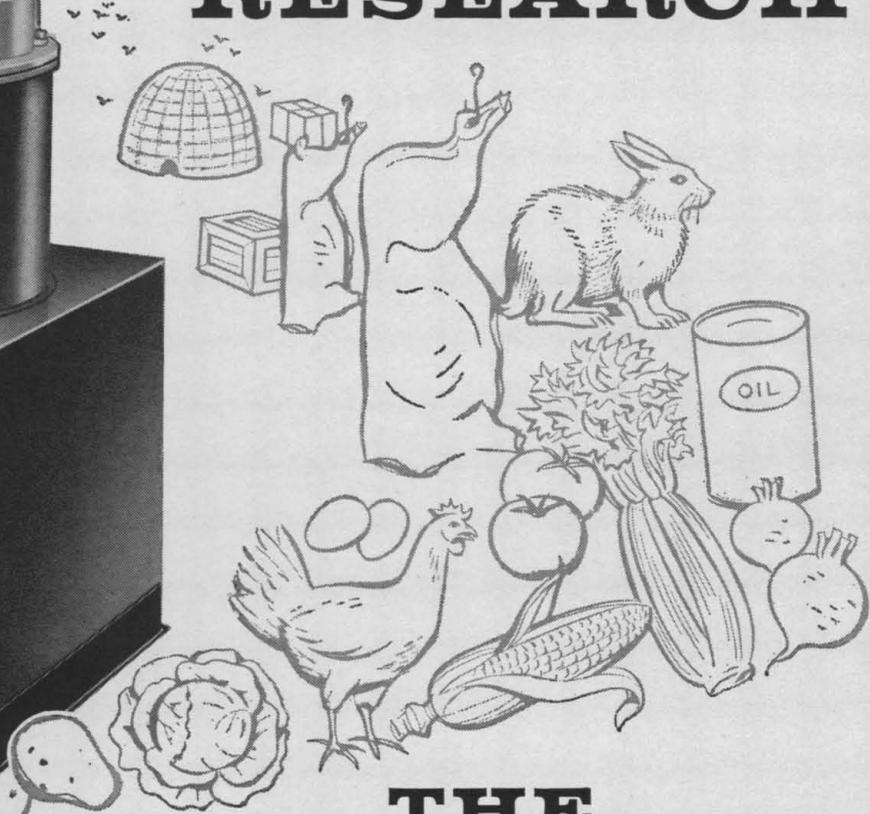
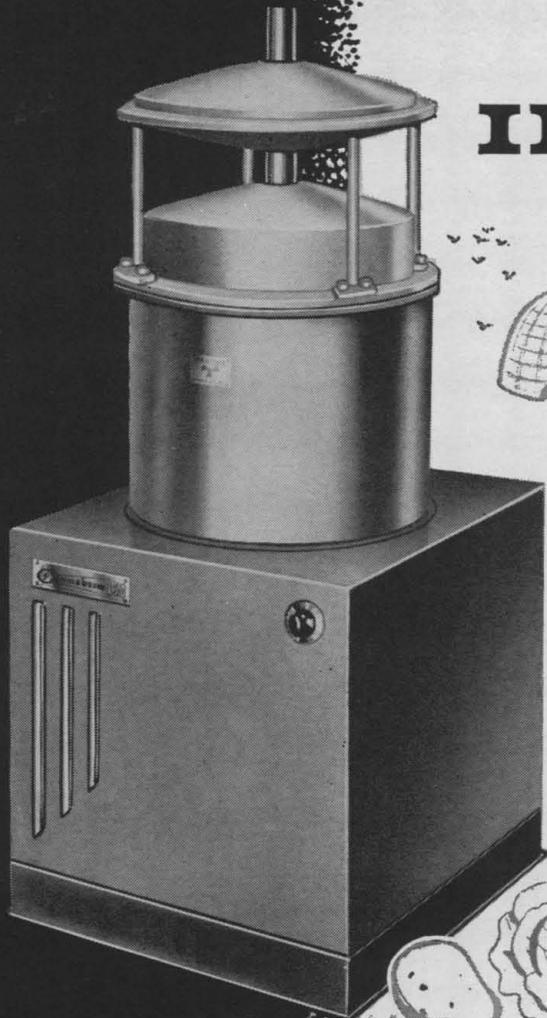
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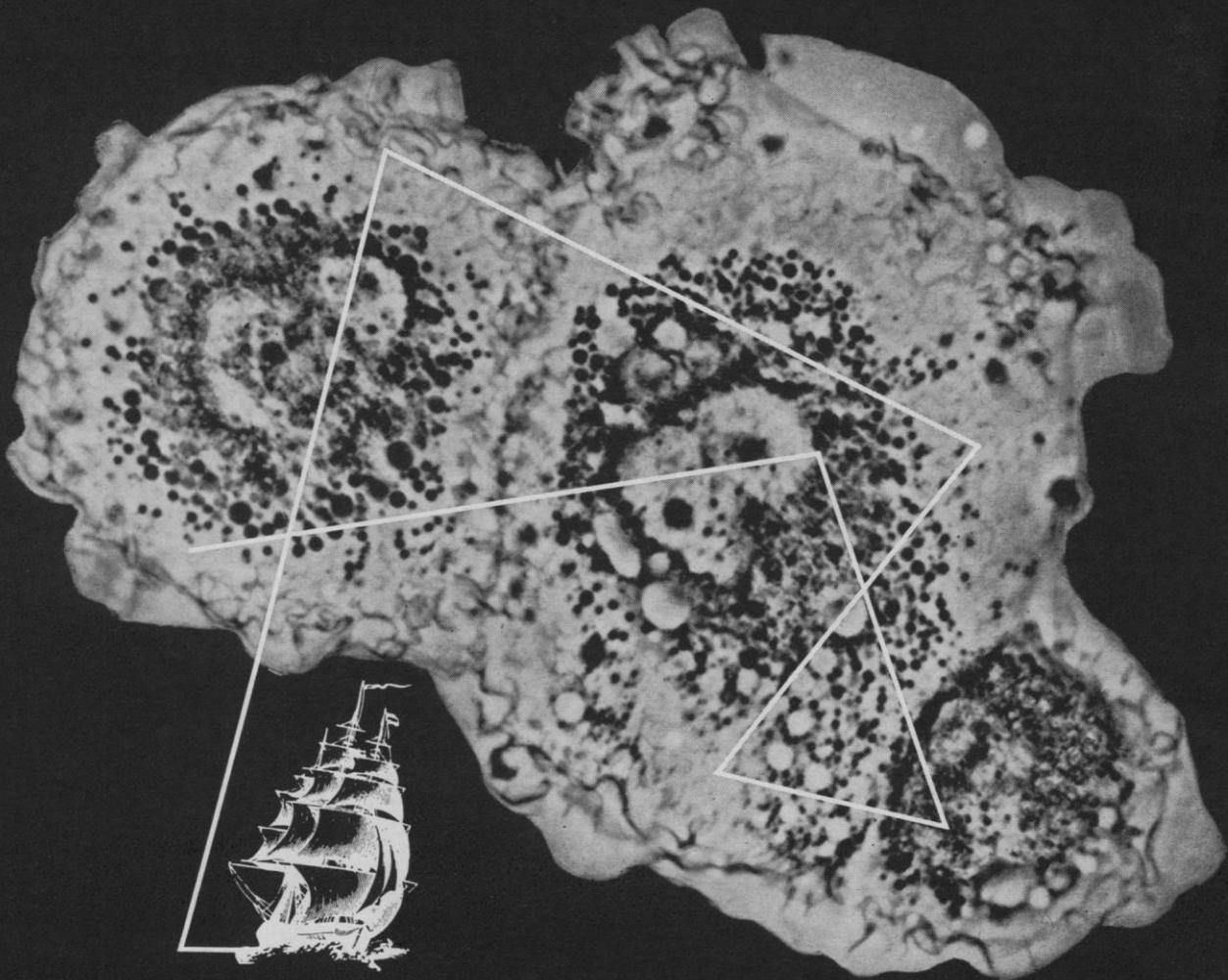
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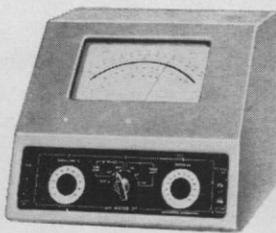
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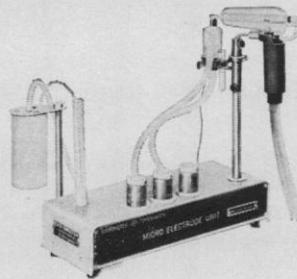
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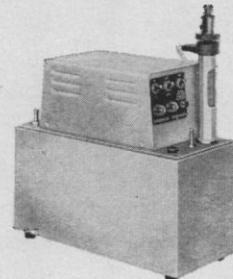
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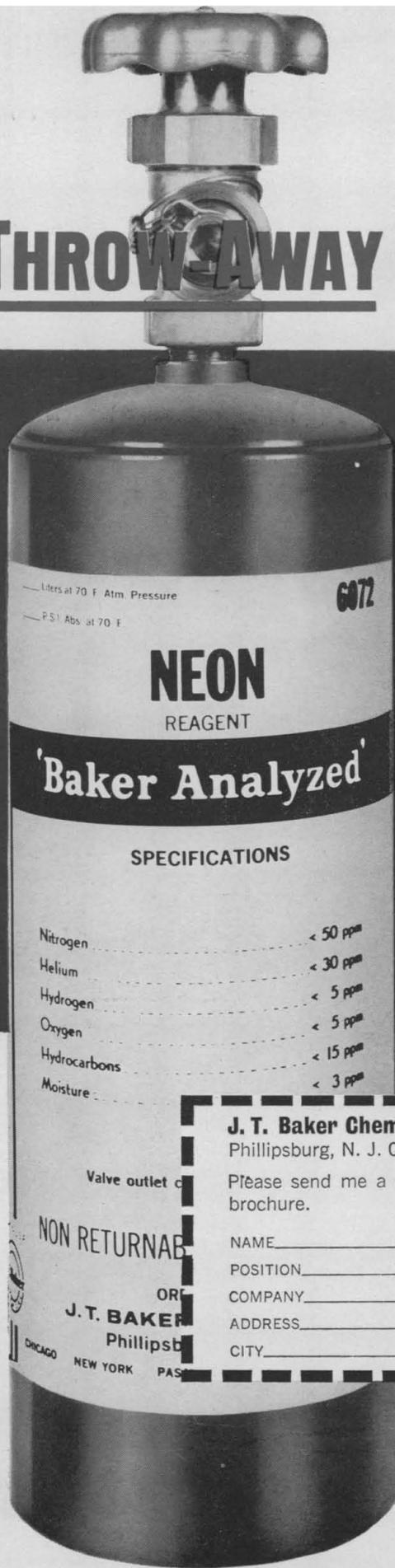
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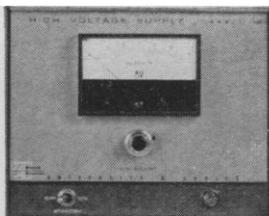
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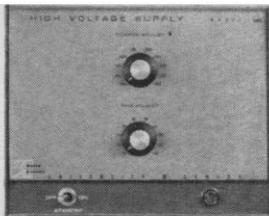
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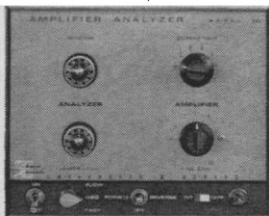
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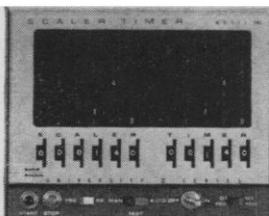
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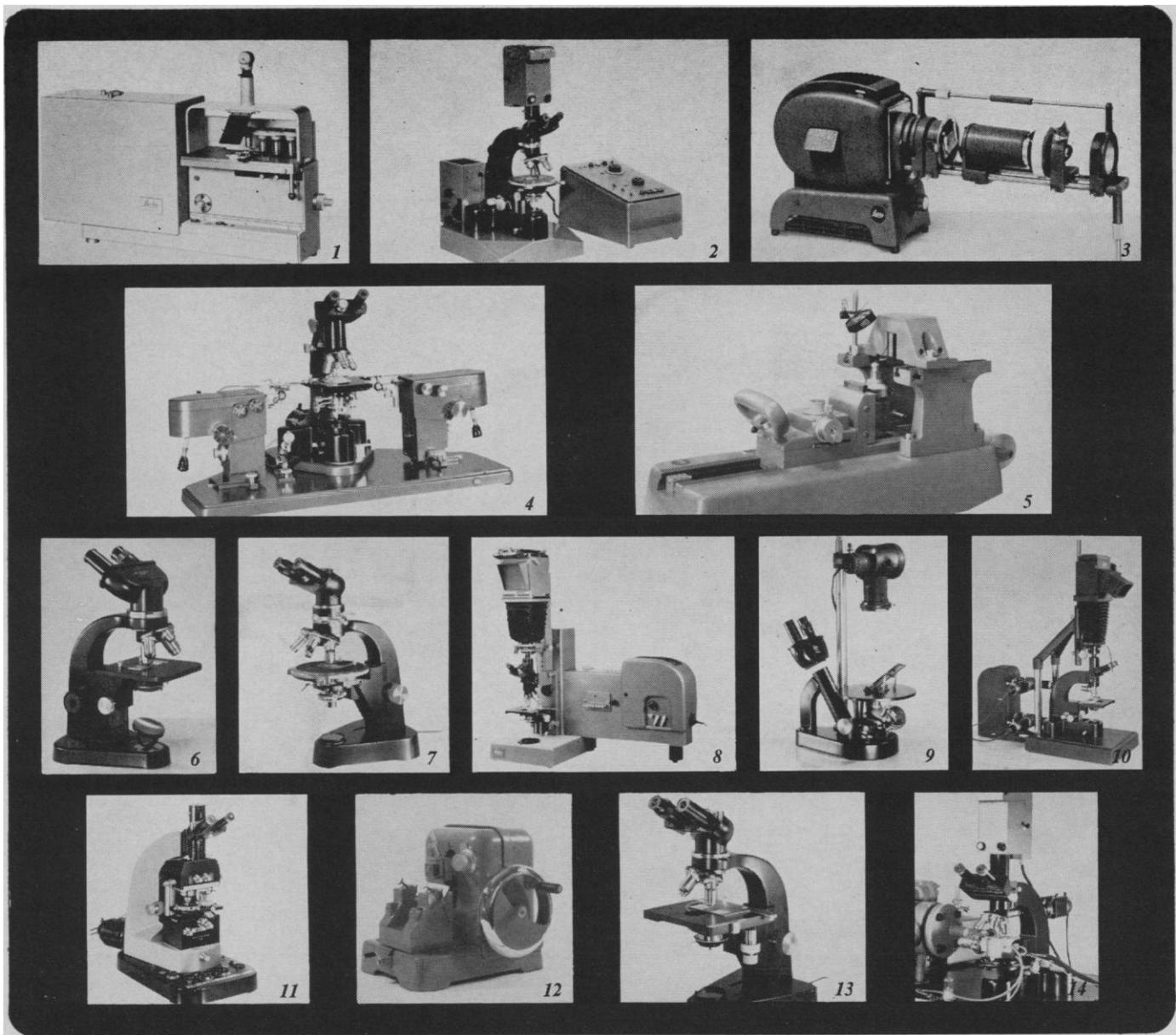
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## Science and the General Welfare in a Democracy

Most speeches by government scientists have the stimulating effect of a stiff dose of tranquilizer. The recent Harrelson lecture by Glenn T. Seaborg departs from this custom. He outlines some of the tremendous questions which face civilization in matters where science and technology affect the general welfare and indicates that our scientific leadership faces thorny problems in dealing with the support of science.

