

surement and Control in Science and Industry, intern. symp., Washington, D.C. (A. Wexler, National Bureau of Standards, Washington 25)

20-23. **Spectroscopy**, 14th annual mid-American symp., Chicago, Ill. (J. E. Forrette, Roy C. Ingersoll Research Center, Wolf and Algonquin Rds., Des Plaines, Ill.)

21-23. **Australian Mathematical Soc.**, Clayton, Victoria, Australia. (G. C. Smith, Dept. of Mathematics, Monash Univ., Clayton)

21-23. **Joint Computer Conf.**, Detroit, Mich. (B. W. Pollard, Burroughs Corp., 6071 Second Ave., Detroit 32)

21-23. **Radioisotopes**, 5th Japanese conf., Tokyo. (J. H. Kane, Div. of Special Projects, U.S. Atomic Energy Commission, Washington 25)

22-25. **Space**, 3rd European symp., Stuttgart, Germany. (U. Seeliger, Verkehrsamst der Stadt Stuttgart)

22-31. **Scientific and Technical Press and Books**, 1st intern. exhibition, Paris, France. (Groupe des Editeurs de Livres de Sciences et de Techniques, Syndicat National des Editeurs, Cercle de la Librairie, 117 Boulevard St. Germain, Paris 6)

23-24. **Radiosensitizers and Radioprotective Drugs**, 1st intern. symp., Milan, Italy. (R. Paoletti, Inst. of Pharmacology, Univ. of Milan, Via A. Sarto 21, Milan)

23-24. **Southern Textile Research**, 3rd conf., Pinehurst, N.C. (M. P. Underwood, P.O. Box A-2, Greensboro, N.C.)

23-25. **American Assoc. for Cancer Research**, Inc., Toronto, Canada. (H. J. Creech, Inst. for Cancer Research, Fox Chase, Philadelphia 11, Pa.)

23-25. **American Soc. for Quality Control**, Chicago, Ill. (C. E. Fisher, Bell Telephone Laboratories, 463 West St., New York 14)

23-26. **Nuclear Fuel Reprocessing**, Eurochem sym., Brussels, Belgium. (O.E.C.D., European Nuclear Energy Agency, 38 Boulevard Suchet, Paris 16^e, France)

26-27. **Society for Industrial and Applied Mathematics**, Menlo Park, Calif. (R. D. Gaskell, Dept. of Mathematics, Oregon State Univ., Corvallis)

26-29. **Institute of Food Technologists**, Detroit, Mich. (C. L. Willey, Inst. of Food Technologists, 176 W. Adams St., Chicago 3, Ill.)

26-31. **American Physical Therapy Assoc.**, New York, N.Y. (L. Blair, APTA, 1790 Broadway, New York 19)

26-1. **Mineral Processing**, 6th intern. Congr., Cannes, France. (D. A. Dahlstrom, Eimco Corp., 301 S. Hicks Rd., Palatine, Ill.)

27. **Operations Research Soc. of America**, Transportation Science Section, Cleveland, Ohio. (L. C. Edie, Port of New York Authority, 111 Eighth Ave., New York 11)

27-29. **Canadian Nuclear Assoc.**, 2nd intern. conf., Montreal, Canada. (CNA, 19 Richmond St., W., Toronto 1, Canada)

27-29. **Frequency Control**, 17th annual symp., Atlantic City, N.J. (Headquarters, U.S. Army Electronics Research and Development Laboratory, Fort Monmouth, N.J.)

27-30. **Tissue Culture Assoc.**, 14th annual, Boston, Mass. (R. L. Sidman, Labo-

ratory of Cellular Neuropathology, Harvard Medical School, 25 Shattuck St., Boston 15)

27-31. **International Astronomical Union**, 21st symp. (by invitation only), Paris, France. (G. M. Clemence, U.S. Naval Observatory, Washington 25)

27-31. **Environmental Engineering**, 1st symp., London, England. (B. & K. Laboratories, 57 Union St., London, S.E.1)

27-31. **Application of Large Radiation Sources in Industry**, conf., Salzburg, Austria. (IAEA, 11 Kärntner Ring, Vienna 1, Austria)

27-8. **International Sedimentological Congr.**, 6th, Amsterdam, Netherlands.

