

A NEW GENUS OF

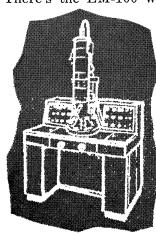
WORKHORSE FOR LABORATORIES

This is an electron microscope whose only equine relationship is its ability to handle great quantities of work, *month-in*, *month-out* and yet remain relatively service free. The EM-75 is an unmatched instrument in the 30 Angstrom area for general service and screening use, process control, clinical procedures and as a teaching tool—primarily because it does not have to be pampered. It also

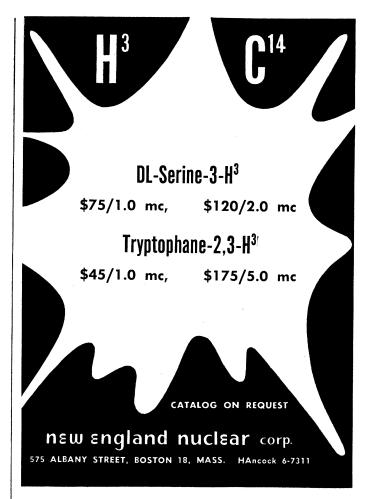
has an interesting dual function. With few hours and a few parts it can be readily converted into a *Projection X-ray Microscope* providing morphological studies of opaque materials.

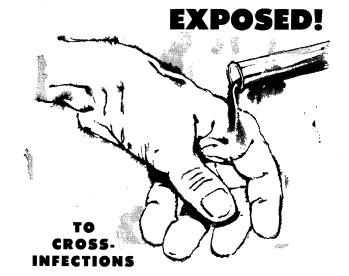


The Norelco line of microscopes is extensive. There's the EM-100 which can be seen wherever



discriminating microscopists gather and also the EM-200 whose new features require pages to cover. Detailed information is available on any or all of these electron optical devices. Simply write Philips Electronic Instruments, Electron Optics Department, Mount Vernon, New York.





HANDS — most active in distribution of INFECTION! For the management and handling of specimen containers requiring a label, use a "no-lick" TIME Tape or TIME Specimen Collection Label for service, a new advancement specified in the "Guide to Laboratory Safety".*



Every dressing, every collection of specimen, blood, sputum, etc. requires hand service. Eliminate contact by using the satin finish, vinyl coated TIME Tape or Label.

A qualified consultant will teach you the effective TIME procedure. It is your first step to a safer laboratory. Write today to Dept. RH.

* In April 1960 issue of Lab World.

PROFESSIONAL TAPE CO., INC.

360-A BURLINGTON AVE. • RIVERSIDE, ILL.

Hickory 7-7800

New Products

Leak detector tests hermetically sealed components for leaks in the range of 10⁻¹¹ atm/cm⁸ sec. Testing is performed in two stages. During the activation stage, components are sealed in a lead-lined chamber and flooded with radioactive tracer gas, krypton-85, under pressures up to 200 lb/in.2 (gage). Detection sensitivity is proportional to soak time, specific activity, and the square of the activation gas pressure differential. After the soak period, the tracer gas is removed, components are air washed, and the chamber is returned to atmospheric pressure. Inspection is performed with a scintillation counter that measures the radiation level. The presence of tracer gas is indicated on an auxiliary rate meter. The equipment can be adjusted to process automatically a wide variety of devices. Individual test programs are set on a master control panel. (Consolidated Electrodynamics Corp., 360 Sierra Madre Villa, Pasadena, Calif.)

Circle 1 on Readers' Service card

Digital computer simulator tests and evaluates complete memory systems for a wide range of operating parameters. The tester accommodates random access memories or serial buffers with address capacities to 16,384 words and word lengths to 48 bits. Four major functions are provided: timing generation, word generation, address generation, and word register and error detection. Timing generation controls the tester as well as the memory that is being tested. Word generation controls the word length and the data contained in each word. The pattern generated can contain any number of ones or zeros provided there is only one transition from logical one to logical zero. The address generator consists of a 14-

The information reported here is obtained from manufacturers and from other sources considered to be reliable. Neither Science nor the writer assumes responsibility for the accuracy of the information. A Readers' Service card for use in mailing inquiries concerning the items listed is included on page 1123. Circle the department number of the items in which you are interested on this card.

bit binary counter organized to be used in any of three modes: as a binary-coded decimal counter; as two seven-bit counters, in memories with two modes of address; or as a straight binary counter. The address counter can be set to count between any two addresses. The memory word register is a flip-flop register. For checking, this register is compared with the word generation portion of the tester. Depending on the mode of operation, when an error occurs, the tester will stop or count the error and continue. (Rese Engineering, Inc., A and Courtland Sts., Philadelphia, Pa.)

Circle 2 on Readers' Service card

Interferometer spectrometer (Fig. 1) analyzes the spectrum of incoming infrared radiation by converting each frequency element into a proportional electrical signal frequency in the range susceptible to electronic spectrum analysis. The interferometer is of the Michelson type which uses two mirrors, a beam splitter, and an infrared detector that observes the central fringe of the interference pattern. One of the mirrors is actuated by a saw-tooth signal to move repetitively at a uniform velocity. A monochromatic radiation signal entering the interferometer results in an electrical output from the radiation detector. The frequency of this output is related to the frequency of the input radiation as the velocity of the mirror is related to the velocity of light. A polychromatic radiation input similarly results in a

superimposed "polychromatic" electrical output.

Since the electrical output is in the appropriate frequency range, a variety of techniques used for radio- or audiofrequency spectrum analysis can be applied. One such technique is the recording of the signal on magnetic tape and subsequent playback through a conventional wave analyzer. The result is a chart record of the spectrum of the radiation. Alternatively, the magneticrecording step can be eliminated, with some sacrifice of resolution, by feeding the signal from the interferometer directly into a panoramic wave analyzer. If one is interested only in specific wavelengths, several tuned narrow-band filters can be placed in the output to indicate continuously the energy level at each of the wavelengths. If desired, the interferogram can be converted into digits, and then Fourier analysis can be performed by a computer.

An advantage claimed for the spectrometer is the increase of sensitivity resulting from the combination of two factors, (i) the large entrance aperture as compared with slit instruments and (ii) the continuous examination of all wavelengths throughout the entire period of each scan. The former is said to increase the sensitivity by a factor of 100 for extended sources and typical instruments. The latter results in an improvement in the signal-to-noise ratio (that according to information theory is proportional to the square root of the measuring time); it is said to be as much as 50 for typical instruments. This gain in sensitivity is paid for by a corresponding increase in the time required to perform the complete analysis.

The instrument consists of an optical head, housing the interferometer optics and measuring 2.5 by 2.5 by 8 in., and an electronics package measuring 6 by 8 by 10 in. Scanning rate is four spectra per second. If fluctuation of the source radiation is too rapid for this rate of

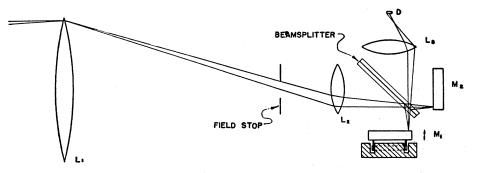
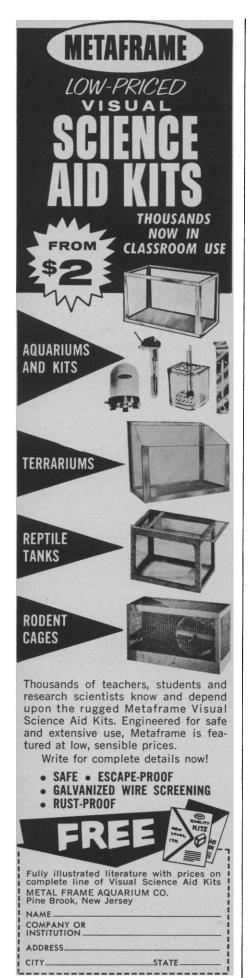


Fig. 1. Ray trace for interferometer spectrometer.



scan, resolution will be lost, but the correct relative shape of the spectral distribution curve will still be shown. Different detectors can be used simultaneously to cover a very broad spectral region in one output channel. Resolution is said to be 0.004 μ at 1 μ . (Block Associates, Inc., 385 Putnam Ave., Cambridge 39, Mass.)

Circle 3 on Readers' Service card

Card reader for automatic control systems will transport IBM cards from a card hopper past two reading stations and into a card stacker at a rate of 30 cards per minute. The cards are scanned row by row, and contact-closure outputs are provided corresponding to the perforations in all 80 columns of both cards. The reader will accept cards perforated in any binary or alphanumeric code and may be operated either from an integral control panel or by a remote automatic control system. (Datex Corp., 1307 Myrtle Ave., Monrovia, Calif.

Circle 4 on Readers' Service card

Universal ratio set is a six-dial instrument designed for calibration of d-c potentiometers and Wheatstone bridges. Ranges are $20 \times 100 + 10(10 + 1)$ +0.1+0.01+0.001) ohms, for a total resistance of 2111.11 ohms. Limit of error at 25°C is said to be 0.002 percent for dial changes of 100 ohms or more; below 100 ohms, accuracy of reading is within two steps on the 0.001 dial (Leeds and Northrup Co., 4939 Stenton Ave., Philadelphia 44, Pa.)

Circle 5 on Readers' Service card

Neutron generator is a portable device that can be turned on and off at will. Heart of the generator is a neutron source tube with a cylindrical titaniumtritium target screen. Output of neutrons is approximately 10⁸ per second with a neutron energy of 14.5 Mev. Outside dimensions are 4-in. diameter and 37-in. length; weight is 32 lb. The device operates on 115-volt 60-cy/sec current. (Dresser Industries Inc., Republic National Bank Bldg., Dallas, Tex.)

Circle 6 on Readers' Service card

Evaporated film thickness monitor depends on the measurement of the optical performance of the material being deposited. This is accomplished by projecting a chopped beam of white light upon a monitor disk in the vacuum chamber and measuring reflectance. Measurement is made at a specific wavelength corresponding to any of six



This CRS-1 (Control Recording System) accepts the output signal of any common gas chromatograph and converts it to digital values of both occurrence time and relative area. Accurate digital values of peak times and areas are then recorded simultaneously in any of the common formats: digital printer or type-writer, punched IBM cards, punched paper tape, or magnetic tape using the INFOTRONICS R-1 digital magnetic recorder.

FEATURES AND SPECIFICATIONS

- Integration depends on curve slope, not amplitude, therefore even "side-lobes" are measured separately. High speed integration response will process peaks spaced as closely
- as two seconds.
- 3. Peak time and peak area are recorded simultaneously
- High resolution 5,000 counts per second give maximum area accuracy.
- Automatic area totalizing feature is available.
- Works equally well with either fast or slow chromatographs. Input: Full scale ranges—1 mv, 10 mv,

100 mv, 1 volt.
Integrator: Six digits standard, additional capacity available.
Accuracy: 0.1% of full scale maximum error in integration conversion. No errors

in counting per se. Transistorized control circuit: Maximum sensitivity to rate of change of detector signal is better than 0.1% of full scale

range per second. Output: Linear to 200% overload on input.



