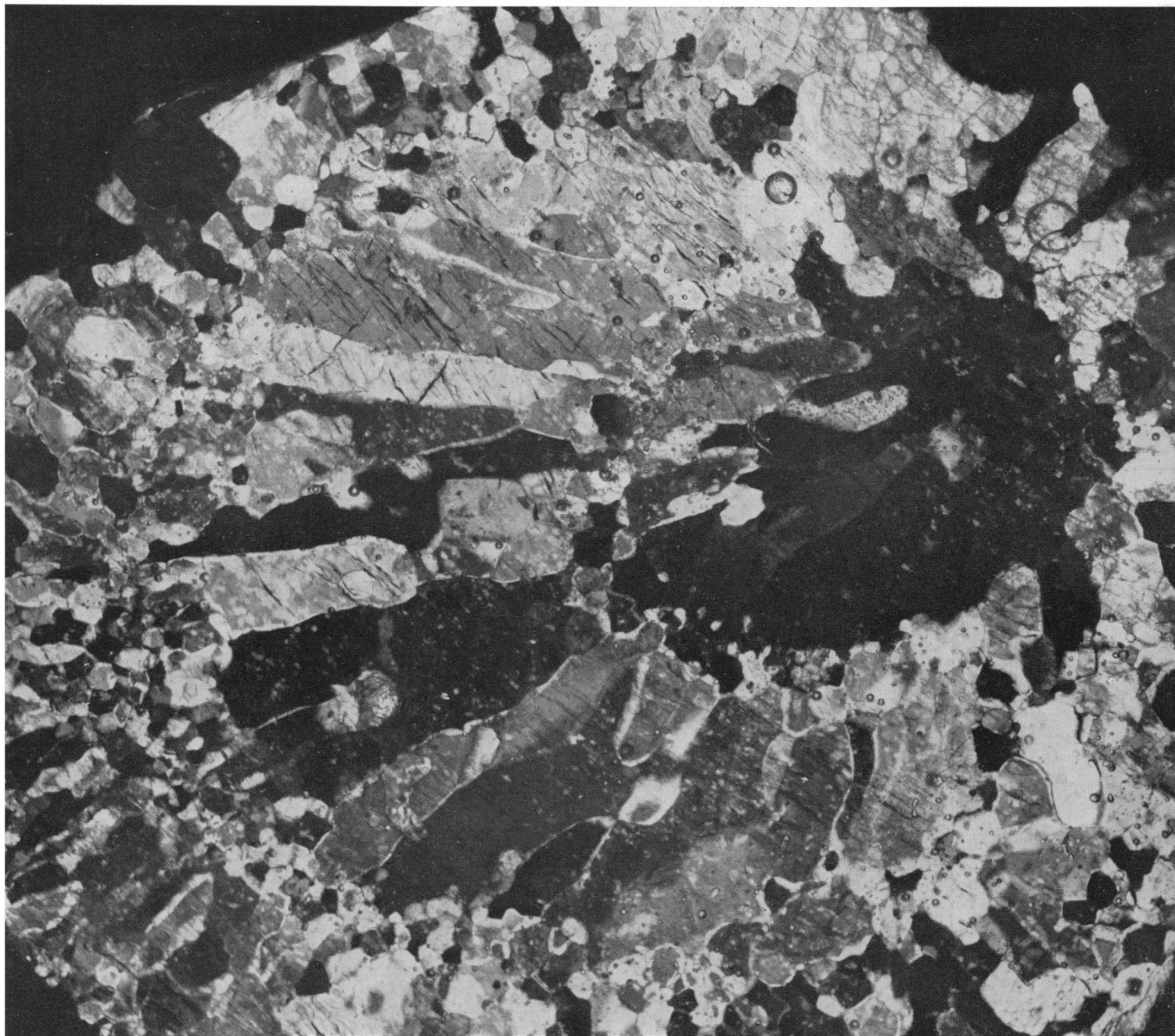


# SCIENCE

21 October 1960

Vol. 132, No. 3434

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE



Instrument Issue





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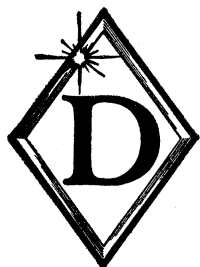


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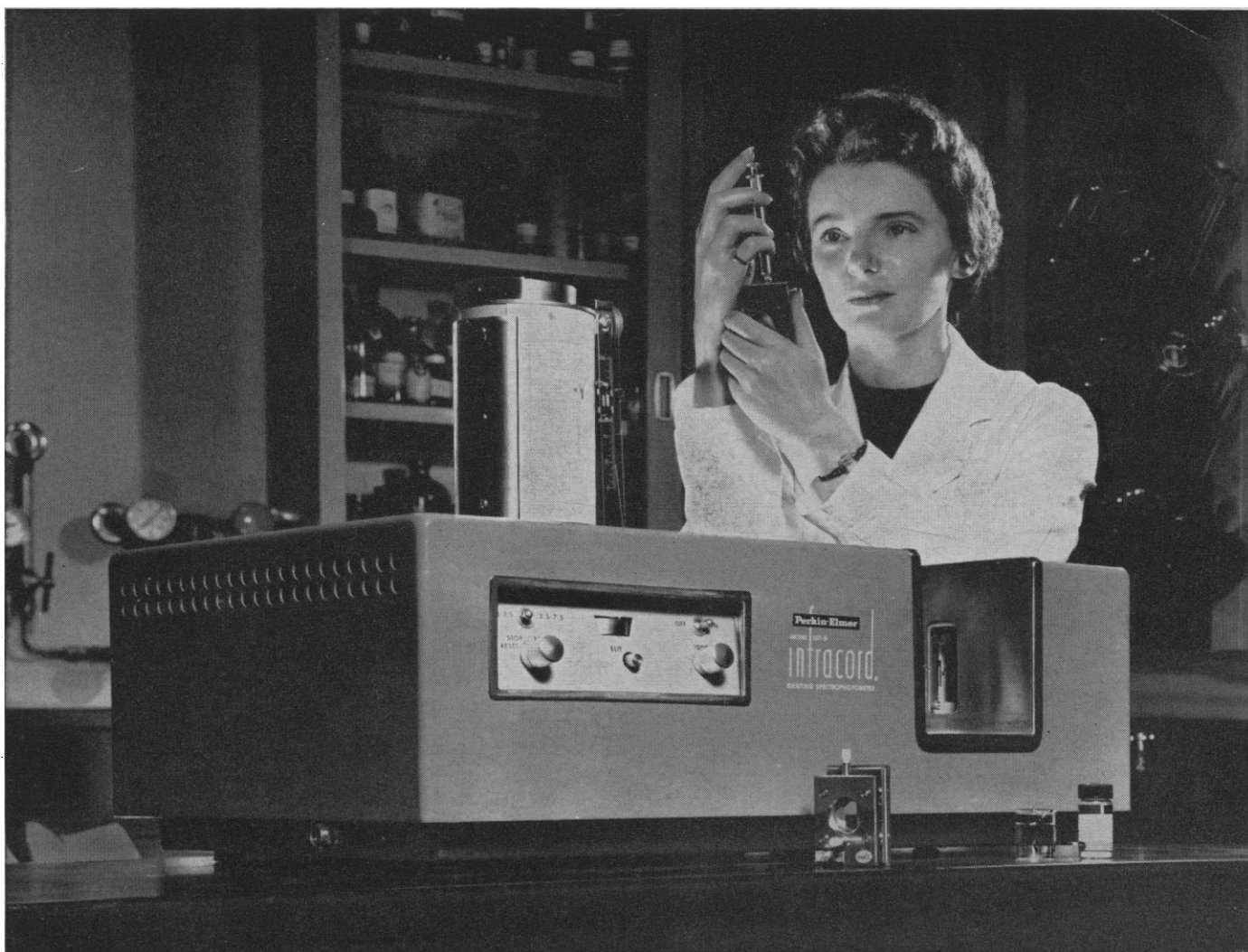
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INSTRUMENT DIVISION

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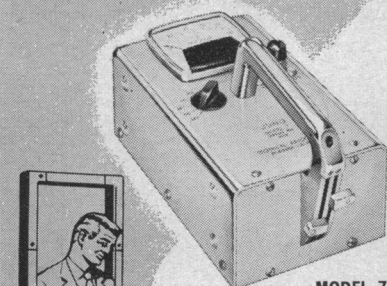
# T/A

## Instruments and Systems for Nuclear Research and Radiation Measurements

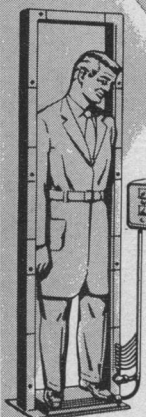
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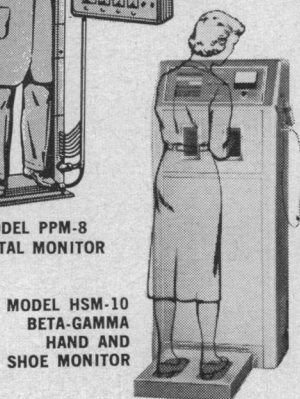
- Juno Survey Meter
- Cutie Pie Survey Meter
- Beta-Gamma Hand and Shoe Monitors
- Portal Monitor
- Alpha Hand Monitors
- Laundry Monitor



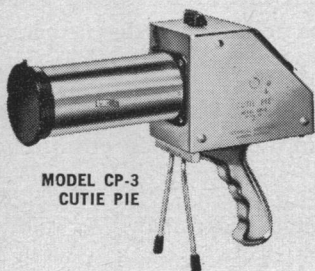
MODEL 7  
JUNO



MODEL PPM-8  
PORTAL MONITOR



MODEL HSM-10  
BETA-GAMMA  
HAND AND  
SHOE MONITOR



MODEL CP-3  
CUTIE PIE

### COUNTING & ANALYTICAL SYSTEMS

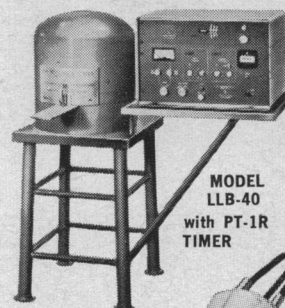
#### MODEL GTS-6 SCALER shown with Model RHV-3 5000 Volt Power Supply

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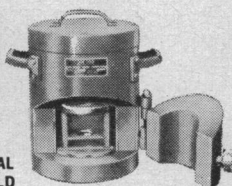
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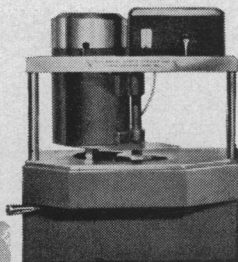
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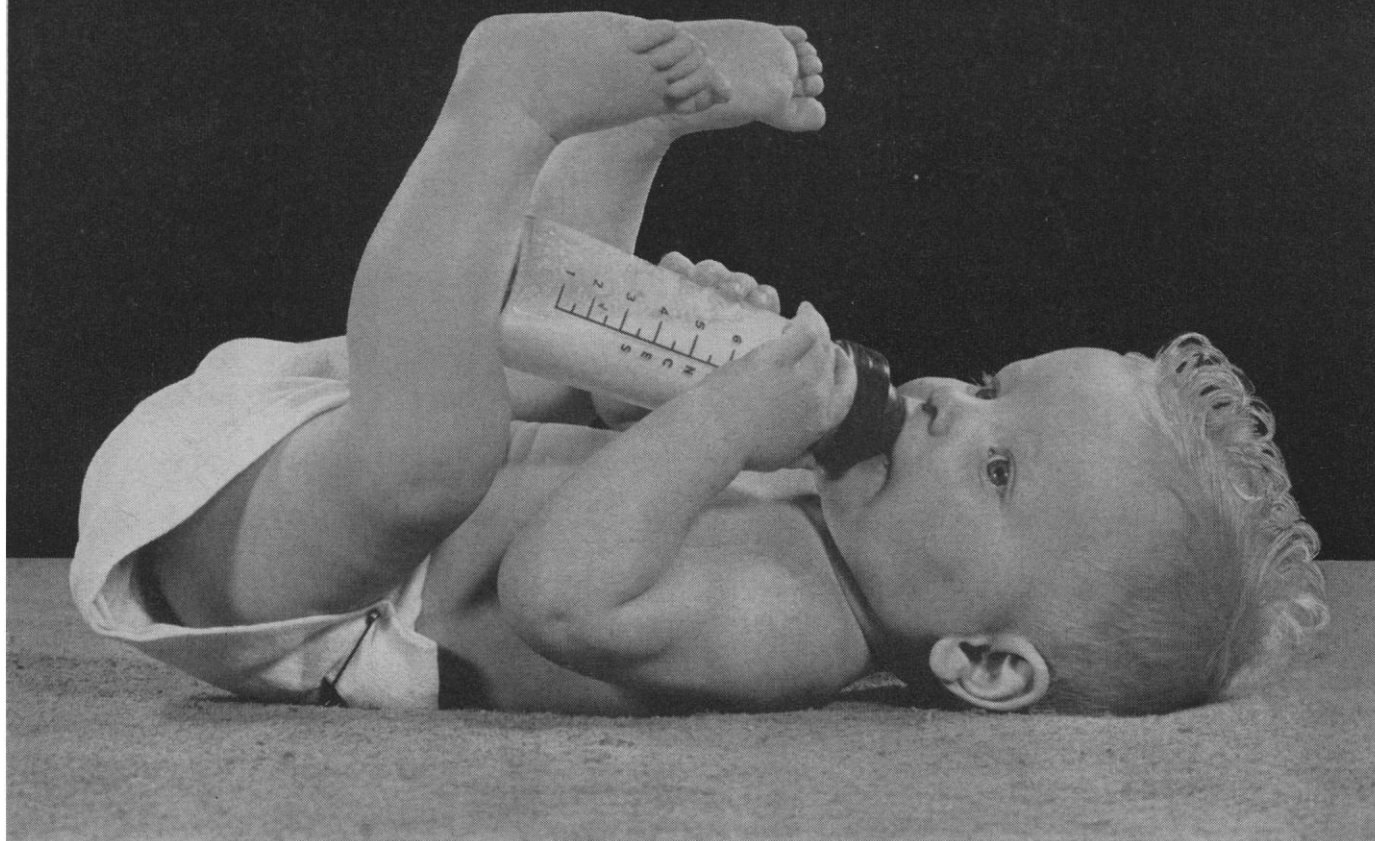
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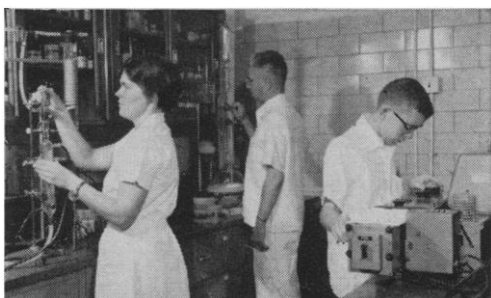
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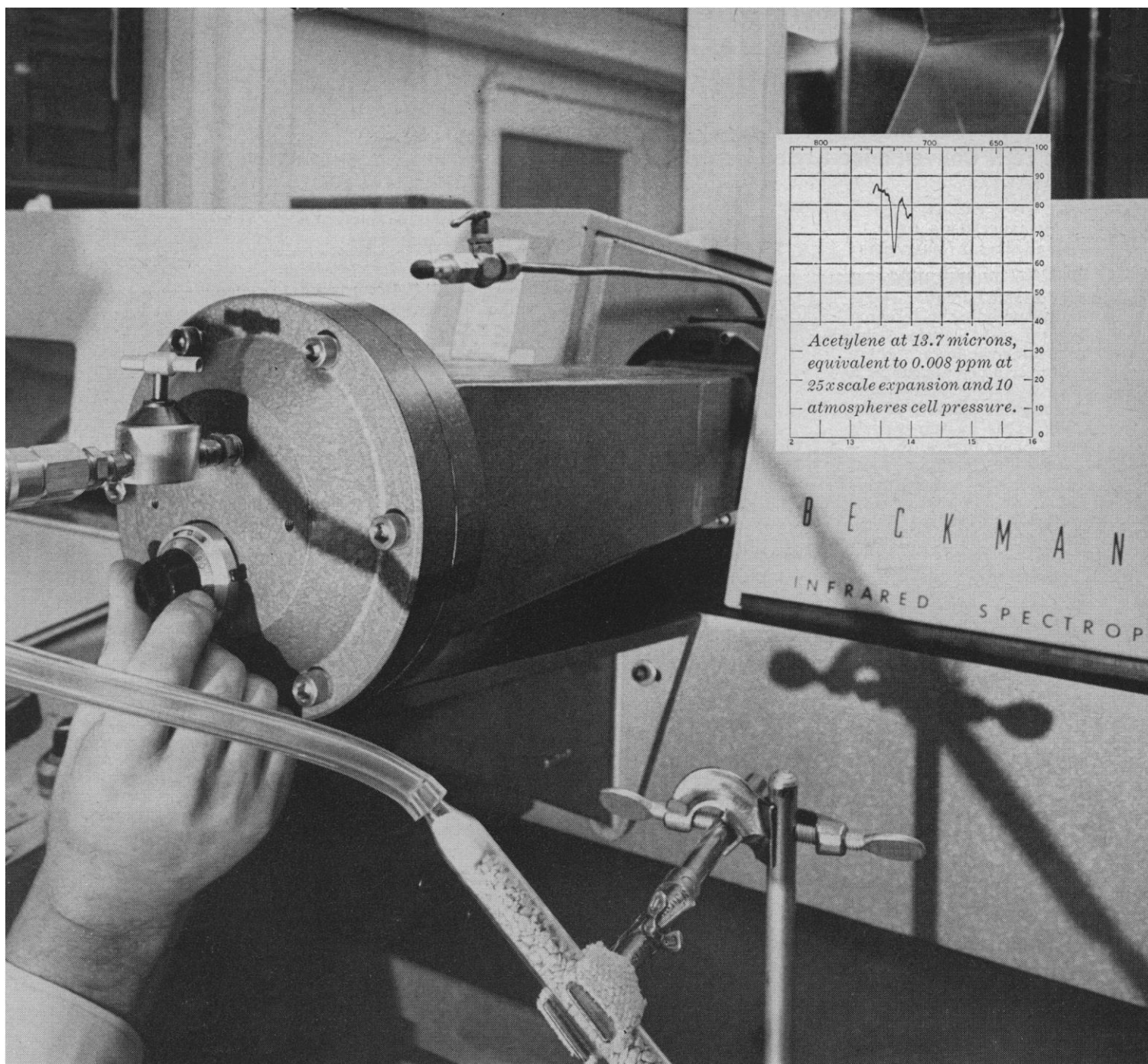
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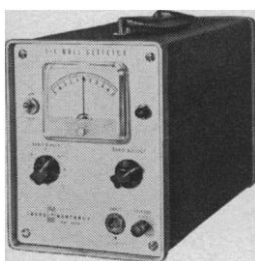
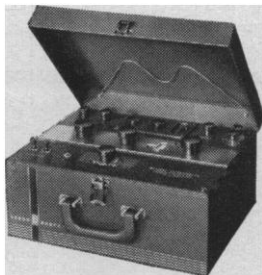