(C. Kruit, Koninklijke/Shell Exploratie en Produktie Laboratorium, Volmerlaan 6, Rijswijk, Netherlands)

28-31. **Gas Chromatography**, 4th symp., Leuna, Germany. (Unterkommission für Gaschromatographie, Sektion Chemie, Deutsche Akademie der Wissenschaften, Permoser Str. 15, Leipzig 5, Germany)

28-1. **Plant Tissue Culture**, intern. conf., University Park, Pa. (F. W. Lester, Pennsylvania State Univ., University Park)

29. **Education in Vacuum Science and Technology**, London, England. (Administration Asst., Inst. of Physics and the Physical Soc., 47 Belgrave Sq., London, S.W.1)

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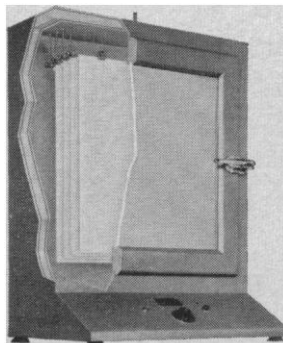
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A comprehensive textbook and critical evaluation based on the author's extensive experience. By TIBOR BARKA, M.D. and PAUL J. ANDERSON, M.D., both at Mt. Sinai Hospital, New York, N.Y. 672 pp., \$18.50.

2. Gellhorn & Loofbourrow: Emotions and Emotional Disorders

A major source book for all concerned in any way with the study and understanding of emotions and emotional disorders. By ERNEST GELLHORN, M.D., Ph.D., University of Minnesota and G. W. LOOFBOURROW, Ph.D., University of Kansas. 508 pp. illus., \$12.00

3. Homburger-Fishman: The Physiopathology of Cancer, 2nd Ed.

The fundamental biochemical and biological aspects of cancer, described by foremost authorities. By 32 Authors. Edited by FREDDY HOMBURGER, M.D., Tufts University School of Medicine. 1189 pp., 189 illus., 100 tables, \$33.00

4. Hollinshead: A Textbook of Anatomy

Employing the regional approach, this new basic textbook of human structure is prepared by an eminent and widely known anatomist. By W. HENRY HOLLINSHEAD, Ph.D., University of Minnesota Medical School. 1058 pp., 980 illus., \$16.50

5. Parker: Methods of Tissue Culture, 3rd Ed.

A detailed laboratory manual for day-to-day use and a guide to the application of the procedures in many areas of investigation. By RAYMOND C. PARKER, Ph.D., School of Hygiene, University of Toronto. 376 pp., 127 illus., \$12.00

6. Sourkes: Biochemistry of Medical Disease

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Potentiometer (model PVP-1000) measures voltage from zero to 1000 volts with worst-case accuracy ± 0.0006 percent in the low range and ± 0.001 percent to 1000 volts, according to the manufacturer. The instrument is comprised of a standard-cell ratio set, a thermally lagged mercury-cell source of working current, a dropping rheostat, and a calibrated resistance chain. The total limit of error for the 1-volt calibration is said to be ± 0.0003 percent including the uncertainty in the primary voltage reference. The potentiometer includes a volt box with ranges 1, 3, 10, 30, 100, 300, and 1000 volts. All accuracy-determining resistors are encapsulated units. The instrument is available for rack mounting or in a mahogany case. The former occupies 5.25 inches of rack height.—J.S. (Julie Research Laboratories, Inc., Dept. S659, 603 W. 130 St., New York 7)

Pulse-actuated syringe injector is an electromechanical apparatus used for rapid injection of radioactive material or dyes into the heart through a catheter. This instrument handles a standard

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, 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).

The information reported is obtained from manufacturers and other sources considered reliable. Neither *Science* nor any of the writers assumes responsibility for the accuracy of the information.

Address inquiries to the manufacturer, mentioning *Science* and the department number.

Luer 2-ml syringe, and permits rapid injection of from close to 0 up to 1.5 ml. The amount injected is regulated by piston travel, and is independent of the level of filling. Injection is accomplished in a matter of milliseconds. The injector is self-cocking and can be used repetitively. It can be triggered by an electrical signal such as the output of an ECG apparatus which times the injection to the cycle of the heart.—R.L.B. (Sage Instruments, Inc., Dept. S665, 2 Spring St., White Plains N.Y.)