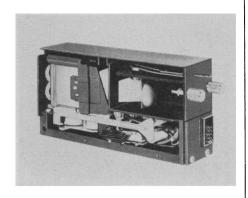
interchangeable filters. The component of the monitoring disk is installed through a 1/2-in. hole in the base of the vacuum chamber. The light beam, chopped at 90 cy/sec, is transmitted through the side of glass vacuum chambers or through a port in metal chambers. A two-channel amplifier permits addition of a second optical monitor system without additional electronics. The system is sensitive to infrared and visible radiation. Two red filters are supplied between 1.5 and 2.5 μ . Accuracy is said to permit control of film thickness to ± 0.25 percent. (Optics Technology, Inc., 248 Harbor Blvd., Belmont, Calif.)

Circle 7 on Readers' Service card

Lecture table oscilloscope features a 12-in, screen that faces the class and a 3-in. monitor and oscilloscope control on the rear panel for the instructor's convenience. All controls operate the two displays simultaneously. The electron beam of the 12-in. tube can be broadened and brightened to provide a wide trace said to be visible from any part of the largest classroom. Operating characteristics are otherwise very similar to the manufacturer's model 2167 oscilloscope. (Welch Scientific Co., 1515 Sedgwick St., Chicago 10, Ill.)

Circle 8 on Readers' Service card

Alpha-numeric readout device accepts binary-coded decimal input up to six bits, decodes the input signal, and displays the proper character. Operating power is 10 mw per bit of signal. Up to 20 characters per second can be displayed; size of characters is 13/8 in. The last character presented will remain



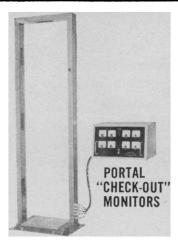
on display after signal-pulse and setpulse power have been removed. Contact closures can be provided for verification that the input signals have been properly accepted. (Industrial Electronic Engineers, Inc., 5528 Vineland Ave., North Hollywood, Calif.)

Circle 9 on Readers' Service card





Portable and rack mounted a, b, γ air particle monitoring units. Moving paper and fixed paper instruments available. Produced to latest AEC and military specifications.



"Head-to-toe" b, γ monitored exiting. Effective rapid portal monitor offers eight individual alarm channels. Complete with long-lived, thin-walled Lionel/Anton halogen-quenched stainless steel detectors.



PORTABLE TRANSISTORIZED SURVEY METERS FOR LABORATORY OR FIELD USE

Available with beta gamma probe, headset, carrying-strap, batteries (standard flashlight "D" cells) and complete manual, Type 700. Also available as above with interchangeable end-mica window alpha, beta, gamma probe in place of standard probe, Type 701.



ALPHA, BETA, GAMMA AND **NEUTRON DETECTORS**

More than 100 types of detectors covering the entire range of nuclear radiation...unique configuration and "special application" devices. The Lionel/Anton Neutron Detector Catalog and the Lionel/Anton a, b, γ Detector Catalog belong in your radiation facility reference file.



LIONEL ELECTRONIC LABORATORIES Division of the Lionel Corporation

1226 FLUSHING AVENUE, BROOKLYN 37, NEW YORK

buy ASCO for

shockproof • accurate

PIRANI-TYPE VACUUM GAUGE



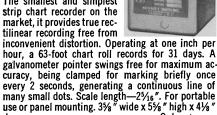
Wide range, fine calibrations, and easy reading are attained with its wide scale, illuminated meter movement and dual reading scale, (.1 microns Hg. to 5000 microns Hg.). It is self-calibrating. A new transistorized circuit insures long, trouble-free use and Zener diode stabilization helps to insure accuracy to better than .1%. The gauge is shock resistant to 8 g.'s and is made of strong polyester, shock-proof case and mount. 115 V.—50-60 cycle operation. 6" wide x 6½" high x 8½" deep. Only \$149

For use with Asco Pirani-Type Gauge, an inexpensive yet highly efficient recorder and controller, in 2 ranges — Oto 25 microns and Oto 5000 microns.

ASCO + **RECORDER**

small, compact trouble-free

The smallest and simplest strip chart recorder on the market, it provides true rec-



ASCO CONTROLLER



versatile. easy-tooperate

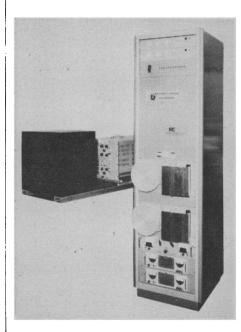
Electro-mechanically controlled, the Asco Controller uses contact meter-relays as its prin-

Only \$193

cipal component. The meter-relay indicates the control variable, and it initiates control action. In applications where a variable is held to a present level, an interrupter is used to separate the meterrelay's locking contacts periodically. This allows the meter-relay to sample to see if further control action is necessary. Input—115/230 volts, 50/60 cycles. SPDT load switch rated 5 amperes 115/230 volts resistive. For portable use or panel mounting. 55/16 wide x 5¾ " high x 10" deep. Only \$194

ARTHUR F. SMITH, INC. 311 ALEXANDER ST., ROCHESTER 4, N. Y.

This pattern converter transforms information from an analog display, such as map, chart, oscilloscope, or graph, into digital x-y coordinate scan points. Output can be to punched cards, punched paper tape, or magnetic tape; or the equipment can be operated online with a computer. The instrument



breaks down an image of the display into a suitably fine grid, 0.05 in. per element in one model, and the blackness of each point and its position are converted to a digital code. Rate of conversion is determined by the system resolution requirements and the speed of the digital output devices. (Rabinow Engineering Co., 7212 New Hampshire Ave., Washington 12, D.C.)

Circle 10 on Readers' Service card

Beryllium analyzer includes a fivedecade scaler, detector head, and lead chamber. In operation, gamma radiation from an antimony-124 source interacts with the sample, carried in a sample slide, to produce neutrons. The neutrons are detected by a scintillation counter, and the count rate is compared with that obtained with a standard sample to determine the beryllium content of the unknown. (Research Chemicals Division, Nuclear Corporation of America, Burbank, Calif.)

Circle 11 on Readers' Service card

Remote control stereomicroscope incorporates the manufacturers zoom optical system. Magnification is continuously adjustable between 1 and 60. A sealing tube permits the instrument to be repositioned at different points in a hot cell without danger of contamination. Self-contained shielding, equivalent



quartz crystal test equipment



LEHIGH VALLEY ELECTRONICS crystal production finishing equipment is automatic in a temperature range that is adjustable from -55 $^{\circ}$ to \pm 90 $^{\circ}$ C., to suit the needs of each program, and enables the operator to handle three or more units simultaneously.

The comparison technique is the system's basis—all crystals being run against previously acceptable crystal standards.

The units are built in a practical size and finished in light green baked enamel.

Matched sets of calibrated thermistors may be obtained in HC-6/U holders.

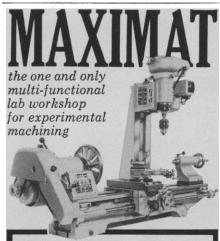
Associated equipment, standard or built to customer specifications, include:

> TRANSISTOR AND DIODE TEST UNITS SPECIALIZED TEST SETS OSCILLATORS . OVENS . AGING RACKS

Detailed Information On Request

LEHIGH VALLEY ELECTRONICS

215 South Third Street • Allentown, Pa.



NEW-from the makers of UNIMAT! This remarkable 10" tool room lathe does the work of FOUR machines (lathe, drill press, jig borer, vertical milling machine) in the space of ONE, and at less cost than a single-purpose lathe meeting the same high tool room standards of precision. The exclusive VERTI-BED holds a detachable head-stock-and-motor unit for vertical functions without impeding simultaneous horizontal operations. Best bet: the double-spindle model shown above-no change-over necessary! WRITE FOR CATALOG AND PRICE LIST

AMERICAN EDELS

Dept. AJ, 350 B'way, N. Y. 13, N. Y.

SCIENCE, VOL. 134 1246

to 12 in. of lead, protects the operator from radiation from the cell access port when the instrument is in position. The standard model is designed for use in a 36-in. wall. Modifications permit installation in walls up to 60 in. thick. Supplied as standard equipment is a 35-mm stereo camera in a swing-on bracket that fits light tight over the eyepieces. (Bausch & Lomb Inc., Rochester 2, N.Y.)

Circle 12 on Readers' Service card

Accessory for x-y plotter adapts the manufacturer's model 560R plotter for on-line operation with medium scale digital computers. The adapter accepts incremental computer output signals and converts them to plotter input signals. The adapter provides the proper termination for the computer output lines, and, where required, returns a signal to the computer to request the next pulse. (California Computer Products, Inc., 8714 Cleta St., Downey, Calif.)

Circle 13 on Readers' Service card

Speech compression system is said to be capable of communicating speech in a total bandwidth of 150 cy/sec. When digitized, the compressed speech signal can be transmitted at an information rate of 1000 bits per second. In analog form, the signal appears as seven 20-cy/sec bandwidth low-passed signals. For digitizing, each of the channels is sampled at a 43.5-cy/sec rate to produce a single-channel stream of 1000 bits per second. The current model weighs less than 50 lb. (Melpar, Inc., Falls Church, Va.)

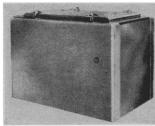
Circle 14 on Readers' Service card

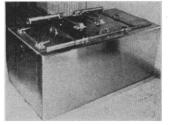
Temperature transducer of the platinum resistor type is designed for indefinite immersion in sea water. The transducer contains its own bridge circuit. Calibration is expressed as millivolts per volt versus temperature over the range -5° to $+30^{\circ}$ C. Accuracy and interchangeability are said to be $\pm 0.09^{\circ}$ C. (Trans-Sonics, Inc., P.O. Box 328, Lexington, Mass.)

Circle 15 on Readers' Service card

Shield chamber for making electrically ultra-quiet measurements is used to enclose and test sensitive electronic circuitry on the workbench. Power is supplied to devices in the chamber by means of an isolation transformer unit with less than 0.005-pf interwinding capacitance and more than 10,000-megohm interwinding leakage resist-

For Sub-Zero Storage The CSI Dry Ice Storage Cabinet





MODEL GS-34

SPECIAL

All cabinets are manufactured of welded and polished stainless steel which contributes to cleanliness, appearance and serviceability. Efficiency has been accounted for in such features as high quality insulation, interchangeable storage inserts and size. The width allows passage through a normal door and the length is the only dimension changed in the three sizes. The cabinets are built with or without the CO₂ entering the storage compartment. The cabinet on the left is our standard model and the unit on the right is specially constructed to the customer's design.

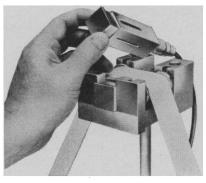
Folder and Prices Upon Request

CUSTOM SCIENTIFIC INSTRUMENTS, INC.

541 Devon St.

Kearny, N.J.

TRITIUM-CARBON RADIO CHROMATOGRAPHS



The chromatogram strip is scanned from both sides with two windowless flow counters (see insert). The chromatogram strip constitutes a part of the cathode of the detector, insuring highest sensitivity for tritium beta rays (Patented). Total background 24 counts/min. The scanning head can be decontaminated through immersion in an ultra-sound bath or in boiling detergent. Gas consumption: 1 No. 1A cylinder lasts for 4000 hours.