Seaborg selects for special discussion three major recent developments, each of which alone has changed or will change civilization irreversibly. Naturally he first examines the destructive and constructive effects of atomic energy. Computers and automation are the second development, one whose eventual impact is not yet fully perceived. Seaborg feels that "the potential effects of this technology are of such significance that we must restudy, and perhaps may have to reshape, what we had thought were unchanging economic concepts and principles." Pointing to a third development which may change man's destiny, he comments on potential discoveries in molecular biology:

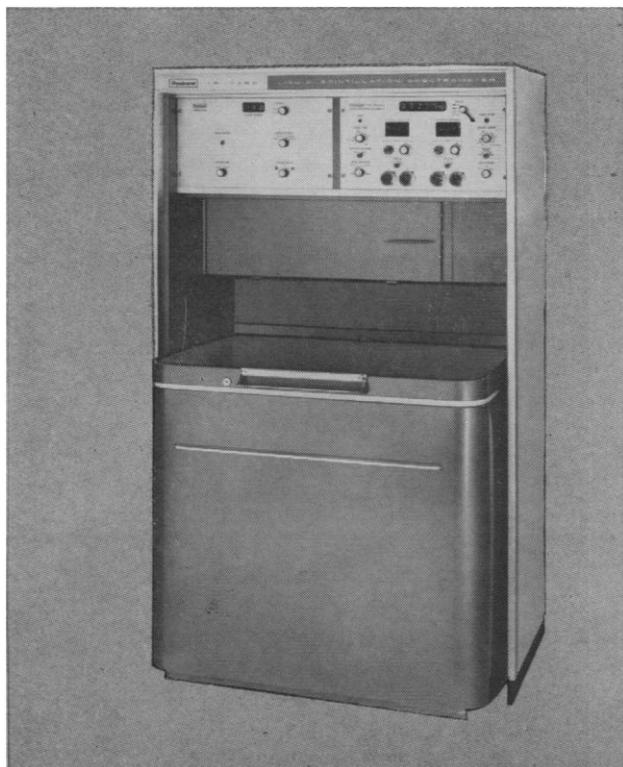
"We may expect that inevitably our recently acquired knowledge of the genetic code will be applied also to the improvement of the human species. . . . But once we have the ability to determine the genetic characteristics of a human infant, who will step forward with sufficient wisdom to choose those traits most beneficial to the man of the future?"

Against this background of the role of science and technology in shaping civilization, Seaborg examines how well we are equipped as a nation to cope with problems in which the health of science is at stake. At this point in his speech he seems to remember that as chairman of the Atomic Energy Commission he must avoid criticism of other bureaucrats. Accordingly, for a few moments his remarks lose their sharpness. However, he ends this section with the observation that "we continue as a nation to be plagued by a persistent myopia as to our long-term national goals in science." He points out that "we will need to apportion funds among the different fields; weigh the relative merits of spending for research, for facilities, and for the improvement of teaching; and decide how much is justified for high-energy physics . . . and for other areas of work in which the costs for basic facilities are high." He asks, "How can we prevent a Science pork barrel?" And he cautions, "We must not let our national support of science and technology degenerate to the point where no state—no Congressional district—is complete without a Post Office, a reclamation project and a new science laboratory. . . . We must manage somehow to provide for the support of new centers . . . in such a way that we do not turn our best scientists into migratory workers . . . gravitating from one scientific mecca to another, dependent upon the fluctuating whims of Federal support."

Seaborg does not provide solutions, but in posing the questions forthrightly he has set a high standard for others. Public discussion of these issues will surely lead to more informed thinking and ultimately to wiser action.—PHILIP H. ABELSON

(Dr. Seaborg gave the Harrelson lecture at North Carolina State University, Raleigh, on 11 March 1964. Reprints can be obtained from the Division of Public Information, U.S. Atomic Energy Commission, Washington 25, D.C.)

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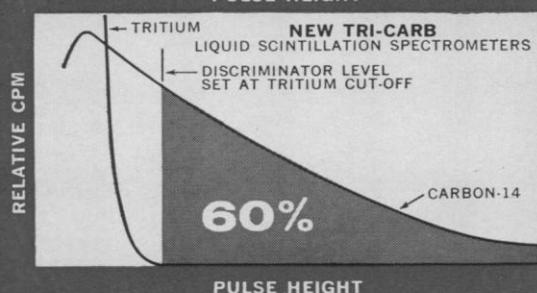
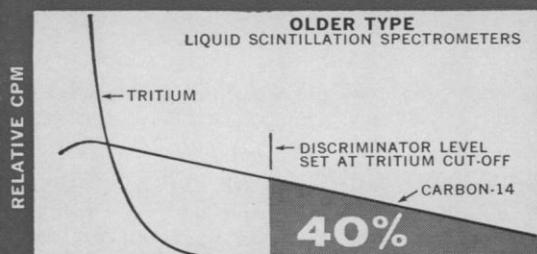
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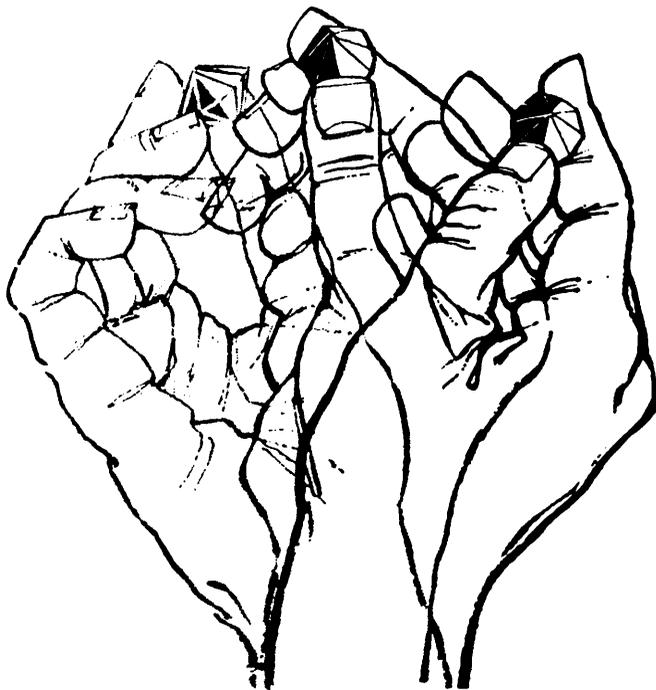
Comparison demonstrating greatly improved isotope separation obtainable with the new TRI-CARB Spectrometers by showing percentage of total carbon-14 which appears beyond tritium cut-off. Data is directly comparable in both cases; discriminator levels were set so that only 0.01% tritium remained in the carbon-14.

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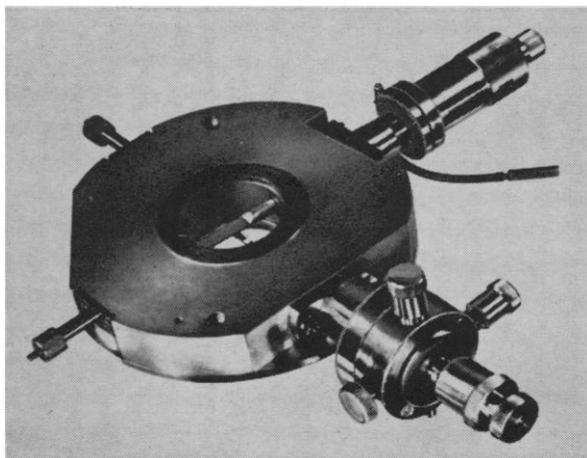
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1-6. **Gastroenterology**, 7th intern. congr., Brussels, Belgium. (Assoc. of Natl. European and Mediterranean Soc. of Gastroenterology, 43, rue des Champs-Elysées, Brussels 5)

2-3. **Photovoltaic Specialists**, 4th annual conf., Cleveland, Ohio. (P. Rappaport, RCA Laboratories, Princeton, N.J.)

2-4. **Global Communications**, intern. symp. (Globcom VI), Philadelphia, Pa. (R. Guenther, RCA Communications Systems Div., Bldg. 1-3-1, Camden, N.J.)

2-4. **Telemetry**, natl. conf., Los Angeles, Calif. (W. S. Pope, 8420 Quinn St., Downey, Calif.)

2-5. **Food Microbiology**, 4th intern. symp., Göteborg, Sweden. (N. Molin, Swedish Inst. for Food Preservation Research, Göteborg 16)

2-6. **Acoustical Conf.**, 3rd., Budapest, Hungary. (Acoustics Div., Hungarian Soc. of Optics, Acoustics, and Film Techniques, Szabadság tér 17, Budapest 5)

2-6. **Ophthalmic-Optics**, intern. congr., Copenhagen, Denmark. (Danmark Special Optiker-Forening, Vesterbrogade 41B, Copenhagen 5)

3-5. Collaborative **Pesticides Analytical Committee**, 8th, Wageningen, Netherlands. (R. de B. Ashworth, c/o Plant Pathology Laboratory, Hatching Green, Harpenden, Hertfordshire, England)

3-10. **American Metalworking Technology** for the European Community (AMTEC), Brussels, Belgium. (E. L. Koester, ASTM, 10700 Puritan Ave., Detroit, Mich.)

7-9. National Public Relations Council of **Health and Welfare Services**, New York, N.Y. (The Council, 257 Park Ave. S., New York 10010)

7-9. **Isotopically Labeled Drugs** in Experimental Pharmacology, conf., Chicago, Ill. (L. J. Roth, Dept. of Pharmacology, Univ. of Chicago, Chicago 60637)

7-11. **Special Libraries** Assoc., St. Louis, Mo. (Mrs. J. North, Missile and Space Div., Lockheed Aircraft Corp., Palo Alto, Calif.)

7-12. **Mass Spectrometry** and Allied Topics, 12th annual conf., Montreal, Quebec, Canada. (N. D. Coggeshall, Gulf Research and Development Co., P.O. Drawer 2038, Pittsburgh, Pa. 15230)

7-13. **European Ophthalmological Soc.**, 2nd congr., Vienna, Austria. (J. François, 15, Place de Smet de Naeyer, Ghent, Belgium)

8-9. **Basic Cancer Research**, 2nd Scandinavian symp., Stockholm, Sweden. (K. E. Hellström, c/o Riksföreningen mot Cancer, Postgiro 90 19 51, Stockholm)

8-10. **Quasi-Optics**, symp., Polytechnic Inst. of Brooklyn, 14th, New York, N.Y. (Polytechnic Inst. of Brooklyn, 55 Johnson St., Brooklyn 1)

8-11. **Cardiovascular Conf.**, 2nd intern., St. Adele, Quebec, Canada. (D. F. M. Bunce, Dept. of Physiology, College of Osteopathic Medicine and Surgery, Des Moines, Iowa)

8-11. **International Planned Parenthood Federation**, conf. of region for Europe, Near East, and Africa, London, England. (J. Bettie, 6 Pembroke Rd., London, W.1)

8-12. **Surface Contamination**, intern. symp., Gatlinburg, Tenn. (B. R. Fish, Health Physics Div., Oak Ridge Natl. Laboratory, P.O. Box X, Oak Ridge, Tenn.)



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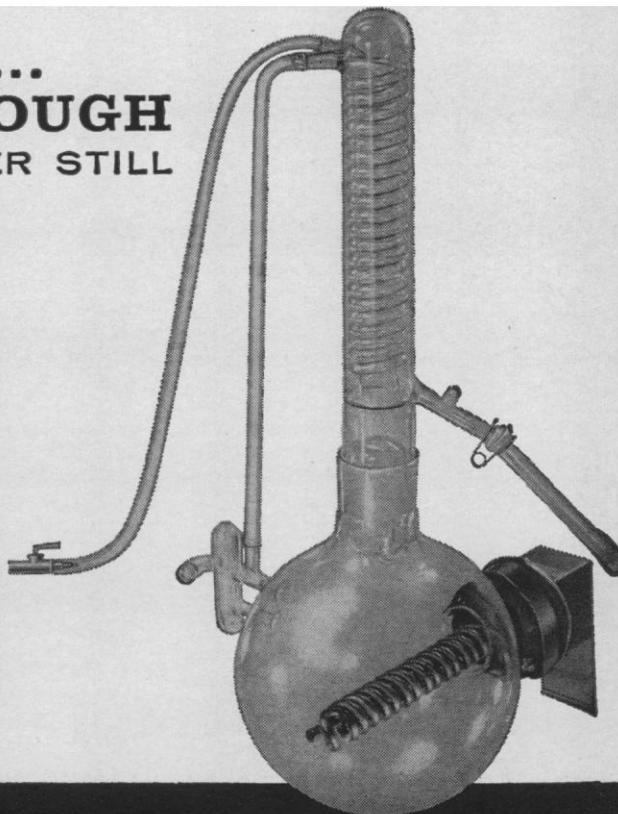
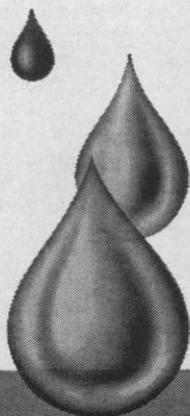
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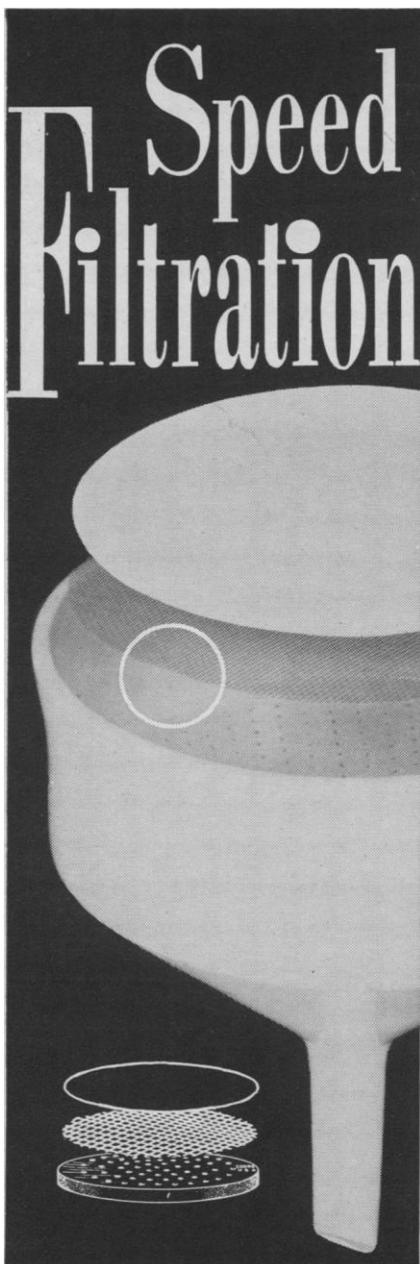
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9. International Assoc. for the **Prevention of Blindness**, Vienna, Austria. (J. P. Baillart, 47, rue de Bellechasse, Paris 7<sup>e</sup>, France)

9-11. **Cobalt Applications**, intern. meeting, Brussels, Belgium. (Cobalt Information Center, Battelle Memorial Inst., 505 King Ave., Columbus 1, Ohio)

9-11. **Electromagnetic Compatibility**, 6th natl. symp., Los Angeles, Calif. (J. A. Eckert, Dept. 3441/32, Northrop Northair, 3901 West Broadway, Hawthorne, Calif.)