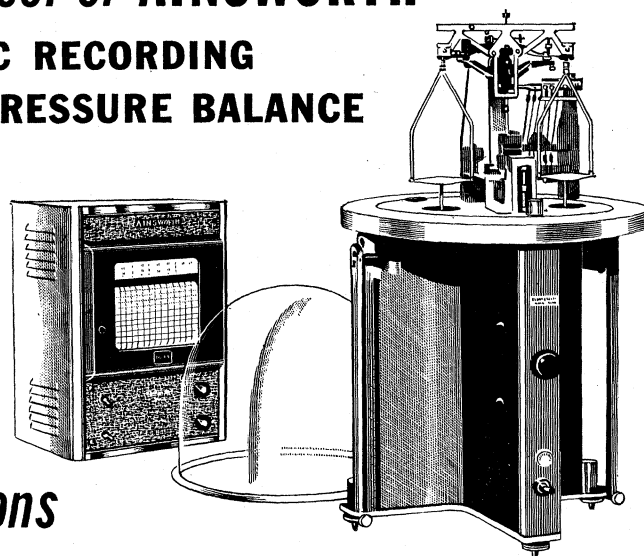
Niobium foil electrolytic capacitors are said to weigh up to 25 percent less than equivalent tantalum foil capacitors. They are designed with either plain or etched foil in both polar and nonpolar ratings. Units are rated at 6 through 50 volts d-c and have operating temperature range of -55° to $+85^{\circ}\text{C}$. Capacitance values are 1.5 to 200 μf with tolerances of +20 percent for plain foil units and -15 , +75 percent for etched foil units.—J.S. (Federal Pacific Electric Co., Dept. S687, 921 Providence Highway, Norwood, Mass.)

Laboratory chromatograph (type 26-204) has automatically programmed temperature and dual columns for reference-column accuracy. The programmed temperature range is ambient to 350°C standard; 450°C optional. This capability insures that all components in a sample of widely varying volatilities are separated with approximately uniform peak widths, peak shapes, and sensitivities. The result is optimum resolution and more rapid analysis cycles. With conventional isothermal instruments, it is necessary to optimize for either the light ends, the heavy ends, or an intermediate part of the spectrum when samples contain components of wide boiling range. Temperature programming is accomplished by driving a variable transformer with a synchronous motor through a gear train. The variable transformer, in turn, feeds a low-voltage, high-amperage transformer which heats the column directly by resistive heating. This makes it possible to achieve a temperature change response time of approximately 1 sec. The chromatograph can operate in three different temperature modes: programmed, isothermal, and stepwise (manual adjustment of the variable transformer). Five sets of change gears provide nine standard programs (zero to full heat) of 15, 20, 30, 40, 60, 90,

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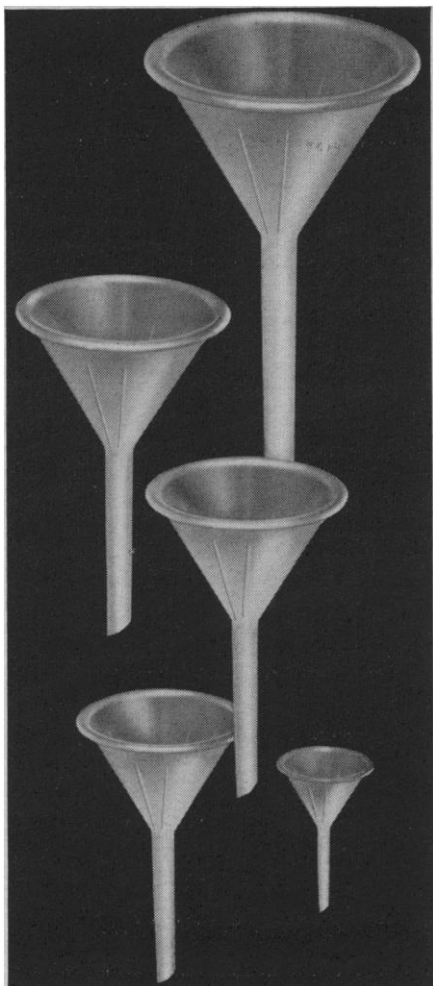
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120, 180, and 240 min nominal. Other features are dual packed columns to compensate for base-line drift, filament type thermal conductivity detectors for stability and long life, and simple design to provide reliability and ease of modification. Sample injection is by hypodermic syringe. The chromatograph will accommodate nearly all types of samples: gases, petroleum products up to waxes and lubricants, petrochemicals, chemicals, biologicals, extracts, flavoring, perfume, some food products, polymers and resins, and plasticizers.—R.L.B. (Consolidated Electrodynamics Corp., Dept. S708, 360 Sierra Madre Villa, Pasadena, Calif.)

