**Equipment**

The information reported here is obtained from manufacturers and from other sources considered to be reliable. Science does not assume responsibility for the accuracy of the information. A coupon for use in making inquiries concerning the items listed appears on page 618.

- **Radiation Shielding Window** is filled with a clear zinc bromide solution of density 2.5, which is equivalent to that of normal concrete. Copper lining, instead of coated steel, is used at all points in contact with the solution to prevent clouding-up caused by attack on steel by the solution. (Research Equipment Co., Dept. 299)

- **Frequency-to-Voltage Converter** can be adjusted in a full-scale frequency range from 300 to 900 cy/sec, with a minimum frequency of 10 cy/sec. Output may be 0 to 5 v, 0 to 100 mv, or 0 to 50 mv, d-c. Linearity is ±0.1 percent of full scale. Long-term stability is ±0.25 percent. The device will operate in ambient temperatures from -65° to +160°F. (Fischer & Porter Co., Dept. 314)

- **Fraction collector accessory** for a gas chromatograph consists of a chromatograph column, with a sample range up to 5 ml, and the collection apparatus. Fractions eluted from the column are condensed in fluted glass collection tubes inside a Dewar flask. Fractions are compacted by centrifugation. (Beckman Instruments Inc., Dept. 315)

- **Q Comparator** provides comparison measurements of relative Q, inductance, and capacitance. The instrument is set up for use with a standard component. Other components are compared with the standard by connection into the test circuit and by observation of the displacement of a centered spot in a cathode-ray-tube display. Deviation along the vertical axis indicates a change in Q and deviation along the horizontal axis indicates a change in L or C. (Boonton Radio Corp., Dept. 316)

- **Colorimetric Titrator** combines a photoelectric colorimeter with a titration adapter to permit objective determination of end-point. The adapter is self-contained and includes a stirring motor and stirrer. A glass cuvette of 35-mm light path serves as a titration vessel. Modification of the colorimeter is not required for installation of the adapter. (Photovolt Corp., Dept. 317)

- **Temperature Test Chambers** are designed for compatibility with hydraulic or electrodynamic vibration generators. The chambers are mounted on casted legs. An aperture in the bottom of the chamber permits mounting of a stand-
A Modern Approach to Organic Chemistry
By JOHN PACKER and JOHN VAUGHAN. This comprehensive textbook develops the student's appreciation of the rational structure of the subject side by side with his increase in factual knowledge. Facts are linked lightly to simplified theory, at first, and later to properly expounded theory. Text figures. $13.45

A History of Technology
Volume IV: The Industrial Revolution c. 1750 to c. 1850
Edited by CHARLES SINGER, E. J. HOLMYARD, A. R. HALL, and TREVOR I. WILLIAMS. This fourth volume in a five volume series deals with such new subjects as Iron and Steel 1750 to 1850; The Steam Engine to 1830; Gas for Light and Heat; Machine Tools; the Change from Craft-Mystery to Science as a Basis for Technology. 397 illustrations. $26.90

D'Arcy Wentworth Thompson, The Scholar-Naturalist, 1860-1948
By RUTH D'ARCY THOMPSON. This is an intimate biography of an unusual scholar whose particular specialities were natural history and classical antiquity, and whose genorous, sympathetic character made him a Victorian times and carried many virtues of that age down to our day. 9 plates. $4.00

Science Students' Guide to the German Language
By A. F. CUNNINGHAM. This up-to-date text pays particular attention to special difficulties such as sentence construction and the use of participial phrases and draws its examples from current scientific writing. Passages for translation have been taken mostly from the fields of physics and chemistry. $2.00

At all bookstores
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oscillator which can be swept to cover any part or all of the frequency range. Approximate frequency is indicated by a panel meter. Adjustments are provided for frequency, FM sweep rate, FM deviation, and AM square-wave frequency. (Wave/Particle Corporation, Dept. 325)

- SENSITOMETER for testing of photosensitive materials is essentially a contact printer with an electronic xenon-filled flash tube as the exposing light. Three capacitor circuits provide exposure times of 1/1000, 1/1000, and 1/10,000 sec. selected by a pushbutton. A standard step negative is printed to make the measurement. Filters permit change of the light-source color from daylight to incandescent. (Edgerton, Germeshausen & Grier, Inc., Dept. 327)