9-12. Canadian Federation of **Biological Societies**, Halifax, N.S. (A. H. Neufeld, The Federation, Univ. of Western Ontario, London, Ont., Canada)

9-12. **Max Planck Soc. for the Furtherance of Science**, general meeting, Hamburg, Germany. (Max-Planck Gesellschaft zur Förderung des Wissenschaften e.V., Düsseldorf, Germany)

10-12. **Heat Transfer and Fluid Mechanics**, Berkeley, Calif., (S. Levy, General Electric Co., 150 Curtner Ave., San Jose, Calif.)

10-19. **Intergovernmental Oceanographic Commission**, 3rd session, Paris, France. (W. S. Wooster, Office of Oceanography, UNESCO, Place de Fontenoy, Paris 7<sup>e</sup>)

11-13. **Manufacturing Chemists' Assoc.**, 92nd annual, White Sulphur Springs, W. Va. (MCA, 1825 Connecticut Ave., NW, Washington, D.C.)

11-13. **Population Assoc. of America**, San Francisco, Calif. (P. C. Glick, Bureau of Census, Washington, D.C. 20233)

13-19. **Medical Film Festival**, Helsinki, Finland. (W. M. A.-Film Finmedicas, Ullanlinnankatu 1, Helsinki)

13-19. **World Medical Assoc.**, 18th general assembly, Helsinki, Finland. (H. S. Gear, 10 Columbus Circle, New York, N.Y. 10019)

14-17. **American Assoc. of Feed Microscopists**, 12th annual, Hot Springs, Ark. (G. M. Barnhart, Missouri Dept. of Agriculture, State Office Bldg., Jefferson City)

14-17. **American Nuclear Soc.**, 10th annual, Philadelphia, Pa. (O. J. DuTemple, 244 E. Ogden Ave., Hinsdale, Ill. 60502)

14-18. **Industrial Pharmaceutical Research**, 6th natl. conf., Land O'Lakes, Wis. (L. W. Busse, 190 Pharmacy Bldg., Univ. of Wisconsin, Madison 6)

14-18. **Health Physics Soc.**, 9th annual, Cincinnati, Ohio. (H. F. Kolde, Taft Sanitary Engineering Center, Cincinnati)

14-19. **Alpha Chi Sigma Fraternity**, Greenvale, L.I., N.Y. (M. L. Griffin, 5503 E. Washington St., Indianapolis, Ind.)

14-19. **Cardiology**, 7th inter-American congr., Montreal, P.Q., Canada. (The Congress, 2052 St. Catherine St., W., Montreal 25)

14-20. **National Speleological Soc.**, annual conv., New Braunfels, Tex. (J. H. Estes, 2818 S. 39 St., Abilene, Tex. 79605)

15-16. Association for **Applied Gnotobiotics**, 4th symp., East Lansing, Mich. (C. K. Whitehair, Dept. of Pathology, Michigan State Univ., East Lansing)

15-17. **Lattice Defects in Quenched Metals**, intern. conf., Argonne, Ill. (The Conference, Bldg. 212, Argonne Natl. Laboratory, Argonne)

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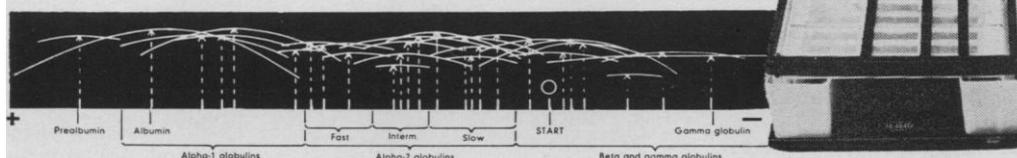
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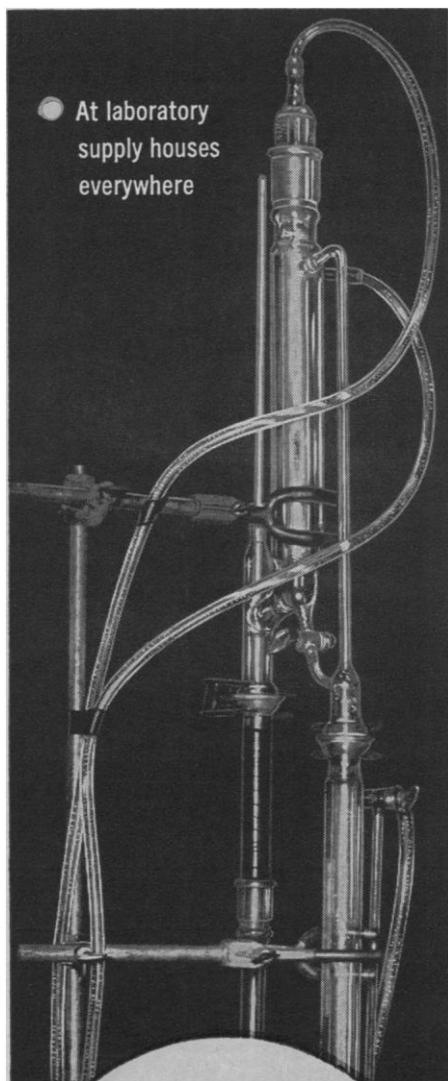
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15-18. **American Soc. of Limnology and Oceanography**, 27th annual, Miami Beach, Fla. (G. H. Lauff, ASLO, Sapelo Island Research Foundation, Sapelo Island, Ga.)

15-18. **Materials**, 2nd intern. symp., Berkeley, Calif. (T. H. Chenoweth, 276 Hearst Mining Bldg., Univ. of California, Berkeley 94720)

15-19. **Antibiotics**, intern. congr., Prague, Czechoslovakia. (V. Vlôek, Antibiotics Research Inst., Roztoky near Prague)

15-19. **Molecular Spectroscopy**, symp., Columbus, Ohio. (H. H. Nielsen, Dept. of Physics, Ohio State Univ., 174 W. 18 Ave., Columbus 43210)

15-19. **Technical Writers**, 12th annual inst., Troy, N.Y. (J. R. Gould, Rensselaer Polytechnic Inst., Troy)

15-21. **Women Engineers and Scientists**, 1st intern. conf., New York, N.Y. (E. Eaves, 18 Third Ave., Port Washington, N.Y. 11050)

15-3. **Relativity**, teaching at undergraduate level, Arlington, Tex. (J. Ellis, Dept. of Physics, Arlington State College, Arlington)

15-4 Sept. **Gordon Research Conf.**, New Hampshire. (W. G. Parks, Dept. of Chemistry, Univ. of Rhode Island, Kingston)

16-17. **Computer Augmentation of Human Reasoning**, symp., Washington, D.C. (W. D. Orr, TRW Computer Div., 8433 Fallbrook Ave., Canoga Park, Calif.)

16-18. **Entomological Soc. of America**, Pacific Branch, annual, Long Beach, Calif. (W. W. Allen, 112 Agric. Hall, Dept. of Entomology, Univ. of California, Berkeley)

17-19. **Microscopy**, 11th intern. symp., Chicago, Ill. (MICRO-64, McCrone Research Inst., 451 E. 31 St., Chicago 60616)

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18-19. **Patent, Trademark, and Copyright Research Inst.**, 8th annual conf., George Washington Univ., Washington, D.C. (PTCR Inst., George Washington Univ., Washington, D.C. 20006)

18-19. **American Rheumatism Assoc.**, San Francisco, Calif. (J. A. Coss, Jr., 20 E. 76 St., New York, N.Y. 10021)

18-20. **Community Psychiatry**, conf., Univ. of Wisconsin, Madison. (L. M. Roberts, 1300 University Ave., Madison)

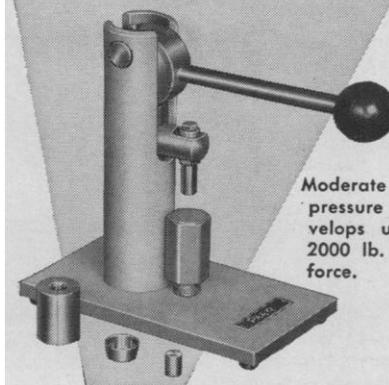
18-20. **Endocrine Soc.**, San Francisco, Calif. (H. H. Turner, 200 N. Walker, Oklahoma City, Okla.)

18-20. **American Assoc. of Physics Teachers**, summer meeting, Madison, Wis. (H. R. Crane, Dept. of Physics, Univ. of Michigan, Ann Arbor)

18-20. **Space Technology**, 4th European symp., Rome, Italy. (A. Eula, Associazione Italiana Razzi, Piazza Santo Bernardo 101, Rome)

18-20. **Sulfite Pulping**, conf., Chicago, Ill. (Technical Assoc. of the Pulp and

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Paper Industry, 360 Lexington Ave., New York, N.Y. 10017)

18-22. American College of **Chest Physicians**, San Francisco, Calif. (M. Kornfeld, 112 E. Chestnut, Chicago, Ill.)

19. **Parenteral Drug Assoc.**, Philadelphia, Pa. (The Association, Broad and Chestnut Sts., Philadelphia 7)

19-20. American **Geriatrics Soc.**, 21st annual, San Francisco, Calif. (AGS, 10 Columbus Circle, New York, N.Y. 10019)

19-27. **Chemical Engineering**, European conv., Frankfurt am Main, Germany (Chicago Section, American Chemical Soc., 86 E. Randolph St., Chicago 1, Ill.)

21. **Surface Physics**, Providence, R.I. (W. H. Brattain, Bell Telephone Laboratories, Murray Hill, N.J. 17971)

21-23. Society for **Investigative Dermatology**, 25th annual, San Francisco, Calif. (H. Beerman, SID, 255 S. 17 St., Philadelphia, Pa. 19103)

21-24. American Soc. of **Agricultural Engineers**, Fort Collins, Colo. (J. L. Butt, ASAE, 420 Main St., St. Joseph, Mich.)

21-25. **Air Pollution Control Assoc.**, 57th annual, Houston, Tex. (The Association, 4400 Fifth Ave., Pittsburgh, Pa.)

21-25. **American Medical Assoc.**, San Francisco, Calif. (F. J. L. Blasingame, N. Dearborn, Chicago, Ill. 60610)

21-26. American Soc. for **Testing and Materials**, 67th annual, Chicago, Ill. (ASTM, 1916 Race St., Philadelphia 3, Pa.)

22-24. American **Dairy Science Assoc.**, Tucson, Ariz. (H. F. Judkins, 32 Ridgeway Circle, White Plains, N.Y.)

22-24. **Medicinal Chemistry**, 9th natl. symp., Minneapolis, Minn. (A. T. Winstead, American Chemical Soc., 1155 16th St., NW, Washington, D.C. 20006)

22-24. Association for Research in **Ophthalmology**, San Francisco, Calif. (H. Kaufman, c/o Hillis Miller Health Center, Gainesville, Fla.)

22-24. **Photosensitization in Solids**, intern. conf., Chicago, Ill. (L. Grossweiner, Dept. of Physics, Illinois Inst. of Technology, Chicago)

22-24. American Assoc. of **Physical Anthropologists**, 33rd annual, Mexico City, Mexico. (T. D. Stewart, The Association, U.S. Natl. Museum, Washington, D.C.)

22-24. **Polymers**, 2nd biennial symp., American Chemical Soc., Durham, N.C. (H. N. Friedlander, Chemstrand Research Center, Inc., Box 731, Durham)

22-25. **Agricultural Pesticides** Technical Soc., Fredericton, N.B., Canada. (W. H. Minshall, University Substation P.O., London, Ont., Canada)

22-25. American Soc. of **Pharmacology**, annual, Pittsburgh, Pa. (R. Blomster, Univ. of Pittsburgh School of Pharmacy, Pittsburgh 15213)

22-26. American Soc. for **Engineering Education**, Orono, Maine. (W. L. Collins, Univ. of Illinois, Urbana)

22-26. **Nobel Prize Winners**, 14th meeting, Lindau im Bodensee, Germany. (H. F. Kinderlen, Standing Working Committee for the Nobel Prize Winners, Postfach 11, 899 Lindau im Bodensee)

22-26. Association of Official **Seed Analysts**, Rochester, N.Y. (E. W. Sundermeyer, 329 U.S. Court House, Kansas City 6, Mo.)

