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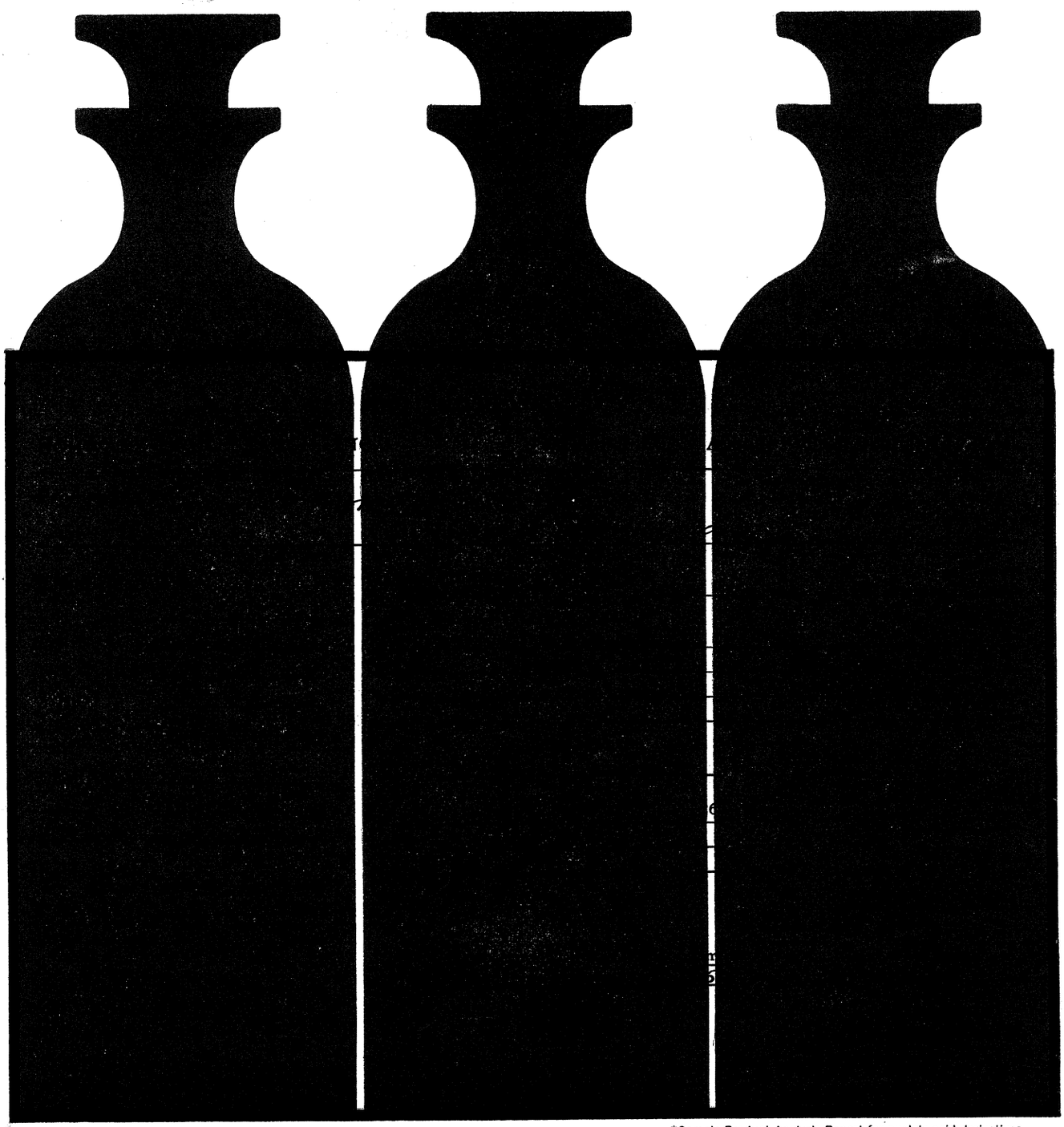

*Sample Product Analysis Report for nucleic acid derivatives.