Model ACSHIC. For continuous processing of $\frac{1}{2}$, 1 and $\frac{1}{2}$ inch wide chromatogram strips, spliced end to end either during scanning, or stored on reels. With Texas rectilinear recorder, with fingertip control speed selector. Automatic coding with separate marker pen. Rf-values can be read directly from the chart. Complete with counting-rate meter with built-in linear amplifier, pulse height discriminator, 11 ranges, 12 time constants and aural monitor\$2,200

INTEGRATING RADIOCHROMATOGRAPH

Model ACSIIC. Plots besides the curve displaying the activity distribution, with the help of a second pen, in different color, the integrated value of the activity curve, i.e. the area under the peaks. Both pens move across the full, wide-grid (93/4) chart paper. Complete with rate meter.......\$3,500

Model MCS. Manual chromatogram scanner with rate meter.....\$400

THE FORRO SCIENTIFIC COMPANY

833 Lincoln Street

Davis 8-5729

Evanston, Illinois

OFFNER

TYPE





DYNOGRAPH

- ☆ completely transistorized
- ☆ two channel
- ☆ rack or portable mounting
- unmatched accuracy and versatility

Microvolt sensitivity, unmatched accuracy and compact design are combined with exceptional versatility in this completely new two channel Type RS Dynograph.

All-transistorized, table or rack mounted, conveniently carried for portable use, the Type RS Dynograph provides the same exceptional performance specifications as the Offner Type R Dynograph.

SPECIFICATIONS

Sensitivity: With preamplifiers, 10 microvolts cm to 50 volts per cm.

Warm-up: Instantaneous.

Drift: One microvolt per hour pen drift at maximum sensitivity.

Ambient Temperature Range: -20° to $+60^{\circ}$

Frequency Response: Within 10% to 150 cps, and 20% to beyond 200 cps.

Recording Media: Rectilinear Heat or Electric, Curvilinear ink or electric, easily converted.

Deflection Time: 2.5 MS with preamplifiers, 1.5 MS without.

Write for complete details.



OFFNER DIVISION

of Beckman Instruments, Inc.

3950 River Rd., Schiller Park, III. (Suburb of Chicago) ance. A complete box shield around the transformer's secondary winding is electrically continuous with the shield chamber. Electromagnetic shielding is said to be 40 db even at power line frequencies. Three sizes are available. (Topaz Transformer Products, Inc., 4995 Weeks Ave., San Diego 10, Calif.)

Circle 16 on Readers' Service card

Rubidium vapor frequency standard is based on optical pumping and transmission monitoring. It derives its stable frequency from the rubidium-87 ground state hyperfine transition of 6834.86 . . . Mcy/sec. Long-term stability is said to be 2 parts in 1010 and short term stability 3 parts in 1011 for a 1-sec sampling time. Absorption cells are manufactured to customer-specified time scale. Examples are Ephemeris Time (A.1) or the current standard frequency broadcast offset of -150×10^{-10} relative to A.1. Other cells for alternative frequencies can be supplied. Fine tuning over a range of 200 parts in 1010 affords time-scale flexibility. The instrument draws 110 watts and is designed for standby battery operation. Standard output frequencies are 5.0, 1.0, and 0.1 Mcy/sec, with others available on request. (Varian Associates, 611 Hansen Way, Palo Alto, Calif.)

Circle 17 on Readers' Service card

Reference current source is a portable battery-operated device for checking electrometer circuits. The source supplies 0.9 to 9 volts with seven current ranges from 10^{-6} to 10^{-12} amp. Accuracy is said to be ± 1.5 percent. Power is supplied by seven mercury cells. (Gyra Electronics Corp., Washington and Elm Sts., La Grange, Ill.)

Circle 18 on Readers' Service card

Millivolt source, regulated by a Zener-diode, provides an output voltage adjustable in two ranges from 0 to 100 mv. Accuracy is said to be ± 0.1 percent of full scale, and noise output less than 0.1 mv across the output terminals or from either output terminal to ground. (Westronics, Inc., 3605 McCart, Fort Worth 10, Tex.)

Circle 19 on Readers' Service card

Biomedical amplifier-transmitter is a three-channel instrument that makes possible remote monitoring of three bioelectrical signals by telemetry. The instrument amplifies, multiplexes, and transmits the signals over the standard FM frequency band. The signals are received up to 100 yards away by an

Just Published!

New 4th Edition



PATHOLOGY





Edited by W. A. D. Anderson

One of the most up-to-date and complete general pathology books in print

This new 4th edition of PATHOLOGY is one of the most complete and detailed one-volume work of its kind. It encompasses general pathology, special or organ pathology and surgical pathology. With 1385 illustrations including 90 new ones, this book continues to be one of the most profusely and most effectively illustrated books on this subject.

Considerable attention has been given to viral diseases, topical and parasitic diseases, oral diseases and new material is included on tumors, endocrine disorders and pulmonary diseases.

Edited by W. A. D. ANDERSON, M.A., M.D., F.A.C.P., F.C.A.P. Written by 35 contributors. Published August, 1961. 4th edition, 1389 pages. $7\frac{V_4}{4}$ " x $10\frac{V_2}{4}$ ", 1385 illustrations, 7 color plates. Price \$18.00.

Just Published! New 11th Edition

Bard MEDICAL PHYSIOLOGY

Through 10 editions this book has gained a reputation for authoritativeness and completeness. The new 11th edition of this classic was written by many of the top physiologists in this country. It gives students full discussions of all the complex and controversial problems within the field of modern medical physiology and a profusely illustrated, detailed evaluation of the clinical application of the newest physiological principles and concepts.

Edited by PHILIP BARD, Professor of Physiology, The Johns Hopkins University. With 15 collaborators. Published August, 1961. 11th edition, 1339 pages, $71/4^{\circ}$ x $101/2^{\circ}$, 308 illustrations, 4 in color. Price, \$16.50.

Gladly Sent to Teachers for Consideration as Texts!

The C. V. Mosby Company 3207 Washington Blvd. St. Louis 3, Mo.

1248

FM tuner and converted to a form suitable for recording or display. One channel has operating characteristics suitable for electrocardiograph, electromyograph, electroencephalograph, or galvanic skin response signals. The other two channels are designed for more slowly varying signals such as temperature, respiration, or blood pressure. (Litton Systems, Inc., Woodland Hills, Calif.)

Circle 20 on Readers' Service card

Spectrum analyzers, (Models MRFR 30-9 and MRFR 30-11) cover, respectively, any 300-cy/sec band and any 1260-cy/sec band between 5 cy/sec and 10 kcy/sec. In the former, the signal is applied to a bank of 100 filters, and in the latter to a bank of 420 filters. Filter outputs are sampled in sequence by a high-speed capacitive commutator, and the detected signal is amplified and displayed on an oscilloscope. A recorder which gives a permanent paper record of analysis can also be supplied. Sampling rate of the MRFR 30-9 is 30 scans per second, and resolution over the entire band is 8 cy/sec with a dynamic resolving range of 35 to 40 db. (Raytheon Co., 55 Chapel St., Newton 58, Mass.)

Circle 21 on Readers' Service card

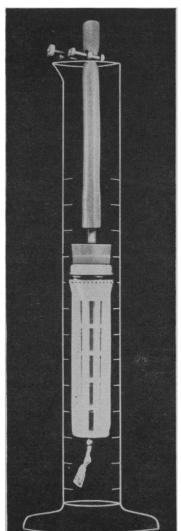
Ultrasonic cell disrupter is said to break down cells effectively without inactivating the liberated enzymatic protein. The apparatus operates at a pretuned frequency of 20 kcy/sec. A magnetostrictive transducer generates ultrasonic energy in a 70-ml chamber. Either batch or continuous-flow models are available. The batch model will disrupt cells in quantities as small as 15 ml and as large as 70 ml. With the continuous-flow unit, as much as 1 lit. of cell slurry per hour may be processed. Both models incorporate a cooling system that maintains the fracturing chamber at 0°C. (Will Corp., P.O. Box 1050, Rochester 3, N.Y.)

Circle 22 on Readers' Service card

Infrared radiation collimator is an off-axis system that produces a beam of unobstructed radiation. It employs a plane reflecting mirror and an off-axis paraboloidal mirror both of which are aluminized and coated for high-reflectivity in the 0.25- to $16-\mu$ region. Angular resolution is said to be 0.2 mil. A variety of sources can be positioned at the entrance aperture. An aperture wheel with seven apertures allows the flux density to be changed over a 1000

THE NEW LKB ULTRAFILTER

for concentrating protein solutions, body fluids, suspensions of micro-organisms...



Operating by vacuum suction, the DIP-TYPE ULTRAFILTER, consisting of a dialysis membrane supported by a Nylon framework, represents a significant improvement in methods of concentrating complex mixtures of biological compounds.

THE PROCESS

leaves labile substances unharmed, causes no alteration in salt concentration, achieves high filtration rates, up to 14ml/h., permits easy selection of end volume.

THE UNIT

is constructed to eliminate risk of contamination, takes next to no space in a refrigerator, grouped in a battery, handles large volumes comfortably, has low initial and operating costs.

The LKB 6300A Ultrafilter is stocked by leading laboratory supply houses in the United States and Canada.

Price f.o.b. Washington, D. C. \$14.90

WRITE FOR BULLETIN 6300ES

LKB INSTRUMENTS, INC. 4840 Rugby Ave., Washington 14, D.C.



International Headquarters LKB-Producter AB, P.O.B. 12220, Stockholm 12, Sweden

20 OCTOBER 1961 1249

Hyland Laboratories 4501 Colorado Blvd. Los Angeles 39, Calif. Please send Tissue Culture catalog to	
Name	
Organization or Firm	
City Zone	ite

SEND FOR HYLAND'S LATEST LISTING OF

TISSUE CULTURE COMPONENTS

Of special interest is unique Newborn Agamma Calf Serum, which provides an excellent protein source for cell propagation and is recommended for detection, propagation and study of many viruses. This specially processed serum, from which gamma-globulin has been completely removed by fractionation technics, provides an unusually high content of alpha- and beta-globulins. In virus studies, it has shown no inhibition of Types I, II and III polio viruses. This serum is available in both liquid and dried form in a variety of practical sizes.

Other bovine specialties include: Newborn Calf Serum (liquid or dried), which is derived from 1- to 4-day-old calves and, because of high alpha-globulin content, is more stimulatory to cell growth than serum from more mature animals; non-toxic Fetal Calf Serum (liquid); Bovine Amniotic Fluid (liquid or dried); Bovine Embryo Extract (dried); Bovine Embryo Extract, Ultrafiltrate (liquid); Bovine Serum (liquid or dried); Bovine Serum (liquid or dried); Bovine Serum (liquid).

Chicken Serum (liquid or dried) is available in large pools for polio testing. Our line also embraces other serums and serous fluids, ultrafiltrates, balanced salt solutions and synthetic media. We welcome your inquiries about special formulations or preparations of particular interest to you.

HYLAND LABORATORIES

4501 Colorado Blvd., Los Angeles 39, Calif.

to 1 range. The collimator can be furnished with auxiliary radiation interrupting devices such as solenoid-actuated shutters or rotating sector disk choppers. (Barnes Engineering Co., 30 Commerce Rd., Stamford, Conn.)

Circle 23 on Readers' Service card

Perfusion apparatus is a system for the oxygenation, pumping, heating, and cooling of blood under "ideal" physiological and clinical conditions for extracorporeal flows during open-heart surgery. It can be used for operations within the normal blood-temperature range or under moderate or profound hypothermia flow conditions. The apparatus is basically a bubble oxygenator with a variable surface area. Instrumentation is provided for continuous monitoring of oxygen flow rate, pump pressure and vacuum, blood flow, pH, temperature, and pO_2 . Pumping of the blood is accomplished by a pressure and vacuum cycle in a chamber containing a flap valve. Flows up to 4500 ml/min are available. Blood volume required for priming is 1700 ml. Overall dimensions are 45 by 38 in.; weight is approximately 400 lb. (Selas Corporation of America, Dresher, Pa.)