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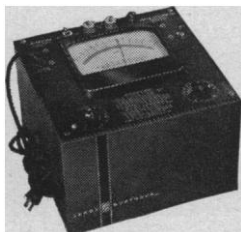
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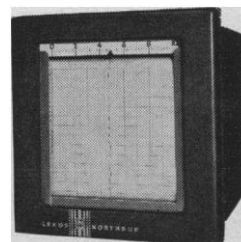
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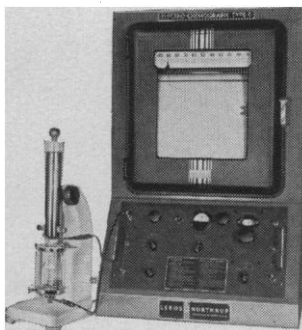
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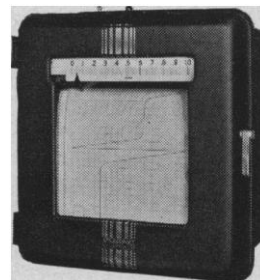
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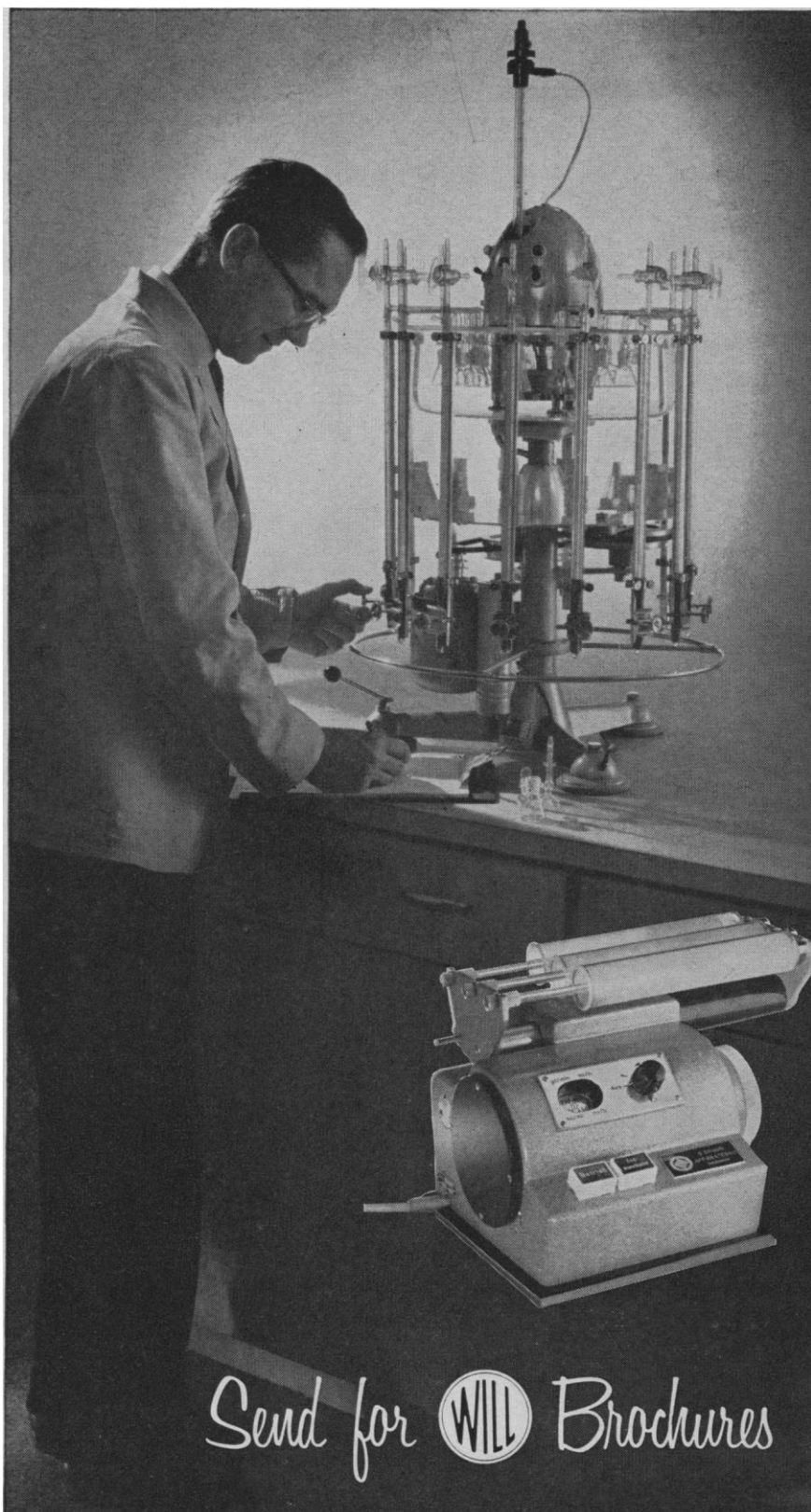


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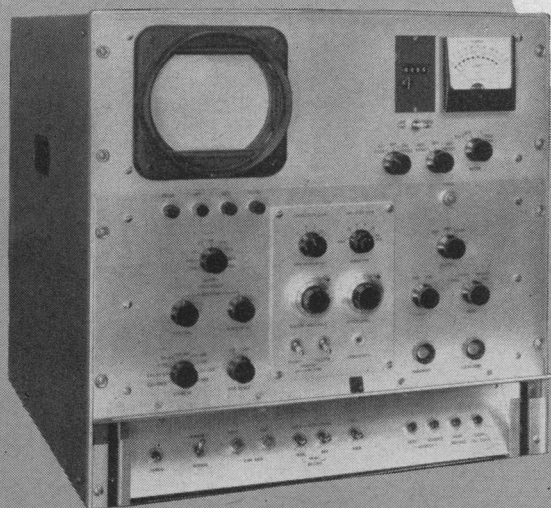
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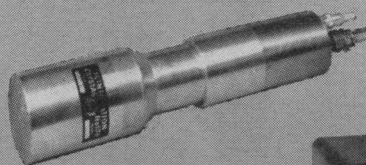
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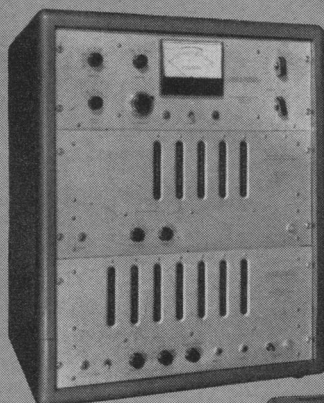
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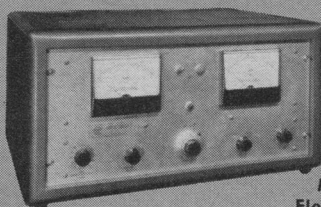


Model 10-2  
Scintillation Detector

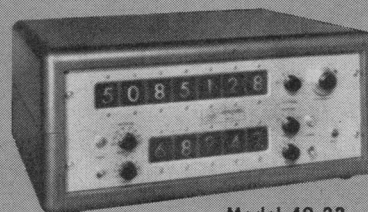
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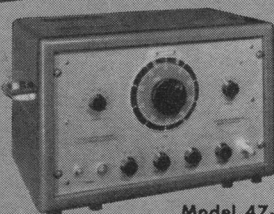
Model 39-1  
Electronic Sweep



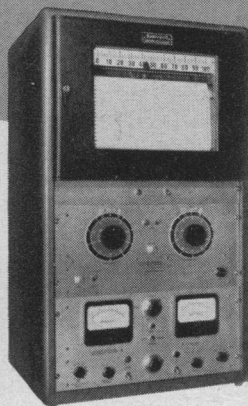
Model 49-22  
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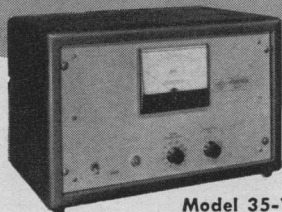
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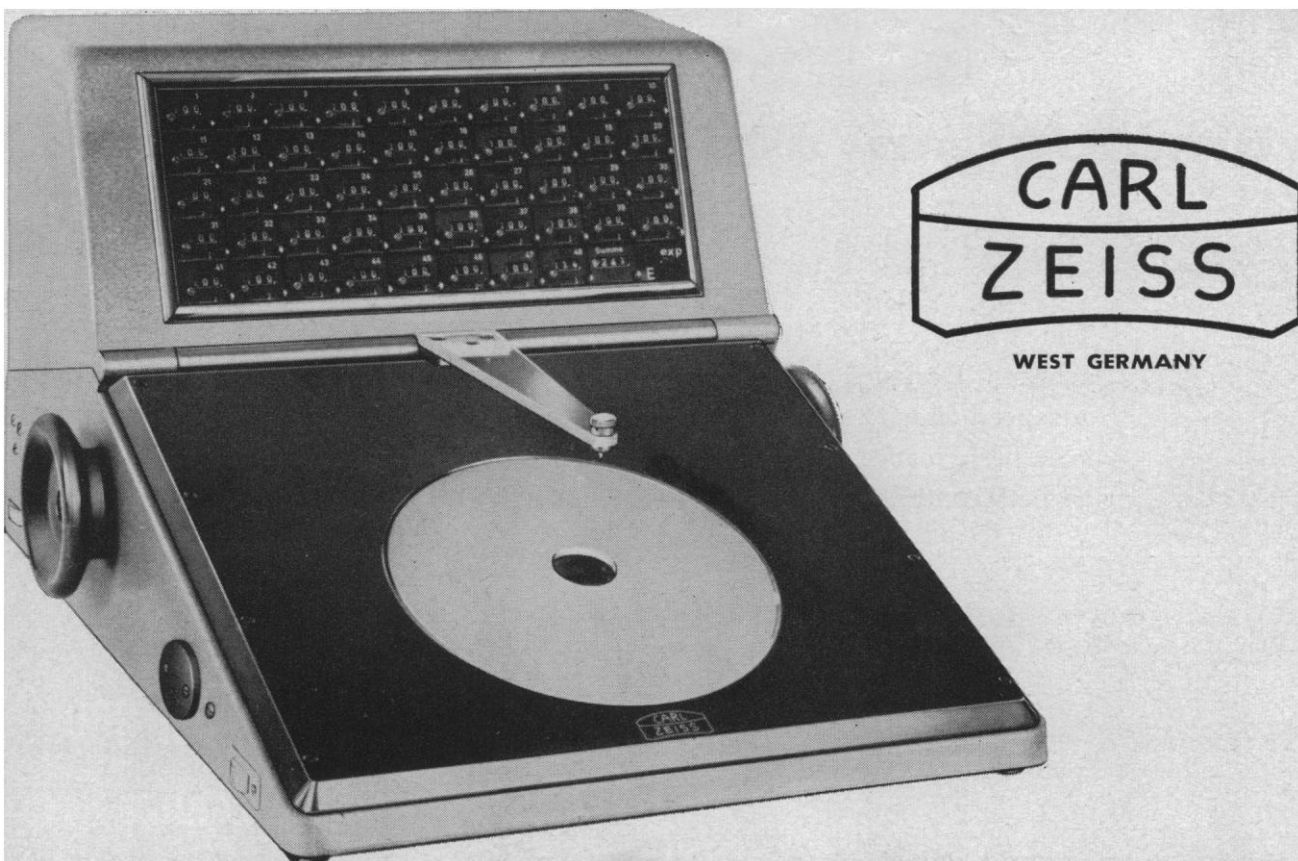


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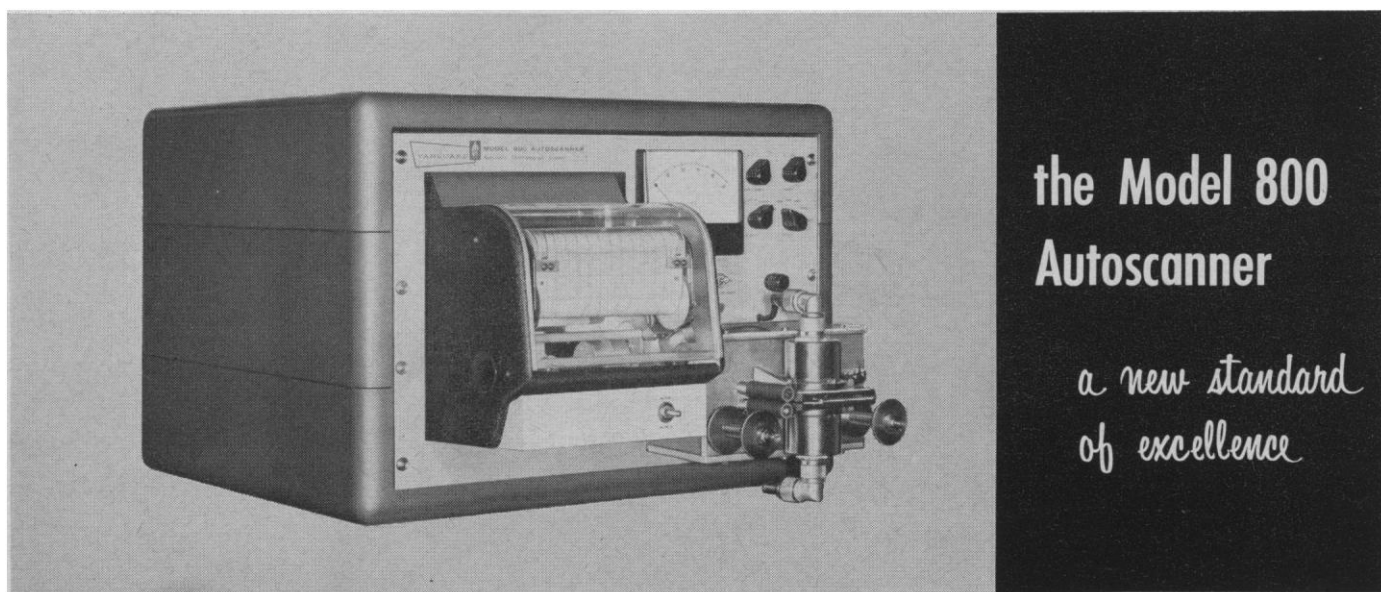
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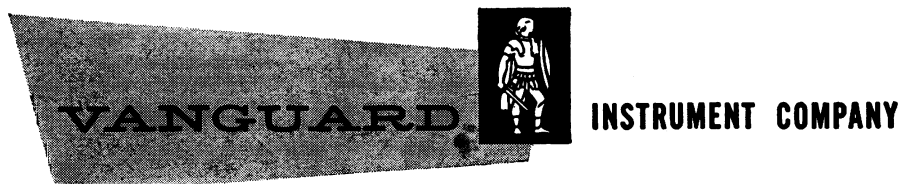
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No longer is it necessary to expend valuable man-hours on tedious, point-by-point potentiometric titrations. Here is a single instrument that both performs and records variable and constant pH titrations — all automatically!

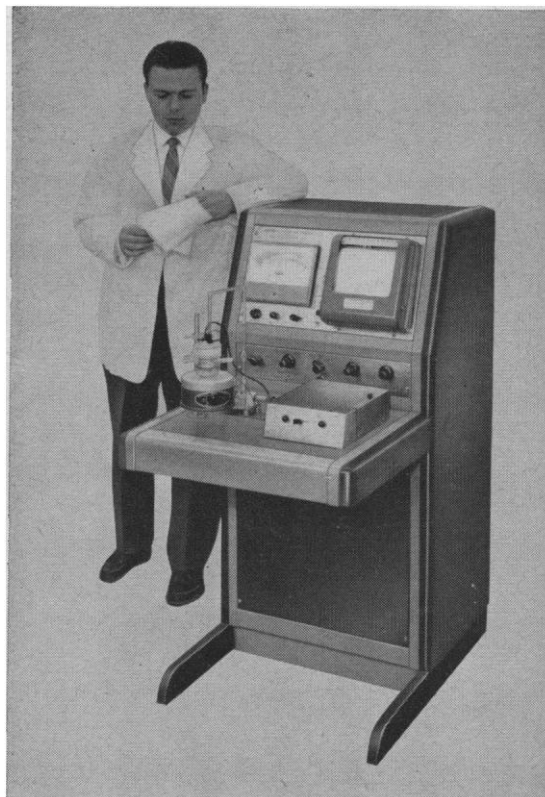
Speeds time-consuming measurements to free chemists for more productive efforts. And it's accurate to  $\pm 0.02$  pH units or  $\pm 1.2$  millivolts.