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New Products

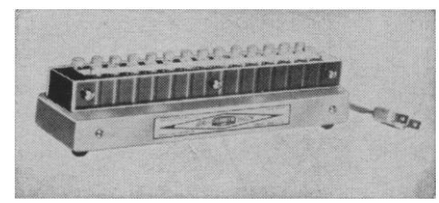
Fish reaction timer measures the interval between initiation of a stimulus to a fish and the start of its reaction. The equipment consists of a tank with an illuminated, checker-board patterned, translucent floor, a photomultiplier cell above the tank, a spring operated hammer which strikes a metal plate on the side of the tank, and an electronic timer. When a thread attached to the hammer is pulled, the hammer is released and the electronic timer is started. The fish in the tank moves in reaction to the sound of the hammer, changing the amount of light received by the photomultiplier. The resulting signal then stops the timer and displays the reaction time in milliseconds on a dial. The equipment is relatively compact and transportable for use at remote locations. Results of tests made with this device have already proved useful to fisheries biologists. As an example, two groups of fish were tested; one with a diet believed to be inadequate, the other with a normal diet. The fish with the normal diet reacted twice as fast (30 msec versus 50 to 60 msec). Tests of this nature could be useful in arriving at an optimum diet for hatchery fish.—R.L.B. (Oceanic Instruments, Inc., Dept. S374, Houghton, Wash.)

Dynamic capacitor electrometer (model 475) measures either small currents or small voltages from a high-impendance source. Input polarity is either positive or negative and is switch selected from the front panel. Basic voltage sensitivities of the instrument extend from 3 mv to 30 v full scale in a 3–10 sequence controlled by a single selection switch on the main panel. Three input resistors, 10^8, 10^{10}, and 10^{12}, ohms provide a 17-step range, not including overlap, of from 3×10^{-15} to 3×10^{-7} amp full scale. The capacitor unit operates automatically in the resonant mode. Operational a-c or battery operation from four D-cells provides portability and fail-safe operation in event of power failure. Drift is said to be less than 15 percent of full scale in 24 hours, noncumulative, on the most sensitive range, and proportionately less on other ranges.—J.S. (Victoreen Instrument Co., Dept. S318, 5806 Hough Ave., Cleveland 3, Ohio)

The model 5140 **digital word generator** is designed to generate serial-binary information at bit rates to 1 Mcy/sec and word lengths up to 40 bits. Output data are provided in either discrete pulse or non-return-to-zero format. Accuracy of all time-related parameters: clock period, clock pulse delay, and output pulse width, is said to be maintained within ±1 percent. To generate a binary word, the word is preset into 40 toggle switches. Bit spacing is adjustable between 1 μsec and 10 msec. Output pulse width is adjustable from 200 nsec to 1000 μsec and output amplitude can be adjusted from 0 to 10 volts. Risetime is 20 nsec when operating into a 1000-ohm load. A delayed clock pulse output is provided with fixed amplitude of −6 volts and adjustable duration from 0.2 to 0.8 μsec. Delay is adjustable from zero to 1000 μsec. A gate output swings from 0 to −6 volts in synchronism with the leading edges of the non-return-to-zero or pulse outputs of the first bit when the generator is operating in a one-word mode, and in synchronism with the second bit on succeeding words. Operating temperature range is 0° to 50°C. —J.S. (Rese Engineering Inc., Dept. S395, A & Courtland Sts., Philadelphia 20, Pa.)

A **4-π radiochomatogram scanner** (model RSC-310, Scanogram III) uses anticoincidence circuitry to reduce cosmic-ray background to about 8 to 12 counts per minute, accepts continuous paper strips up to 50 feet long, and scans both sides simultaneously in a gas-filled chamber, using windowless Geiger-Mueller detectors. Efficiency is 1 to 2 percent for tritium and 5 to 10 percent for carbon-14. The system includes a single-channel chart recorder with ten chart speeds. Optional features include electronic integration, a wide-grid recorder, and Mylar windows for high beta energies. The scanner is also available without the low-background circuitry or the recorder. Owners of current Scanogram I models can add the low background circuit and any of the optional features to their scanners. Bulletin P-310.—R.L.B. (Atomic Accessories, Inc., Dept. S334, 811 W. Merrick Rd., Valley Stream, N.Y.)

Micro **Dri-Bath** designed for incubation of minute samples of specimens is excellent for phosphatase analysis, microbiochemical analysis, and microchemistry studies. Its use for pediatrics and geriatrics, where blood samples necessarily must be small, is ideal. The self-contained, specially designed control is factory set to maintain specimens at a constant temperature of 37°C. The bath will accommodate 28 test tubes up to 7 mm in diameter with ¾ inch immersion of tubes. It is completely port-



able. It requires a minimum of maintenance and unlike the water bath, the problems of adjustment, cleaning and spillage are eliminated. It is compact (2¼ inches wide, 2 inches high, 8½ inches long).—R.L.B. (Thermolyne Corp., Dept. S336, Huff St., Dubuque, Iowa)

Radiation detector for large-area samples (model 1180 flow detector) is designed for either Geiger or proportional gas flow operation and accommodates samples up to 4½ by 4½ inches. It is furnished with three replaceable 0.15-mg/cm² Micromil windows for efficient alpha and soft beta counting. Gold or aluminum coated 0.9-mg/cm² Mylar windows are also available. High,

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

Robert L. Bowman (R.L.B.), 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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uniform sensitivity is obtained over the entire window surface. This detector is recommended for counting air filters (either disks or sections of rectangular filters), large precipitates, residues, slurries, or liquids of low specific activity. It is also suitable for low-level counting when used in an anticoincidence shield. —R.L.B. (Nuclear-Chicago Corp., Dept. S332, 359 E. Howard Ave., Des Plaines, Ill.)