Circle 24 on Readers' Service card

High temperature hardness indentor is designed for use at temperatures as high as 3000°F. The indentor consists of a sapphire mounted in a molybdenum shank. It is available in sphero-conical and pyramidal shapes. The pyramidal model incorporates the standard Vickers 136-deg angle. (F. F. Gilmore & Co., 725 Boylston St., Boston 16, Mass.)

Circle 25 on Readers' Service card

Audiometer provides tone tests in nine steps from 250 to 8000 cy/sec, and it provides speech tests from a recording or live by means of a microphone. Signals can be presented to either or both ears, and a phone balance permits regulation of relative intensities. A monitor earphone with its own volume control is also provided. A threshold-level dial ranges from 10 to 100 db with markings in 1-db steps. The test tone can be interrupted manually or by automatic pulses; a masking signal of adjustable intensity is provided. (Otarion Listener Corp., Ossining, N.Y.)

Circle 26 on Readers' Service card

High-vacuum calculator of the sliderule type is designed to permit calculation of pump or chamber size as well as time and pressure for high-vacuum systems. The calculator (over-all size, 8½ by 11 in.) consists of two slides held in place by a rigid vinyl casing. Each slide can be used to solve simple problems, and together, they are said to be capable of solving complex high-vacuum problems. (Consolidated Vacuum Corp., 1775 Mt. Read Blvd., Rochester 3, N.Y.)

Circle 27 on Readers' Service card

Gyro power source supplies a-c power for four two-phase gyro motors and records voltage and current for one phase of each motor. An eight-channel recorder simultaneously charts phase voltage with sensitivity to 0.01 percent per centimeter, and it charts the inphase component of current consumed by that phase with sensitivity of 0.5 ma/cm. Output frequency is 800 cy/sec ±0.001 percent with frequencies between 300 and 5000 cy/sec available. Output voltage is 2 to 15 v ± 0.1 percent. Regulation against line or load variations is ± 1 percent. Maximum distortion is said to be 1 percent, with 0.1 percent available on special order. (Behlman Engineering, Burbank, Calif.)

Circle 28 on Readers' Service card Joshua Stern

National Bureau of Standards, Washington, D.C.





SPECTROFLUOROMETER

For photo-fluorometric identification and analysis. Far more discriminating than conventional colorimetric or spectrophotometric techniques. Modular construction makes this instrument particularly flexible and versatile. New feature measurements

ures absorption or transmission characteristics. Can be used for micro or macrotechniques and extremely low concentrations. For manual, oscilloscope, or chart recording. Utilizes Farrand's precision grating Monochromators.

MONOCHROMATOR

Grating type—compact, rugged, precise. Models available for monochromatic illumination at wavelengths ranging between 220 and 6000 millimicrons

in the ultra-violet visible and infra-red regions. Simple and convenient to use with microscopes, colorimeters, photometers and other instruments.

FLUOROMETER

Provides precise, reliable, repeatable measurements for all fluorometric methods of analysis.

Accurate over a wide range of sensitivities. Ideal

for extremely low concentrations in micro and macro volumes.

PHOTOMETER

Exceptional sensitivity, stability, and linear response at extremely low light levels. Choice of

interchangeable photomultiplier tubes for optimum response in selected spectral regions.

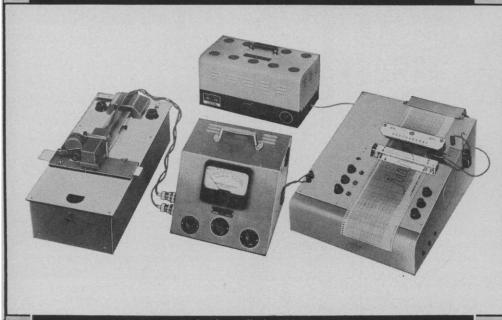
Farrand OPTICAL COMPANY, INC.

Bronx Blvd. and East 238th St., New York 70, N.Y. Engineering, research, development, design, and manufacture of precision optics, and electronic and scientific instruments.

FARRAND OPTICAL CO., INC. DEPT A N. Y. 70, N. Y. Please send me catalog material and p SPECTROFLUOROMETER MONOG	, BRONX BLVD. & EAST 238th STREET rices on the instruments checked CHROMATOR FLUOROMETER
NAME ORGANIZATION ADDRESS CITY	ZONE STATE

PHOTOVOLT DENSITOMETRIC EQUIP

for ELECTROPHORESIS and CHROMATOGRA



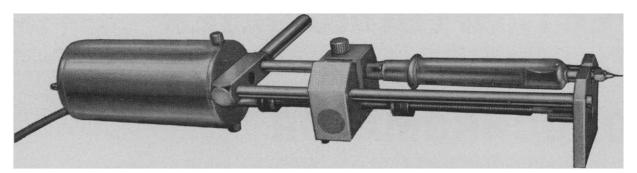
Write for Bulletin 800-5 to:

PHOTOVOLT CORPORATION

1115 Broadway . New York 10, N. Y.

New building-block system permits adding of units as required, from manual and semi-automatic operation to fullyautomatic recording and integrating

- · For scanning of electrophoresis strips and readings on large sheets in chromatography
- For work in visible and ultraviolet ranges
- For evaluation by colortransmission, reflection or fluorescence
- · For readings on filter paper, agar, starch and other gels



PORTABLE INFUSION-WITHDRAWAL PUMP

Catalog No. 1100

Small size and complete portability permit use in limited working space where flexibility of mounting is important. Pumping mechanism consists of a precision-cut, stainless steel lead screw and moving carriage assembly. Limit stops automatically terminate pumping action at any pre-set point. Its special construction allows the pump to be placed in any position without impairing pumping action.

The pump is designed to use interchangeable, plugin motors which are synchronous and reversible. A wide variety of motors is available to produce any desired pumping rate. Motors are quickly interchanged by the user with no tools required.

SPECIFICATIONS

- Rates from 2.59 ml./min. to 0.018 ml./24 hrs.
- Maximum reproducibility due to synchronous motors
- 110-120 volt A.C., 60 cycle operation
- Accepts standard Luer Lok syringes

- Extra motors, each\$ 12.00

Prices are f.o.b. Dover, Mass.

Data Sheet 1100 and Catalog 1960-61 available on request



HARVARD APPARATUS CO., INC. Dover, Mass., U.S.A

(a non-profit organization)

1252 SCIENCE, VOL. 134

ANNUAL BUYER'S GUIDE TO ADVERTISED PRODUCTS

On the pages that follow is a classified listing of all products advertised in SCIENCE since 13 October 1960. We have made every effort to make this Guide an aid to purchasers of new instruments and equipment for the laboratory. Under each classification is listed the name of the manufacturer and the issue and page where the advertisement appeared.

Cover positions are designated as follows:

IFC — Inside front cover

IBC — Inside back cover

BC — Back cover

1A — Page opposite inside front cover

By using this Buyer's Guide, it is possible to obtain immediately manufacturers' specifications on the newest laboratory tools. If, however, you do not find what you are looking for in this Guide, our Advertising Office will be happy to assist you further. Our market research department maintains extensive files on all types of laboratory equipment. Write to the address below, stating your requirements, and we will try to provide you with several sources.

SCIENCE Magazine
11 West 42 Street
New York 36, N.Y.

20 OCTOBER 1961

THE * EQUIPHASE TRIPLE-POINT-OF-WATER CELL



EQUIPHASE Triple-Point-of-Water Cell establishes a reference temperature of 0.01°C with guaranteed accuracy of 0.0005°C. Unaffected by atmospheric pressure, contamination-free, easy and convenient to use. Just 17° high, 8° diameter.

This new laboratory standard establishes the precise point, 0.01°C, where ice, water, and water vapor coexist in equilibrium. The reference temperature point produced by the Equiphase Cell is accurate within 0.0005°C and may be quickly established with a minimum of technique or set-up.

established with a minimum of technique or set-up.

The Equiphase Cell's accuracy cannot be easily duplicated with an ice bath. The triple-point-of-water is a physical constant—so precisely reproducible that it has been recently designated as a defining fixed point for the International Practical Temperature Scale of 1948 by the General Conference on Weights and Measures.

Reliability? Ease of use? Reasonable price?

Reliability? Ease of use? Reasonable price? You get all these as well. But even more important — if you must have accuracy, this must be your standard.

Please write today for complete information.

To put the <u>sure</u> in measurement **TRANS-SONICS**, INC. BURLINGTON, MASSACHUSETTS

Accelerators, Electron

High Voltage Engineering Cor 1960: 28 Oct. 1220 1961: 20 Jan., 162; 24 Feb., 548; 24 Mar., 846; 28 Apr., 1324; 19 May, 1556; 28 July, 248; 5 Aug., 438; 22 Sept., 800 Radiation Dynamics, Inc. 1960: 21 Oct., 1047 1961: 24 Mar., 812

Accelerators, Positive Ion

High Voltage Engineering Corp. 1961: 20 Jan., 162; 18 Aug., 438 Radiation Dynamics, Inc. 1960: 21 Oct., 1047

Air Pollution Test Equipment

Central Scientific Co. 1961: 24 Mar., 791

Amino Acid Analyzers

1960: 14 Oct., IFC
1961: 24 Feb., IFC; 12 May, IFC; 14
July, IFC; 11 Aug., IFC
Phoenix Precision Instrument Co.
1960: 21 Oct., 1180; 11 Nov., 1432; 2
Dec., 1690
1961: 17 Feb., 536; 24 Mar., 816; 21
Apr., 1292; 19 May, 1656; 16 June, 1964; 18 Aug., 502
Research Specialties Co.
1961: 3 Mar., 656
Technician Chromatography Corp.
1961: 20 Jan., 221; 21 July, 226

Beckman Instruments, Inc., Spinco Div.

Amplifiers

American Electronic Laboratories, Inc. 1961: 17 Feb., 513
Argonaut Associates
1961: 20 Jan., 214
Baird-Atomic, Inc.
1960: 2 Dec., 1613
1961: 20 Jan., 139
Beckman Instruments, Inc., Scientific and

Process Instruments Div.

1960: 23 Dec., 1900

1961: 17 Mar., 768; 9 June, 1836

Decker Corp.

1961: 24 Mar., 787

Philbrick, George A., Researches, Inc. 1961: 18 Aug., 478
Sanborn Co.