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22-27. AAAS Pacific Division, 45th meeting, Vancouver, B.C., Canada. (R. C. Miller, California Acad. of Sciences, San Francisco)

22-27. International Organization for Pure and Applied Physics, 2nd general assembly, Paris, France. (J. Tonnelot, Laboratoire de Biologie Physico-Chimique, Orsay, Seine-et-Oise, France)

23. National Assoc. of Science Writers, San Francisco, Calif. (M. D. Spencer, Buffalo Evening News, Buffalo, N.Y.)

23-25. Precision Electromagnetic Measurements, conf., Boulder, Colo. (National Bureau of Standards, Boulder Labs., Boulder)

23-26. American Home Economics Assoc., 55th annual, Detroit, Mich. (AHEA, 1600 20th St. NW, Washington, D.C.)

24-25. Computers and Data Processing, 11th annual, symp., Estes Park, Colo. (W. H. Eichelberger, Denver Research Inst., Univ. of Denver, Denver, Colo. 80210)

24-26. Joint Automatic Control Conf., Stanford, Calif. (L. Zadeh, Univ. of California, Berkeley)

24-28. American Assoc. of Bioanalysts, annual, Las Vegas, Nev. (W. N. Reich, AAB, P.O. Box 607, Walnut Creek, Calif.)

24-1. Air Pollution, European conf., Strasbourg, Austria. (A. Stern, Div. of Air Pollution, U.S. Public Health Service, Washington, D.C. 20201)

25-26. Fundamental Phenomena in Hypersonic Flow, intern. symp., Buffalo, N.Y. (H. S. Tolley, Cornell Aeronautical Laboratory, P.O. Box 235, Buffalo 14221)

25-27. American Physical Soc., Denver, Colo. (R. G. Sachs, Sterling Hall, Univ. of Wisconsin, Madison 53706)

25-28. Rockets and Space Flight, 13th symp., Darmstadt, Germany. (A. F. Staats, Hermann-Oberth-Gesellschaft, Fritz-Beindorff-Allee 9, Hanover Germany)

28-4. American Library Assoc. St. Louis, Mo. (D. H. Clift, 50. E. Huron St., Chicago, Ill.)

29-30. Vacuum Metallurgy, conf., New York, N.Y. (M. A. Cocca, G.E. Laboratory, P.O. Box 088, Schenectady, N.Y.)

29-1. American Soc. of Heating, Refrigerating, and Air-Conditioning Engineers, 71st annual, Cleveland, Ohio. (ASHRAE, 345 E. 47 St., New York, N.Y.)

29-1. Effects of Radiation on the Hereditary Fitness of Mammalian Populations, symp., Bar Harbor, Maine. (T. H. Roderick, Jackson Laboratory, Bar Harbor)

29-2. American Inst. of Aeronautics and Astronautics, 1st annual, Washington, D.C. (AIAA, 500 Fifth Ave., New York, N.Y. 10036)

29-2. American Dermatological Assoc., Honolulu, Hawaii. (W. M. Sams, 303 Ingrham Bldg., Miami 32, Fla.)

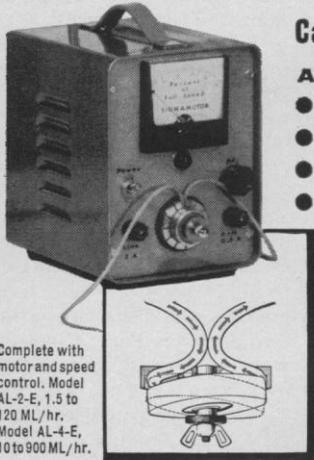
30-5. Society for Social Responsibility in Science, Fellowship Farm, Pa. (W. C. Davidson, Dept. of Physics, Haverford College, Haverford, Pa.)

July

1-4. National Soc. of Professional Engineers, annual, Asheville, N.C. (K. E. Trombley, NSPE, 2029 K St., NW, Washington, D.C.)

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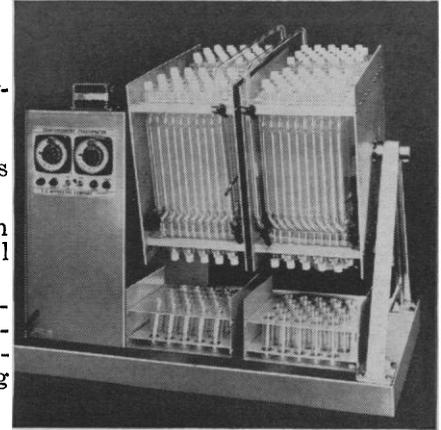
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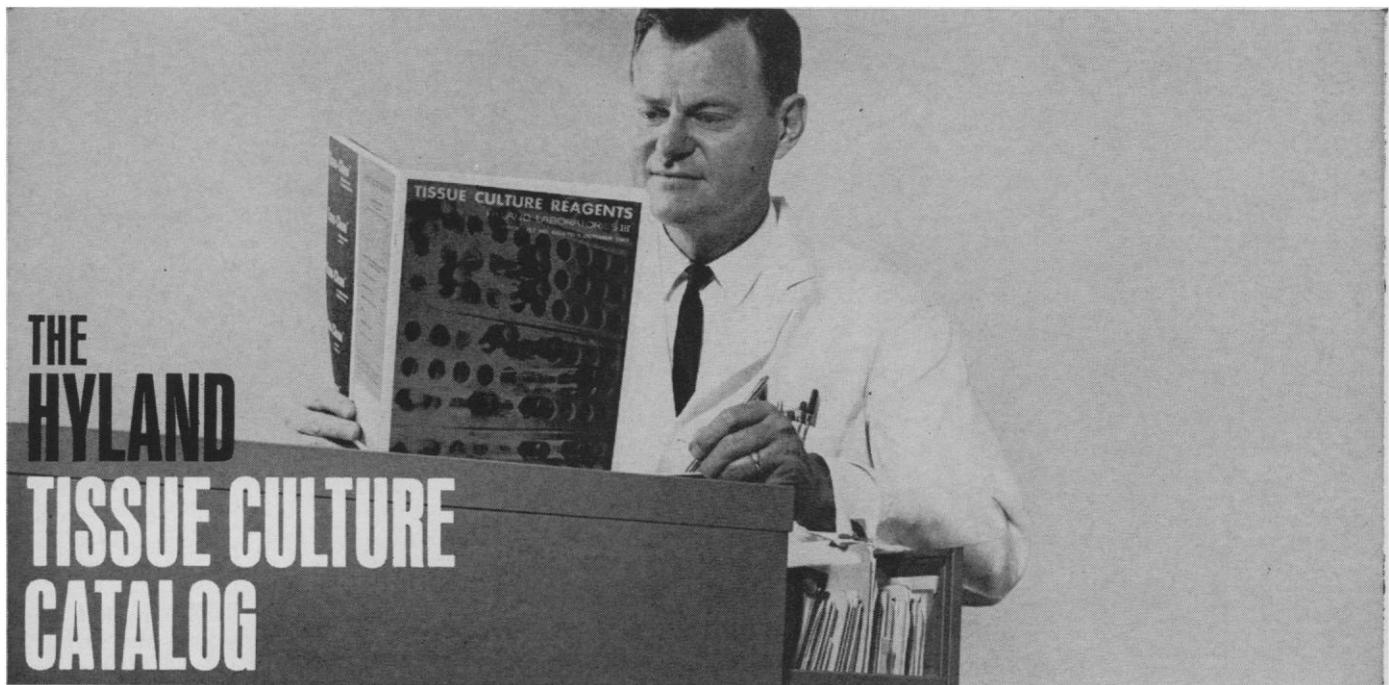


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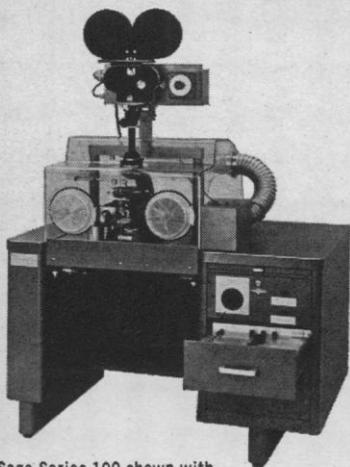
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1-4. British Tuberculosis Assoc., St. Andrews, Scotland. (BTA, 59 Portland Place, London, W.1, England)

2-3. **Spectrochemical Analysis**, limits of detection, conf., Exeter, England, Institute of Physics and the Physical Society, 47 Belgrave Sq., London, S.W.1, England)

2-4. Scandinavian, **Dental Congr.**, Helsinki, Finland. (N. Anderson, Bergmang. 11 D, Helsinki)

2-5. Northwest **Proctologic Soc.**, Banff, Canada. (F. C. Swartzlander, Greyhound Bldg., Calgary, Canada)

2-8. **Nuclear Physics**, intern. congr., Paris, France. (The Congress, B.P. No. 14, Orsay, Seine-et-Oise, France)

5-10. American **Physical Therapy Assoc.**, annual conf., Denver, Colo. (H. J. Hislop, 1790 Broadway, New York, N.Y. 10019)

6-8. **Electron-Beam Processes** for Microelectronics, symp., Malvern, Worcester, England. (Information Officer, Royal Radar Establishment, St. Andrews Rd., Malvern)

6-9. **Learning and Associated Phenomena in Invertebrates**, Cambridge, England. (D. Davenport, Dept. of Biological Sciences, Univ. of California, Santa Barbara)

6-9. **Signal Processing** in Radar and Sonar Directional Systems, Birmingham, England. (British Institution of Radio Engineers, 9 Bedford Sq., London, W.C.1)

6-10. **Magnetic Recording**, intern conf., London, England. (Secretariat, the Conference, c/o Inst. of Electrical Engineers, Savoy Pl., London, W.C.2)

6-10. **Theoretical and Applied Mathematical Programming**, intern. symp., London, England. (M. Kinnaird, Operational Research Soc., 64 Cannon St., London, E.C.4)

6-10. **Physics of Non-crystalline Solids**, intern congr. Delft, Netherlands, (J. A. Prins, Lab. Technische Natuurkunde T.H. Delft)

6-11. **Magnetohydrodynamic Electrical Power Production**, Paris France. (European Nuclear Energy Agency, 38 Blvd. Suchet, Paris 16<sup>e</sup>)

6-12. **Sanitary Engineering**, 9th inter-American congr., Bogotá, Colombia. (J. A. Jove, Inter-American Assoc. of Sanitary Engineering, Centro Simón Bolívar, Edificio Sur, 6<sup>o</sup> piso, Caracas, Venezuela)

7-10. **American Dental Soc. of Europe**, annual, Brighton, England. (A. E. F. Sturridge, 35 Harley St., London, W.1)

7-11. European **Orthodontic Soc.**, 40th congr., Athens, Greece. (H. N. Haralabakis, Akadimias St. 31, Athens 135)

8-11. International Soc. of **Gastroenterology**, 6th intern. congr., Medellín, Colombia. (J. L. A. Roth, 419 S. 19 St., Philadelphia, Pa.)

8-16. **Entomology**, 12th intern. congr., London, England. (P. Freeman, British Museum of Natural History, Cromwell Rd., London, S.W.7)

10-11. Rocky Mountain **Cancer Conf.**, Denver, Colo. (N. P. Isbell, 1809 E. 18 Ave., Denver 80218)

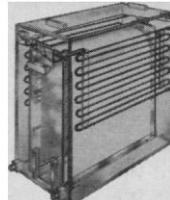
10-15. **Pleistocene Geomorphology**, symp., Exeter, England. (T. H. Elkins, Royal Geographical Soc., Kensington Gore, London, S.W.7)

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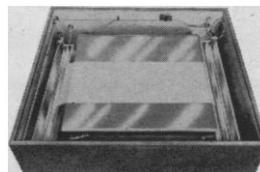
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12-15. **Solid Propulsion**, NASA meeting, Philadelphia, Pa. (W. H. Hunter, Office of Program Development, Washington, D.C. 10025)

12-16. **Gastroenterology**, 9th Pan American Congr., Bogotá, Colombia. (C. A. Estape, Soriano 877, Montevideo, Uruguay)

13-15. **Problems of Capillary Permeability** in Health and Disease, Univ. of Michigan 1964 summer symp., Ann Arbor, Mich. (M. M. Dewey, Dept. of Anatomy, Univ. of Michigan, Ann Arbor)

13-15. **Data Processing and Acquisition in Biology and Medicine**, conf., Rochester, N.Y. (K. Enslein, 42 East Ave., Rochester 14604)

13-17. **Canadian Teachers' Federation**, Lac Beauport, P.Q., Canada. (G. Nason, 444 MacLaren St., Ottawa, Ont., Canada)

13-17. **Chemistry of Carbohydrates**, intern. symp., Münster, Germany. (F. Micheel, Organisch-Chemisches Institut, Universität, Hindenburgplatz 55, Münster)

13-17. **International Assoc. for Child Psychiatry and Allied Professions**, London, England. (F. H. Stone, Royal Hospital for Sick Children, 70 University Ave., Glasgow, W.2 Scotland)

13-18. **Instrumental Analytical Chemistry**, 3rd annual symp., Bethlehem, Pa. (A. J. Diefenderfer, Dept. of Chemistry, Lehigh Univ., Bethlehem)

13-18. **Latin Federation of Medical Electro-Radiological Socs.**, 6th Congr., Brussels, Belgium. (Secretariat, 256 Chaussee de Wavre, Heverle-Louvain, Belgium)

14-17. **Rarefied Gas Dynamics**, 4th intern. symp., Toronto, Ont., Canada. (G. N. Patterson, Inst. of Aerophysics, Univ. of Toronto, Toronto 5)

14-17. **Regional Science Assoc.**, 4th Congr., Ghent, Belgium. (W. Isard, Univ. of Pennsylvania, Philadelphia 19104)

14-17. **Western Resources Conf.**, Boulder, Colo. (Bureau of Continuation Education, 352 Chemistry Bldg., Univ. of Colorado, Boulder)

14-19. **Sociology**, 7th Latin American Congr., Bogotá, Colombia. (C. E. Angulo, Facultad de Sociología, Universidad Nacional de Colombia, Bogotá)

15-19. **Pleistocene Geomorphology**, symp., Cambridge, England. (T. H. Elkins, Royal Geographical Soc., Kensington Gore, London, S.W.7, England)

16-24. **British Medical Assoc.**, annual Manchester, England. (D. Gullick, BMA, Tavistock Sq., London, W.C.1, England)