## CAPABILITIES

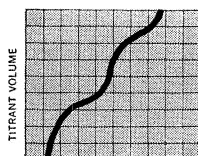
- ★ Automatic recording pH stat for reaction rate studies
- ★ Records variation in pH or EMF as a function of titrant added
- ★ Titrates to any pre-set end point
- ★ Records first and second derivative titration curve
- ★ Performs automatic titrations in aqueous or non-aqueous media: Acid-base reactions — Oxidation-reduction reactions — Precipitation reactions — Complex-ion reactions
- ★ Automatic process control, lab or industry

## FEATURES

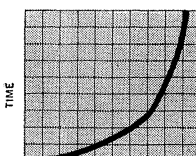
- ★ Internal calibrator to check titrator's response
- ★ Titrant addition rate adjusts automatically as end-point approaches
- ★ Variable titrant delivery rate and chart speed
- ★ Automatic cutoff for unattended operation
- ★ Interchangeable burets for micro and macro titrations
- ★ With plug-in differentiator, pH or EMF is displayed on meter as recorder plots first or second derivative curve
- ★ Adjustable recorder span; maximum sensitivity 2 pH or 120 mv full scale



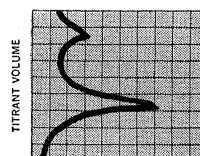
records  
of typical  
functions —  
by model  
AT-2A



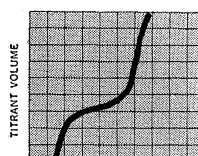
pH  
Typical Variable pH Titration



TITRANT VOLUME  
Typical Constant pH Titration



dPH/dV  
Typical First Derivative Titration

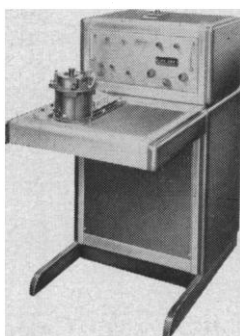


EMF  
Typical Precipitation Titration

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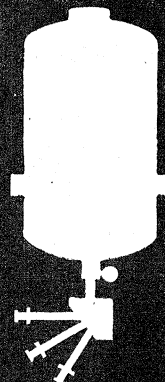
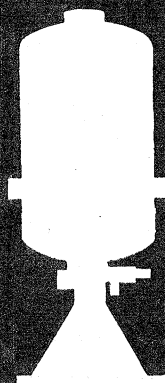
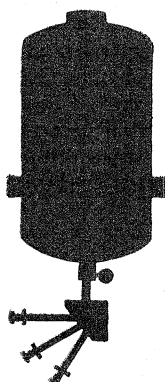
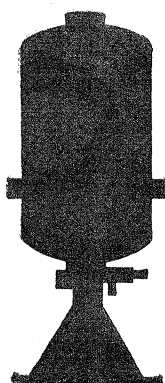
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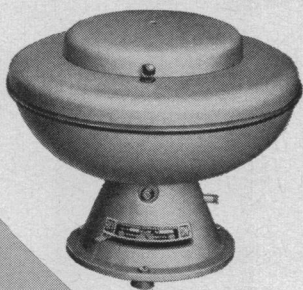
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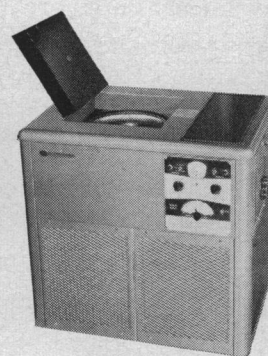
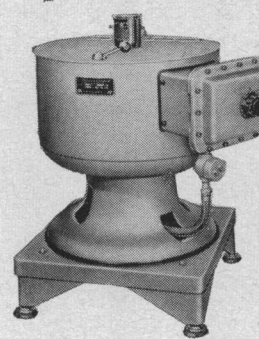
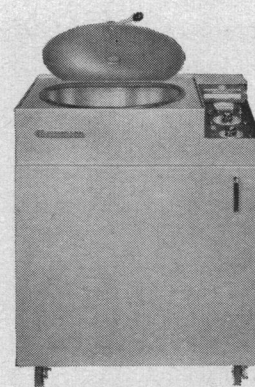
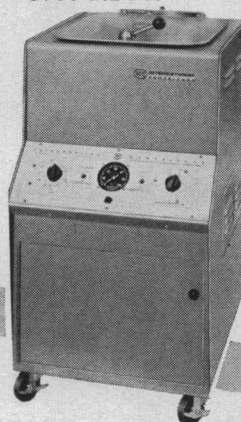
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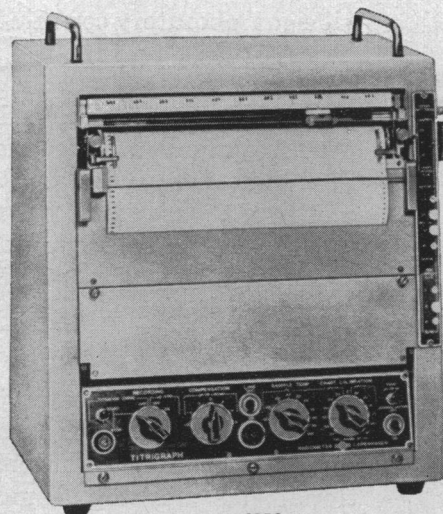
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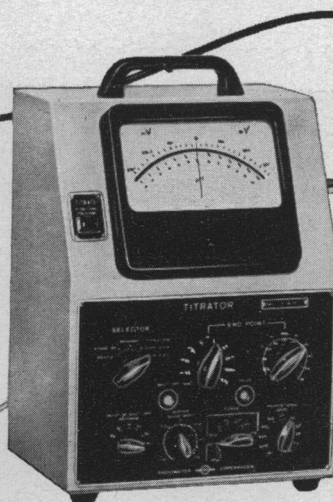
1219 SOLDIERS FIELD ROAD, BOSTON 35, MASS.

# TITRIGRAPH

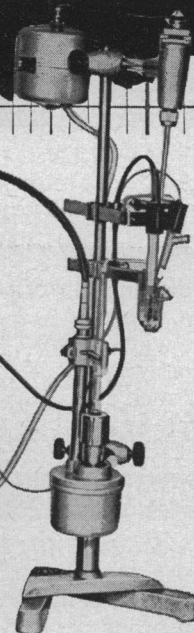
For recording Titration Curves  
For Use as a Recording pH Stat



SBR2  
RECORDER



TTT-1  
AUTOMATIC TITRATOR



SBU1  
SYRINGE BURETTE  
UNIT

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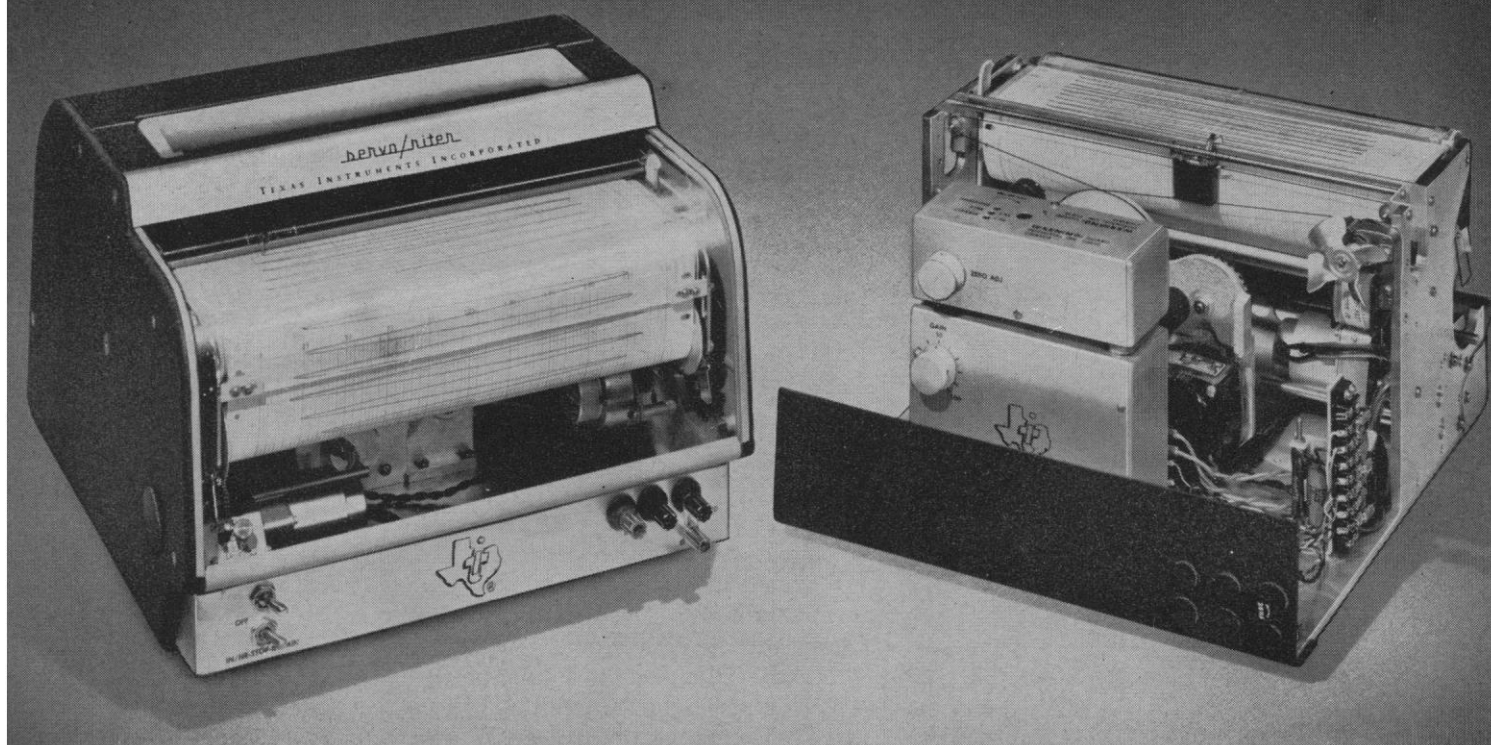
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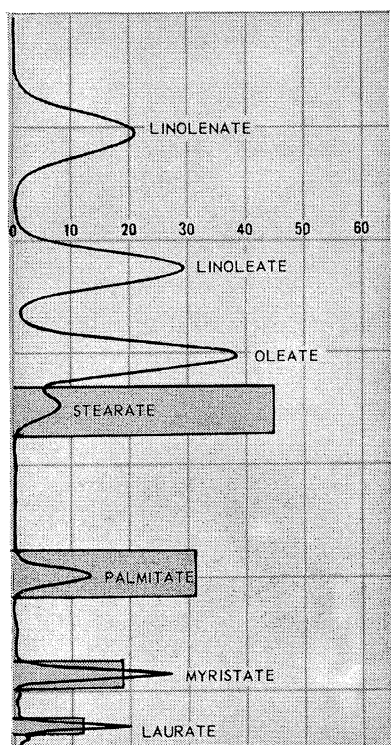
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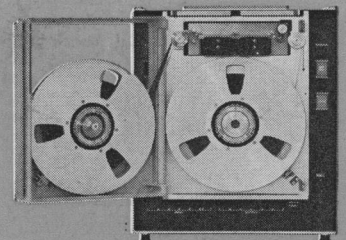
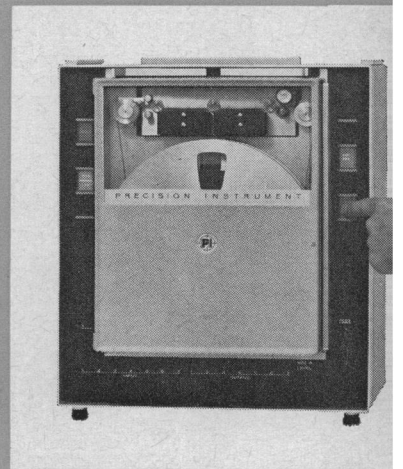
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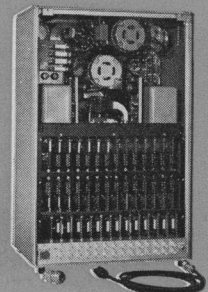
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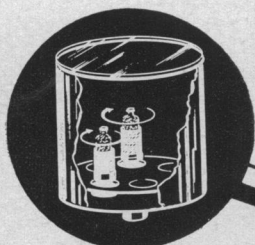


Open door view of 7-channel machine, showing loaded tape magazine which can be interchanged in 5 seconds.

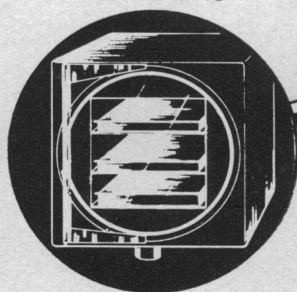


Rear view of 14-channel recorder which weighs only 105 pounds, fits in only 26½ inches of rack space.

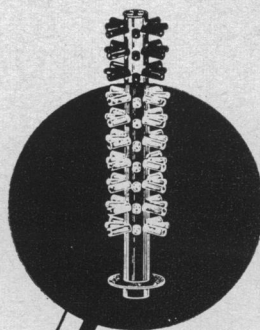
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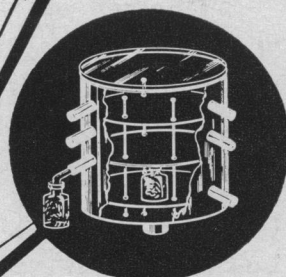
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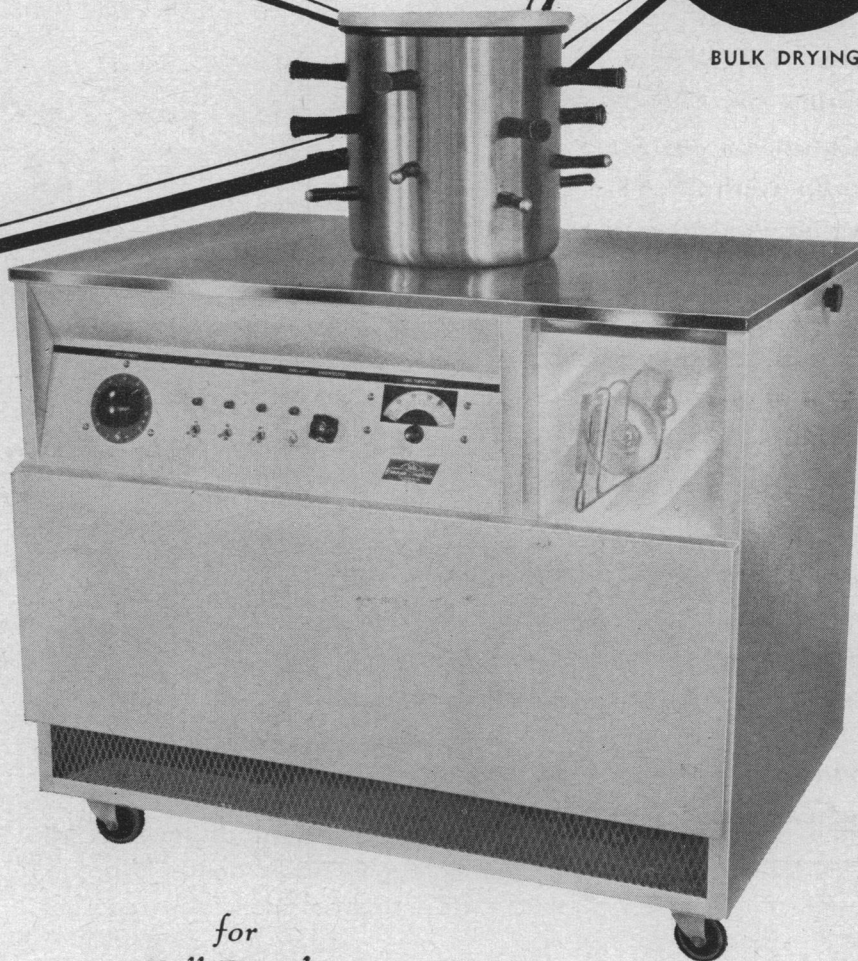


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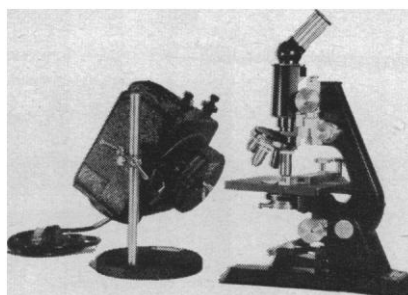
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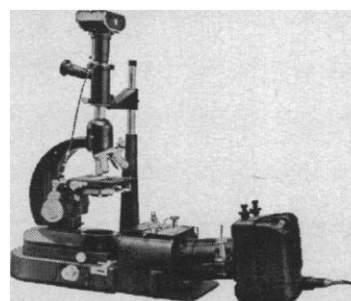
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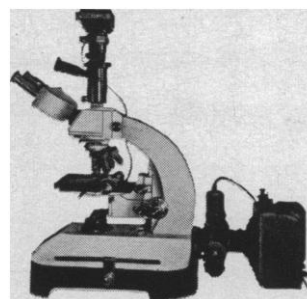
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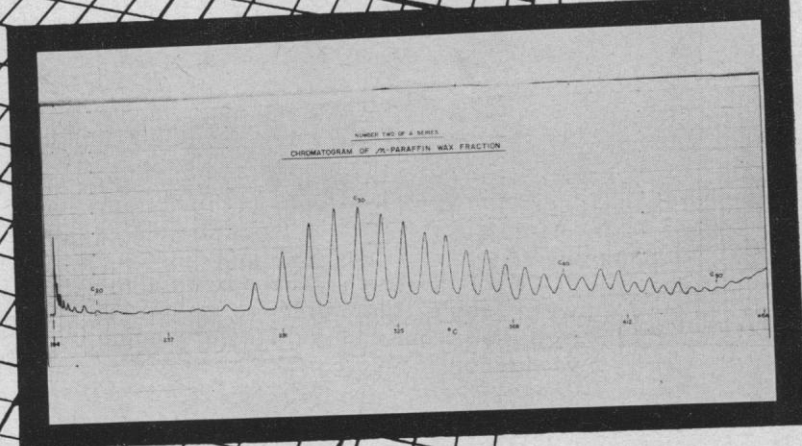
WRITE FOR 6 page brochure illustrating the fields covered by Model 500, and descriptive brochure summarizing F&M's five chromatographic instruments.



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### 2. ANALYSIS OF PARAFFIN WAX FRACTION TO C<sub>50</sub>

Gas chromatography is established as a reliable technique for the determination of n-paraffins in waxes<sup>4</sup>. An analysis of a C<sub>21</sub> to C<sub>34</sub> wax fraction was performed in 70 minutes using constant temperature operation of 320°C. At a fixed temperature however, analysis of wider range fractions is not practical. This is due to the excessively long retention times resulting in broad peaks which blend into the baseline and are lost. A C<sub>12</sub> to C<sub>38</sub> fraction, for example, required 3 separate temperature levels to resolve the fraction<sup>2</sup>.

With a linear programmed high temperature gas chromatograph, this limitation to n-paraffin wax analysis has been removed. It is now possible to completely analyze in a single run a hydrocarbon mixture to C<sub>70</sub><sup>1,3,5</sup>. The chromatogram on the left shows a separation from C<sub>10</sub> to C<sub>50</sub> performed on a 4 ft. Silicone Gum Rubber column using a linear heating rate of 2.9°C./min. from 194°C. to 453°C. The block is maintained at 430°C. and the injection port at 460°C.

Model 500 Linear Programmed High Temperature Gas Chromatograph, the unit responsible for the successful separation shown on the left, uses separate heaters for detector and injection port. This permits stable baselines while the column undergoes linear increase in temperature. In addition, Model 500 can be preset to shut off and cool after programming or hold the column temperature at a fixed value for isothermal operation.