The model JM-2000 **aerosol photometer** is a self-contained instrument for the continuous measurement of mass concentration of particulate matter in the atmosphere. The meter reading is a function of the magnitude of small-angle forward scattering of light by particles dispersed in a gaseous medium continuously drawn through a dark-field illumination chamber. Logarithmic amplification provides a range of approximately five decades, readings over the entire range being made on a single meter or recorder scale. By adding a contact meter, the instrument may be used in an alarm system.—J.S. (Phoenix Precision Instrument Co., Dept. S392, 2803–05 N. Fifth St., Philadelphia 40, Pa.)

Battery powered sequence timer provides switch closures and openings ranging from once every 10 minutes to once every 12 hours. A 4.5-volt battery powers the timer for from 8 to 12 months. Accuracy is said to be ±10 sec/day over a temperature range 30° to 140°F and is unaffected by voltage variations. The 15-jewel driving movement is temperature compensated and has shock-mounted pivot shaft bearings. A single-pole-double-throw switch is actuated by a cam mounted on the output shaft. Cams are available with 1, 2, 3, 4, or 6 lobes. Switch closure times are adjustable.—J.S. (Geodyne Corp., Dept. S396, 180 Bear Hill Rd., Waltham 54, Mass.)

The model 2619 **cathode follower** operates in the temperature range −65° to +500°F so that it may be mounted in close proximity to piezoelectric transducers designed to operate at high temperatures thus avoiding loss of signal that would result if long cables were used to run from the high-temperature area to a lower temperature area. All electronic components are vibration isolated from the external housing and the instrument is resistant to a saw-tooth shock pulse of 6 msec duration and 100g amplitude. Output is linear to 5 volts r.m.s., 0.5 ma. Frequency range is less than 2 cy to 20 kcy/sec within ±2 percent with 100-kohm load. Size is 1 by 1 by 2.5 inches.—J.S. (Endevco Corporation, Dept. S394, 161 East California Blvd., Pasadena, Calif.)

Angle and angular rate measuring system is comprised of an optical unit and an electronic unit. In operation, light from a monochromatic point source passes through a grid, a beam-splitter, and a collimating lens and strikes a mirror mounted on the object whose rotation is to be monitored. The image is reflected back into the system where it is directed by another beam-splitter to a reference photosensor. The image is also reflected by the first beam-splitter through a second grid to a control photosensor. As the object mirror rotates, the image of the first grid passes across the second grid which allows minimum and maximum amounts of light to reach the control photosensor. The output of the photosensor has a period of 12.8 arc-seconds, the angle subtended by the grid spaces. Digital output pulses are produced at 12.8 arc-seconds and an analog voltage output of 30 v/arc-second is also provided. Rate accuracy is said to be 0.0002 deg/hr in less than 1 minute of time. Angular accuracy is said to be ±0.02 arc-second. The 2.5-deg range of the instrument is extendable to 360 deg.—J.S. (Razdow Laboratories, Inc., Dept. S397, 72 Twelfth Ave., Newark 3, N.J.)

Electrode paste formulated especially for electrocardiography and electroencephalography maintains a reliable skin-to-electrode contact for as long as 2 days. It contains no abrasives or allergens and is nonirritating in short, long, or repeated use. It smooths on like a cosmetic cream, and does not run off or leave a messy residue. The packaging of "Translyte" in a plastic squeeze bottle enables the user to open, squeeze, and close the bottle with one hand.—R.L.B. (Electronic Medical Systems, Dept. S339, 1449 University Ave., St. Paul 4, Minn.)