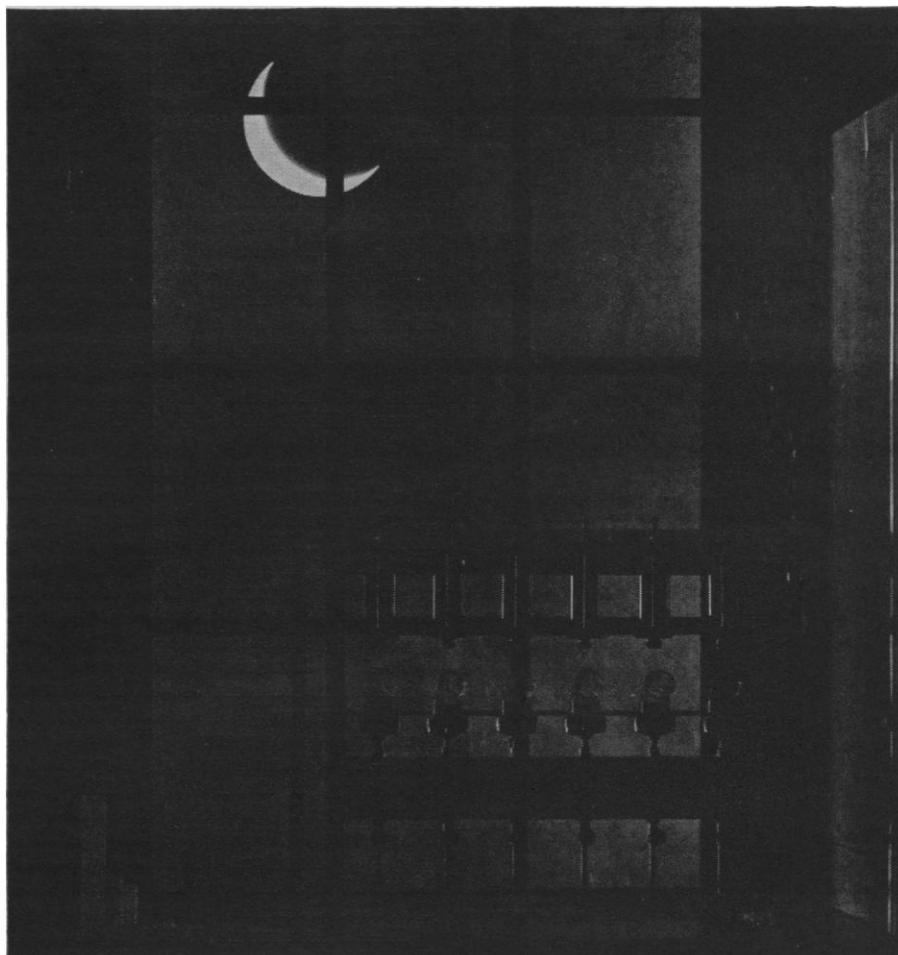
16-24. **Organic Photochemistry**, intern. symp., Strasbourg, France. (G. S. Hammond, Gates and Crellin Laboratories of Chemistry, California Inst. of Technology, Pasadena)

18-22. **International Union of Biological Sciences**, 15th general, Prague, Czechoslovakia. (G. L. Stebbins, Dept. of Genetics, Univ. of California, Davis)

19-24. **American Veterinary Medical Assoc.**, 101st annual, Chicago, Ill. (AVMA, 600 South Michigan Ave., Chicago 5)

19-25. **Polarography**, 3rd intern. Congr., Southampton, England. (D. A. Pantony, Dept. of Metallurgy, Royal School of Mines, Prince Consort Rd., London, S.W.1, England)

19-26. **Comparative Endocrinology**, 4th intern. symp., Paris, France. (L. Gallien, Laboratoire d'Embryologie, Faculté des



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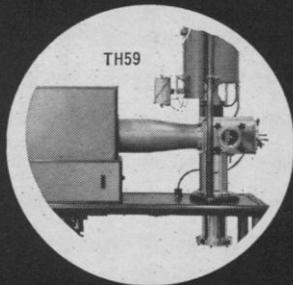
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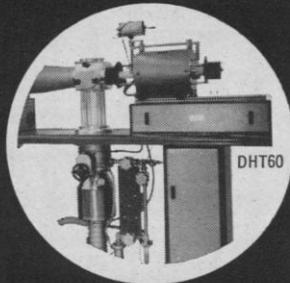
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Sciences de Paris, 9 quai St.-Bernard, Paris 5<sup>e</sup>)

20-22. **Magnetic Resonance** in Biological Systems. Boston, Mass. (R. G. Shulman, Bell Telephone Laboratories, Murray Hill, N.J.)

20-23. New Mexico Acad. of **General Practice**, Ruidoso. (H. L. Douglas, Box 767, Tatum, N.M.)

20-24. International **Diabetes** Federation, 5th congr., Toronto, Ont., Canada. (H. Best, Organizing Council, 477 Mt. Pleasant Rd., Toronto 7)

20-24. **Nuclear Radiation** Effects, technical conf., Seattle, Wash. (Inst. of Electrical and Electronics Engineers, Box A, Lenox Hill Station, New York, N.Y. 10021)

20-24. **Organic Reaction Mechanism**, intern. symp. Cork, Ireland. (General Secretary, Chemical Soc., Burlington House, London, W.1, England)

20-24. **Semiconductor Physics**, intern. conf., Paris, France. (M. Balkanski, Laboratoire de Physique, Ecole Normale Supérieure, 24, rue Lhomond, Paris 5<sup>e</sup>)

20-25. **Catalysis**, 3rd intern. conf., Amsterdam, Netherlands. (D. M. Brouwer, c/o Badhuisweg 3, P.O. Box 3003, Amsterdam-N, Netherlands)

21-23. Physiology and Experimental Psychology of **Color Vision**, Ciba Foundation symp., London, England. (Ciba Foundation, 41 Portland Pl., London, W.1)

21-24. American **Malacological** Union, New Orleans, La. (M. C. Teskey, Rt. 2, Box 318, Marinette, Wis.)

21-28. International **Geographical** Union, 20th intern. congr., London, England. (T. H. Elkins, Royal Geographical Soc., Kensington Gore, London, S.W.7)

25-1. **Religion and Science**, 11th conf., Star Island, Portsmouth, N.H. (Religion and Science, 280 Newton St., Brookline, Mass. 02146)

26-29. **Photobiology**, 4th intern. congr., Oxford, England. (Blandford Site, Whiteknights Park, Reading, England)

26-31. American **Crystallographic** Assoc., Bozeman, Mont. (B. Post, Brooklyn Polytechnic Inst., 333 Jay St., Brooklyn, N.Y.)

26-31. **Mineralogical** Soc. of America, Bozeman, Mont. (G. Switzer, MSA, U.S. Natl. Museum, Washington, D.C. 20560)

26-1. **Biochemistry**, 6th intern. congr., New York, N.Y. (R. A. Harte, 6th Intern. Biochemistry Congr., 9650 Wisconsin Ave., NW, Washington, D.C. 20014)

27-21. **Engineering Foundation** Research Confs., Andover, N.H. (United Engineering Center, 345 E. 47 St., New York 17)

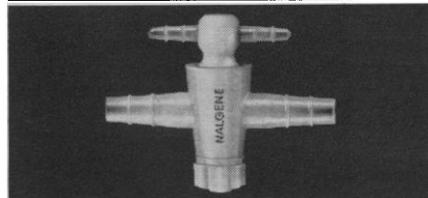
27-28. International **Cartographic** Assoc., 2nd general assembly, London, England. (D. E. Imhof, Kartographisches Institut, Eidgenössische Technische Hochschule, Zurich, Switzerland)

27-30. Technical Assoc. of the **Pulp and Paper Industry**, engineering conf., Seattle, Wash. (TAPPI, 360 Lexington Ave., New York, N.Y. 10017)

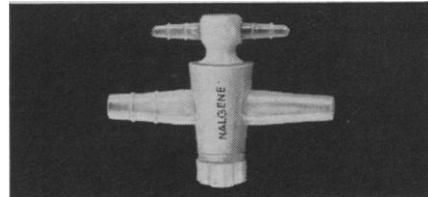
27-31. American **Dietetic** Assoc., 47th annual, Portland, Ore. (ADA, 620 N. Michigan Ave., Chicago, Ill. 60611)

30-1. International Soc. for **Human and Animal Mycology**, 3rd, Edinburgh, Scotland. (R. Vanbreuseghem, Inst. of Tropical Medicine, 155 rue National, Antwerp, Belgium)

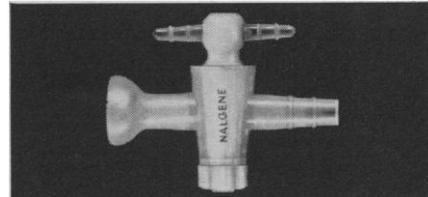
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3-7. Instrument Soc. of America, instrumentation conf., Geneva, N.Y. (H. S. Kindler, 530 William Penn Place, Pittsburgh, Pa.)

3-7. World Federation for Mental Health, 17th annual, Bern, Switzerland. (F. Cloutier, 1, rue Gevray, Geneva, Switzerland)

3-8. International Years of the Quiet Sun, regional symp., Buenos Aires, Argentina. (J. G. Roederer, Facultad de Ciencias, Perú 272, Buenos Aires)

3-10. Anthropologists and Ethnologist, 7th world conf., Moscow, U.S.S.R. (American Anthropological Assoc., 1530 P St., NW, Washington, D.C. 20005)

3-12. Botanical Congr., 10th intern., Edinburgh, Scotland. (Miss S. C. Penny, 5 Hope Park Sq., Edinburgh 8)

4-7. Poultry Science Assoc., annual, Minneapolis, Minn. (E. L. Johnson, Dept. of Poultry Science, Univ. of Minnesota, St. Paul 55101)

4-17. Methods of Hydrological Forecasting, 3rd inter-regional seminar, World Meteorological Organization/UN Economic Commission for Asia and the Far East, Bangkok, Thailand. (WMO, Secretariat, Geneva, Switzerland)

5-7. Sonic Investigations on Internal Damping in Solids, symp., London, England (Administration Assistant, Institute of Physics and the Physical Society, 47 Belgrave Square, London, S.W.1)

5-12. Atmospheric Radiation, symp., World Meteorological Organization/Intern. Union of Geodesy and Geophysics, Leningrad, U.S.S.R. (Secretariat, WMO, Geneva, Switzerland)

5-15. High Energy Physics, 12th intern. conf., Dubna, U.S.S.R. (M. L. Goldberger, Commission on High Energy Nuclear Physics, IUPAC, Princeton Univ, Princeton, N.J. 08540)

6-11. American Podiatry Assoc., New York, N.Y. (F. A. Kalbacher, American Podiatry Assoc., 3301 16th St., NW, Washington, D.C. 20010)

7-14. Scientific Study on Mental Retardation, intern. congr., Copenhagen, Denmark. (A. Dupont, Statens Andsvageforsorg, Nyropsgade 28.2, Copenhagen 5)

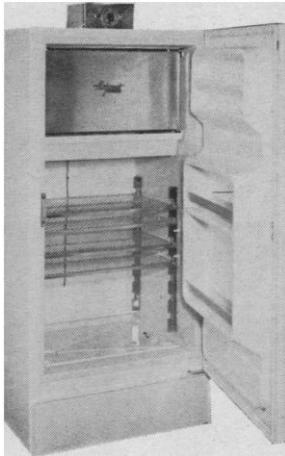
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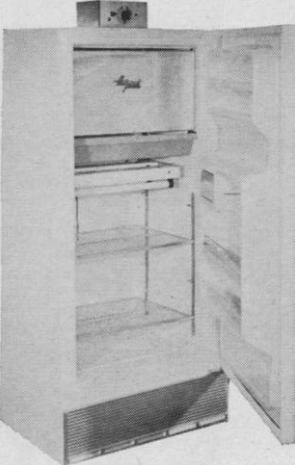
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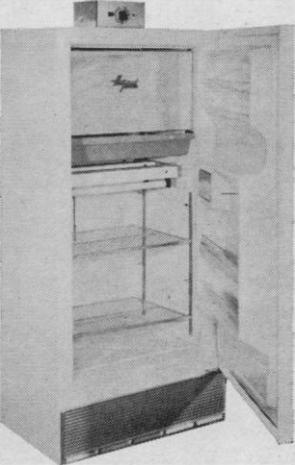


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The material in this section is prepared by the following contributing writers:

Robert L. Bowman (R.L.B.), with the assistance of Denis J. Prager (D.J.P.), Laboratory of Technical Development, National Heart Institute, Bethesda 14, Md. (medical electronics and biomedical laboratory equipment).

Joshua Stern (J.S.), Basic Instrumentation Section, National Bureau of Standards, Washington 25, D.C. (physics, computing, electronics, and nuclear equipment).