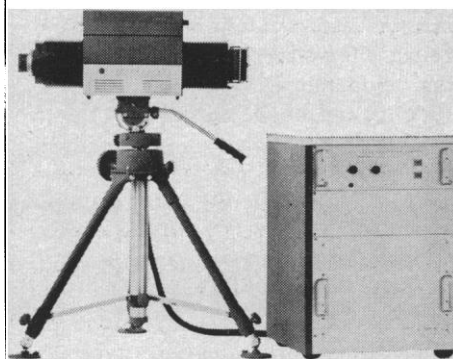
Recorder is a solid-state, null balance, servo-operated instrument that requires only a 6-inch-square cutout for mounting. Available in a single-pen type 520 or a dual-pen type 521, the recorder accepts a variety of electrical or derived quantities. Measurement is either d-c potentiometric or d-c bridge. Accuracy is said to be +0.5 percent of span. Speed of the 4-inch rectilinear chart ranges from 0.5 in./hr to 60 in./hr. Speed of response is 1 or 4 seconds. The type 520 recorder can be used for recording only, for on-off control with snap-action switches, or for three-mode control with a companion type-524 controller. The measuring element provides torque to operate up to eight switches plus transmitting and control slide-wires. The type 521, for the continuous measurement of two variables, has two completely isolated measuring circuits each of which may be d-c potentiometric or d-c bridge.—J.S. (General Electric, Dept. S691, Schenectady 5, N.Y.)

Direct reading **variable attenuator** covers continuously the attenuation range to 10 db from d-c to 1000 Mcy/sec. It is designed to be used in low-level systems. The attenuator uses the principle of a variable T-pad with optimum match over the entire range and employs stable filter resistor elements on a ceramic base. Mechanical design features a vernier drive with an eccentric bearing on the pinion shaft to minimize backlash. The dial is calibrated directly in db at the center frequency, 500 Mcy/sec, and correction factors are provided for 300, 750, and 1000 Mcy/sec. The device is equipped with stainless-steel type-N connectors. It is designed to be used on the workbench or it can be panel

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mounted. Maximum input voltage-standing wave ratio is 1.25 from d-c to 500 Mcy/sec and 1.50 from d-c to 1000 Mcy/sec. Maximum power input is 1 watt. Accuracy of calibration is said to be 0.2 db.—J.S. (Weinschel Engineering Co., Dept. S660, Gaithersburg, Md.)

Lee cryosurgery apparatus consists of a 20-cm long, 2½-mm probe, the tip of which is cooled by passage of liquid nitrogen down an inner concentric tube and out between the tubes. Tip temperature is monitored by means of a thermocouple so that controlled cooling or freezing of a local area of tissue is possible. Insulation and electrical heating of the outer tube restricts the freezing effect to the tip. The instrument has been used for surgical relief of neurological disorders by destruction of specific regions of the brain by freezing. Cooling prior to destruction permits confirmation of the effect before it is made permanent. The instrument promises to be of use in physiological and anatomical investigations.—R.L.B. (Invengeering, Inc., Dept. S663, P.O. Box 360, Belmar, N.J.)

Marble table for analytical balances provides 650 lbs of inertia to reduce vibration when one is using analytical balances. It provides the utmost stability when reading optical scales. The table is 35 inches wide by 31 inches high and is 24 inches deep. The 3-inch marble legs are reinforced with a cast-iron support rod. A 50-lb marble slab is also available for use on laboratory furniture, which substantially reduces vibration in situations where a balance table cannot be used.—R.L.B. (Mettler Instrument Corp., Dept. S698, 20 Nassau St., Princeton, N.J.)