1961: 17 Feb., 414; 29 Sept., IFC

Animal Food

Staley, A. E., Mfg. Co. 1961: 27 Jan., 247; 24 Feb., 589; 21 Apr., 1288; 19 May, 1658; 16 June, 1938; 14 July, 115; 11 Aug., 397; 29 Sept., 909

Animals, Laboratory

Charles River Breeding Laboratories 1960: 7 Oct., 974 Sprague-Dawley, Inc. 1960: 2 Dec., 1714; 9 Dec., 1846 1961: 13 Jan., 111

Atomic Absorption Photometers

Engis Equipment Co. 1960: 21 Oct., 1173 1961: 7 July, 63

Balances, Analytical

Ainsworth, Wm., & Sons, Inc. 1961: 20 Jan., 201; 24 Mar., 911; 19 May, 1635 Brinkmann Instruments, Inc. 1960: 7 Oct., 917; 21 Oct., 1119 1961: 17 Feb., 419 Burrell Corp. 1961: 22 Sept., 881 Exact Weight Scale Co. 1961: 21 July, 223 Harshaw Scientific Co. 1960: 18 Nov., 1503 Mettler Instrument Corp. 1960: 21 Oct., 1081; 2 Dec., 1612 1961: 24 Mar., 931; 21 Apr., 1188; 21 July, 152 Sauter, August, of New York, Inc. 1960: 21 Oct., 1181 1961: 17 Feb., 530; 21 Apr., 1288 Scientific Products, Div. of American Hospital Supply Corp. 1961: 22 Sept., 776 Stoelting, C. H., Co. 1960: 21 Oct., 1203 1961: 6 Jan., 55; 24 Mar., 931; 22 Sept., Torsion Balance Co. 1960: 21 Oct., 1065; 11 Nov., 1343 1961: 24 Mar., 833; 21 Apr., 1163; 22 Sept., 755 Will Corp. 1960: 11 Nov., 1411 1961: 21 Apr., 1275

Balances, Analytical, Micro

Mettler Instrument Corp. 1961: 20 Jan., 155
Sauter, August, of New York, Inc. 1960: 2 Dec., 1692
1961: 24 Mar., 902

Balances, Animal

Aloe Scientific
1961: 16 June, 1963; 21 July, 229
Exact Weight Scale Co.
1960: 21 Oct., 1161; 2 Dec., 1674
1961: 17 Feb., 523; 19 May, 1616; 21
July, 223; 22 Sept., 891

Balances, Micro Torque

Brinkmann Instruments, Inc. 1960: 28 Oct., 1263 1961: 24 Mar., 914; 22 Sept., 859

Balances, Prescription

Harshaw Scientific Co. 1961: 24 Mar., 952; 21 Apr., 1284
Torsion Balance Co. 1961: 20 Jan., 137; 24 Mar., 833; 21
Apr., 1163; 19 May, 1509; 21 July, 143

Balances, Trip

Ohaus Scale Corp. 1961: 22 Sept., 894

Balances, Triple Beam

Ohaus Scale Corp.
1961: 22 Sept., 894
Welch, W. M., Scientific Co.
1960: 28 Oct., 1267; 4 Nov., 1321
1961: 3 Feb., 341; 5 May, 1433

Balances, Vacuum

Ainsworth, Wm., & Sons, Inc. 1961: 21 July, 217

Batteries, Instrument

Esse Radio Co. *1960*: 2 Dec., 1714

Beakers, Plastic

Nagle Co., Inc. 1961: 20 Jan., 231

Binoculars

Edmund Scientific Co. 1960: 21 Oct., 1078; 11 Nov., BC; 2 Dec., BC 1961: 20 Jan., 151; 17 Feb., 410; 21 Apr., 1186; 21 July, 201; 18 Aug., 434; 22 Sept., 781

Blenders

Waring Products Corp.

1960: 11 Nov., 136: 2 Dec., 1677

1961: 21 Apr., 1177; 19 May, 1541; 16

June, 1865; 18 Aug., 433; 22 Sept., 775

Will Corp.

1961: 10 Mar., 716

Blood Cell Counters

Coulter Electronics, Inc. 1961: 24 Mar., 958
Sanborn Co. 1961: 20 Jan., 159; 24 Mar., 821; 12
May, IBC; 7 July, 6; 1 Sept., 621

Bombs, Combustion

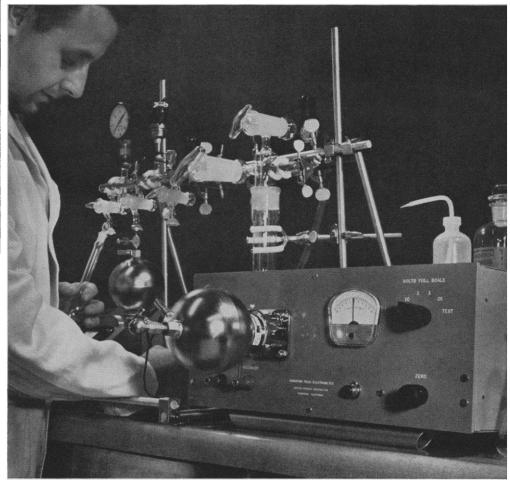
Parr Instrument Co. 1961: 22 Sept., 856

Books and Journals, Scientific

Academic Press 1960: 2 Dec., 1706 1961: 24 Mar., 908; 21 Apr., 1228, 1229 Addison-Wesley Publishing Co., Inc. 1960: 2 Dec., 1680 1961: 8 Sept., 680 Annual Reviews, Inc. 1960: 7 Oct., 972; 21 Oct., 1203; 4 Nov., 1328; 2 Dec., 1705 1961: 13 Jan., 113; 17 Feb., 491; 21 Apr., 1273; 16 June, 1933; 18 Aug., 486 Artia 1960: 9 Dec., 1772 Basic Books, Inc. 1960: 7 Oct., 916 1961: 6 Oct., 1014 Burgess Publishing Co. 1960: 21 Oct., 1152; 2 Dec., 1699 1961: 17 Feb., 494; 21 Apr., 1267; 25 Aug., 567 Cambridge University Press 1961: 21 Apr., 1265 Columbia University Press 1961: 21 Apr., 1260; 7 July, 62; 14 July, 114 Davis, F. A., Co. 1961: 21 Apr., 1268; 22 Sept., 853 Doubleday & Co., Inc. 1961: 21 Apr., 1181 **Dover Publications**

1961: 5 May, 1388

Cary Model 32 Electrometer



Obtaining reliable, precise data in radiation studies. For details ask for Data File E29-101.

Precision to better than ± 0.5% S.D. in radioactivity measurements, with single calibration over periods of months, has made Cary Vibrating Reed Electrometers and Ion Chambers standards for radiation research since 1947. Extremely high sensitivity and stability of the Cary Model 32 permit detection of C¹⁴ to about 25 dis./min...H³ to about 300 dis./min...using a 250 cc ion chamber. Other outstanding advantages are: No limit on sample size or activity...continuous measurement in flow systems...stable operation with samples to 250°C.

APPLIED PHYSICS CORPORATION
2724 SOUTH PECK ROAD MONROVIA, CALIFORNIA

CATY.
INSTRUMENTS

Raman/UV/IR Recording Spectrophotometers • Vibrating Reed Electrometers

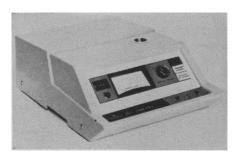
Elsevier Publishing Co. 1961: 20 Jan., 208 Harper & Brothers 1960: 16 Dec., 1846 Harvard University Press 1961: 17 Feb., 497; 26 May, 1670 Institute for Scientific Information 1960: 4 Nov., 1326 1961: 21 Apr., 1176; 16 June, 1956; 21 July, 220; 18 Aug., 504; 22 Sept., 886 Interscience Publishers, Inc. 1961: 21 Apr., 1293 Johns Hopkins Press 1961: 21 Apr., 1263 Lea & Febiger 1960: 2 Dec., 1677 1961: 21 Apr., 1171

Library of Science 1960: 14 Oct., 985 1961: 27 Jan., 246 Little Brown and Co. 1961: 21 Apr., 1270 Matheson Co., Inc. 1961: 17 Feb., 427 McGraw-Hill Book Co. 1961: 3 Mar., 609; 7 Apr., 1040 Merck Co., Inc. 1960: 11 Nov., 1406 Mosby, C. V., Co. 1961: 17 Feb., 522; 24 Mar., 902; 21 Apr., 1230; 5 May, 1435; 19 May, 1613 National Academy of Sciences-National Research Council 1961: 3 Feb., 338; 21 Apr., 1259

Natural History Book Club 1961: 24 Feb., 547 Oxford University Press 1960: 2 Dec., 1692 1961: 17 Feb., 500; 21 Apr., 1282 Pergamon Press 1960: 21 Oct., 1154 1961: 17 Feb., 503; 24 Mar., 956; 21 Apr., 1307 Philosophical Library 1960: 14 Oct., 1023; 21 Oct., 1158; 4 Nov., 1325 Prentice-Hall, Inc. 1961: 21 Apr., 1187 Princeton University Press 1961: 3 Mar., 654 Reinhold Publishing Corp. 1961: 10 Mar., 669; 21 Apr., 1159 Rockefeller Institute Press 1960: 18 Nov., 1506 Ronald Press Co.

Announcing the new compact GAMMACORD

altominim



The first analytical counting and computing system for routine measurements of all gamma ray samples

FEATURES

Complete System **Fully Transistorized Automatic Background Subtract Automatic Normalization Permanent Calibration** Compact-Bench Top Simple to Operate Fast **Accurate**

APPLICATIONS

Medical-Physiological In Vitro Thyroid Function (T-3) **Excretion, Circulation, Dilution** Measurements **Biochemical Metabolism**

Analytical Procedures

Activation Tracers Water, Soil, Filters, Foils

Designed and manufactured by:

940 Main Street, Waltham 54, Massachusetts/Tel. TW 4-6900, CABLE—ATOMIUM WEST COAST OFFICE/ 1929 Irving Street, San Francisco 22, California International Branch/27 Alkmaarsestraat, Scheveningen, Holland/Tel. (070)550621

For further information write Dept. 70E

* trademark

1960: 21 Oct., 1168 1961: 13 Jan., 111; 17 Mar., 772; 21 Apr., 1286; 16 June, 1942 Rutgers University Press 1961: 6 Oct., 1025 Saunders, W. B., Co. 1960: 7 Oct., 1A; 4 Nov., 1A; 2 Dec., 1A 1961: 13 Jan., 1A; 10 Feb., 1A; 10 Mar., 1A; 7 Apr., 1A; 14 Apr., 1098; 21 Apr., 1A; 28 Apr., 1322; 5 May, 1A; 12 May, 1451; 19 May, 1A; 26 May, 1668; 2 June, 1A; 14 July, 1A; 11 Aug., 1A; 8 Sept., 1A; 6 Oct., 1A Springer-Verlag 1961: 21 Apr., 1281; 29 Sept., 906 Stanford University Press 1961: 21 Apr., 1274 University of Chicago Press 1960: 25 Nov., 1518 1961: 21 Apr., 1175; 28 Apr., 1374 University of Michigan Press 1960: 18 Nov., 1452; 2 Dec., 1717 1961: 6 Jan., 7; 15 Sept., 695 University of Wisconsin Press 1961: 21 Apr., 1276 Van Nostrand, D., Co., Inc. 1960: 7 Oct., 921; 28 Oct., 1219 Wesleyan University Press 1960: 7 Oct., 971 1961: 29 Sept., 957 Wiley, John, & Sons, Inc. 1960: 14 Oct., 1019; 2 Dec., 1584 1961: 10 Feb., 352; 10 Mar., IBC; 21 Apr., 1152, 1153; 26 May, 1723 Williams & Wilkins Co. 1961: 20 Jan., 126; 17 Feb., 412; 24 Mar., 810; 21 Apr., 1192, 1193; 22 Sept., Year Book Medical Publishers Inc. 1961: 21 Apr., 1254 Borers, Cork

Sargent, E. H., & Co. 1961: 22 Sept., 794

Bottles, Plastic

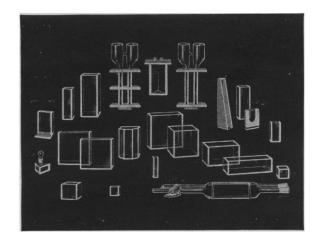
Nalge Co., Inc. 1960: 2 Dec., 1596; 23 Dec., 1898 1961: 17 Feb., 490; 21 Apr., 1266; 19 May, 1622; 21 July, 218; 22 Sept., 870

Burettes, Automatic

Kimble Glass Co. 1961: 24 Mar., 803 Sargent, E. H., & Co. 1960: 2 Dec., 1590



GLASS ABSORPTION made KLETT **CELLS** Ьy



SCIENTIFIC APPARATUS Klett-Summerson Photoelectric Colorimeters— Colorimeters — Nephelometers — Fluorimeters— Bio-Colorimeters — Comparators — Glass Standards—Klett Reagents.