### LITERATURE CITED

- (1). \*Anon, "Gas Chromatograph Hits High °C.," *Chem. and Eng. News*, 38, 42-43 (1960).
- (2). Dal Nogare, S., and Safranski, L. W., *Anal. Chem.*, 30, 894-898 (1958).
- (3). \*Martin, A. J., Bennett, C. E., and Martinez, F. W. Jr., "Linear Programmed Temperature Gas Chromatography to 500°C.," presented at the Cleveland ACS Meeting, April 1960.
- (4). Ogilvie, James L., Simmons, M. C., and Hinds, G. P. Jr., *Anal. Chem.*, 30, 25-27 (1958).
- (5). Scott, C. G., and Rowell, D. A., *Nature*, 187, No. 4732, 143-144 (1960).

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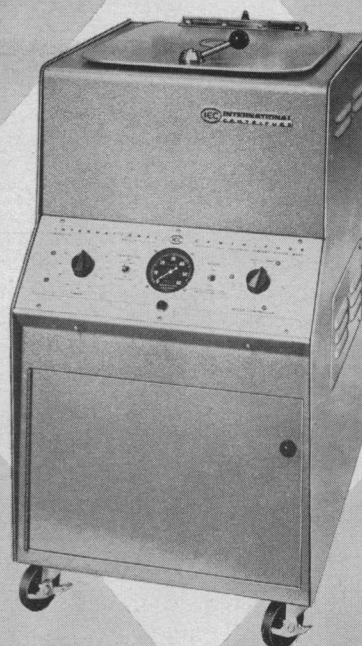
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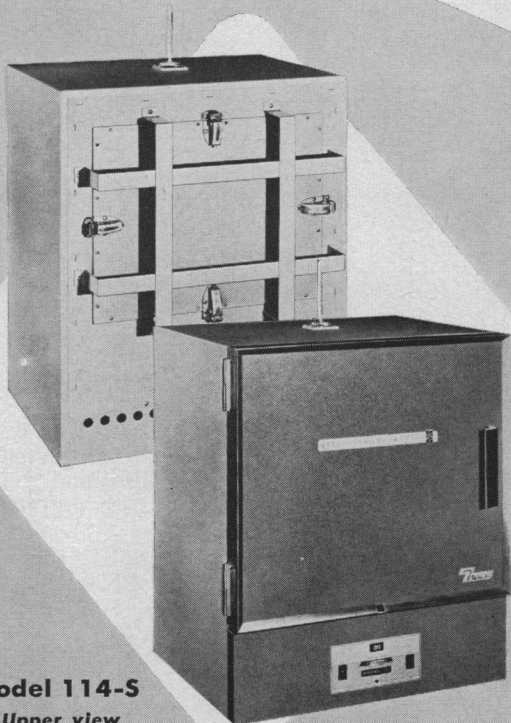
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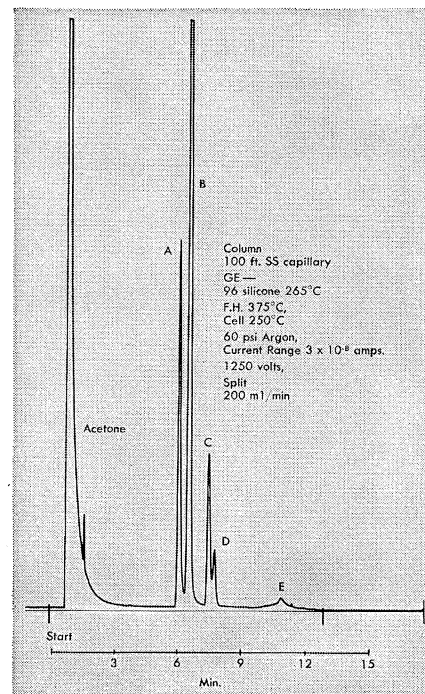
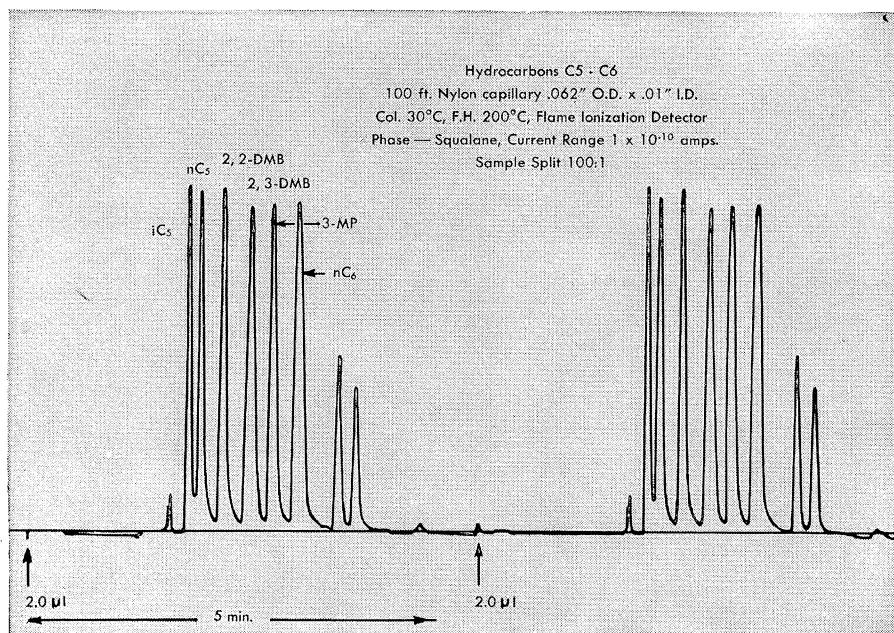
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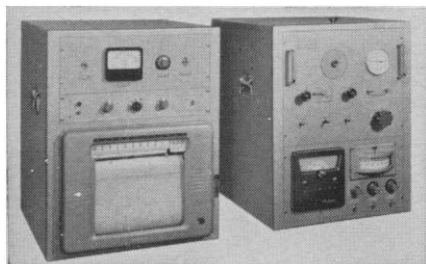
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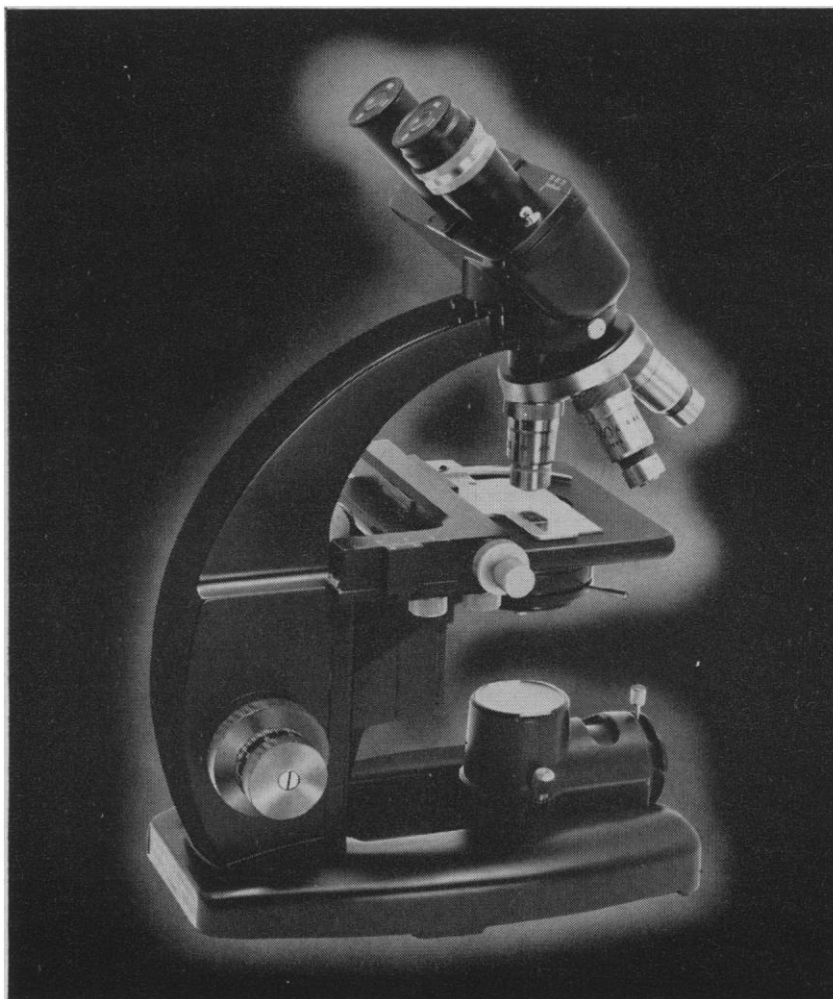
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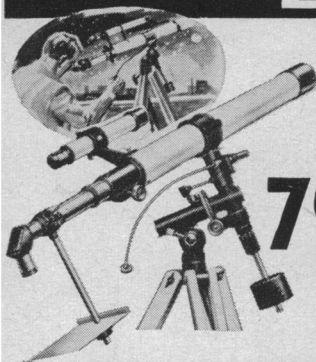
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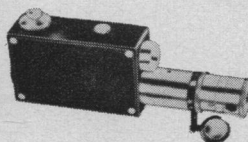


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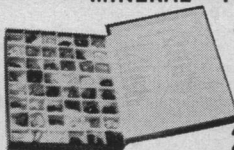
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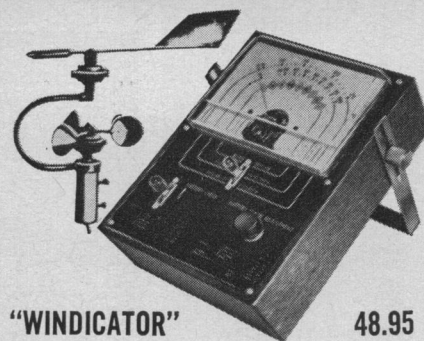
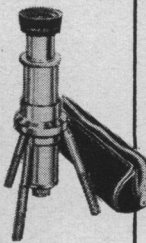
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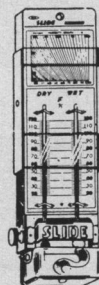
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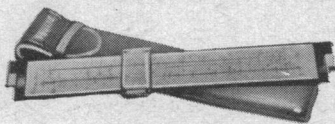
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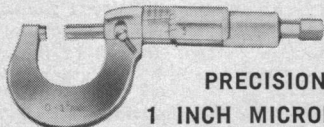
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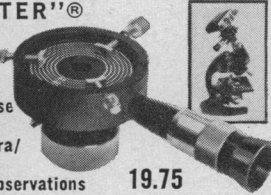
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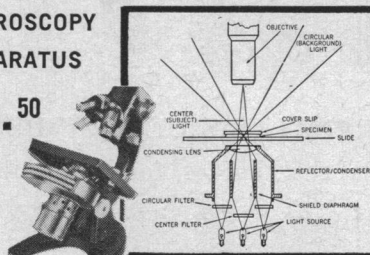
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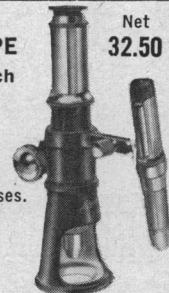
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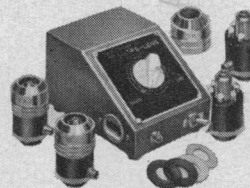
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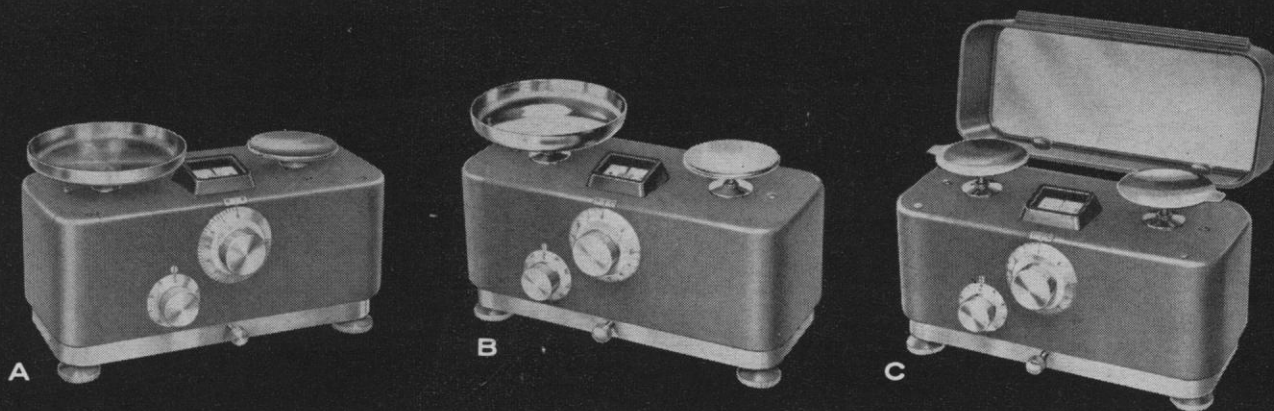
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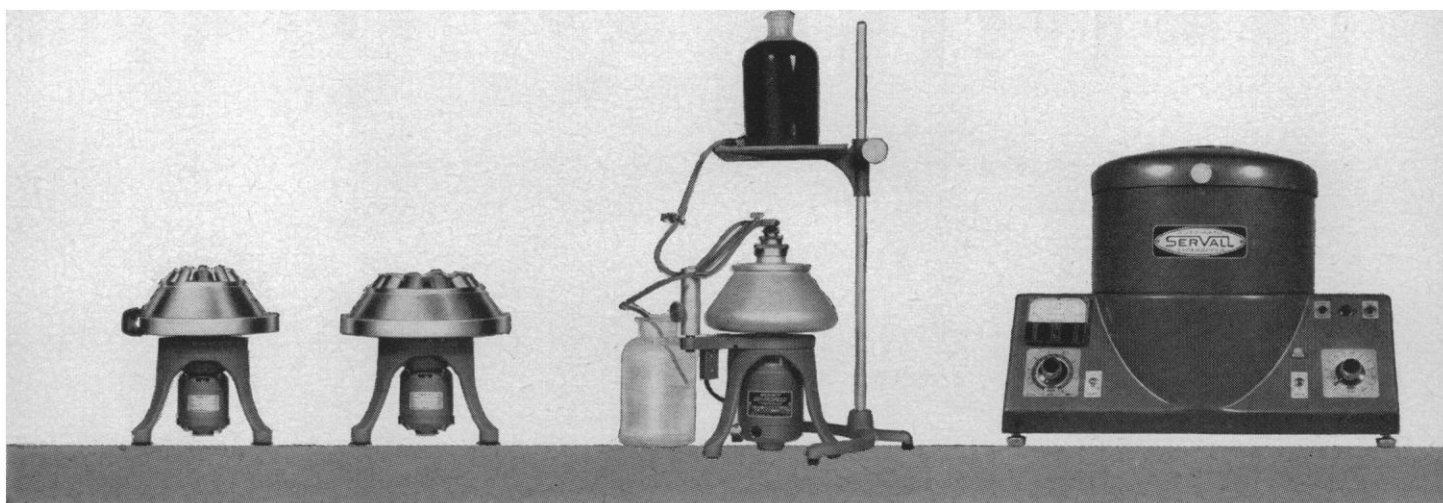
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Specifications are same as the DWL-2 except that this model has scoop for seeds or other bulky material.



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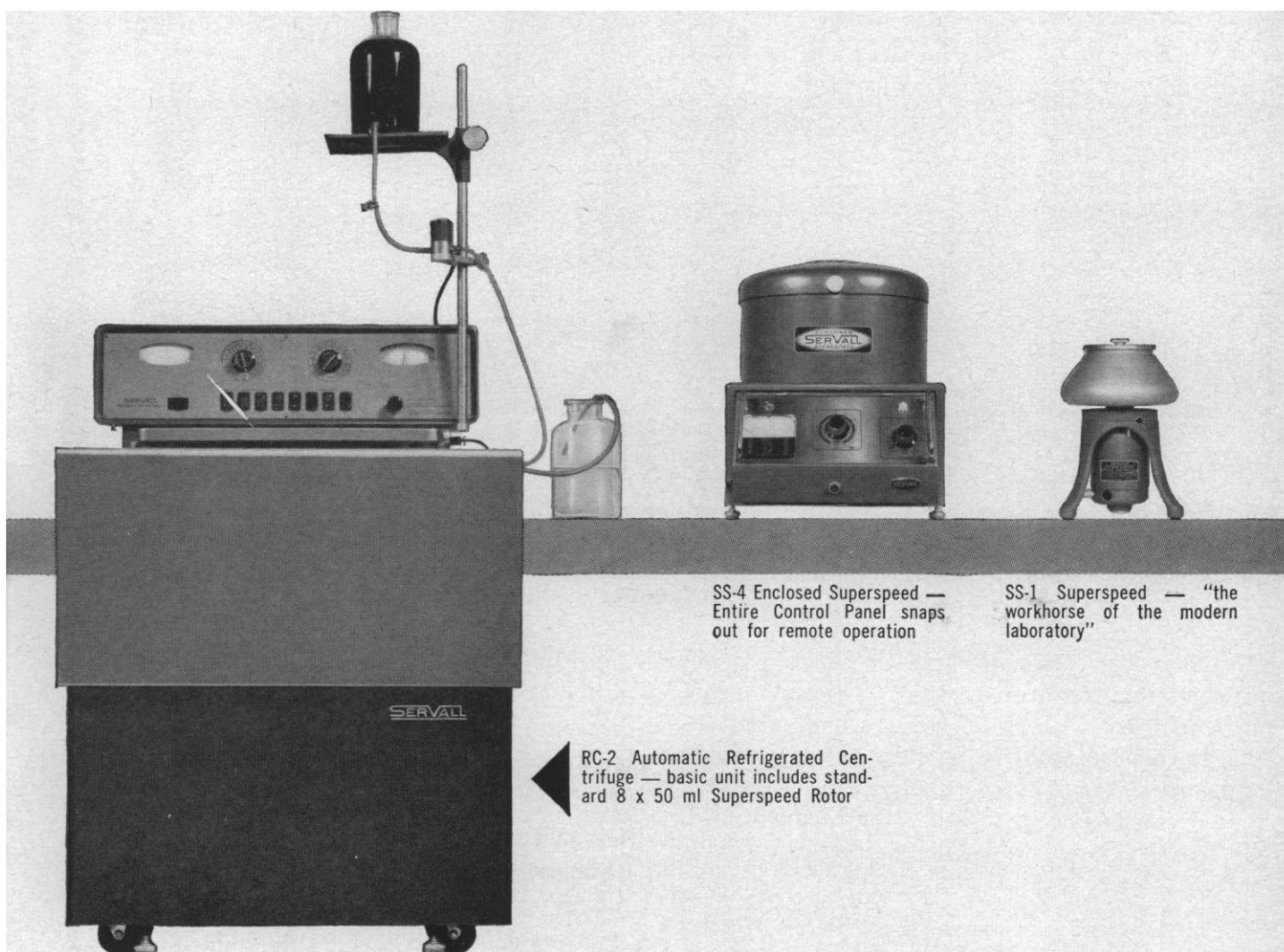
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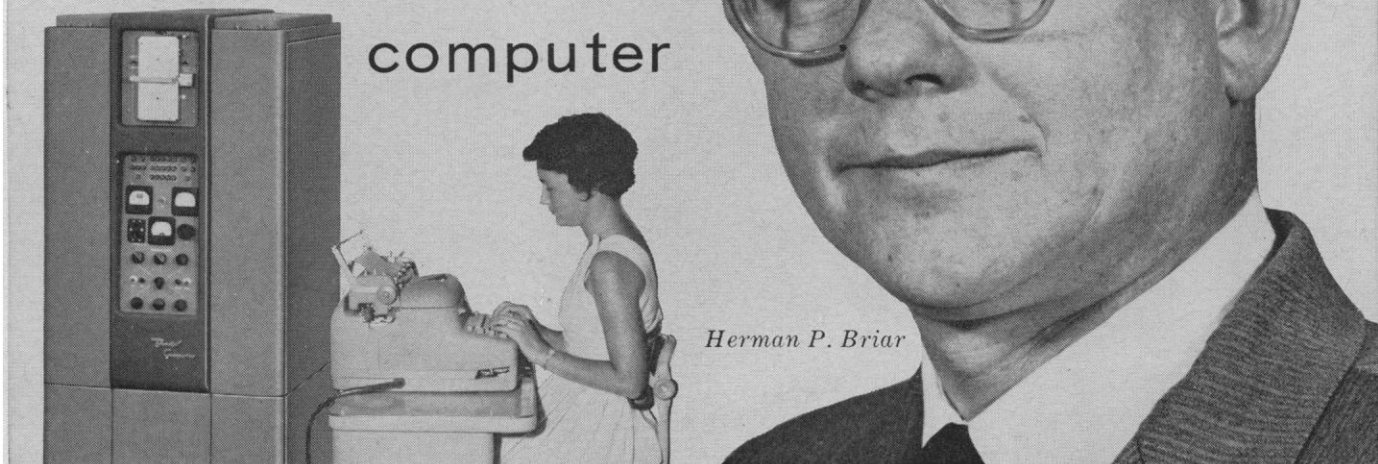
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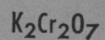
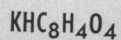
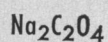
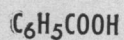