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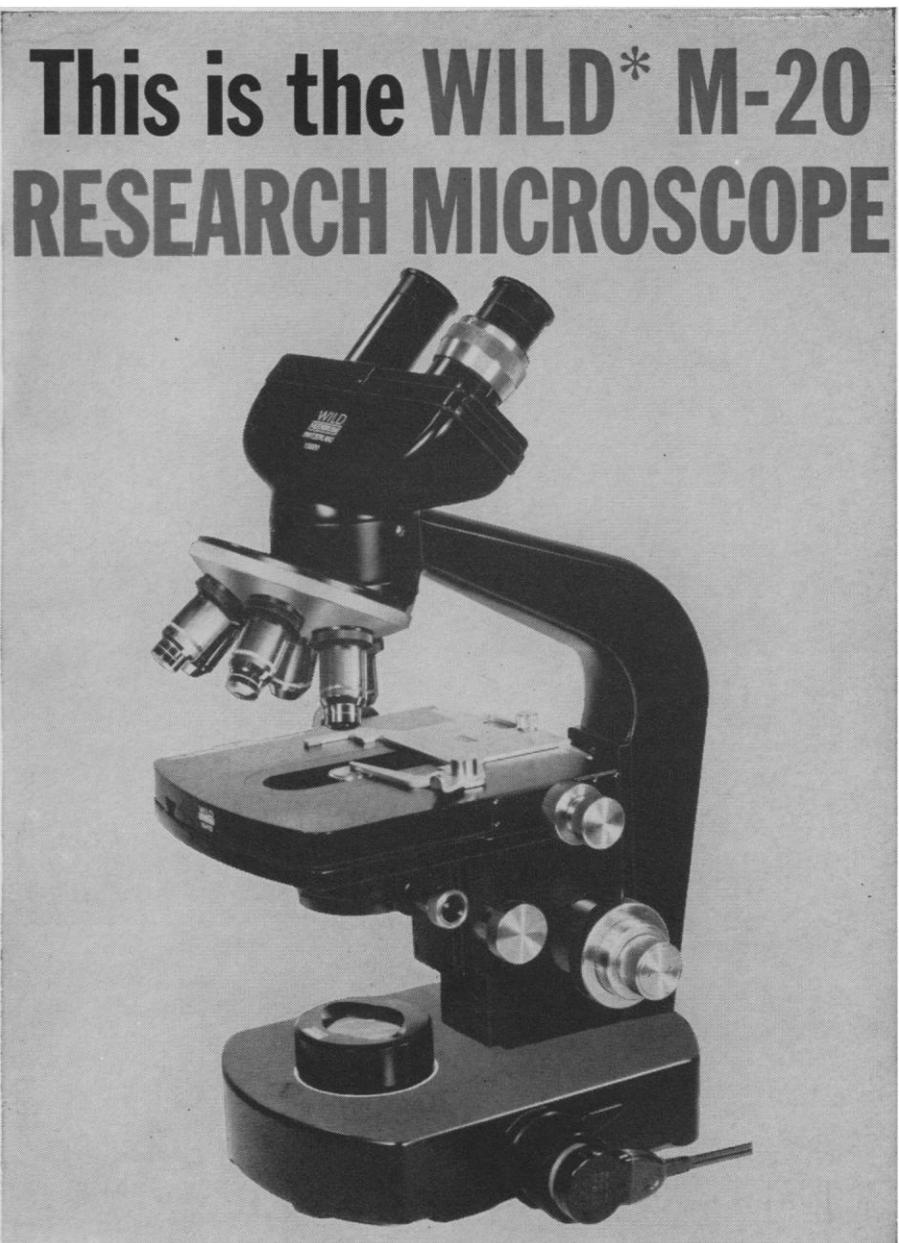
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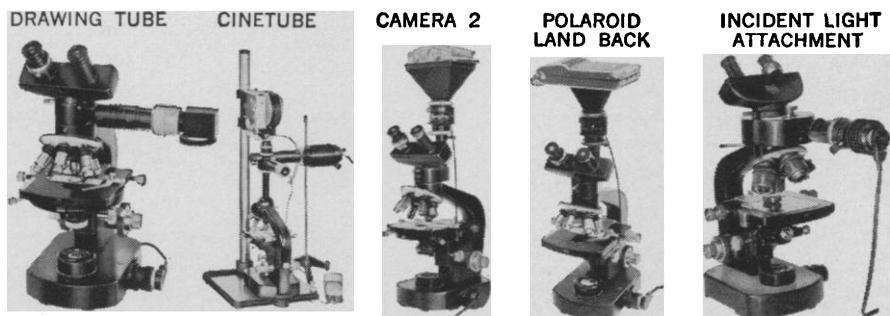
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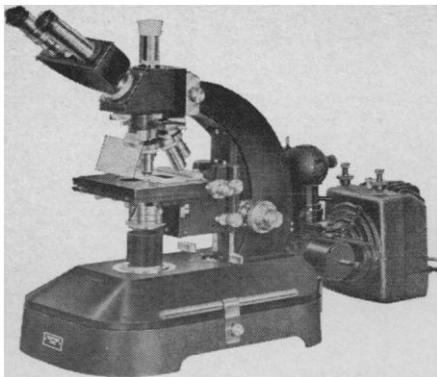


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**Cosmic Dust.** A. Dauvillier. Translated from the French edition (Paris, 1961) by Alan Crozy. Philosophical Library, New York, 1964. 175 pp. Illus. \$15. The French edition, *La Poussiere Cosmique*, was reviewed in *Science* [135, 720 (1962)] by G. de Vaucouleurs.

**Crystalline Olefin Polymers.** pt. 2. R. A. V. Raff and K. W. Doak, Eds. Interscience (Wiley), New York, 1964. 689 pp. Illus. \$22.50.

**Discrete and Continuous Boundary Problems.** F. V. Atkinson. Academic Press, New York, 1964. 584 pp. Illus. \$16.50.

**Discretus Calculus.** A variable-metric approach to physical theory. Herbert S. Ingham. Philosophical Library, New York, 1964. 217 pp. Illus. \$6.

**The Dynamic Method in Oceanography.** L. M. Fomin. Translated from the Russian by Scripta Technica. Elsevier, New York, 1964. 224 pp. Illus. \$12.

**The Elastic Constants of Crystals.** H. B. Huntington. Academic Press, New York, 1964. 141 pp. Illus. \$3.95. Reprinted from *Solid State Physics*, vol. 7, 1958.

**Electromagnetic Theory for Engineering Applications.** W. L. Weeks. Wiley, New York, 1964. 764 pp. Illus. \$18.

**Electron Energy Bands in Solids.** Joseph Callaway. Academic Press, New York, 1964. 118 pp. Illus. \$3.95. Reprinted from *Solid State Physics*, vol. 7, 1958.

**Electronic Charges of Bonds in Organic Compounds.** G. V. Bykov. Translated from the Russian edition (Moscow, 1960) by J. T. Greaves. Pergamon, London; Macmillan, New York, 1964. 199 pp. Illus. \$9.

**Electronic Fundamentals and Applications.** John D. Ryder. Prentice-Hall, Englewood Cliffs, N.J., ed. 3, 1964. 711 pp. Illus. \$17.

**Electronic Spectra of Molecules and Ions in Crystals.** pt. 1, *Molecular Crystals*; pt. 2, *Spectra of Ions in Crystals*. Donald S. McClure. Academic Press, New York, 1964. 179 pp. Illus. \$3.95. Two papers, reprinted from *Solid State Physics*, vols. 8 and 9, 1959.

**The Elements and Structure of the Physical Sciences.** J. A. Ripley, Jr. Wiley, New York, 1964. 604 pp. Illus. \$8.95.

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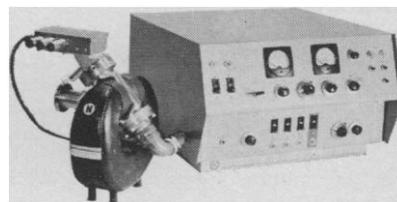
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**Japanese Miniature Electronic Components and Assemblies Data Annual, 1964-65.** G. W. A. Dummer and J. Mackenzie Robertson, Eds. Pergamon, London; Macmillan, New York, 1964. 507 pp. Illus. \$21.

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**Lectures in Abstract Algebra.** vol. 3, *Theory of Fields and Galois Theory*. Nathan Jacobson. Van Nostrand, Princeton, N.J., 1964. 335 pp. Illus. \$9.75.

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**Matrix Methods of Structural Analysis.** B. Fraeijs de Veubeke, Ed. Pergamon, London; Macmillan, New York, 1964. 349 pp. Illus. \$15. Five papers presented to the Structures and Materials Panel of the Advisory Group for Aeronautical Research and Development, NATO. "Matrix methods of structural analysis—a precis of recent developments," J. H. Argyris, S. Kelsey, and H. Kamel; "Upper and lower bounds in matrix structural analysis," B. M. Fraeijs de Veubeke; "Further development and applications of the stiffness method," M. J. Turner, H. C. Martin, and R. C. Weikel; "Some problems in the discrete element representation of aircraft structures," I. C. Taig and R. I. Kerr; and "Digital analysis of nonlinear structures by the force method," P. H. Denke.

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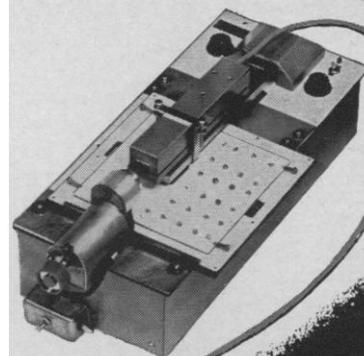
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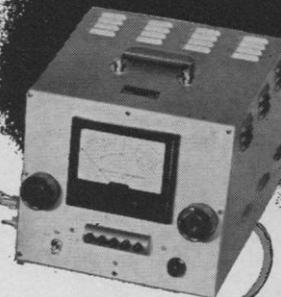
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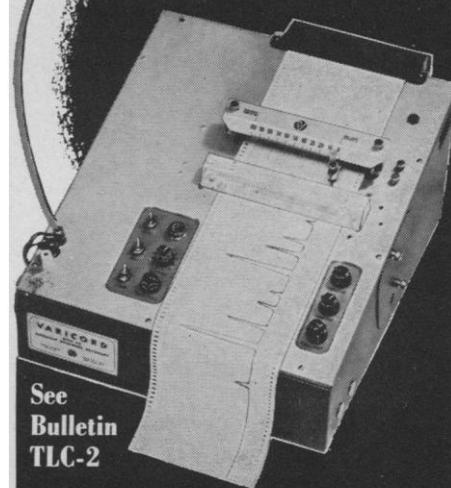
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**Quantum Electronics.** vols. 1 and 2. Proceedings of the Third International Congress (Paris), February 1963. P. Grivet and N. Bloembergen. Eds. Dunod, Paris; Columbia Univ. Press, New York, 1964. vol. 1, 996 pp.; vol. 2, 957 pp. Illus. 2 vols., \$35.

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**Relativité Généralisée Gravitation.** Henri Arzelies. vol. 2. J. Moulis. Gauthier-Villars, Paris, 1963. 318 pp. Illus. Paper. \$16.

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**Special Ceramics, 1962.** Proceedings of a symposium (Stoke-on-Trent, England), July 1962. P. Popper, Ed. Published for the British Ceramic Research Assoc. by Academic Press, New York, 1963. 496 pp. Illus. \$16.

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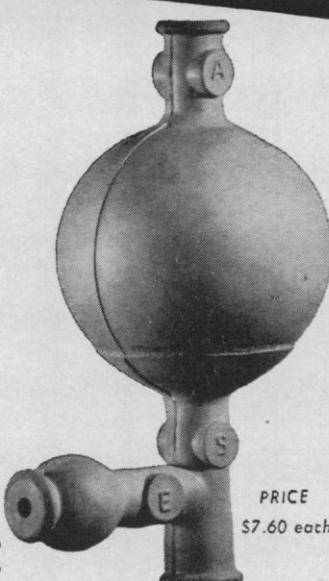
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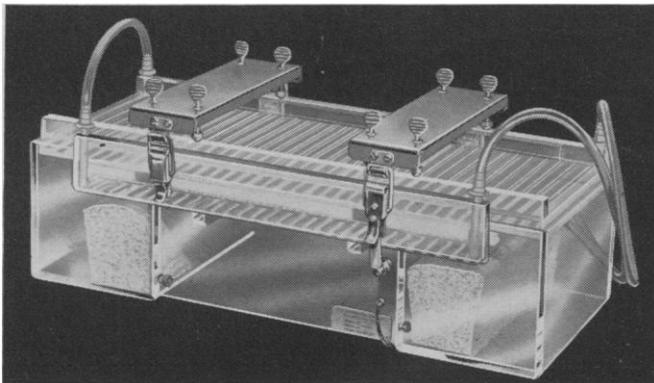
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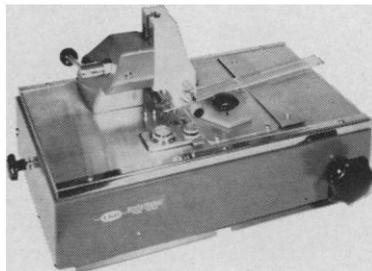
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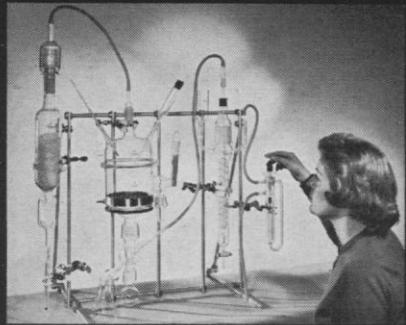


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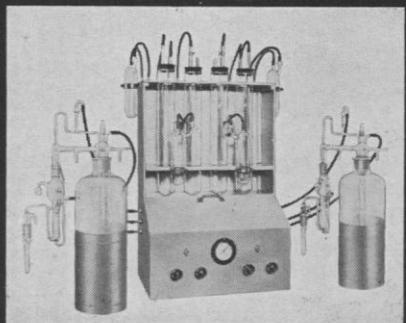
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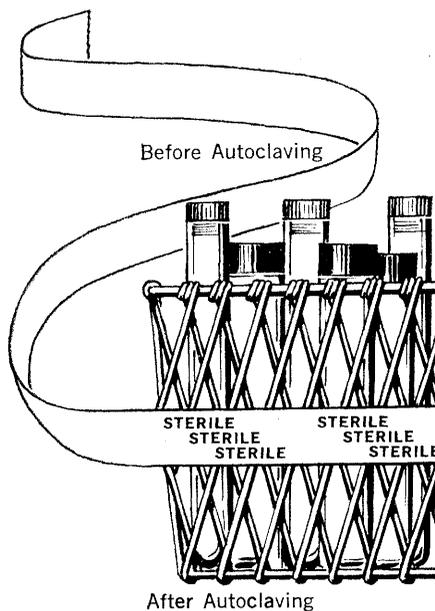
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radiobiology," Howard J. Curtis; "Electron paramagnetic resonance studies of biological interest," Bernard Smaller; "Polarimetric analysis of protein structure," Don Ridgeway; and "The analysis of biological similarity," Walter R. Stahl.

**Advances in Lipid Research.** vol. 1. Rodolfo Paoletti and David Kritchevsky, Eds. Academic Press, New York, 1963. 432 pp. Illus. \$14. Ten papers: "The structural investigation of natural fats," M. H. Coleman; "Physical structure and behavior of lipids and lipid enzymes," A. D. Bangham; "Recent developments in the mechanism of fat absorption," John M. Johnston; "The clearing factor lipase and its action in the transport of fatty acids between the blood and the tissues," D. S. Robinson; "Vitamin E and lipid metabolism," Roslyn B. Alfin-Slater and Rosemary S. Morris; "Atherosclerosis—spontaneous and induced," Thomas B. Clarkson; "Chromatographic investigations in fatty acid biosynthesis," M. Pascaud; "Carnitine and its role in fatty acid metabolism," Irving B. Fritz; "Present status of research on catabolism and excretion of cholesterol," Henry Danielsson; and "The plant sulfolipid," A. A. Benson.

**Advances in Metabolic Disorders.** vol. 1. Rachmiel Levine and Rolf Luft, Eds. Academic Press, New York, 1964. 380 pp. Illus. \$12. Eight papers: "Glycogen storage disease," H. G. Hers; "The parathyroids," G. D. Aurbach and John T. Potts, Jr.; "Mitochondrial respiratory control: biochemical, physiological, and pathological aspects," Lars Ernster and Rolf Luft; "Osteoporosis," B. E. C. Nordin; "Basal metabolic rate and thyroid hormones," J. R. Tata; "Insulin antagonists and inhibitors," J. Vallance-Owen; "Aldosterone: its biochemistry and physiology," John H. Laragh and William G. Kelly; "Folic acid deficiency in man and its interrelationship with vitamin B<sub>12</sub> metabolism," A. Leonard Lubby and Jack M. Cooperman.