Micromanipulator "Sensaur" provides both coarse and fine adjustments in all axes with sufficient force for dissecting the toughest specimens. This is a variable ratio double micromanipulation instrument with reduction ratios adjustable from 20 to 1 to 2000 to 1 in the x-y

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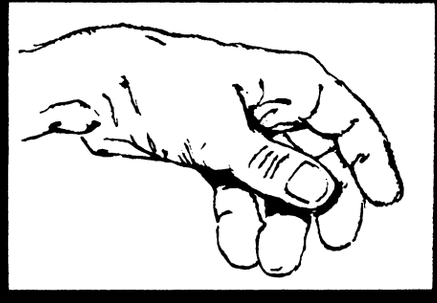

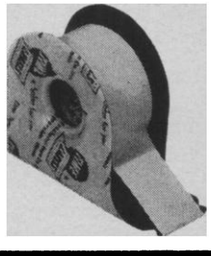

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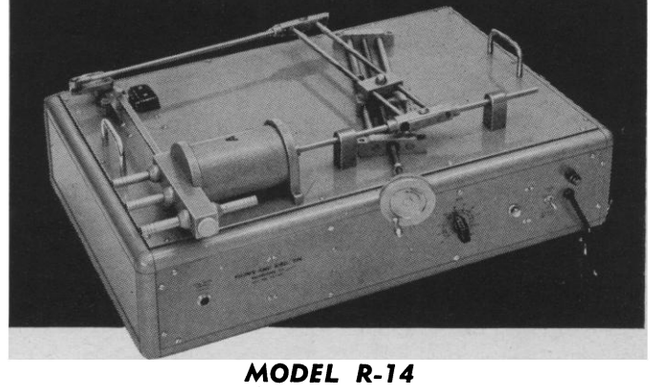

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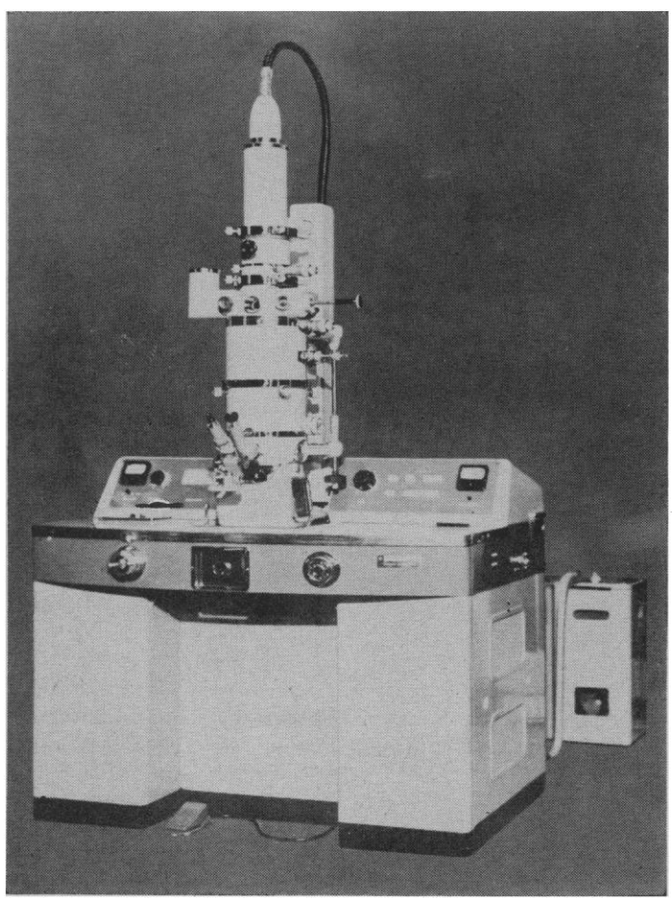

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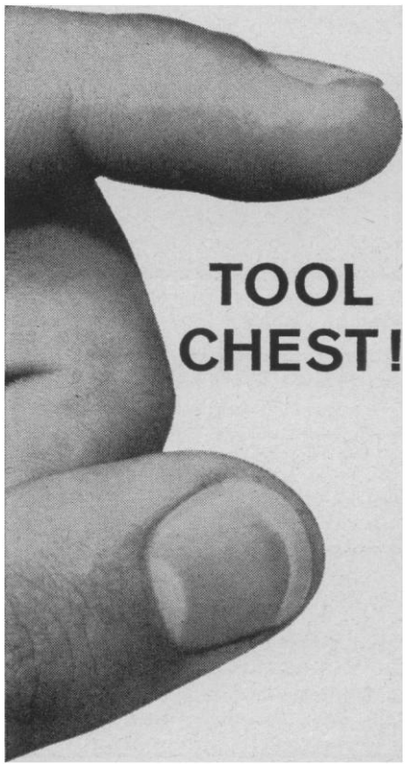

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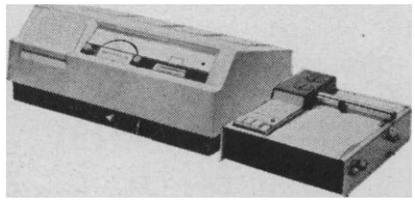