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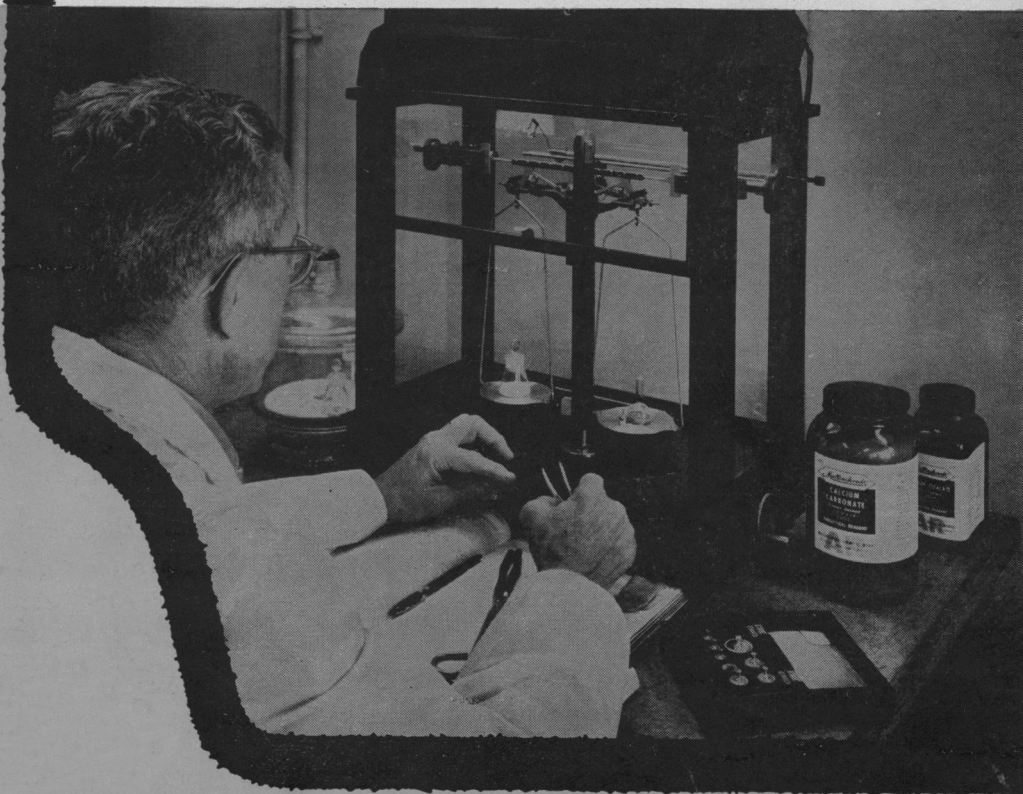
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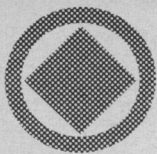
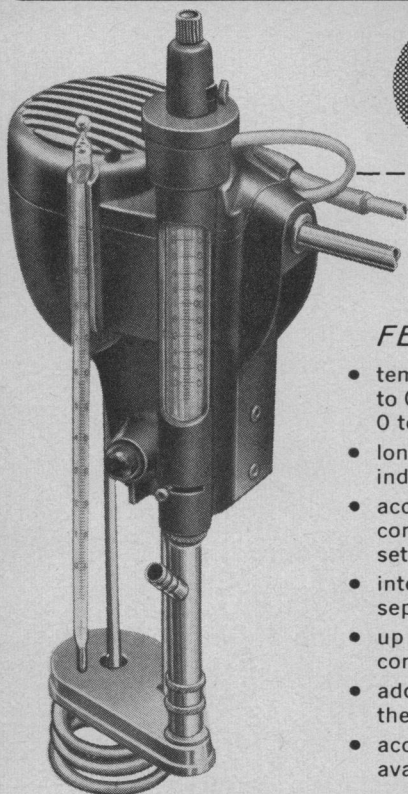
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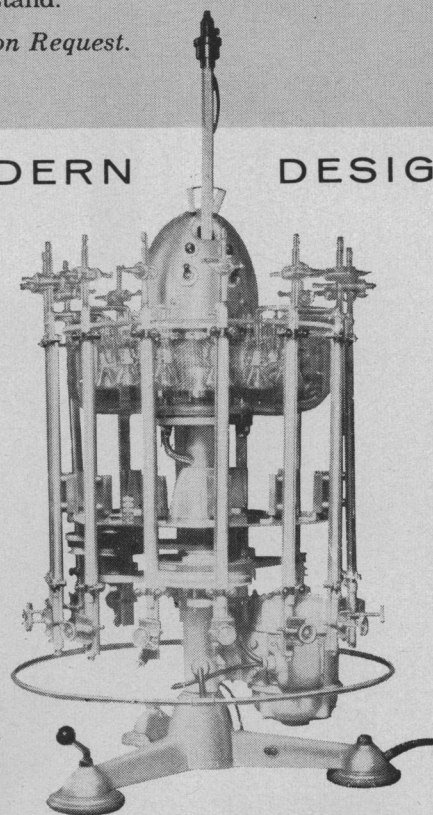
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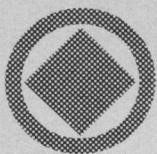
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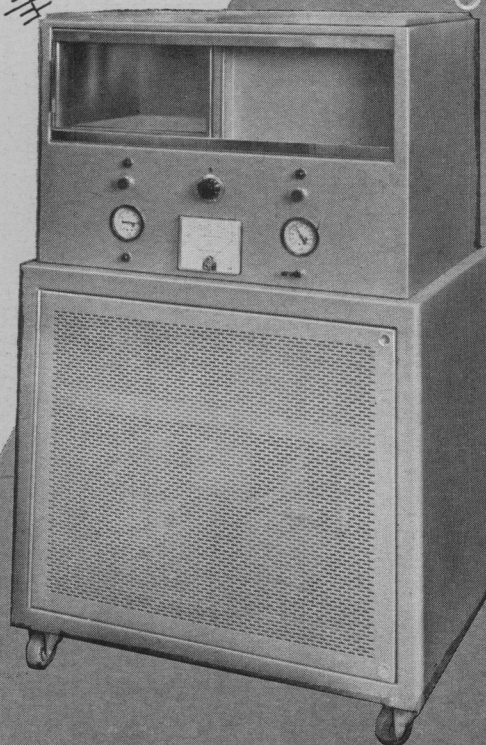
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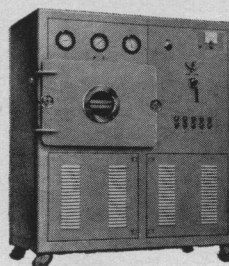
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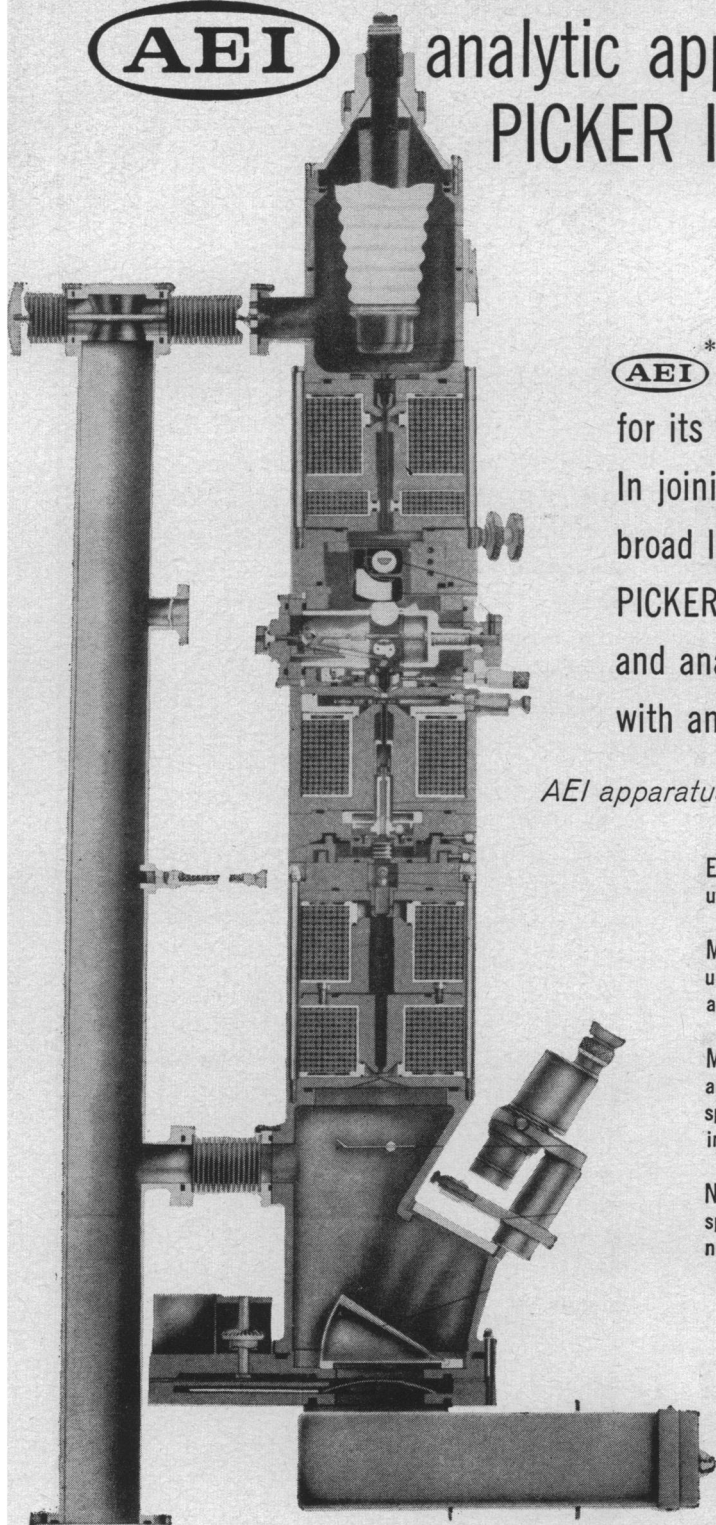
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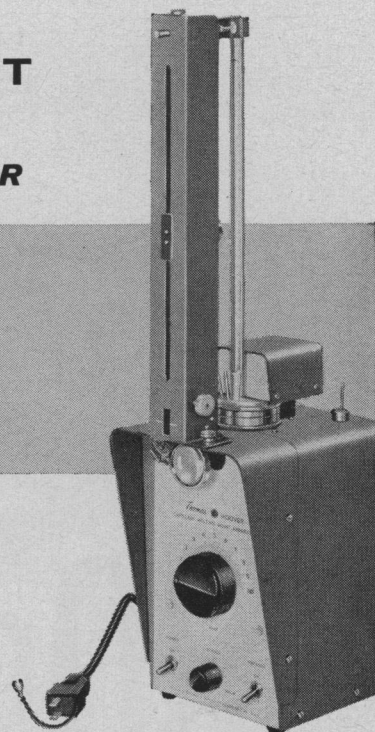
Provides magnified thermometer indication in window adjacent to capillary magnifier, for ease in observation of both bath temperature and melting sample. Upper mirror assembly of periscope is raised or lowered to follow mercury level of thermometer by turning knob at side of reader housing.

**Safety**—Bath enclosed except for observation port. Removal of bath disconnects heater and stirrer.

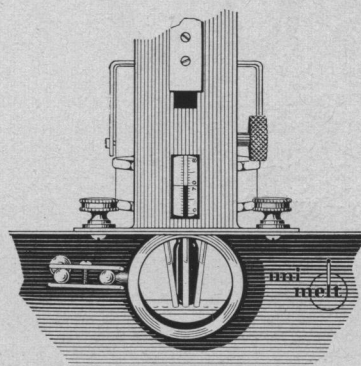
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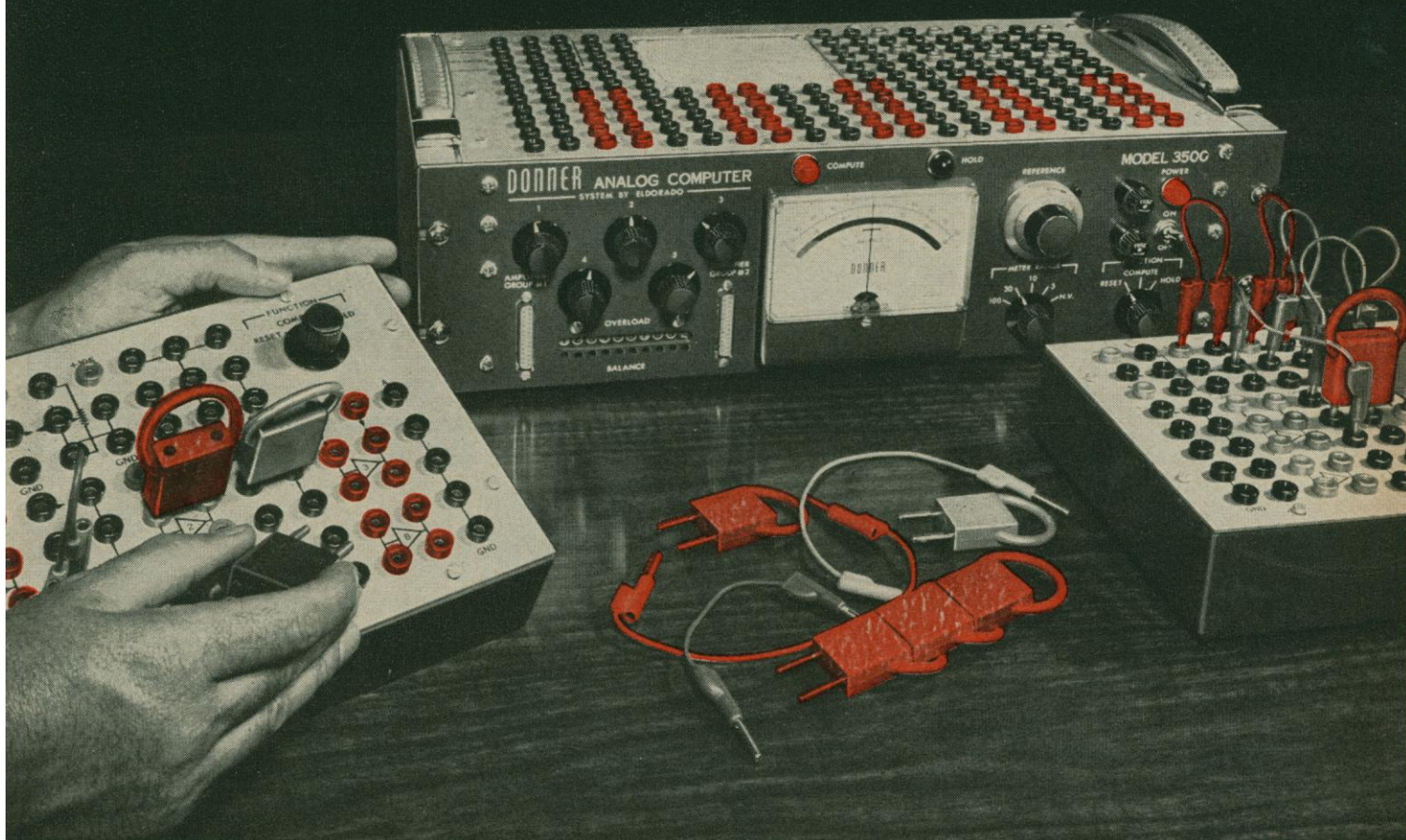
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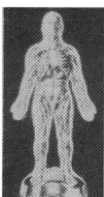
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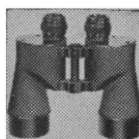
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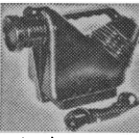


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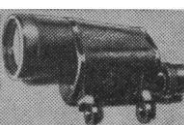
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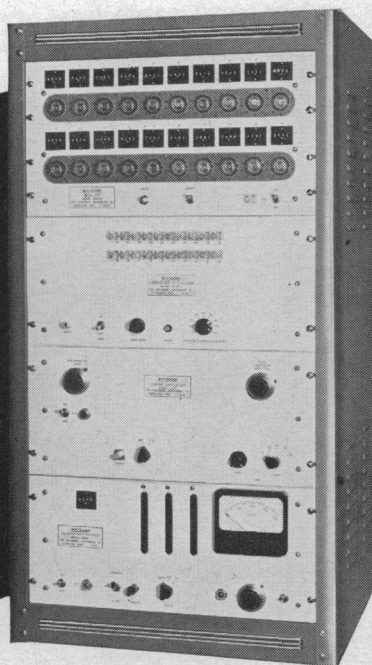


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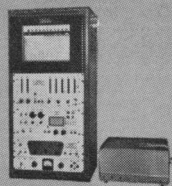
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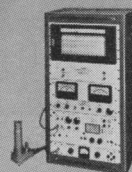
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*Let's Talk About*

# RATEMETERS...

Pictured left to right: Transistorized Dual Ratemeter; SC-80 Ratemeter Spectrometer; SC-79 Tracermatic Ratemeter and Model SC-91 Scaler-Ratemeter.