High-frequency plasma torch (model H) uses induction heating of the plasma to avoid the use of electrodes that are subject to deterioration. The complete system includes torch, power supply, control system, and associated equipment. The characteristics of the high-frequency power supply depend on torch application. The control system meters gases and automatically ignites the torch. The gas is ionized in an intense high-frequency field within a water-cooled or ceramic tube. Circulating currents set up within the gas by the field raise its temperature. High-temperature plasmas beyond 50,000°F are said to be produced continuously without deterioration of the plasma



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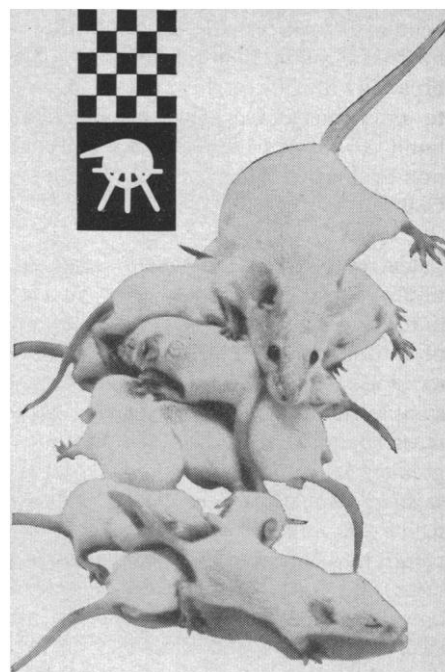
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generator. Oxidizing as well as inert gases may be used. Plasmas of diameter greater than 4 inches are said to be produced at power levels as low as 20 kw. Power level is 2 to 200 kw; gas flow is 1 to 300 lb/hr; plasma length is 1 to 30 inches; and plasma velocity is 5 ft/sec and higher.—J.S. (Humphreys Corp., Dept. S682, 180 N. Main St., Concord, N.H.)

Ultraviolet-visible direct-reading spectrophotometer (model 139) employs a precision diffraction grating to cover the entire ultraviolet and visible region. The diffraction grating has 1440 lines per millimeter and measures 30 by 32 mm. All controls and large direct-reading meters are located on the front of the instrument so that the operator may sit comfortably while using it. Normal range for absorption spectrophotometry is 205 to 800 mμ. The available range is 180 to 1000 mμ. Wavelength accuracy is better than ±0.5 mμ and wavelength reproducibility is better than 0.1 mμ. The instrument's detector is a single, high-sensitivity, wide-range phototube manufactured by Hitachi, which covers the entire wavelength range. Hydrogen and tungsten lamps are provided as sources. A linear wavelength control is provided so that complex spectral structures can be scanned manually and observed visually on the meter. Thus, important peaks can be located quickly without ambiguity by the operator prior to undertaking quantitative determinations. The spectrophotometer includes line-operated transistorized power supply.—R.L.B. (Perkin-Elmer Corp., Dept. S699, 1001 Main Ave., Norwalk Conn.)

Triggered arc gap (model 108A), using the needle triggered gap technique is said to provide fault current diversion of infinite range with power supplies up to 230 kv. Used with the manufacturer's model 101A logic circuit, the device can place a short on the power supply within 2 μsec. A multiple fire adapter prevents recharging of the capacitor bank during the interval between initial firing and removal of the primary power supply. The adapter relights the arc at 4-msec intervals for 56 msec. Operating principle of the unit is the voltage holdoff characteristic of a two-sphere-needle configuration and the uniform field resulting between them. The needle, held at an equipotential plane by a resistive divider, does not, under normal conditions, affect the holdoff characteristic



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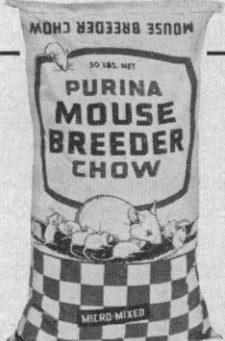
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of the ball gap. Unbalance of the needle from this plane establishes a needle-to-ball configuration with lower breakdown voltage. The needle is said to show no sign of erosion even after hundreds of gap firings.—J.S. (Radiation at Stanford, Dept. S692, Palo Alto, Calif.)