Klett Manufacturing Co. 179 East 87 Street, New York, New York

NEW

from Percival.

COMPACT PLANT GROWTH LAB

for controlled climate needs

Model PGC-78-A completely-assembled, selfcontained unit ready to plug in. Maximum growth area. Minimum floor space. Completely portable. Offers:

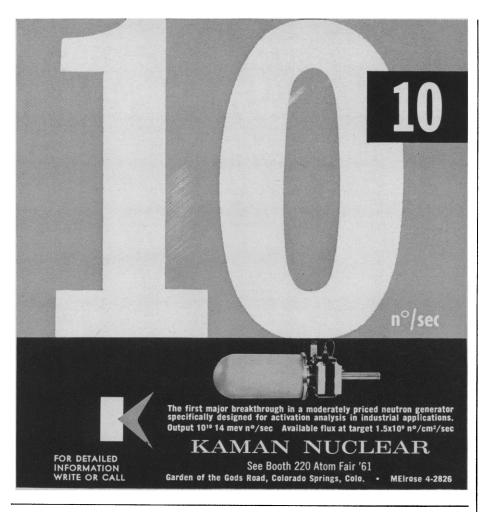
HIGH LIGHT INTENSITY: May be varied from 5,000 down to 200 ft. candles. Three simultaneous light intensities are possible by adjusting sectional work tray.

FLEXIBILITY: Reproduces climatic requirements from 45° F to 90° F, and any photo period desired. Photo periods and temperature programmed and automatically controlled.

ECONOMY: Low initial cost. Low operating

Write today for further information.





now, at low cost, the new ASCO "50" enables you to compare your present processing costs with those of



Fields of investigation heretofore made prohibitive through use of highly expensive investigative techniques can now be explored with this simple-tooperate molecular still. Since the "50" still is the laboratory counterpart of the large commercial Rota-Film Still, results obtained may be duplicated on a commercial scale of any magnitude.

With this simple-to-operate still you may...

· explore falling agitated film evaporation and distillation • distill materials with molecular weights ranging from 200 to 1250 weight (hydrocarbons) and some materials to 4000 molecular weight (silicones and halocarbons) • deglycerinate and distill mixtures of mono-, di- and tri-glycerides · distill tall oil · distill paraffin from slack wax or petroleum residue • deodorize oils • remove color bodies from materials of high molecular weights.

- · Batches from 10 ml to 20 liters
- · Vacuum range from atmospheric to 1 micron Hg.
- Temperature range to 450°C.
- · Teflon or carbon rotor-wiper blades
- Stainless-steel (18-8 type 304) wiper-holders (Available with Hastelloy B)
- · Continuous or batch feed
- · All parts made of glass except wiper-holders and top plate
- . UNITS MAY BE COUPLED FOR FRACTIONATION.

Burettes, Micro

Greiner, Emil, Co. 1960: 21 Oct., 1180

Burettes, Multiple Column

Buchler Instruments, Inc.

1960: 21 Oct., 1183; 2 Dec., 1600

Burners, Glass Blowing

Bethlehem Apparatus Co., Inc. 1960: 11 Nov., 1422

Burners, Laboratory

LABASCO

1961: 24 Mar., 819

Cages, Dog and Primate

Harford Metal Products 1961: 6 Oct., 1022 Kirschner Manufacturing Co. 1960: 21 Oct., 1199; 11 Nov., 1419; 2 Dec., 1691 1961: 21 July, 219 Porter Mathews Co., Inc. 1961: 7 July, 8

Cages, Dog and Primate, Plastic

Aloe Scientific 1961: 21 July, 229 Kirschner Manufacturing Co. 1960: 21 Oct., 1199; 11 Nov., 1419; 2 Dec., 1691 1961: 20 Jan., 207; 31 Mar., 1025; 19 May, 1655; 16 June, 1936; 21 July, 219; 22 Sept., 871

Cages, Metabolism

Delmar Scientific Laboratories 1961: 17 Feb., 534; 21 Apr., 1278

Cages, Small Animal, Metal

Aloe Scientific 1961: 16 June, 1963 Harford Metal Products 1961: 6 Oct., 1022 Porter Mathews Co., Inc. 1961: 7 July, 8 Will Corp. 1961: 16 June, 1933

Cages, Small Animal, Plastic

Aloe Scientific 1960: 11 Nov., 1417; 2 Dec., 1709 1961: 16 June, 1963; 21 July, 229 Keystone Plastics Co. 1961: 17 Feb., 494; 24 Mar., 898; 21 Apr., 1267; 19 May, 1624 Labline, Inc. 1961: 20 Jan., 233; 17 Feb., 504; 21 Apr., 1287; 19 May, 1631; 15 Sept., 756 Maryland Plastics, Inc. 1960: 21 Oct., 1087 1961: 17 Feb., 535; 24 Mar., 960; 21 Apr., 1302; 19 May, 1514; 22 Sept., 768

Calorimeters

Parr Instrument Co. 1960: 21 Oct., 1184 1961: 20 Jan., 206; 19 May, 1610

Capacitance Measuring Equipment

Decker Corp.

1961: 24 Mar., 786

Carbon Hydrogen Analyzers

Coleman Instruments, Inc.

1961: 17 Feb., 422; 19 May, 1546

Carbon Sulphur Analyzers

Lindberg Engineering Co. 1961: 19 May, 1618

Cardiotachometers

Gilford Instrument Laboratories, Inc. 1961: 22 Sept., 879

Carts, Laboratory

Harshaw Chemical Co. 1961: 26 May, 1720

Catalogs, Laboratory Equipment

Cole-Parmer Instrument & Equipment Co. 1961: 19 May, 1628; 16 June, 1951

Labline, Inc.

1961: 24 Mar., 902; 22 Sept., 850

LaPine Scientific Co. 1961: 22 Sept., 876 Matheson Coleman & Bell

1961: 16 June, 1874; 21 July, 200 New York Laboratory Supply Co., Inc.

1961: 3 Feb., 336 Sargent, E. H., & Co.

1961: 21 Apr., 1169; 19 May, 1543; 18

Aug., 421

Thomas, Arthur H., Co.

1961: 13 Jan., BC; 24 Mar., BC

Will Corp.

1961: 19 May, 1644

Cells, Absorption

Beckman Instruments, Inc., Scientific and Process Instruments Div.

1961: 26 May, 1672 Klett Manufacturing Co.

1960: 7 Oct., 973; 14 Oct., 1022; 21 Oct., 1152; 28 Oct., 1265; 4 Nov., 1328; 11 Nov., 1427; 18 Nov., 1505; 2 Dec., 1703; 9 Dec., 1779; 16 Dec., 1848; 23 Dec., 1901; 30 Dec., 1946

1961: 6 Jan., 51; 13 Jan., 117; 20 Jan., 215; 27 Jan., 287; 3 Feb., 338; 10 Feb., 390; 17 Feb., 532; 24 Feb., 596; 3 Mar., 652; 10 Mar., 715; 17 Mar., 773; 24 Mar., 703; 14 Mar., 703; 7 Mar., 703; 920; 31 Mar., 1025; 7 Apr., 1088; 14 Apr., 1141; 21 Apr., 1294; 28 Apr., 1371; 12 May, 1497; 19 May, 1637; 26 May, 1721; 2 June, 1776; 9 June, 1839; 16 June, 1949; 23 June, 2023; 30 June, 2073; 7 July, 64; 14 July, 116; 21 July, 289; 4 Aug. 347; 11 Aug., 398; 18 Aug., 507; 1 Sept., 625; 15 Sept., 745; 22 Sept., 852; 29 Sept., 953

Cells, Spectrophotometer

Brinkmann Instruments, Inc. 1961: 3 Feb., 340

Centrifuges, Analytical (Student)

1961: 20 Jan., 161; 3 Mar., 607 International Equipment Co.

1961: 24 Mar., 826

OFFERS YOU AN ELECTRONIC SQUARE WAVE

FOR EVERY PURPOSE FOR EVERY PRICE RANGE

Study the brief summaries below of the complete line of quality AEL Electronic Square Wave Stimulators designed to meet every requirement of classroom and research laboratory use. You will find the Stimulator that will meet both your budget and technical requirements. AEL Stimulators come to you with a background covering thousands of hours of classroom and laboratory operation.

model 198 . . . \$95.
CLASSROOM AND RESEARCH LABORATORY USE
A many-purpose . . yet inexpensive unit, designed for both classroom and research laboratory use.
Undergraduate students find it particularly desirable because of its simple-to-operate controls. However, the ranges of variable stimulus, output and duration also make the "198" attractive for research laboratory use. Produces recurrent or single stimuli. Versatility provided through continuously variable controls. Offers sync-pulse of 10 volts amplitude for use with cathode ray oscilloscopes.



model 751 . . . \$145.
CLASSROOM AND RESEARCH LABORATORY USE
Performance-proven over years of service, the
"751" offers stepped controls of frequency and
duration that permit exact resetting in conducting
consistent, repeatable experiments. Straightforward
control operation and a wide range of variables
make this unit ideal for both student and research
laboratory use. Pulse pairs are obtained by combining two Model 751's with a Model 951 Dualpulse Synchronizer, making it possible to study the
refractory cycle of such tissue as nerve, striated
muscle and cardiac muscle. A signal magnet output
is also provided.



model 404 . . . \$400.

ALL-PURPOSE RESEARCH LABORATORY USE

Designed for the physiology laboratory, the "404" provides a wide variety of stimuli. The five modes of operation include . . SINGLE SHOCKS . . . REPETITIVE STIMULATION . . SINGLE PAIR OF STIMULI . . . REPETITIVE PAIRS OF STIMULI . . . DIRECT CURRENT STIMULATION. Trains of pulses are produced by coupling two Model 404's. Output: 60 ma at 150V or 9 watts. Stimulus Intensity: 1 millivolt to 150 volts. Stimulus Duration: 10 microseconds to 1 second. Delay: Adjustable from 10 microseconds to 1 second. Stimulus Frequency: 1 every second to 10,000/second.



model 104-A . . . \$550.

THE ULTIMATE IN RESEARCH LABORATORY USE
An extremely accurate, all-purpose stimulator, the
"104-A" is designed specifically for the most exacting research laboratory use. Six modes of operation include . . SINGLE SHOCKS . . REPETITIVE
STIMULATION . . SINGLE PAIRS OF STIMULI .

REPETITIVE PAIRS OF STIMULI . . SINGLE TRAINS
OF STIMULI . . . REPETITIVE TRAINS OF STIMULI .