One glance at the vast array of ratemeters on the market today and you can readily realize the growing importance of these instruments for use in radioisotope laboratories and clinics. To help select the one best ratemeter for you from this bewildering variety of models, a simple seven-point check list has been developed. Before making a decision, consider these points carefully:

1. Range and Number of Scales
2. Range and Number of Time Constants
3. Stability and Range of the High Voltage Supply
4. Stability of Calibration
5. Low Zero Drift
6. Functional Design
7. Cost

When you examine the Tracerlab line, we believe you will find that for versatility, quality, ease of operation, precision and real value, you simply can't beat Tracerlab Ratemeters.

For example, Tracerlab's standard laboratory ratemeters offer a choice of nine full-scale ranges from 0-100 c.p.m. all the way up to 0-1,000,000 c.p.m. with intermediate ranges in multiples of 3 and 10. This extremely wide choice of ranges provides the versatility you require in selecting the optimum range for any given application.

Number and range of time constants is important, too (Tracerlab's standard laboratory ratemeter has eight). Very

short time constants on the upper range scales permit rapid response with no significant increase in probable error while longer time constants on the lower ranges will damp out most of the statistical fluctuations common to these count rates. On the higher ranges a minimum time constant of 0.05 seconds is provided, while for low count rates, a 40 seconds time constant is available. Tracerlab Ratemeters have stability of calibration and zero drift is virtually eliminated.

The ratemeter you select should have a precision high voltage power supply with a high degree of regulation to insure negligible output voltage changes when input voltage varies. The power supply output voltage of Tracerlab Ratemeters changes less than 0.003% for a 1% change in input voltage. As a result, they can be used with scintillation as well as geiger detectors. What's more, you don't need to buy an additional power supply when you use a Tracerlab Ratemeter with a Spectrometer. Why? Because standard equipment on all Tracerlab Spectrometers includes a super regulator that provides all the additional stability your Tracerlab Ratemeter power supply needs for precision spectrometry.

Should you require an unusually com-

pact, low power, dual channel Ratemeter with the operating benefits of solid state circuitry, Tracerlab offers an all-transistor instrument. This light weight precision built unit provides both linear or log response, plug-in construction, dual power supply and, when desirable, a Spectrometer input. Very low power consumption and heat dissipation contribute substantially to the long life and reliability of these fully transistorized units.

Tracerlab also offers a Basic Ratemeter and Laboratory Monitor, a compact instrument of simple circuitry designed for laboratory use and 24-hour-per-day operation.

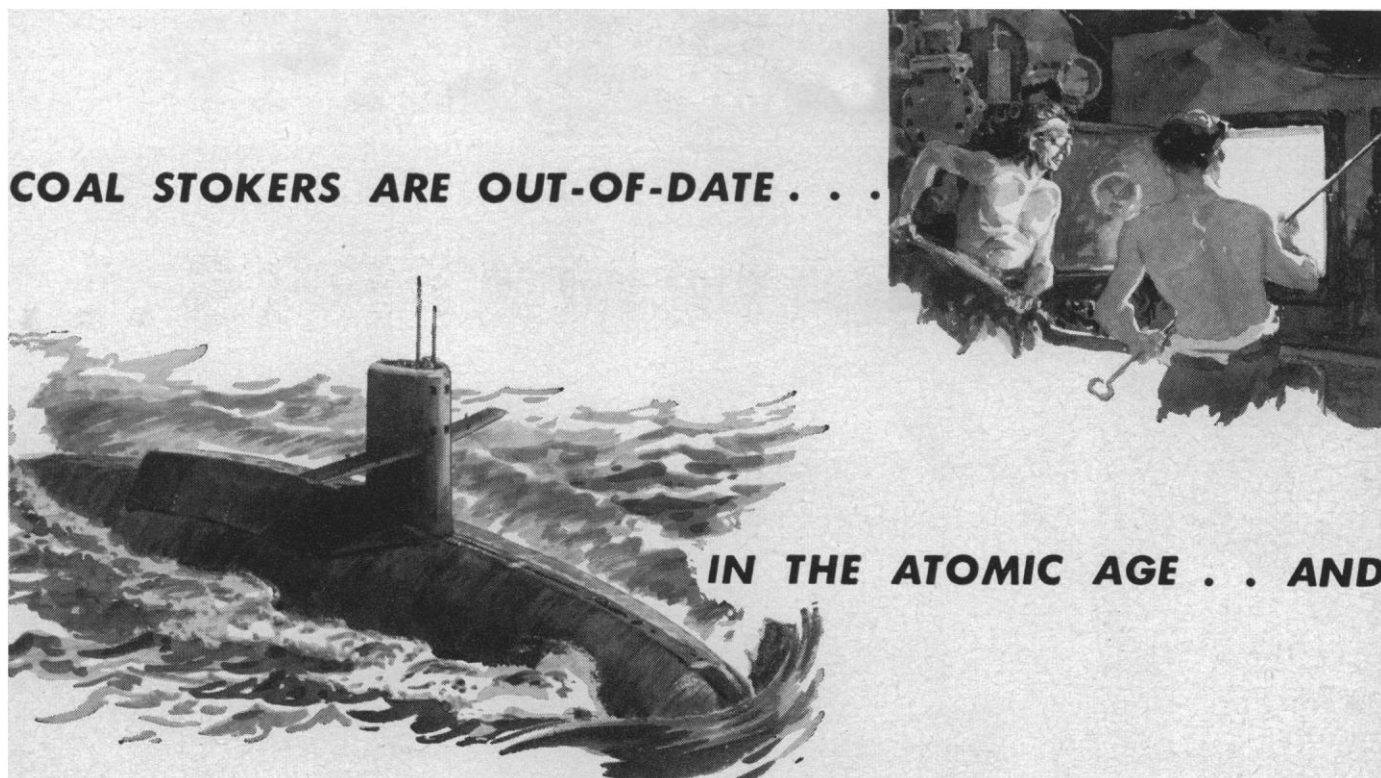
Last, but by no means least, Tracerlab Ratemeters are low in cost, yet they incorporate numerous hidden plusses and extra values. Their inherent quality and advanced design is the result of years of specialization in nuclear instrumentation. A large staff of nuclear applications engineers and a world-wide network of authorized service representatives back up all claims made for satisfactory and lasting performance.

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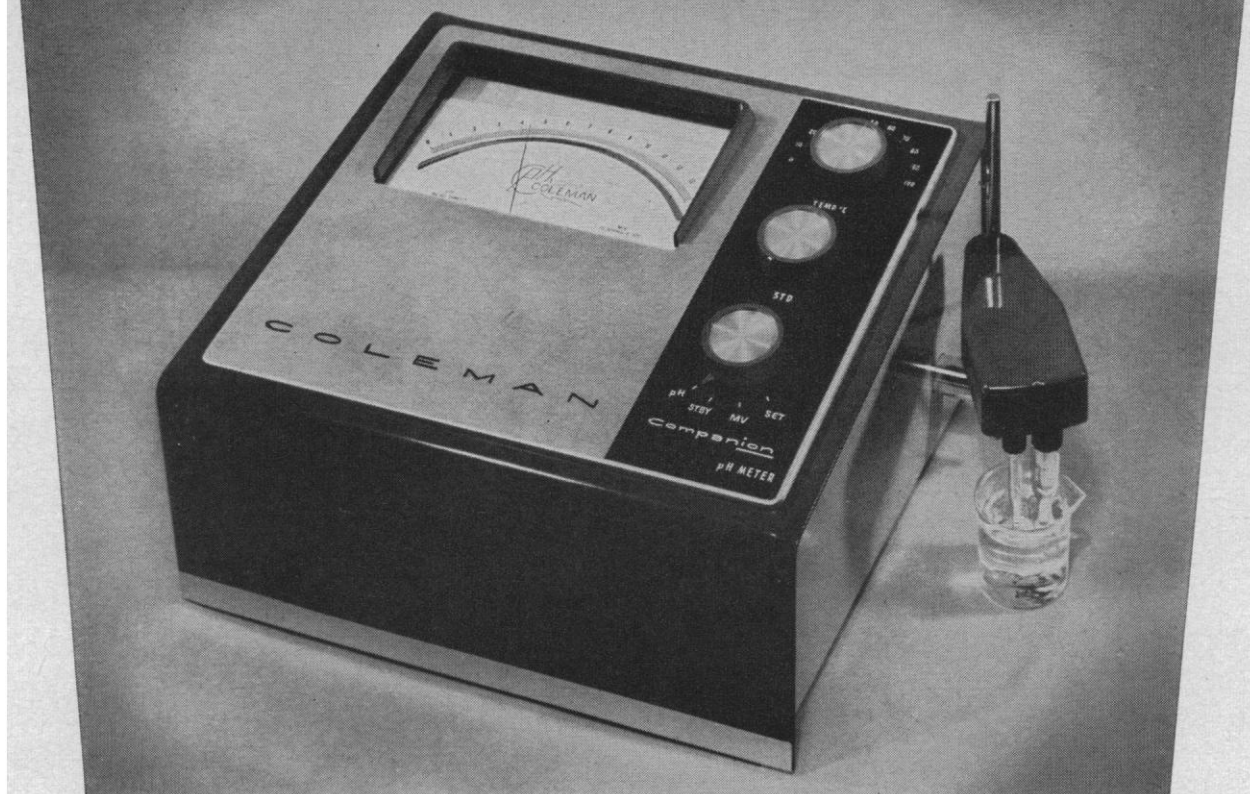
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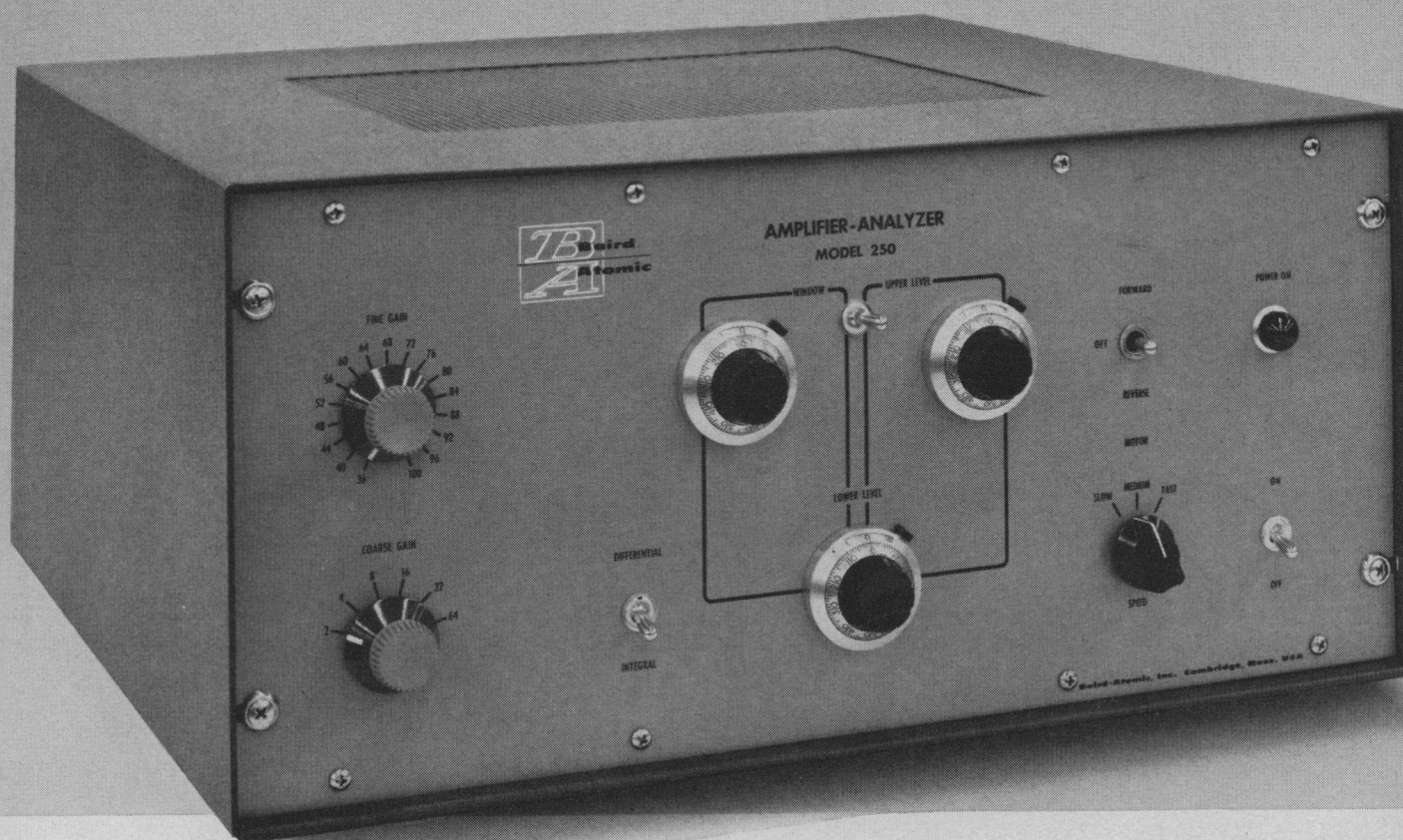
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### New York, 26-31 December 1960

The five hotels for the AAAS New York meeting have established special, low, flat rates and have reserved appropriately large blocks of rooms for this meeting. Thus everyone making room reservations for the AAAS meeting is assured substantial savings.

The list of hotels and the reservation coupons below are for your convenience in making your hotel reservation in New York. Please send your application, *not* to any hotel directly, but to the AAAS Housing Bureau in New York and thereby avoid delay and confusion. The experienced Housing Bureau will make assignments promptly; a confirmation will be sent you in two weeks or less.

If requested, the hotels will add a comfortable rollaway bed to any room, at \$3.00 per night. Mail your application now to secure your first choice of desired accommodations. All requests for reservations must give a definite date and estimated hour of arrival, and also probable date of departure.

#### AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

For a list of the headquarters of each participating society and section, see page 230, *Science*, 22 July. Both the Commodore and the Biltmore are AAAS headquarters hotels.

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(Attach list if this space is insufficient. The name and address of each person, including yourself, must be listed.)

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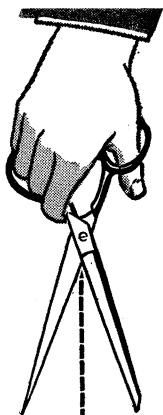
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(These must be indicated—add approximate hour, A.M. or P.M.)

NAME .....  
(Individual requesting reservation) (Please print or type)

ADDRESS .....  
(Street) (City and Zone) (State)

Mail this now to the Housing Bureau. Rooms will be assigned and confirmed in order of receipt of reservation.