**Advances in Protein Chemistry.** vol. 18. C. B. Anfinsen, Jr., M. L. Anson, and John T. Edsall, Eds. Academic Press, New York, 1963. 345 pp. Illus. \$14. Four papers: "Recent studies on the structure of tobacco mosaic virus," F. Alfred Anderer; "Assembly and stability of the tobacco mosaic virus particle," D. L. D. Caspar; "The dissociation and association of protein structures," F. J. Reithel; and "The amino acid composition of some purified proteins," G. R. Tristram and R. H. Smith.

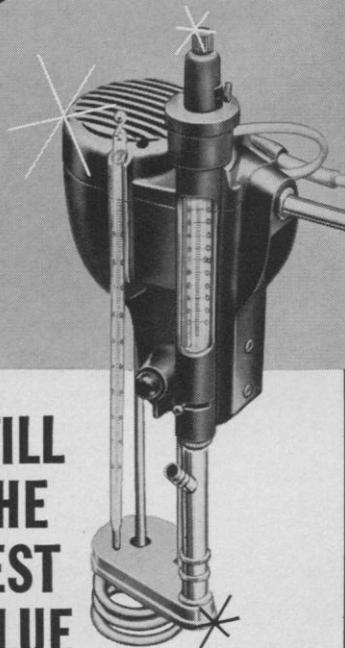
**Amino Acids and Serum Proteins.** Based on the Richard J. Block Memorial Symposium, sponsored by the Division of Biological Chemistry (Atlantic City, N.J.). September 1962. Jacob A. Stekol, Ed. American Chemical Soc., Washington, D.C., 1964. 178 pp. Illus. \$5.50.

**Anatomy and the Problem of Behaviour.** G. E. Coghill. Hafner, New York (reprint of 1929 edition), 1964. 125 pp. Illus. \$4.75.

**Animal Biology.** Michael F. Guyer and Charles E. Lane. Harper and Row, New York, ed. 5, 1964. 807 pp. Illus. \$8.95.

**Animal Body Fluids and Their Regulation.** A. P. M. Lockwood. Harvard Univ. Press, Cambridge, Mass., 1964. 185 pp. Illus. \$2.75.

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**Animal Diversity.** Earl D. Hanson. Prentice-Hall, Englewood Cliffs, N.J., ed. 2, 1964. 128 pp. Illus. Paper, \$1.75; cloth, \$3.95.

**Animal Genetics.** Frederick B. Hutt. Ronald, New York, 1964. 560 pp. Illus. \$12.

**Annelids.** R. Phillips Dales. Hillary House, New York, 1963. 200 pp. Illus. \$3.

**Annual Review of Entomology.** vol. 9. Ray F. Smith and Thomas E. Mittler, Eds. Annual Reviews, Palo Alto, Calif., 1964. 400 pp. Illus. \$8.50. Sixteen papers, of which nine are contributed by workers outside the United States: L. B. Barton-Browne (Australia) on water regulation in insects; D. Schneider (Germany) on insect antennae; G. P. Holland (Canada) on evolution, classification, and host relationships of Siphonaptera; H. Klomp (Netherlands) on intraspecific competition and the regulation of insect numbers; E. Rivnay (Israel) on the influence of man on insect ecology in arid zones; F. Wilson (Australia) on the biological control of weeds; W. Fyg (Switzerland) on anomalies and diseases of the queen honey bee; J. F. B. Edeson and T. Wilson (England) on the epidemiology of filariasis due to *Wuchereria bancrofti* and *Brugia malayi*; and G. M. Saccà (Italy) on comparative bionomics in the genus *Musca*.

**Bibliographie der Pflanzenschutz-Literatur.** vol. 2, 1958. J. Bärner. Parey, Berlin, 1963. 329 pp. Paper, DM. 68.

**Bioastronautics.** Karl Schaefer, Ed. Macmillan, New York, 1964. 416 pp. Illus. \$16.

**The Biochemistry of Clinical Medicine.** William S. Hoffman. Yearbook Medical Publishers, Chicago, ed. 3, 1964. 824 pp. Illus. \$12.50.

**The Biology of Plant Parasitic Nematodes.** H. R. Wallace. St. Martin's Press, New York, 1964. 288 pp. Illus. \$9.50.

**Brain Mechanisms and Intelligence.** A quantitative study of injuries to the brain. K. S. Lashley. Hafner, New York (reprint of 1929 edition), 1964. 200 pp. Illus. Plates. \$5.50.

**Brains of Rats and Men.** A survey of the origin and biological significance of the cerebral cortex. C. Judson Herrick. Hafner, New York (reprint of 1926 edition), 1963. 401 pp. Illus. \$6.

**Cell Physiology and Biochemistry.** William D. McElroy. Prentice-Hall, Englewood Cliffs, N.J., ed. 2, 1964. 128 pp. Illus. Paper, \$1.75; cloth, \$3.95.

**Cellular Membranes in Development.** A symposium (Storrs, Conn.), June 1963. Michael Locke, Ed. Academic Press, New York, 1964. 398 pp. Illus. \$12.

**Cerebral Function in Infancy and Childhood.** Albrecht Peiper. Translated from the third revised German edition (Leipzig, 1961) by Benedict Nagler and Hilde Nagler. Consultants Bureau, New York, 1963. 695 pp. Illus. \$25.

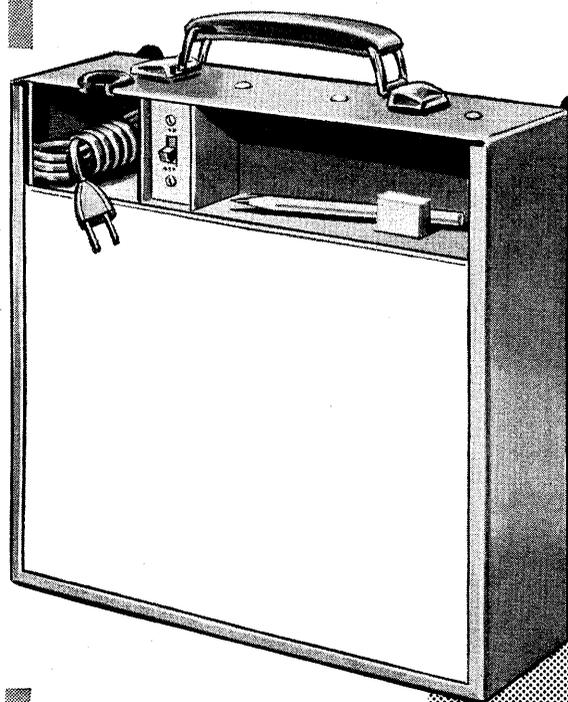
**Chelation Therapy.** Alfred Soffer, Maynard Chenoweth, Gunther L. Eichhorn, Betty Rosoff, Martin Rubin, and Herta Spencer. Thomas, Springfield, Ill., 1964. 173 pp. Illus. \$8.

**Chemical and Biological Aspects of Pyridoxal Catalysis.** Proceedings of symposium of the International Union of Biochemistry (Rome), October 1962. E. E. Snell, P. M. Fasella, A. Braunstein, and A. Rossi Fanelli, Eds. Pergamon, London;

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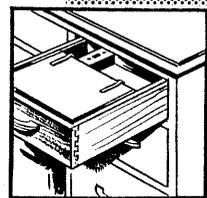
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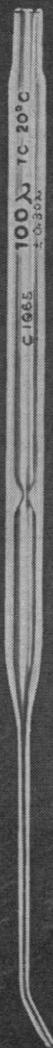


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**Chemical Protection of the Body Against Ionizing Radiation.** V. S. Balabukha, Ed. Translated from the Russian edition (Moscow, 1960) by J. T. Greaves. J. H. Barnes, Ed. Pergamon, London; Macmillan, New York, 1963. 180 pp. Illus. \$8.50.

**Cold Spring Harbor Symposia on Quantitative Biology.** vol. 28, *Synthesis and Structure of Macromolecules.* Biological Laboratory, Long Island Biological Assoc., Cold Spring Harbor, N.Y., 1963. 630 pp. Illus. \$15.

**Comparative Anatomy and Embryology.** William W. Ballard. Ronald, New York, 1964. 626 pp. Illus. \$10.

**Comparative Neurochemistry.** Proceedings, Fifth International Neurochemical Symposium (St. Wolfgang, Austria), 1962. Derek Richter, Ed. Pergamon, London; Macmillan, New York, 1964. 503 pp. Illus. \$14.

**Cosmetics and the Skin.** F. V. Wells and Irwin I. Lubowe. Reinhold, New York; Chapman and Hall, London, 1964. 698 pp. \$22.

**Craigie's Neuroanatomy of the Rat.** Revised and expanded by Wolfgang Zeman and James Robert Maitland Innes. Academic Press, New York, 1963. 240 pp. Illus. \$8.50.

**The Cytology and Genetics of Barley 1951-1962.** Robert A. Nilan. Washington State Univ. Press, Pullman, 1964. 288 pp. Illus. Paper, \$4. This compendium presents information gathered from more than 1200 articles published between 1951 and 1962.

**Data Acquisition and Processing in Biology and Medicine.** vol. 2. Proceedings of the 1962 Rochester conference. Kurt Enselin, Ed. Pergamon, London; Macmillan, New York, 1964. 377 pp. Illus. \$11.50.

**Electronic and Computer-Assisted Studies of Biomedical Problems.** Otto H. Schmitt and Cesar A. Caceres, Eds. Thomas, Springfield, Ill., 1964. 344 pp. \$12.50.

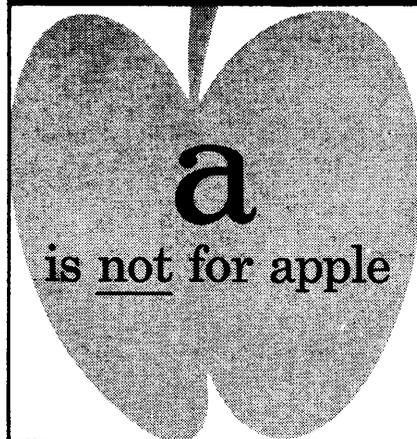
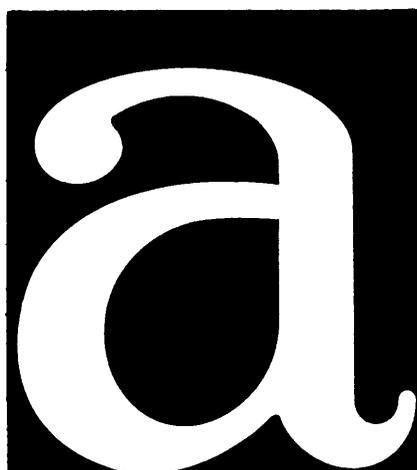
**The Enzymes of Lipid Metabolism.** Proceedings of the Sixth International Conference on the Biochemistry of Lipids (Marseilles), 1960. P. Desnuelle, Ed. Pergamon, London, 1961; Macmillan, New York, 1964. 324 pp. Illus. \$10.

**Evolution of the Atherosclerotic Plaque.** Richard J. Jones, Ed. Univ. of Chicago Press, Chicago, 1964. 374 pp. Illus. \$6.75. A collection of papers given at an international symposium held at Chicago, Ill., in March 1963, under the joint sponsorship of the Chicago Heart Association and the Council on Arteriosclerosis of the American Heart Association.

**Evolutionary and Genetic Biology of Primates.** vol. 2. John Buettner-Janusch, Ed. Academic Press, New York, 1964. 342 pp. Illus. \$12.50.

**Experimental Surgery.** Including surgical physiology. J. Markowitz, J. Archibald, and H. G. Downie. Williams and Wilkins, Baltimore, Md., ed. 5, 1964. 671 pp. Illus. \$13.

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**Trees.** A symposium (Harvard Forest, Petersham, Mass.), April 1963. Martin H. Zimmerman, Ed. Academic Press, New York, 1964. 578 pp. Illus. \$16.

**Fortschritte der Zoologie.** Max Hartmann, Ed. vol. 16, pt. 2. Hansjochem Autrum and Friedrich Seidel. Fischer, Stuttgart, Germany, 1963. 146 pp. Illus. Paper, DM. 34. Two papers: "Physiologie des Stoffwechsels" by Klaus Urich and "Vergleichende Physiologie der mechanischen Sinne" by Christian Hoffmann.

**Function of the Human Body.** Arthur C. Guyton. Saunders, Philadelphia, ed. 2, 1964. 441 pp. Illus. \$7.75.

**The Genetics of Bacteria and Their Viruses.** Studies in basic genetics and molecular biology. William Hayes. Wiley, New York, 1964. 752 pp. Illus. \$13.75.

**Growth and Maturation of the Brain.** A series of lectures delivered during a workshop (Amsterdam, Netherlands), September 1962. Dominick P. Purpura and J. P. Schade, Eds. Elsevier, New York, 1964. 299 pp. Illus. \$14.50.

**Handbook of Physiology.** Section 4, *Adaption to the Environment.* D. B. Dill, E. F. Adolph, and C. G. Wilber, Eds. Published for American Physiological Soc., Washington, D.C., by Williams and Wilkins, Baltimore, 1964. 1066 pp. Illus. \$32.

**Heat and Life.** The development of the theory of animal heat. Everett Mendelsohn. Harvard Univ. Press, Cambridge, Mass., 1964. 222 pp. \$4.50.

**The Hormones.** Physiology, chemistry, and applications. vol. 4. Gregory Pincus, Kenneth V. Thimann, and E. B. Astwood, Eds. Academic Press, New York, 1964. 702 pp. Illus. \$22.