Utilizing 10-turn linear helipots which are resettable
to 0.1 percent, the "104-A" is accurate within five
percent across the dial . . in all ranges, it
produces trains of pulses, can be externally or
remotely driven and has a 250 volt output.



ACCESSORIES FOR USE WITH MODEL 104-A & 404 STIMULATORS



STIMULUS ISOLATION UNIT . . . model 112 Provides the means of isolating a stimulator pulse from ground reference to reduce ground loop artifacts.

PHOTIC STIMULUS ACCESSORY ... model 127
Provides a source of short duration light flashes at three different intensities and at repetition rates controlled by the stimulator.

Write for detailed literature on each of the above instruments and accessories. Send your request, plus any other information that you may desire, to . . .

One year warranty on all models



American Electronic Laboratories, Inc.

RICHARDSON ROAD, COLMAR, PENNA.



$S^{i}S$ Reference Sheets on

Selectacel

ION EXCHANGE CELLULOSES

for use in chromatographic columns

New Selectacel Ion Exchange Celluloses have remarkable properties when used with ionic and colloidal materials of high molecular weight.

Such applications include -

- ENZYMES
- LIPIDS
- PROTEINS
- NUCLEIC
- HORMONES
- **ACIDS**

These materials produce separations that far exceed what usually can be accomplished alone by ion exchange resins, chromatography, electrochromatography, or electrophoresis.

There are several kinds of Selectacel Ion Exchange Celluloses:

ANION EXCHANGERS

Туре	Grade	Capacity
DEAE (Diethyl- aminoethyl Cellulose)	Standard 20 40	meq/g 0.9

Separation and purification of proteins, peptides, enzymes, hormones and related materials.

Туре	Grade	Capacit
ECTEOLA	Standard	meq/g
(Epichlorohydrin	20	0.3
triethanolamine)	40	ŀ

Separation and purification of viruses.

CATION EXCHANGERS

Туре	Grade	Capacit
CM	Standard	meq/g
arboxymethyl Cellulose)	40	0.7

Weakly acidic - most effective at pH's slightly above 4.

Type P (Cellulose Phosphate)	Grade Standard	Capacity meq/g 0.9
acidic and v	– containing veakly acidic xchange capa	both strongly groups. Rela- cities.

Send for these new free Selectacel Reference



Sheets today --- no obligation of course.

Carl Schleicher & Schuell Co. Keene, New Hampshire Department S-110

STATE

Jenu I KLL Jereciacer Kererence Jineers.
NAME
COMPANY
ADDRESS

Sand EPEE Salactacal Pafaranca Shaat

Selectacel is manufactured by Brown Company and exclusively packaged and distributed for laboratory use by S & S.

Centrifuges, Continuous Flow

Lourdes Instrument Corp. 1961: 17 Feb., 499; 21 Apr., 1291 Sorvall, Ivan, Inc. 1960: 11 Nov., 1067; 2 Dec., 1580, 1581 1961: 17 Feb., 402; 24 Mar., 800

Centrifuges, General Purpose

Custom Scientific Instruments, Inc. 1961: 18 Aug., 497 International Equipment Co. 1960: 21 Oct., 1049 1961: 6 Jan., 10; 20 Jan., 145; 24 Mar., 827; 28 July, 1A Lourdes Instrument Corp. 1960: 7 Oct., 969; 21 Oct., 1155 1961: 17 Feb., 499; 21 Apr., 1291 Scientific Glass Apparatus Co., Inc. 1960: 21 Oct., 1059 Sorvall, Ivan, Inc. 1960: 21 Oct., 1066, 1067: 2 Dec., 1580 1961: 17 Feb., 402; 24 Mar.. 800

Centrifuges, Hematocrit

Clay-Adams 1961: 17 Feb., 437 International Equipment Co. 1960: 11 Nov., 1340 1961: 3 Mar., IBC; 24 Mar., 826; 8 Sept., 632

Centrifuges, Micro

Beckman Instruments, Inc., Spinco Div. 1961: 23 June, IFC; 8 Sept., IFC International Equipment Co. 1961: 8 Sept., 632

Centrifuges, Refrigerated

International Equipment Co. 1960: 21 Oct., 1049; 11 Nov., 1341 1961: 17 Feb., 428; 24 Mar., 827; 14 Apr., 1099; 12 May, 1449; 9 June, 1791; 23 June, 1977; 28 July, 1A; 25 Aug., 523; 29 Sept., 907 Lourdes Instrument Corp. 1960: 21 Oct., 1155; 11 Nov., 1431 1961: 17 Feb., 499; 21 Apr., 1291; 22 Sept., 893 Sorvall, Ivan, Inc. 1960: 21 Oct., 1067; 2 Dec., 1581 1961: 20 Jan., 142; 17 Feb., 402; 24 Mar., 801; 19 May, 1606; 16 June, 1866

Centrifuges, Super Speed

International Equipment Co. 1960: 11 Nov., 1341 Lourdes Instrument Corp. 1960: 21 Oct., 1155; 11 Nov., 1431 1961: 22 Sept., 893 Sorvall, Ivan, Inc. 1960: 21 Oct., 1067 1961: 17 Feb., 402; 24 Mar., 801; 19

Centrifuges, Ultra Speed

May, 1606

Beckman Instruments, Inc., Spinco Div. 1960: 28 Oct., IFC; 9 Dec., IFC; 23 Dec., IFC 1961: 13 Jan., IFC; 27 Jan., IFC; 10 Mar., IFC; 14 Apr., IFC; 9 June, IFC; 28 July, IFC; 22 Sept., IFC

Labconco laboratory carts -



GLASSWARE CART—Cuts hours from the task of picking up, washing, drying and delivering glassware. Optional rubber-mounted drip pan helps keep floors dry, clean. Made of poly-vinyl covered wire, removable baskets are corrosion resistant, easy on glassware.



PORTABLE TABLE—Ideal work bench. No guard rails to prevent easy transfer from bench top to cart. Like all Labconco Carts, frame is one-inch, seamless steel tubing, welded into a single piece, then heavily nickel-plated.



CHEMICAL CART—Ideal for picking up and distributing samples, packages, glassware, equipment and instruments. Rolls freely in any direction. Compressed asbestos shelves, treated and polished, withstand acids, caustics and stain.

Ask your dealer about Labconco Laboratory Carts—or write factory today for brochure describing 19 models of Carts.

LABORATORY CONSTRUCTION CO. Kansas City, Mo. 8811 Prospect

Centrifuges, Vacuum

Lourdes Instrument Corp. 1961: 24 Mar., 939; 19 May, 1657

Charts, Biological

Welch, W. M., Scientific Co. 1960: 2 Dec., 1685 1961: 3 Mar., 652; 1 Sept., 623

Charts, Periodic Table

Central Scientific Co. 1961: 21 Apr., 1263

Chemical Analyzers, Automatic

Research Specialties Co. 1961: 3 Mar., 656 Technicon Chromatography Corp. 1961: 20 Jan., 221; 17 Feb., 529; 24 Mar., 905; 21 Apr., 1305; 16 June, 1961; 22 Sept., 895

Chemicals, Biological

Applied Science Laboratories., Inc. 1961: 22 Sept., 892 Borden Chemical Co. 1961: 24 Mar., 954; 28 Apr., 1376; 16 June, 1958; 8 Sept., 682 Colorado Serum Co. 1961: 24 Mar., 941; 21 Apr., 1263; 11 Aug., 400 Eastern Chemical Corp. 1960: 7 Oct., 971 1961: 6 Oct., 1022 General Biochemicals 1961: 20 Jan., 156; 17 Feb., 417; 24 Mar., 837; 21 Apr., 1182; 19 May, 1554;

16 June, 1881; 21 July, 141 Hyland Laboratories 1961: 19 May, 1639; 16 June, 1948; 21

July, 225; 18 Aug., 482 Nutritional Biochemicals Corp.

1960: 14 Oct., 1A; 28 Oct., 1A; 11 Nov., 1A; 25 Nov., 1A; 2 Dec., 1A; 23 Dec., 1A 1961: 6 Jan., 1A; 20 Jan., 1A; 3 Feb., 1A; 17 Feb., 1A; 3 Mar., 1A; 17 Mar., 1A; 31 Mar., 1A; 14 Apr., 1A; 28 Apr., 1A; 12 May, 1A; 26 May, 1A; 9 June, 1A; 23 June, 1A; 7 July, 3; 21 July, 1A; 4 Aug., 1A; 18 Aug., 1A; 1 Sept., 1A; 15 Sept., 1A; 29 Sept. 1A Pabst Laboratories

1961: 20 Jan., 212; 17 Feb., 495; 24 Mar., 899

Pfanstiehl Laboratories, Inc.

1961: 24 Mar., 936

Schwarz BioResearch, Inc.

1960: 21 Oct., 1169; 4 Nov., 1327; 2 Dec., 1695

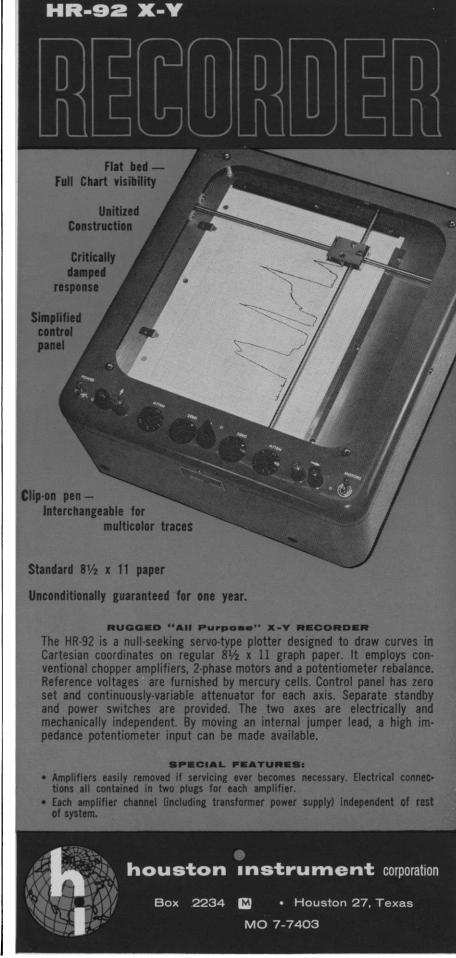
1961: 6 Jan., 57; 20 Jan., 152; 3 Feb., 337; 17 Feb., 435; 3 Mar., 604; 17 Mar., 774; 7 Apr., 1041; 21 Apr., 1161; 5 May, 1390; 26 May, 1718; 16 June, 1856; 21 July, 235; 4 Aug., 301; 18 Aug., 411; 8 Sept., 638; 15 Sept., 697; 22 Sept., 777 Sigma Chemical Co.