Carbon dioxide analyzer and end tidal sampler provides a means of continuous indication of the CO_2 content of alveolar air, which is closely related to blood CO_2 tension. A polyethylene sample tube is placed in the respiratory tract so that the respiratory volume is greater than the dead space beyond the sample tube. In operation the sampler detects the expiration inflection in the respiratory pressure wave across a screen in the breathing tube, and after an adjustable time delay draws the end tidal sample through a buffered bromthymol blue solution. As the solution equilibrates with the CO_2 tension, the color change is monitored by a photoelectric system which displays the response to the color change on a meter calibrated from 0 to 12 percent CO_2 with 0.5 percent subdivisions. The performance is optimal when respiratory rate and volume are constant and the tidal volume is well in excess of the volume of the tract beyond the sample tube so that monitoring of rates below 300 cc tidal volume in man requires intratracheal sampling. Response to an abrupt change in $p\text{CO}_2$ to within 99 percent of final value occurs in from 75 to 90 sec.—R.L.B. (Lexington Instruments, Dept. S706, 16 Mechanic St., Waltham 54, Mass.)

Event marker galvanometers make it possible to use light beam oscillographs as event recorders. Introduced by CEC for use on their light-beam oscillographs, these galvanometers indicate by the presence or absence of a trace on the oscillogram, time of starting, stopping, duration, and duration between events. Upon activation of the galvanometer, a standard galvanometer movement rotates a shutter away from a mirror fixed to the galvanometer's front post. Manual adjustment of this post positions the trace horizontally on the oscillogram. Response time from signal to trace is 10 msec for the type 7-371, 1 msec for the 7-372, and 0.5 msec for the 7-373, with sensitivities of 400 μa , 6.0 ma, and 25 ma, ± 5 percent respectively.—R.L.B. (Consolidated Electrodynamics Corp., Dept. 641, 360 Sierra Madre Villa, Pasadena, Calif.)

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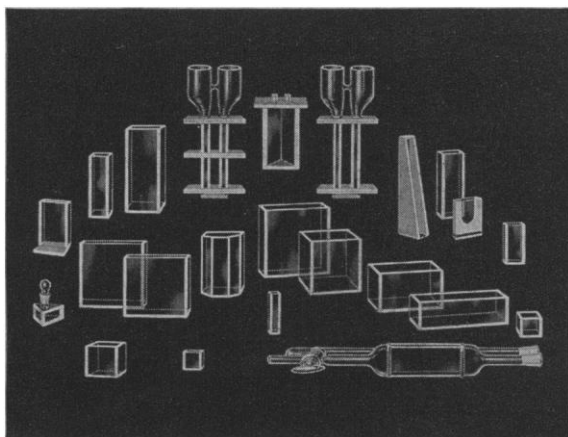
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4 April: **MATHEMATICS OF IMPRECISION: PROBABILITY AND STATISTICAL INFERENCE**—Conference Board of the Mathematical Sciences. Chairman: S. S. Wilks, Professor of Mathematical Statistics, Princeton University.

11 April: **MEDICAL ELECTRONICS**—Institute for Electrical and Electronics Engineers. Chairman: E. M. Bluestone, M.D., member, Expert Panel on Medical Care, World Health Organization. Professor at New York University and Columbia University.

18 April: **COMPUTERS**—Conference Board of the Mathematical Sciences. Chairman: J. Barkley Rosser, Chairman, Department of Mathematics, Cornell University.