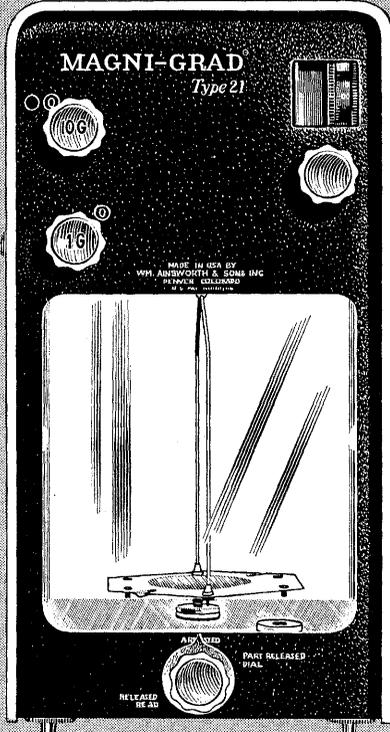
**International Review of Experimental Pathology, 1963.** vol. 2. G. W. Richter and M. A. Epstein, Eds. Academic Press, New York, 1963. 460 pp. Illus. \$16. Eight papers: "Cellular recognition of foreign matter," Stephen Boyden; "The nucleic acids of viruses as revealed by their reactions with fluorochrome acridien orange," Heather D. Mayor; "Cytochemical aspects of experimental leukemia," Bo Thorell; "The use of statistics in the etiologic study of malignant neoplasms," Johannes Clemmesen; "A lymphoma syndrome in Tropical Africa," Denis Burkitt; "Microscopic morphology of injured living tissue," Ian K. Buckley; "Melanin granules," P. Drochmans; and "Biological effects of ionizing radiations," Arthur C. Upton.

**International Review of Neurobiology.** vol. 6. Carl C. Pfeiffer and John R. Smythies, Eds. Academic Press, New York, 1964. 488 pp. Illus. \$15. Seven papers: "Protein metabolism of the nervous system," Abel Lajtha; "Patterns of muscular innervation in the lower chordates," Quentin Bone; "The neural organization of the visual pathways in the cat," Thomas H. Meikle, Jr., and James M. Sprague; "Properties of afferent synapses and sensory neurons in the lateral geniculate nucleus," P. O. Bishop; "Regeneration in the vertebrate central nervous system," Carmine D. Clemente; "Neurobiology of phencyclidine (sernyl), a drug with an unusual spectrum of pharmacological activity," Edward F. Domino, and "Free behavior and brain stimulation," José M. R. Delgado.

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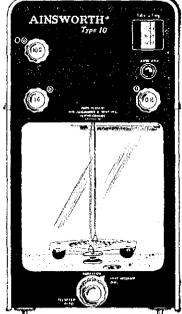
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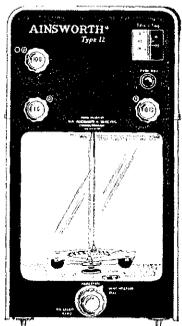
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## NEWS AND COMMENT

(Continued from page 982)

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Faculty in the nonscientific disciplines on calendar-year contracts in general had much lower salaries than engineers, scientists, and mathematicians on the same sort of contracts, and this difference, as much as any thing, seems to reflect the real advantage of the latter group in the academic market place.—J.W.

## Announcements

**Science & Public Policy**, a new AAAS magazine, will begin publication on an experimental basis on 1 June.

The magazine, which is now scheduled for publication every other month, will contain public affairs articles that have previously appeared in *Science*, as well as other material. It is being distributed without charge to government officials, research administrators, and others interested in public policy matters involving science and technology. Complimentary copies are available to *Science* subscribers upon request. (*Science & Public Policy*, 1515 Massachusetts Avenue, NW, Washington, D.C. 20005)

A conference on **viral diseases of poikilothermic vertebrates** is scheduled 23–26 September in New York. Approximately 45 papers will be presented, dealing with histopathology, immunity, etiology, cytology, electron microscopy, and tissue culture of fishes and amphibians. (S. F. Snieszko, Eastern Fish Disease Laboratory, Leetown, P.O. Kearneysville, W. Va. 25430)

The establishment of a \$15 million fund at Massachusetts Institute of Technology, earmarked for basic research in the **physical sciences**, was announced Monday. It includes a \$5 million personal gift from Alfred P. Sloan, Jr., the remainder being from the Alfred P. Sloan Foundation. The money, according to Sloan, is to be used to help correct the imbalance he feels exists between basic and applied research. The fund will be managed by three administrators appointed by the M.I.T. Corporation's executive committee. Although primarily for research in phys-

ical sciences, it may also be used in areas where development in physical sciences impinges on other disciplines. Money from the fund may also be allocated for use in institutions other than M.I.T.

## Grants, Fellowships, and Awards

A graduate fellowship in **electrochemistry** has been established at Columbia University, in honor of Samuel Ruben, inventor of the mercury dry cell and of the dry electrolytic capacitor. The \$1000 fellowship is presented by the P. R. Mallory Foundation. Applications should be sent to H. B. Linford, Department of Chemical Engineering, Columbia University, New York.

## Courses

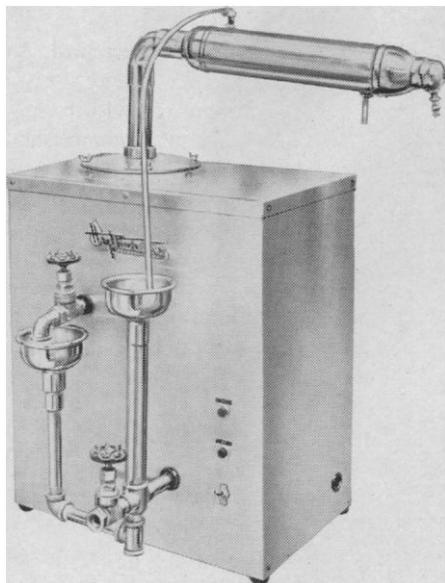
An advanced seminar in **theoretical metallurgy** is scheduled 15 June to 7 August at the University of Denver's Denver Research Institute. It will consist of five lectures on "energetics in metallurgical phenomena," each to be delivered daily for 1 to 2 weeks, and supplemented by regularly scheduled informal discussion sessions. Attendance is open and there are no fees. Postdoctoral participants are eligible for stipends of \$100 per week plus travel and dependency allowances; predoctoral stipends of \$50 a week, plus travel allowances, are available. (M. D. Robbins, Denver Research Institute, University of Denver, Denver, Colo. 80210)

## Scientists in the News

Columbia University's C. F. Chandler medal for achievement in pure or applied chemistry has been presented to **Henry Taube**, professor of chemistry at Stanford University. He was cited for pioneering work in the mechanisms of inorganic reactions.

**Victor T. Tomberg**, formerly with Kollsman Instrument Corp., New York, has been appointed senior research associate in the research department of neurosurgery, at the medical school of New York University.

**Earl R. Parker**, professor of metallurgy and director of the Institute of Engineering Research at the University



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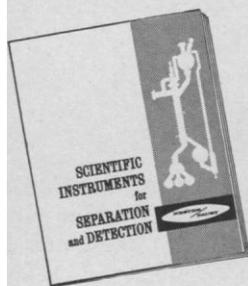
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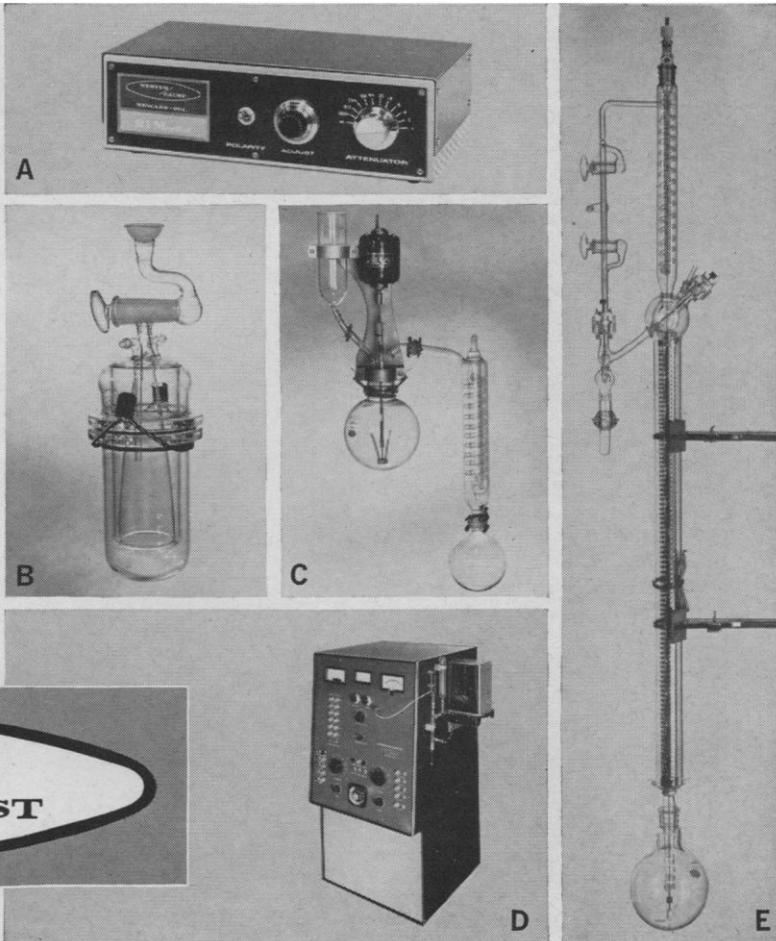


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**GLUCOSE** in Blood or Serum at 540 m $\mu$ . (Same filtrate may be used for Urea-Nitrogen assay. (COLORIMETRIC).....Bulletin No. 14  
**GLUCOSE-6-PHOSPHATE DEHYDROGENASE** in Red Cells or other fluids. A semi-quantitative, extremely simple visual method; requires no instrument. (Bergner Method).....Bulletin No. 400  
 **$\alpha$ -HYDROXYBUTYRIC DEHYDROGENASE ( $\alpha$ HBD)** in Serum at 340 m $\mu$ . (ULTRAVIOLET).....Bulletin No. 20-UV  
**ISOCITRIC DEHYDROGENASE** in Serum at 340 m $\mu$ . (Wolfsen).....Bulletin No. 150-UV  
**ISOCITRIC DEHYDROGENASE** in Serum at 400 m $\mu$ . (A modification of Baron & Bell and of Taylor & Friedman).....(COLORIMETRIC).....Bulletin No. 175  
**L(+)** LACTIC ACID in Blood, Plasma, zymatic procedure. (ULTRAVIOLET).....Bulletin No. 825-UV  
**LACTIC DEHYDROGENASE** in Serum and Urine at approximately 500 m $\mu$ . (Bergner-Broida Method.) An original colorimetric procedure developed in the Sigma Laboratories. Includes Isozymes. (COLORIMETRIC).....Bulletin No. 500  
**LACTIC DEHYDROGENASE** in Serum at 340 m $\mu$ . (ULTRAVIOLET).....Bulletin No. 340-UV  
**LEUCINE AMINO PEPTIDASE** in Serum and Urine at 540-620 m $\mu$ . (Sigma modification of Goldbarg and Rutenburg Procedure).....(COLORIMETRIC).....Bulletin No. 250  
**LIPASE** in Serum. A simple titration procedure using our stabilized Olive Oil Substrate. Requires only 3 to 6 hours. (Sigma-Tietz Method.).....Bulletin No. 800  
**MALIC DEHYDROGENASE** in Serum at 340 m $\mu$ . (ULTRAVIOLET).....Bulletin No. 340-UV  
**ORNITHINE TRANS-CARBAMYLASE** (Ornithine Carbamyl Transferase; OCT) in Serum. (Reichard Method; Nesslerization or titration of ammonia formed.) An indication of liver damage. (ULTRAVIOLET).....Bulletin No. 108  
**PHOSPHATASE, Alkaline and Acid**, in Blood Smears or Tissue Sections. Histological procedure. Extremely simple; requires only 15 minutes. (ULTRAVIOLET).....Bulletin No. 85  
**PHOSPHATASE, Acid, Alkaline, and Prostatic** in Serum at approximately 410 m $\mu$ . Also Urinary Alkaline Phosphatase. Probably the fastest and most accurate procedure available (Bessey-Lowry Method). (COLORIMETRIC).....Bulletin No. 104  
**PHOSPHOHEXOSE ISOMERASE** at 490 m $\mu$  (per Bodansky). Elevations have been reported in various types of carcinoma. (COLORIMETRIC).....Bulletin No. 650  
**PYRUVIC ACID** in Blood at 340 m $\mu$ . A simple enzymatic procedure. (ULTRAVIOLET).....Bulletin No. 725-UV  
**TRANSAMINASE, GO and GP**, at approximately 505 m $\mu$ . This is the famous Sigma-Frankel Method that is now the most widely used and respected the World over. (COLORIMETRIC).....Bulletin No. 505  
**TRANSAMINASE, GO and GP**, at 340 m $\mu$ . (Karmen, LaDue, and Wroblewski Methods.) (ULTRAVIOLET).....Bulletin No. 410-UV  
**UREA-NITROGEN** in Blood or Serum at 400-420 m $\mu$ . (Same filtrate may be used for Glucose assay).....(COLORIMETRIC).....Bulletin No. 14  
**URIC ACID** in Serum at 650-750 m $\mu$ . A simple enzymatic procedure. No Cyanide used; combines the accuracy of the enzyme Uricase with the simplicity of a Colorimetric procedure. (ULTRAVIOLET).....Bulletin No. 680

of California, Berkeley, has been named to receive the 1964 Albert Sauveur achievement award from the American Society of Materials. The prize, in recognition of "pioneering metallurgical achievements which have stimulated organized work" that has furthered knowledge in basic metallurgy, will be presented during the society's meeting in October.

**Alexander Spoehr**, former chancellor of the East-West Center and professor of anthropology at the University of Hawaii, has been appointed professor of anthropology at the University of Pittsburgh. He is scheduled to begin in the winter trimester, after an extended tour of anthropological research and educational facilities in the Pacific islands.

**Paul R. Peabody**, formerly supervisor of applied mathematics at the Jet Propulsion Laboratory, has been appointed manager of the new department of mathematical analysis at Computer Sciences Corporation, a data processing service organization in Los Angeles, Calif.

**Hasmukh J. Mehta**, assistant professor of anatomy at Western Reserve University, has been appointed professor and chairman of the department of anatomy in the recently organized St. John's Medical College, Bangalore, India, which is scheduled to open in July. He has been in charge of gross anatomy studies in the W.R.U. dentistry school for the past year.

### Recent Deaths

**Igor I. Bondarenko**, 37; Soviet nuclear physicist, deputy director of the Physical Energy Institute, Obninsk, Russia; 7 April.

**Burt G. Chollett**, 88; orthopedic surgeon and a founder of the National Society for Crippled Children; 4 May.

**Marin S. Dunn**, 65; director of the biology department, Philadelphia College of Pharmacy and Science; 14 April.

**R. Carl Millican**, 46; of the Laboratory of Biochemical Pharmacology, National Institute of Arthritis and Metabolic Diseases; 7 March.

**Howard Zahniser**, 58; conservation leader, former chairman of the National Resources Council of America and a member of the Secretary of the Interior's advisory committee on conservation; 5 May.