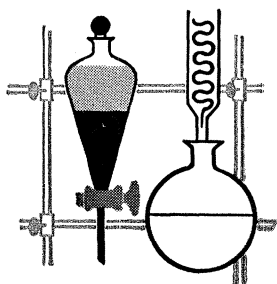


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Acetic Anhydride (R)  
Acetyl Chloride (R)  
Benzoyl Chloride (R)  
n-Butyric Acid (P)  
Formic Acid (R)  
Lactic Acid (R, USP)  
Oleic Acid (USP)  
Propionic Acid (R)

## Alcohols, Glycols, and Phenols

Alcohol, Specially Denatured (R)  
iso-Amyl Alcohol (R)  
n-Amyl Alcohol (R)  
tert-Amyl Alcohol (R, P)  
iso-Butyl Alcohol (R, P)  
n-Butyl Alcohol (R)  
tert-Butyl Alcohol (R)  
Cresol (USP)  
Cyclohexanol (R)  
Ethylene Glycol (R, P)  
Glycerol (R, USP)  
n-Hexanol (R)  
Methanol (R, P)  
2-Octanol (P)  
Phenol, Liquified (USP)  
iso-Propanol (R)  
n-Propanol (R)

## Aldehydes and Ketones

Acetone (R, NF)  
Benzaldehyde (NF)

Cyclohexanone (P)  
Formaldehyde Solution (R, USP)  
Furfural (R)  
Methyl iso-Butyl Ketone (R)  
Methyl Ethyl Ketone (R, P)  
Paraldehyde (USP)

## Amides and Amines

Aniline (R, P)  
N, N-Dimethylaniline (R)  
Dimethylformamide (R)  
Formamide (P)  
Pyridine (R, P)  
Triethanolamine (NF)

## Esters

iso-Amyl Acetate (P)  
n-Butyl Acetate (P)  
Ethyl Acetate (R, NF)  
Methyl Acetate (P)  
Methyl Formate (P)  
Methyl Salicylate (USP)  
iso-Propyl Acetate (P)  
n-Propyl Acetate (P)

## Ethers

Butyl Ether (P)  
Dioxane (T)  
Ether (R, NF)  
Ether, Anhydrous (R, P)  
iso-Propyl Ether (R)  
Tetrahydrofuran (R)

## Halogenated Hydrocarbons

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mono-Bromobenzene (R)  
Bromoform (P)  
Carbon Tetrachloride (R, NF, T)  
Chlorobenzene (R)  
Chloroform (R, USP, T)  
Ethyl Bromide (R)  
Ethyl Iodide (R)  
Ethylene Dibromide (P)  
Ethylene Dichloride (P)  
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Methylene Chloride (R)  
Tetrabromoethane (P)  
Tetrachloroethane (P)  
Tetrachloroethylene (T)  
Trichloroethylene (R, P)

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Methylcyclohexane (P)  
Petroleum Ether, 20-40°C. (R)  
Petroleum Ether, 30-60°C. (R)  
Petroleum Ether, 30-75°C. (R)  
Petroleum Ether, 60-110°C. (R)  
Toluene (R, P)  
Xylene (R)

## Miscellaneous Compounds

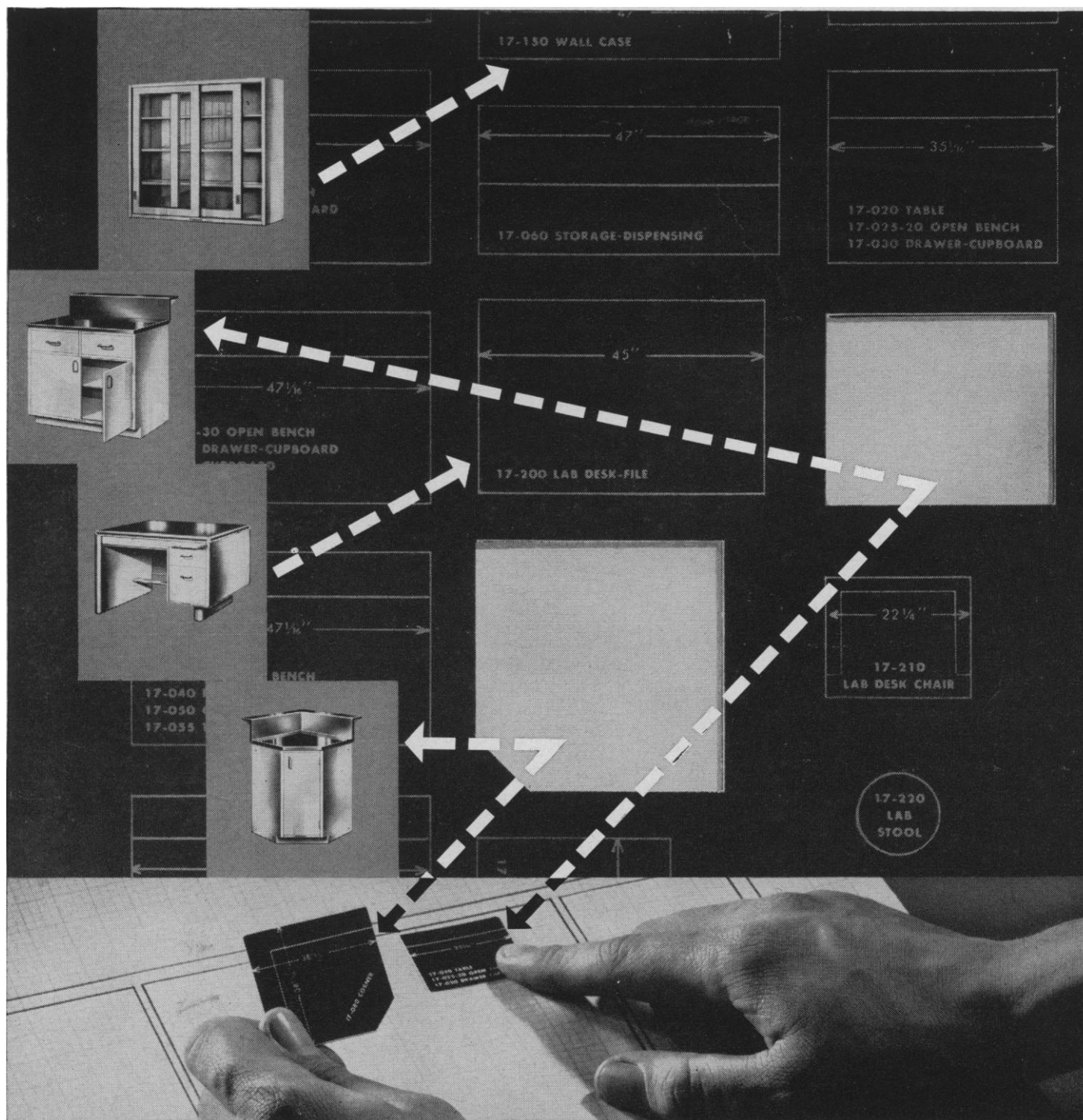
Acetonitrile (R)  
Carbon Disulfide (R, T)  
Collodion (USP)  
Dimethylsulfoxide (R)  
Nitrobenzene (P)  
o-Nitrotoluene (R)  
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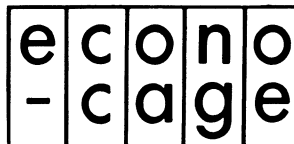


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The cage sides have a 3° draft and four side ribs to permit easy stacking and nesting. The ribs also permit steam to circulate inside of nested cages during autoclaving. The cage bottom is supported by four feet.

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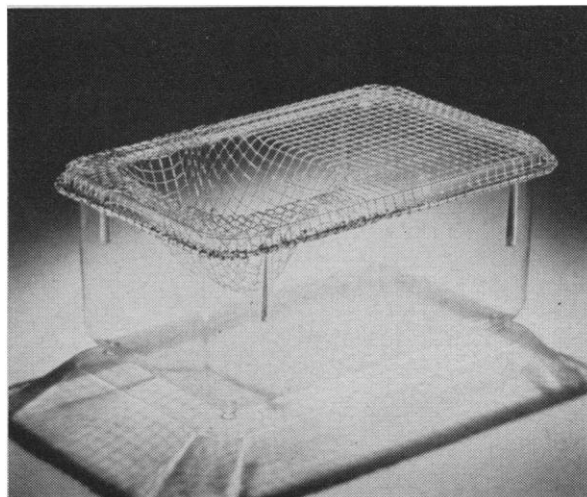
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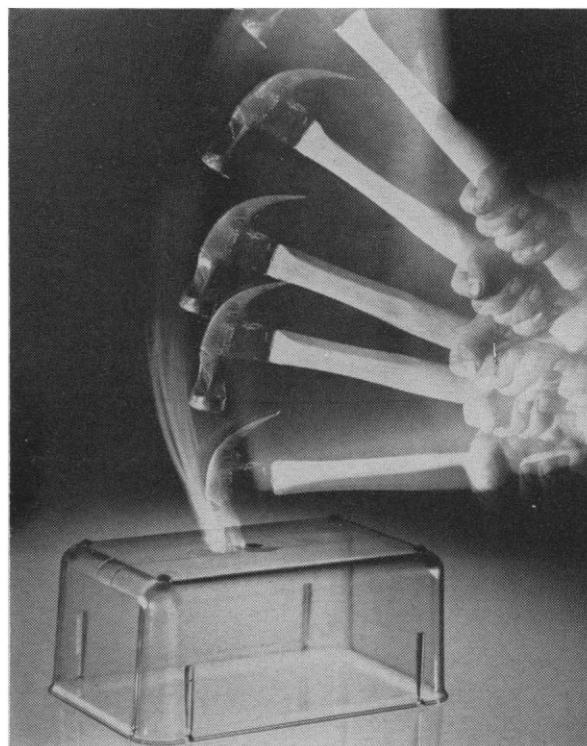
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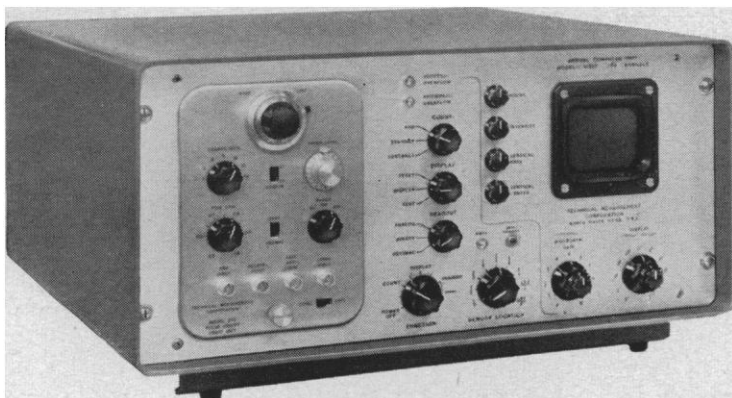
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## Difficult Decisions

If you can't do everything you want to do, how do you decide what to do? For an individual, such decisions are comparatively easy—a washing machine instead of a Deepfreeze or both in some order of priority: a washing machine this year, a Deepfreeze next year. For the individual scientist a similar system of choice must prevail; he gives one experiment priority over another.

The decisions become more difficult to make in assigning experiments for large and expensive equipment. More people want to schedule experiments for a big synchrotron or a nuclear pile than time permits. Who is to decide how to allocate experiments? One solution would be to build enough synchrotrons and nuclear piles so that all worthy projects could be carried out promptly. But decisions of this kind have to be made at the national level. Shall we build this additional equipment or an oceanographic vessel? Or a radiotelescope?

Perhaps no scientific activity poses these questions in clearer form than does the exploration of space. The lead time for planning experiments and the vehicles to launch them is several years. The equipment is expensive, and it can be used only for one group of experiments. It is as though an oceanographic vessel would be able to set up only one buoy equipped with numerous instruments and would then explode: one ship, one set of experiments.

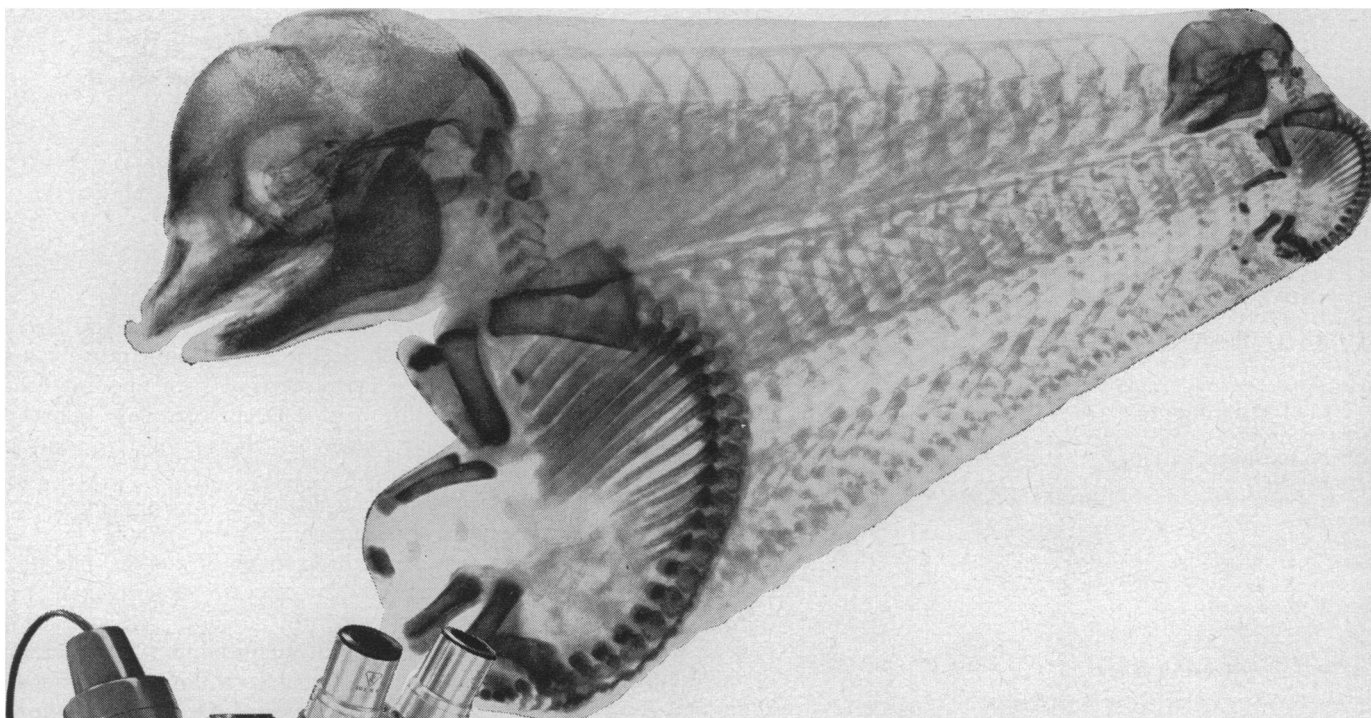
The decisions in this field have had to be made by the National Aeronautics and Space Administration (NASA). No perfect mechanism for decision making exists, but NASA has worked in close liaison with the National Academy of Sciences—National Research Council's Space Science Board and the President's Science Advisory Committee, as well as with panels of scientists from outside the government.

One of the major decisions that had to be made early was whether or not to launch a crash program to overtake Russia in the brute force competition in spatial weight lifting. NASA decided instead to develop a well-balanced scientific program and has recently laid out a ten-year schedule to accomplish its aims, which will include the development of high-thrust vehicles.

Although most of the projects seem to most scientists to be in good balance, one in particular is criticized. This is the Mercury or man-in-orbit project, which has been given a top priority. The argument against this undertaking is that the yield of scientific information from a man in low orbit will probably be less than that attainable by substituting for a man and his supplies an equivalent weight of instruments. Here is a prime example of a difficult decision. Granted that the immediate scientific results of launching a manned satellite will not be as great as those obtainable by other means, is this the overriding consideration? The NASA decision can be defended on two grounds. Sooner or later man is going to go deep into space—say, to the moon or Mars—where he can contribute much to the scientific results, and exploratory flights over short periods of time are essential first steps. Furthermore, the United States does not exist in a political vacuum; it cannot afford to lag far behind the Soviet Union in getting a man into orbit.

That all decisions made in so vast an enterprise as the exploration and exploitation of space will satisfy everyone is obviously too much to hope for. That in the first two years of its existence NASA has done as well as it has in balancing all factors—political, psychological and scientific—is ground for congratulations.—G.DuS.





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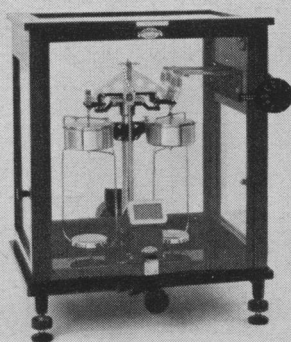
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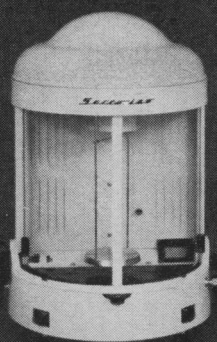
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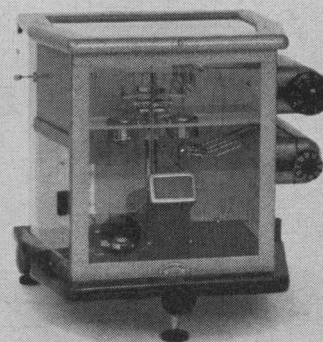




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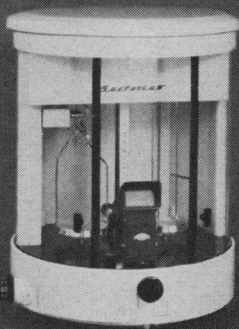
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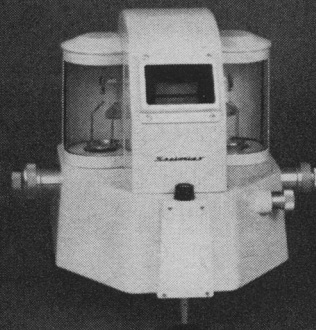
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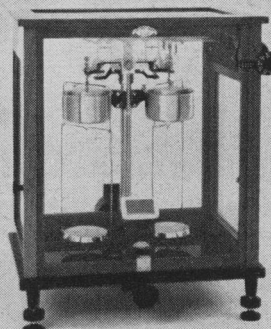
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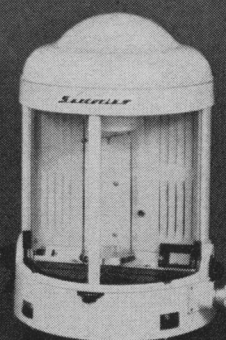
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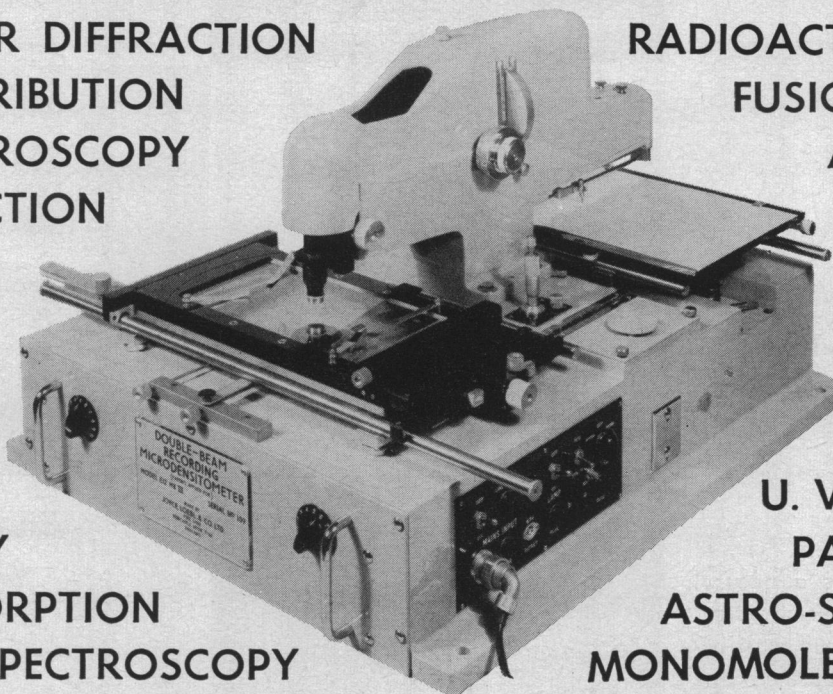
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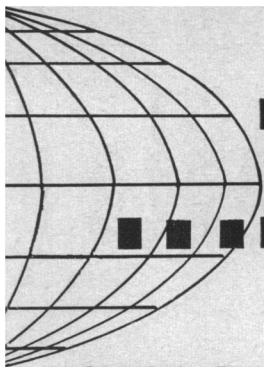
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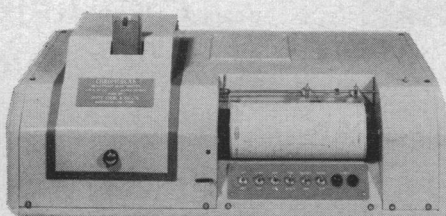
# ...From All Over The World!