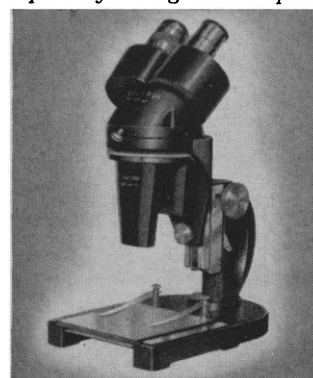
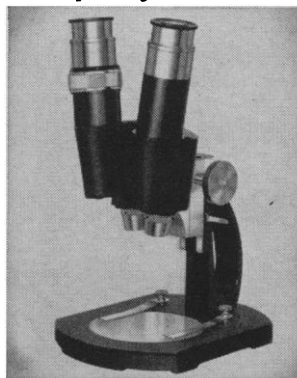
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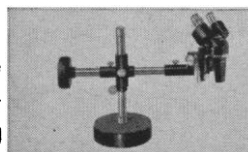
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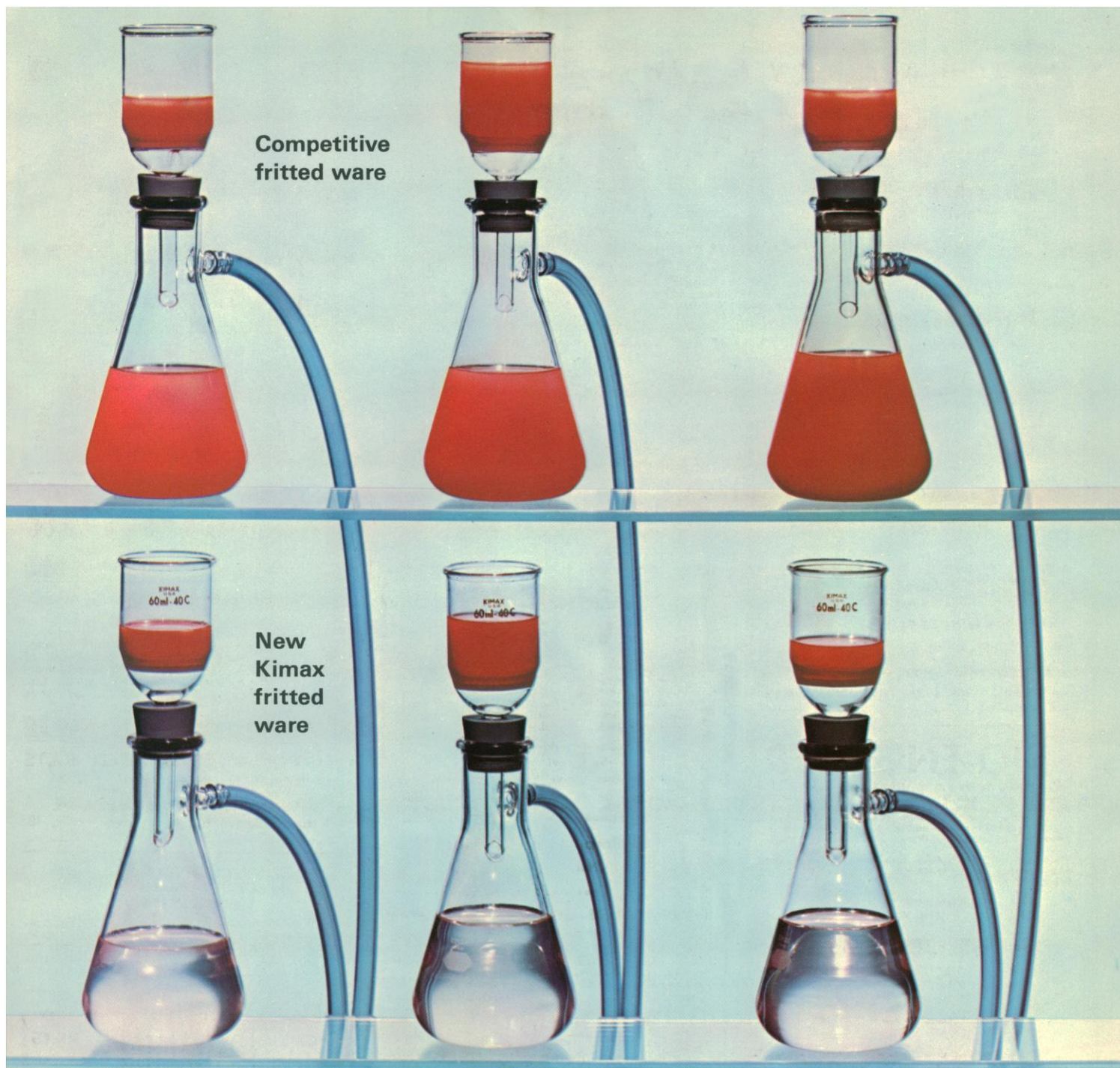
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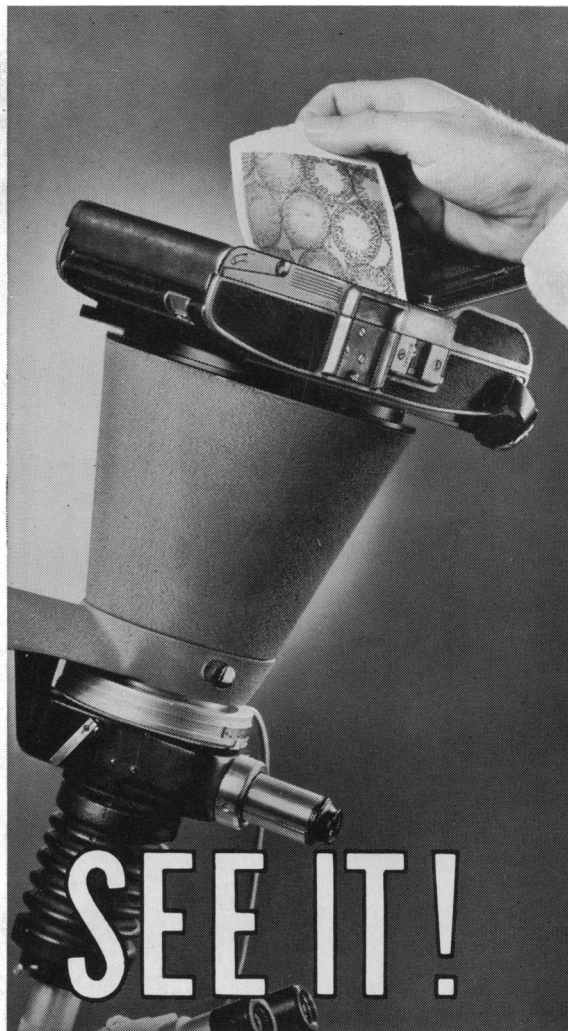
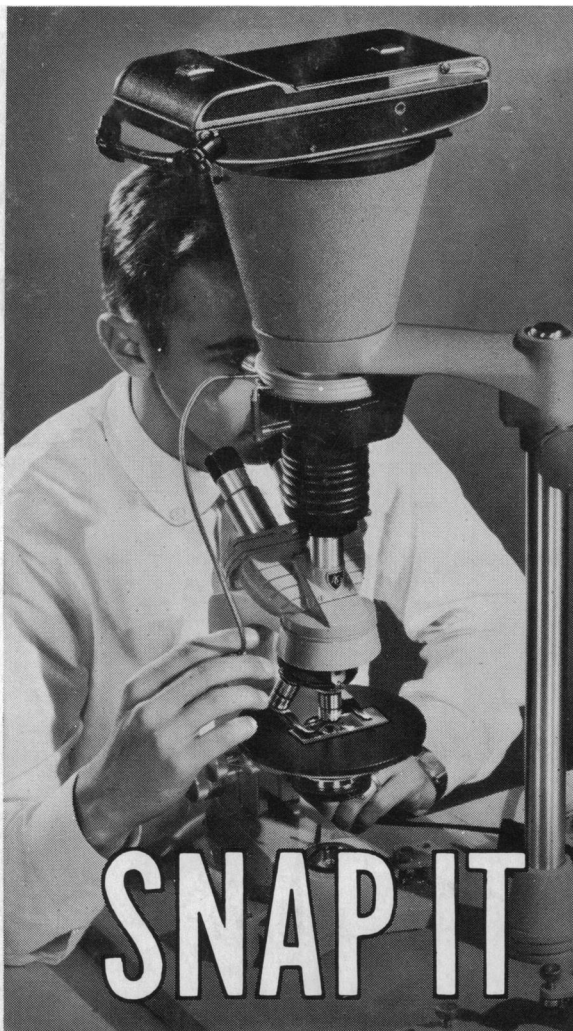
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