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axes and 32 to 1 to infinity in the z direction. Different ratios may be used on the two sizes as work may require. Direction of motion in relation to the hand motion can be reversed so that either stereo or standard microscopes can be used to give apparent tool motion matching the operator's normal hand motions. Left-hand and right-hand chessman joysticks provide the high precision positioning in the x-y plane, while two levers control fine vertical movement. There is no lag in the mechanical system, and the entire frame is damped with rubber mountings and felt pads to minimize transmission of vibration to the work stage.—R.L.B. (Aloe Scientific, Dept. S365, 1831 Olive St., St. Louis 3, Mo.)

The model SD-100 **synchronous detection system** is designed for use in electron paramagnetic resonance equipment. It provides the excitation signal for the magnetic field modulation coil and contains all the necessary low-level amplification and signal processing circuits to provide a direct voltage output indication of paramagnetic resonance. The instrument uses a phase modulated signal and coherent detection to achieve improved sensitivity and stability in slow-sweep investigations; conventional detection of continuous waves is available for fast-sweep operation. Operation frequency range is 80 to 120 kcy/sec and excitation level range 1 mw to 16 w. Excitation impedance level is 0.25 to 400 ohms. Preamplifier sensitivity is −140 dbm. Input impedance is 1000 ohms. Time constant selection is 0.01 to 10 seconds.—J.S. (Triconix, Inc., Dept. S393, Bear Hill, Waltham, Mass.)

The Projecto-Lab is a **projecting comparator** invaluable for study and comparison of small parts and assemblies. With the lens included, it is a microprojector. The instrument projects greatly enlarged silhouettes of objects, chemical reactions or even microscopic forms of life, which then can be studied by single technicians or larger groups. It also serves as a copying device since projected images can be quickly traced on paper or chalkboard, or even photographed for future reference. It can be used as an overhead projector or a conventional projector for wall or screen. It accommodates film strips and 35-mm slides. The projector measures 14 inches high; other specifications are 100 watts, 120 volts, 80 mm focal length, three-element, $f/3.5$ anastigmat lens, and a blower for cooling projector. In leatherette case it measures 7 by 5½ by 3¼ inches, and weighs about 3 pounds. Blower measures 4 by 4¼ inches and weighs about 4 pounds. Price $59.50 postpaid.—R.L.B. (Edmund Scientific Co., Dept. S364, Barrington, N.J.)

Liquid scintillation **paper chromatographic scanner** combines the high sensitivity of liquid scintillation counting with automatic scanning of paper chromatographic strips for determining low energy beta emitters such as carbon-14, tritium, sulfur-35, and calcium-45. Very high efficiencies of determination—50 to 60 percent—are obtained with this technique. Tritium can also be determined with an efficiency of 2 to 5 percent. When filter or chromatographic paper is wetted with a liquid scintillation solution the paper becomes translucent to the light produced by the radiation acting on the phosphor. When the wet paper is placed in close contact with a photomultiplier tube the radiation is converted into electrical energy with high efficiency. To scan a chromatographic strip continuously, the paper is fed between a reservoir containing the liquid scintillator and a 2-inch photomultiplier. Liquid scintillation solution is slowly fed from capillary openings onto the paper, causing it to become translucent. The resulting scintillation flashes are read directly by the photomultiplier. High efficiency is obtained because of the excellent geometry of paper in relation to the photomultiplier and a highly polished reflection surface located above the paper which reflects scintillation light back down through the paper into the photomultiplier tube. The paper is moved past the photomultiplier by a motor-driven spool operating at 0.5, 1.0, or 2.0 centimeters per minute. Auxiliary equipment includes power supply, amplifier, ratemeter, and recorder.—R.L.B. (NUMEC Instruments and Controls Corp., Dept. S335, Apollo, Pa.)

Permanent magnet material (Alnico VIII) has more than twice the resistance to demagnetization of Alnico V and is substantially higher in both coercive force and maximum energy product than Alnico VI or VII. The new material is cast in shape and further formed by abrasive cutting or grinding, or both. It requires a magnetic heat treatment in order to develop its strong directional magnetic properties. It is hard, brittle material. Nominal data provided by the manufacturer include:

B_r, 8700 gauss; H_c 1450 oersted; BH (max.), 4.5 10^6 gauss-oersted; B_0 5200 gauss (B/H=6.0); density, 0.265 lb/in.^{3}; electrical resistivity, 50×10^{-6} ohm-cm; reversible temperature coefficient, 0.013 percent per degree centigrade; irreversible flux loss, 0.5 percent on cooling from 20° to −190°C, 1.5 percent on heating from 20° to +200°C; Rockwell-C hardness, 57/58. Some of the data are tentative and the temperature characteristics are influenced by design configuration.—J.S. (Crucible Steel Company of America, Dept. S355, P.O. Box 88, Pittsburgh 30, Pa.)