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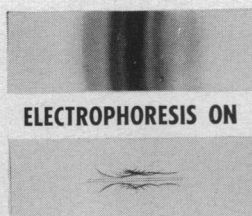
A new double-beam scanning and recording integrator for chromatography and electrophoresis on agar gel, membrane foil, paper and film

- 9-fold magnification of narrow bands
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BULLETIN 60/2



MICRO  
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### THE APPARATUS

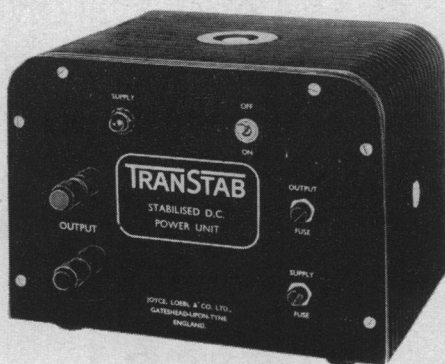
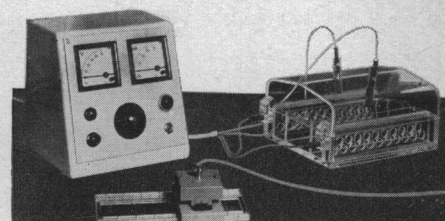
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BULLETIN 257

## AGA FOR

- Complete electrophoretic separations in 45 minutes.
- Average sample size 0.001 ml, resulting in sharpest zones with minimum diffusion.
- Immunological reactions observable immediately following electrophoresis.
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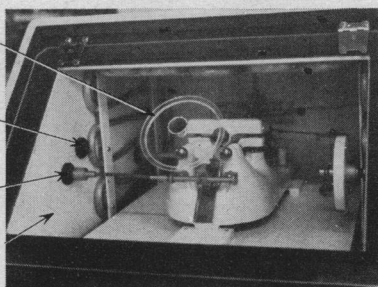
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From fresh tissue to mounted stained sections in 3 minutes.

### FEATURES

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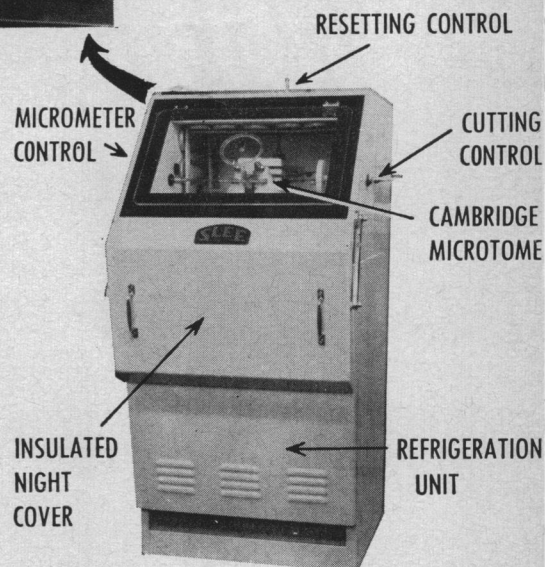
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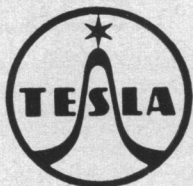
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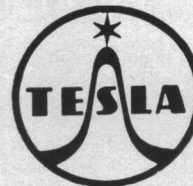


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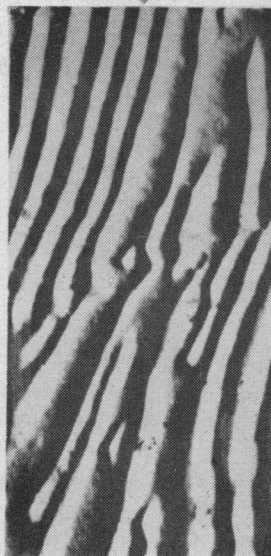


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Giant*

60 kV  
30,000X  
30Å



**TESLA**



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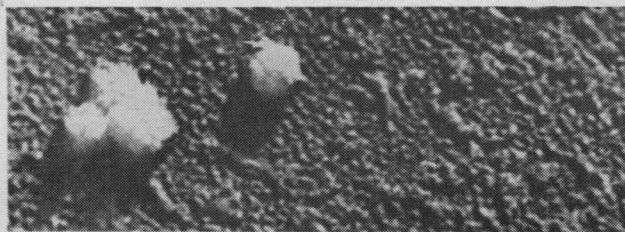


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# Meetings

## Forthcoming Events

### November

3-4. Muscle as a Tissue, conf., Philadelphia, Pa. (Division of Research, Lankenau Hospital, Philadelphia 31)

4-5. West-Central States Biochemical Conf., Lincoln, Neb. (J. H. Pazur, Dept. of Biochemistry and Nutrition, Univ. of Nebraska, Lincoln)

4-6. Assoc. of Clinical Scientists, Washington, D.C. (R. P. MacFate, 54 W. Hubbard St., Chicago 10, Ill.)

5. Society for Industrial and Applied Mathematics, Philadelphia, Pa. (G. Kaskey, Remington Rand Univac, 1900 W. Allegheny Ave., Philadelphia)

7-10. Society of Exploration Geophysicists, 30th annual intern., Galveston, Tex. (C. C. Campbell, Box 1536, Tulsa, Okla.)

8-10. Forensic Sciences, 2nd symp., Washington, D.C. (Director, Armed Forces Inst. of Pathology, Washington 25)

9-10. Use of Secondary Surfaces for Heat Transfer with Clean Gases, symp., London, England. (Secretary, Institution of Mechanical Engineers, 1 Birdcage Walk, London, S.W.1)

9-11. Clinical Chemistry Methods, symp., Cleveland, Ohio. (A. Hainline, Cleveland Clinic, 2020 E. 93 St., Cleveland 6)

10-12. Geological Soc. of America, 73rd conv., Denver, Colo. (H. R. Aldrich, GSA, 419 W. 117 St., New York 27)

10-12. National Assoc. of Geology

Teachers, Denver, Colo. (F. Foote, Dept. of Geology, Williams College, Williams-town, Mass.)

10-13. Pacific Coast Fertility Soc., Las Vegas, Nev. (A. C. Wineberg, 3120 Webster St., Oakland, Calif.)

11-12. Paleontological Soc., Denver, Colo. (H. B. Whittington, Harvard Univ., Cambridge 38, Mass.)

13-16. Society of American Foresters, 60th annual, Washington, D.C. (H. Clapper, SAF, 825 Mills Bldg., Washington 6)

14-17. Magnetism and Magnetic Materials, 6th annual conf., New York, N.Y. (L. R. Bickford, Jr., I.B.M. Research Center, Yorktown Heights, N.Y.)

14-18. American Soc. of Agronomy, Chicago, Ill. (L. G. Monthey, 2702 Monroe St., Madison 5, Wis.)

14-18. Nuclear Ship Propulsion, symp., Taormina, Sicily. (International Atomic Energy Agency, 11 Kärntner Ring, Vienna 1, Austria)

15-16. Engineering Application of Probability and Random Function Theory, symp., Lafayette, Ind. (J. L. Bogdanoff, School of Aeronautical and Engineering Sciences, Purdue Univ., Lafayette)

16-19. Society of Naval Architects and Marine Engineers, annual, New York, N.Y. (W. N. Landers, SNAME, 74 Trinity Pl., New York 6)

17-19. Extrapyramidal System and Neuroleptics, intern. symp., Montreal, Canada. (J.-M. Bordeleau, Dept. of Psychiatry, Univ. of Montreal, Montreal)

17-19. Surgery of Endocrine Organs, symp., New York, N.Y. (Office of the Associate Dean, New York Univ. Post-

Graduate Medical School, 550 First Ave., New York 16)

17-20. American Anthropological Assoc., Minneapolis, Minn. (B. J. Meggers, 1530 P St., NW, Washington 5)

17-20. Southern Thoracic Surgical Assoc., Nassau, Bahamas. (H. H. Seiler, 517 Bayshore Blvd., Tampa 6, Fla.)

18-19. American Medical Writers' Assoc., Chicago, Ill. (H. Swanberg, 510 Maine St., Quincy, Ill.)

21-23. Fluid Dynamics, annual, Baltimore, Md. (R. J. Emrich, Div. of Fluid Dynamics, APS, Dept. of Physics, Lehigh Univ., Bethlehem, Pa.)

24-25. American Physical Soc., Chicago, Ill. (K. K. Darrow, APS, 538 W. 120 St., New York 27)

24-26. Central Assoc. of Science and Mathematics Teachers, 60th annual conv., Detroit, Mich. (L. A. Conrey, School of Education, Univ. of Michigan, Ann Arbor)

25-26. American Soc. of Animal Production, Chicago, Ill. (C. E. Terrill, Animal Husbandry Research Div., Agricultural Research Center, Beltsville, Md.)

25-26. National Council for Geographic Education, Cincinnati, Ohio. (L. Kenndmer, Univ. of Texas, Austin)

25-16. Bahamas Medical Conf., Nassau. (B. L. Frank, P.O. Box 4037, Fort Lauderdale, Fla.)

27-1. Latin American Cong. of Neurology, Santiago, Chile. (R. Nunez, Almirante Montt 485, Dep. 11, Santiago)

27-2. American Soc. of Mechanical Engineers, annual, New York, N.Y. (A. B. Conlin, Jr., ASME, 29 W. 39 St., New York 18)

27-5. International Federation of Agricultural Producers, 11th conf., New Delhi, India. (IFAP, 1624 Eye St., NW, Washington 6)

28-1. Entomological Soc. of America, Atlantic City, N.J. (R. H. Nelson, 4603 Calvert Rd., College Park, Md.)

29-2. American Medical Assoc., Washington, D.C. (F. Blasinggame, 1535 N. Dearborn St., Chicago 10, Ill.)

30-2. Steels in Reactor Pressure Circuits, symp., London, England. (Secretary, Iron and Steel Inst., 4 Grosvenor Gardens, London, S.W.1)

### December

1-16. Commission for Climatology, 3rd session, London, England. (World Meteorological Organization, Campagne Rigot, 1, avenue de la Paix, Geneva, Switzerland)

2-5. Central American Medical Conf., 8th, Panama City. (A. Bissot, Departamento de Salud Publica, Ministerio de Trabajo, Prevision Social y Salud Publica, Panama)

3-6. Visual Communications, 4th annual intern. cong., Chicago, Ill. (Visual Communications Cong., 10600 Puritan Ave., Detroit 38, Mich.)

3-8. American Acad. of Dermatology and Syphilology, Chicago, Ill. (R. R. Kierland, First National Bank Building, Rochester, Minn.)

4-6. Spectroscopy, annual southern seminar, Gainesville, Va. (Annual Seminar on Spectroscopy, Univ. of Florida, Gainesville)

4-7. American Inst. of Chemical Engineers, annual, Washington, D.C. (F. J. Van Antwerpen, AICE, 25 W. 45 St., New York 36)

4-9. Radiological Soc. of North Amer-

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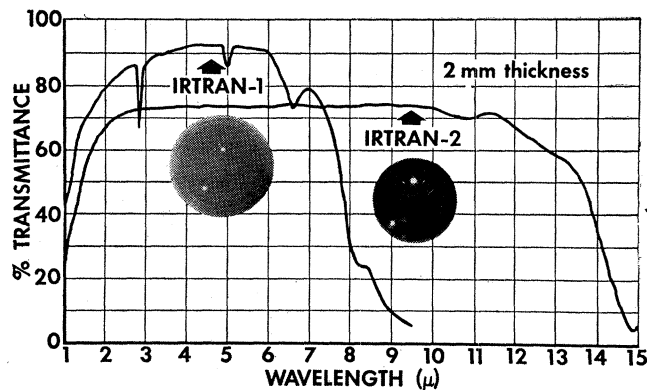


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*Irtan-1\** material, the other one, needs no anti-reflection coating because its refractive index is only 1.38 at 1μ. Its big glory, aside from high infrared transmittance at 2 to 7μ even when very hot, stems from a 9.4 kmc dielectric constant of 5 and a loss tangent of 10<sup>-4</sup>.

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$$\frac{8.686\pi}{\lambda_0} \sqrt{K} \tan \delta$$

where  $K$  = dielectric constant  
 $\lambda_0$  = wavelength in vacuum  
 $\tan \delta$  = loss tangent  
 $\delta$  is the complement of the vector angle whose cosine the power engineer calls "power factor."

One untuned *Irtan-1* sample .012" thick we tested in the X-band frequency range introduced an attenuation of less than 0.3db and exhibited a maximum standing wave ratio of 1.5 over the band.

The ideal radome material would have a kilomegacycle dielectric constant of unity, i.e. to microwaves it would be the same as nothing at all. Plastics commonly used for radomes run around 2 or 3, but they don't transmit infrared rays. On the other hand, there are materials that are good for infrared transmission but have dielectric constant around 13.

Another way the *Irtan* materials shine figuratively is their very low tendency to glow literally when hot and thus to

\*Formerly designated "Irtan AB-1."

blind themselves by swamping transmittance with emissivity. They survive undamaged through the conventional torture tests of temperature-humidity cycling for 28 days, vacuum-steam pressure for 2,000 cycles in saline solution, sand and dust blast, acids, alkalis, organic solvents, plunges from hot to cold, etc.

Currently we can supply either of these polycrystalline *Irtan* materials as optical elements up to 6½" in diameter, among other forms. Let us have no jurisdictional disputes among optickers, microwavers, and infra-redders as to who sends for the supporting data from Eastman Kodak Company, Special Products Division, Rochester 4, N. Y.

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"You press the button, it does (or in an alternate version, "we do") the rest." It was one of the more successful slogans in advertising history. It made us a great deal of money. Millions bought the philosophy, and millions still buy it. A few hundred thousand don't buy it. Them, too, we love, admire, and respect. We have just published a fancy new book for them. Fancy is the word.

This book contains more than just pages. Snuggled among them are an actual standard color negative and positive, two special slide-rule computers, and a big nomograph in color about color correction. One of the pages has windows fitted with six different color-print viewing filters. Under the title "Kodak Color Dataguide," it is sold by camera shops for \$4.95. (If you send a check to Eastman Kodak Company, Sales Service Division, Rochester 4, N. Y., we shall sigh at how people have forgotten how to walk these days and mail you a copy.)

Frightening as it looks, the book contains virtually no photographic theory. It is a repackaging of operating instructions for two basic categories of users (a better word in this case than "readers"):

1) The professional, be he photographer, scientist, or something in between.

Commercial color labs in many cities do slick work in making color prints or transparencies from exposed film. From Kodacolor or Kodachrome Film, a Kodak dealer would just as soon accept orders to have the work done by Kodak itself as sell a book. But when requirements are too specialized to convey to labs geared for production, the hard way may be the better way.

2) The dedicated amateur who might be painting in oils or water-colors if only he had a better hand for it and who finds that serious color photography brings into play the exact combination of technology and a good eye that best unwinds him from workaday cares.

In art, the best effects often come from a skillful violation of the rules. But the result is usually a mess unless one has first perfected himself in the rules.

## Cinefluorography, mid-1960

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ica, Cincinnati, Ohio. (D. S. Childs, 713 E. Genesee St., Syracuse 2, N.Y.)

5-7. American Soc. of Agricultural Engineers, winter, Memphis, Tenn. (J. L. Butt, ASAE, 420 Main St., St. Joseph, Mich.)

5-7. Electronic Industries Assoc., 3rd conf. on maintainability of electronic equipment, San Antonio, Tex. (E. B. Harwood, Office of the Secretary of Defense, Room 3D1018, Pentagon, Washington 25)

5-8. American Rocket Soc., 15th annual, Washington, D.C. (R. L. Hohl, ARS, 500 Fifth Ave., New York 36)

7-13. American Acad. of Optometry, San Francisco, Calif. (C. C. Koch, 1506-08 Foshay Tower, Minneapolis 2, Minn.)

9-10. The Myocardium—Its Biochemistry and Biophysics, New York, N.Y. (A. P. Fishman, New York Heart Assoc., 10 Columbus Circle, New York 19)

9-11. American Psychoanalytic Assoc., New York, N.Y. (D. Beres, 151 Central Park West, New York 23)

10-11. Academy of Psychoanalysis, New York, N.Y. (J. H. Merin, 125 E. 65 St., New York 21)

11-14. Hot Laboratory and Equipment Conf., 8th, San Francisco, Calif. (J. R. Lilienthal, Los Alamos Scientific Laboratory, P.O. Box 1663, Los Alamos, N.M.)

12-14. American Nuclear Soc. (Isotopes and Radiation Div.), San Francisco, Calif. (O. J. Du Temple, ANS, 86 E. Randolph St., Chicago 1, Ill.)

12-14. Water Pollution, natl. conf., Washington, D.C. (Natl. Conf. on Water Pollution, F. A. Butrico, Office of Engineering Resources, Div. of Engineering Services, U.S. Public Health Service, Washington 25)

12-16. Atomic Industrial Forum, conf., San Francisco, Calif. (D. J. Scherer, 3 E. 54 St., New York 22)

13-15. Eastern Joint Computer Conf., New York, N.Y. (E. C. Kubie, EJCC, Computer Usage Co., Inc., 18 E. 41 St., New York 17)

19-20. Statistical Mechanics, conf., London, England. (Organizing Secretary, Physical Soc., 1, Lowther Gardens, London)

22-2. Panamerican Diabetic Congress, 1st, British Honduras. (B. R. Hearst, Director, Diabetic Inst. of America, 55 E. Washington St., Suite 1646, Chicago 2, Ill.)

26-30. Inter-American Cong. of Psychology, 7th, Havana, Cuba. (G. M. Gilbert, Psychology Dept., Long Island Univ., Brooklyn 1, N.Y.)

27. American Astronautical Soc., Lunar Exploration symp., New York, N.Y. (F. F. Martin, AAS, 516 Fifth Ave., New York 36)

27-14. Bahamas Surgical Conf., Nassau. (B. L. Frank, P.O. Box 4037, Fort Lauderdale, Fla.)

28. Association for Education in International Business, St. Louis, Mo. (J. N. Behrman, Univ. of Delaware, Newark, Delaware)

28-30. American Economic Assoc., St. Louis, Mo. (J. W. Bell, Northwestern Univ., Evanston, Ill.)

28-30. Econometric Soc., St. Louis, Mo. (R. Ruggles, Dept. of Economics, Yale Univ., New Haven, Conn.)

28-29. Linguistic Soc. of America, annual, Hartford, Conn. (A. A. Hill, Box 7790, University Station, Austin 12, Tex.)