- OPTICAL PROJECTOR for inspection of contours makes it possible to inspect objects covering a field of 6 in. at a magnification of 10. The instrument's transparent screen is 60 in. wide by 40 in. high. (Optical Gaging Products, Inc., Dept. 328)

- LIQUID-NITROGEN GENERATOR, a self-contained unit, is fully automatic in operation, producing pure liquid nitrogen from atmospheric air. Production rate is approximately 4 qt/hr. Floor space required is 20 by 72 in. (Philips Electronics Inc., Dept. 334)

- MINIATURE SYRINGE permits direct reading of fractions of a microliter. The smallest model has a capacity of 10 μl and a dead volume of 0.5 μl. The needle is 0.018 in. in diameter and 2 in. long. (Hamilton Co., Dept. 335)

- GLOSOMETER measures 20°, 60°, and 85° ASTM gloss of materials. Gloss readings are indicated on a 7.5-in. meter. A single standard suffices for calibration of results at all angles. Standardization can be accomplished in 30 sec. Substituted aperture plates permit estimation of the sharpness of source image. (Manufacturers Engineering & Equipment Co., Dept. 337)

- GAGING HEAD features a constant measuring pressure and has graduations of 20 μm. and a dial range of ± 0.001 in. Measuring accuracy is stated to be ± 0.1 μm over the entire range. The sapphire-tipped contact point is lifted and lowered by a cable release to avoid effects of heat from the operator's hand. Instrument size is 2½ by 3¾ in. (George Scherr Co., Dept. 339)

- RATIO COMPUTER accepts two independent d-c signals as low as 1-mv full-scale per channel and computes their ratio with ± 1-percent accuracy. The computer contains two d-c differential chopper pre-amplifiers, a power supply, and a servo divider. Response time is 1 sec. (Magnetic Instruments Co., Dept. 338)

- WARBURG APPARATUS is a bench model designed for use where space is limited; diameter is 16 in., weight 63 lb. Four pairs of operating manometers and one thermobarometer are accommodated. Rotation of the manometer table is unlimited in either direction. Temperature range is ambient to 50°C. (American Instrument Co., Inc., Dept. 336)

- VACUUM-TUBE VOLTOMETER for a-c uses a vacuum thermocouple as its detector. Measurements are made by comparing the unknown voltage with an accurately calibrated 1000-cy/sec signal. Accuracy is ± 0.5 percent from 50 cy to 5 kcy/sec, and ± 2 percent from 10 cy to 500 kcy/sec. Voltage range is 300 μv to 1 kv. (Millivac Instruments, Dept. 318)

- ULTRASONIC CLEANERS are available in 1/4- and 1/8-gal capacity. Ultrasonic generators are furnished with or without timers. Power output to transducers is 35 w (average), and 140 w (pulse) at 90 kcy/sec. The cleaners operate on 115 v, 60-cy/sec power. They weigh 10 lb. (Narda Ultrasonics Corp., Dept. 343)

- DISPLACEMENT TRANSDUCER is a spring-loaded cable reel operating a precision potentiometer to produce a signal voltage output proportional to cable extension. Tension throughout the instrument's 10-ft range is maintained constant by a constant-torque spring. Linearity is ± 1 percent of displacement. Response is constant for frequencies up to 0.3 cy/sec. A bridge null detector is available for interpretation of the transducer output. (Research Incorporated, Dept. 333)

- FOUR-GUN OSCILLOSCOPE incorporates interchangeable amplifiers and sweep-generator modules. Available modules include a single-input low-frequency amplifier; differential low-frequency amplifier; high-frequency amplifier; horizontal-vertical amplifier; and a combination sweep generator and horizontal amplifier. The instrument is 21 in. high and may be mounted in a 19-in. rack. (Advanced Electronics Manufacturing Corp., Dept. 340)

- POWER SUPPLIES for high-voltage testing of dielectrics are available in 19 models with output voltage ranges from 0 to 25 to 0-to-150 kv and power outputs from 5 to 100 kv/amp. The supplies are furnished with panels indicating instruments of ±5-percent accuracy. Protective features prevent damage to the instrument or to personnel. (Beta Electric, Dept. 331)

Joshua Stern
National Bureau of Standards
Equipment

JOSHUA STERN

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