Warburg **syringe manometers** combine the recently introduced plastic micrometer syringe with a short "U" tube to measure gas volume changes. The gas volume is measured by restoring the pressure to the starting point after the syringe barrel has been rotated until the fluid levels in the manometer are equal. The volume is then read from the micrometer in 0.2-μl divisions, to a capacity of 200 μl. Overall length of the manometer assembly is one-third that of the usual 300-mm manometers. The manometers are available for single vessel or for differential pressure in two flasks.—R.L.B. (Roger Gilmont Instruments, Inc., Dept. S341, 1 Great Neck Rd., Great Neck, N.Y.)

Geiger-Mueller survey meters are fully transistorized and operate on ordinary flashlight batteries (D cells). Plug-in printed circuit cards are used to simplify maintenance in the field. The weight, including the meter unit, probe, and case, is 4½ pounds. The model 2651 has a side-window probe, for hard beta and gamma measurements, equipped with a revolving shield which cuts out beta radiation when desired. The model 2652 has an end-window probe for alpha, soft beta, and gamma measurements. Alpha and beta measurements as low as 40 kev may be made, or a cap on the probe may be used to shield out alphas and betas, thus permitting gamma surveying only. Both probes may be purchased separately. A color-coded meter scale has seven overlapping ranges up to 100 mr/hr and 150,000 cpm. Selectable time constants on the most sensitive ranges allow fastest response times consistent with accuracy. The probe may be used in the adjustable, all-position mount on the case or held free at the end of a 40-inch coiled, retractable cable. A miniature earphone for aural monitoring and a calibration source are also supplied. The instrument

is designed for laboratory monitoring, radiological, and health physics applications. The 2650 series is suitable for civil defense work.—R.L.B. (Nuclear-Chicago Corp., Dept. S337, 359 E. Howard Ave., Des Plaines, Ill.)

Fluorescence attachment for Beckman DU and DK spectrophotometers replaces the standard source unit on these instruments. The sample in a test tube is illuminated with ultraviolet light from a high-efficiency, low-pressure mercury lamp. A fluorescent phosphor in the lamp converts the energy in the mercury resonance radiation into a continuum of longer wavelength ultraviolet light. A Schott UG-11 filter eliminates visible radiation and transmits a higher percentage of the ultraviolet light, below 400 mμ. Light from the sample at 90 deg from the incident radiation enters the spectrophotometer for measurement of spectra or intensity at a selected wavelength. When used as a fluorometer the ultimate sensitivity is given as 0.5 parts per billion of quinine sulfate. The sample housing may be water-cooled for temperature sensitive materials and paper chromatogram strips ½ by 1⅜ inches can be placed in the sample holder.—R.L.B. (Beckman Instruments, Inc., Scientific and Process Instruments Division, Dept. S363, Fullerton, Calif.)

Miniature multichannel oscillograph recorders are available in three models recording on 35-mm, 60-mm, and 70-mm film with 9, 15, and 18 channels, respectively. The instrument uses interchangeable pencil galvanometer elements with sensitivity 1.53 μa/cm at a natural frequency of 40 cy/sec. Frequency response is d-c to 6000 cy/sec natural frequency. Two ranges of five film transport speeds from 0 to 12 in./sec are provided by interchangeable gears. Chart capacity is 50 feet for paper and 35 feet for film daylight loading in interchangeable automatic cassettes. A 200-foot magazine is available as an accessory. A time base driving one or two galvanometers can be built in. Light spots may be deflected from the film plane to a spot setting screen. Trace identification is provided on color film by individual color filters and on monochrome film or paper by a built-in sequential trace breaker. Trace width is 0.006 inch. According to the manufacturer, reading accuracy can be as high as ±0.1 percent in the 70-mm instrument and ±0.2 percent in the 35-mm instrument when trace excursions need not be limited. Size of the nine-channel instrument is 9.8 by 4.12 by 2.75 inches and of the 18-channel instrument 9.8 by 4.12 by 4.12 inches.—J.S. (Techne [Cambridge] Ltd., Dept. S401, Brunswick Pike, Princeton, N.J.)

Dosimeter that will detect as little as 0.1 r is based on the thermoluminescent property of manganese-activated fluoride crystals which will trap electrons in lattice defects caused by radiation. The amount of trapping, and therefore of luminescence, is said to be directly proportional to the amount of radiation. The crystals can be neutralized after they have been read. Dosimeter units have been developed in the form of flat plaques and needles. A readout unit measures the accumulated dose from 0.1 to 10 kr. The unit consists of a heater to bring the dosimeter up to luminescence temperatures, a multiplier phototube, an amplifier, and an output indicating meter.—J.S. (Metcom, Inc., Dept. S406, 76 Lafayette St., Salem, Mass.)

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Protein, Total	Protein-bound Iodine	
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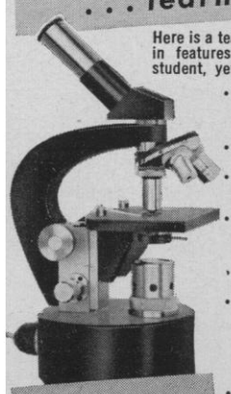

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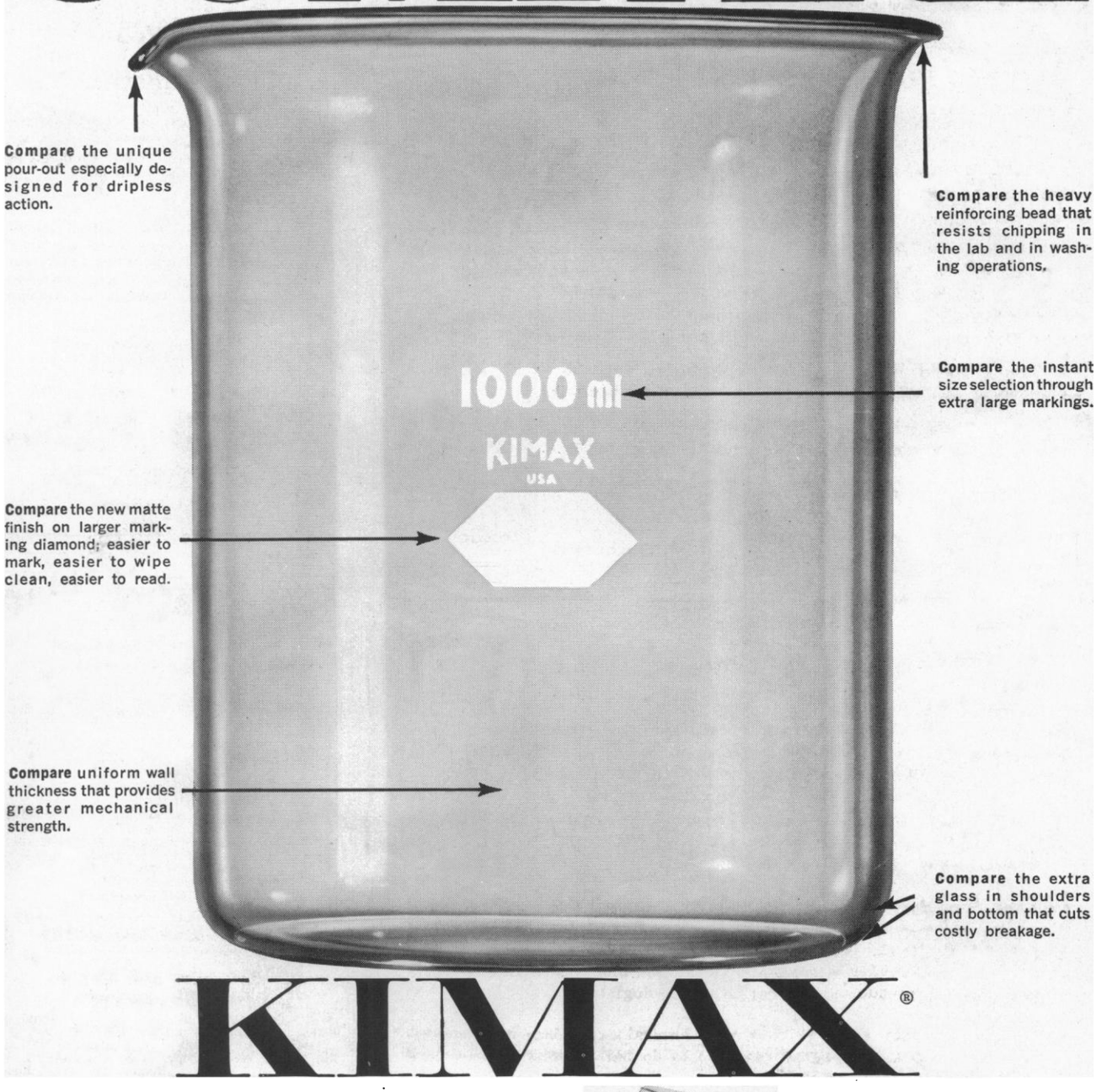

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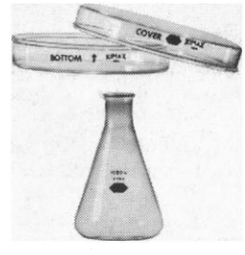

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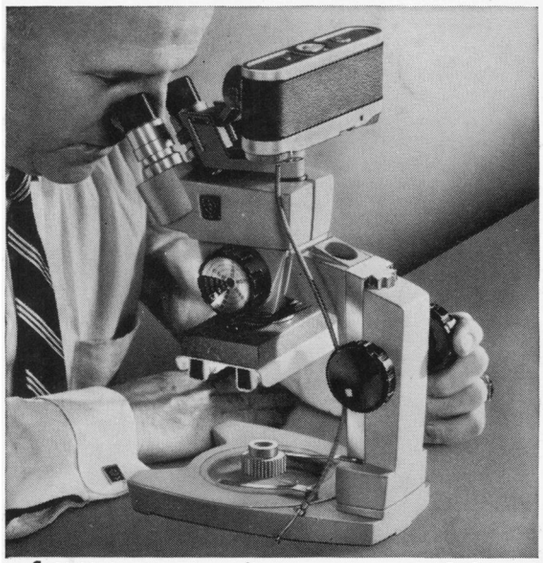

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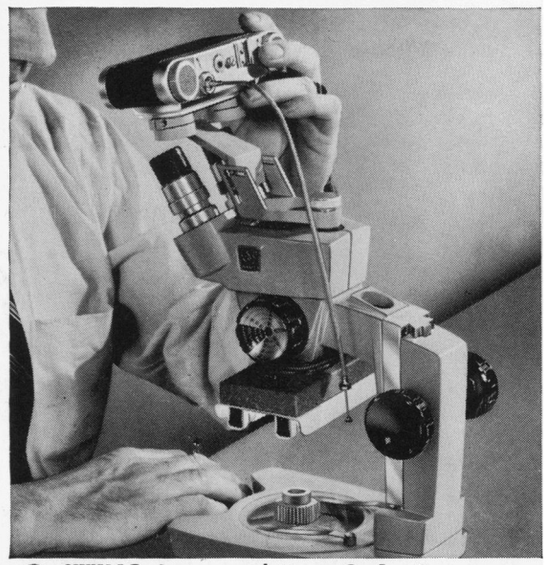

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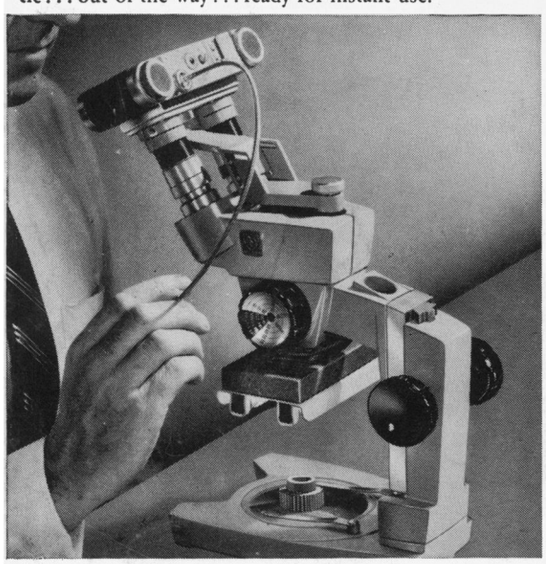

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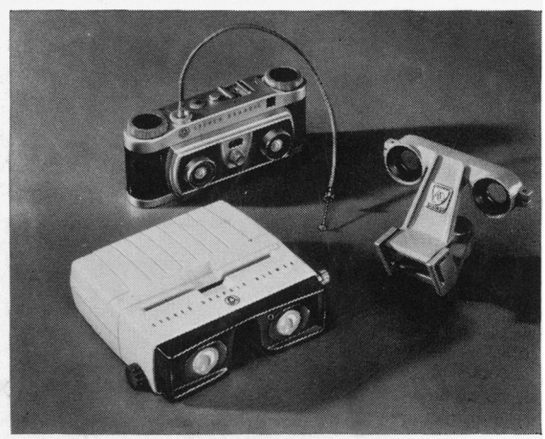

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