1960: 21 Oct., 1205; 11 Nov., 1426 1961: 6 Jan., 51; 20 Jan., 227; 3 Mar., 653; 31 Mar., 1025; 21 Apr., 1285; 19 May, 1618; 16 June, 1946; 21 July, 211; 22 Sept., 859

Winthrop Laboratories

1960: 25 Nov., 1566

1961: 10 Feb., 390; 17 Mar., 773; 15 Sept., 741



Worthington Biochemical Corp. 1960: 4 Nov., 1322; 2 Dec., 1710 1961: 24 Feb., 595; 24 Mar., 938; 28 Apr., 1372; 26 May, 1674; 16 June, 1966; 21 July, 228; 18 Aug., 510; 22 Sept., 860

Chemicals, Organic

Allied Chemical, General Chemical Div. 1961: 24 Mar., 1A
Baker, J. T., Chemical Co. 1960: 21 Oct., 1085
Eastern Chemical Corp. 1960: 7 Oct., 971
1961: 6 Oct., 1022
Matheson Coleman & Bell 1960: 21 Oct., 1174
1961: 22 Sept., 764

Chemicals, Radiation

ChemTrac Corp. 1961: 21 July, 204; 22 Sept., 848 Isomet Corp. 1961: 22 Sept., 889 Isotopes Specialties Co. 1960: 21 Oct., 1163; 2 Dec., 1717 New England Nuclear Corp. 1960: 7 Oct., 972; 21 Oct., 1151; 4 Nov., 1329; 11 Nov., 1424; 9 Dec., 1779 1961: 6 Jan., 48; 20 Jan., 235; 3 Feb., 340; 17 Feb., 491; 24 Mar., 913; 14 Apr., 1141; 28 Apr., 1374; 28 Apr., 1377; 5 May, 1436; 26 May, 1721; 2 June, 1779; 16 June, 1955; 30 June, 2073; 14 July, 116; 28 July, 289; 11 Aug., 398; 1 Sept., 681; 22 Sept., 1A; 29 Sept., 953; 6 Oct., 1021

Nuclear-Chicago Corp. 1961: 10 Mar., BC Oak Ridge National Laboratory 1960: 21 Oct., 1164; 4 Nov., 1325; 2 Dec., 1678 1961: 20 Jan., 225; 17 Feb., 522; 24 Mar., 916; 21 Apr., 1260; 19 May, 1623; 16 June, 1962; 14 July, 115; 18 Aug., 570; 15 Sept., 742 Picker X-Ray Corp. 1961: 22 Sept., 790 Pilot Chemicals Inc. 1960: 21 Oct., 1195; 2 Dec., 1685 1961: 20 Jan., 230; 19 May, 1646 Radiochemical Centre 1961: 6 Jan., 55; 3 Mar., 655; 28 Apr., 1371; 23 June, 2027; 21 July, 212; 15 Sept., 745 Schwarz BioResearch, Inc. 1961: 3 Feb., 337; 17 Mar., 774; 26 May, 1718; 16 June, 1856 Tracerlab, Inc. 1961: 9 June, 1837; 11 Aug., 401

Chemicals, Reagents

Div. 1960: 11 Nov., 1412; 2 Dec., 1676 1961: 24 Mar., 783; 19 May, 1611, 1613, 1615; 22 Sept., 773
Baker, J. T., Chemical Co. 1960: 21 Oct., 1085; 11 Nov., 1418; 2
Dec., 1589
1961: 20 Jan., 134; 17 Feb., 510; 24
Mar., 795; 19 May, 1521; 16 June, 1934
Burrell Corp.
1961: 28 Apr., 1373

Allied Chemical Corp., General Chemical

Dupont, E. I., de Nemours & Co., Inc. 1961: 17 Feb., 528; 24 Mar., 957; 21 Apr., 1280; 19 May, 1632; 16 June, 1940; 21 July 208; 18 Aug., 490; 22 Sept., 846; 29 Sept., 956 Eastern Chemical Corp. 1961: 6 Oct., 1022 Fisher Scientific Co. 1961: 24 Mar., 843; 7 Apr., 1039; 5 May, 1387; 9 June, 1789 Hyland Laboratories 1961: 21 Apr., 1272; 16 June, 1948; 21 July, 225 Mallinckrodt Chemical Works 1960: 2 Dec., 1610, 1611 Matheson Coleman & Bell 1960: 21 Oct., 1174; 2 Dec., 1700 1961: 17 Feb., 536; 24 Mar., 807; 19 May, 1545; 16 June, 1874; 21 July, 200 Research Specialties Co. 1961: 7 Apr., 1086

Chromatogram Scanners

Atomic Accessories, Inc.

1961: 16 June, 1852
Forro Scientific Co.
1961: 17 Feb., 505
National Instrument Laboratories, Inc.
1961: 21 July, 228
Photovolt Corp.
1961: 17 Feb., 509; 24 Mar., 901; 21
Apr., 1267; 21 July, 205
Picker X-Ray Corp.
1961: 21 Apr., 1156
Vanguard Instrument Co.
1961: 17 Feb., 425; 21 Apr., 1168; 19
May, 1528; 16 June, 1864; 1 Sept., IBC







PRICE REDUCTIONS

We are pleased to announce reduced prices for the following highly purified coenzymes prepared by Pabst Laboratories.

Cat. No	o. Coenzyme	Pkg.	Size		Price
900	TRIPHOSPHOPYRIDINE	25	mg.	\$	6.00
	NUCLEOTIDE	100	mg.		15.75
	TPN	500	mg.		62.50
		1	g.	1	00.00
300	DIPHOSPHOPYRIDINE	200	mg.		5.50
	NUCLEOTIDE	500	mg.		9.00
	DPN	1	g.		11.30
		5	g.		51.00
2200	DIPHOSPHOPYRIDINE	100	mg.		4.90
	NUCLEOTIDE, REDUCED	500	mg.		15.80
	DPNH	1	g.		25.40

Prices include delivery to destination via air mail

Complete Specifications given in PABST CIRCULAR OR-17

These savings were made possible by your confidence in the high quality and reliability of Pabst NUCLEOTIDES and COENZYMES. Increased demand for these important biochemical compounds plus improvements in processing created savings which we are pleased to pass on to you.

Now Available for Distribution

ULTRAVIOLET ABSORPTION SPECTRA OF PYRIDINE NUCLEOTIDE COENZYMES AND COENZYME ANALOGS

Write for Circular OR-18

WORLD LEADER IN COENZYME-A AND 5'-NUCLEOTIDES

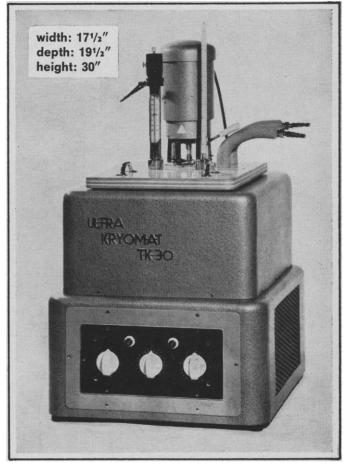


KRYOMAT

LOW TEMPERATURE CIRCULATORS

TABLE MODEL TO -30°C

CONSOLE MODELS TO -80°C



Introducing the world's first table model Kryomats for low temperature control—offered in two models. Range from +20 to -30°C.

A separate line of instruments, Ultra Kryostats, for variable control or measurements between +40 and -80° C, are also available. Air or water cooling, built-in timer and accuracy to $\pm 0.02^{\circ}$ C are just a few of the many outstanding features of these instruments.

Most important is the unique and exclusive use of a secondary cooling system instead of conventional compensating heaters.

for all your temperature control problems
between-80°C and+300°C, contact:

auda Instruments, Inc.

P.O. Box 422 Great Neck, N.Y.



Chromatographs, Column Packing

Johns-Manville 1961: 21 Apr., 1166; 19 May, 1512; 16 June, 1859; 22 Sept., 796

Chromatographs, Gas

Barber-Colman Co., Industrial Instruments

1960: 21 Oct., 1960; 16 Dec., 1A Beckman Instruments, Inc., Scientific and Process Instruments Div.

1960: 2 Dec., 1604

1961: 10 Feb., 353; 24 Feb., 546; 14 Apr., 1102; 16 June, 1877; 18 Aug., 505; 29 Sept., 911

Burrell Corp.

1961: 24 Feb., 592; 24 Mar., 932 Central Scientific Co.

1960: 7 Oct., 973; 2 Dec., 1717

1961: 10 Mar., 716 Fisher Scientific Co. 1961: 24 Mar., 843

F & M Scientific Corp.

1960: 21 Oct., 1058; 11 Nov., 1346; 2 Dec., 1603

1961: 20 Jan., 143; 17 Feb., 433; 24 Mar., 802; 21 Apr., 1160; 19 May, 1544; 16 June, 1848; 21 July, 130; 18 Aug., 416; 22 Sept., 770

Gow-Mac Instrument Co.

1961: 21 July, 202

Nester & Faust 1961: 22 Sept., 866

Perkin-Elmer Corp.

1960: 2 Dec., 1576 1961: 27 Jan., 244

Precision Scientific Co.

1961: 19 May, 1531; 16 June, 1871; 21

July, 151; 18 Aug., 427 Research Specialties Co.

1960: 2 Dec., 1718; 30 Dec., 1948

1961: 20 Jan., 234

Scientific Glass Apparatus Co., Inc. 1961: 21 Apr., 1304; 19 May, 1506

Standard Scientific Supply Corp.

1961: 18 Aug., 480

Chromatographs, Liquid

Brinkmann Instruments, Inc.

1960: 25 Nov., 1565

1961: 20 Jan., 219; 19 May, 1532

Buchler Instruments, Inc.

1961: 21 July, 219; 22 Sept., 762; 6

Oct., 1018

Gilford Instrument Laboratories, Inc.

1961: 6 Oct., 1022

Gilson Medical Electronics

1961: 6 Jan., 50 LKB Instruments, Inc.

1960: 16 Dec., 1791

Technicon Chromatography Corp.

1960: 21 Oct., 1181

Chromatographs, Paper Strip

Gilson Medical Electronics 1961: 7 Apr., 1036

Kensington Scientific Corp. 1960: 28 Oct., 1265; 2 Dec., 1713; 30

Dec., IBC

RESEARCHES, INC.

127 CLARENDON ST. BOSTON 16, MASS.

COMMONWEALTH 6-5375, TWX; BS 1032, FAX; BSN REPRESENTATIVES IN PRINCIPAL CITIES

EXPORT OFFICE; 240 W. 17TH ST., N. Y. 11, N. Y.
TEL. CHELSEA 3-5200, CABLE; TRILRUSH

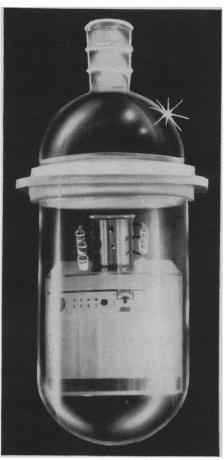
1961: 20 Jan., 229; 17 Feb., 491; 24 Mar., 913; 21 Apr., 1281; 19 May, 1633; 16 June, 1949; 21 July, 209

LKB Instruments, Inc.

1961: 21 Apr., 1158

National Instrument Laboratories, Inc.

1961: 21 July, 228



Freeze-Drying Flasks Quickseal Freeze-Drying Flasks maintain the same high vacuum as the standard flasks, which rely on lubricated ground glass surfaces, without any grease at all! Both the bottom and top sec-

tions of these flasks have a smoothly beveled edge which slip fits into a double faced silicone rubber gasket.

Quickseal Freeze-Drying Flasks are available in volume capacities from 25 ml. to 1,000 ml. with either 19/38 or 24/40 top joint. *Patent Pending

THE VirTis COMPANY, INC. GARDINER, NEW YORK



GEORGE A.

Photovolt Corp.
1961: 19 May, 1641
Research Specialties Co.
1960: 2 Dec., 1718
1961: 13 Jan., 112; 10 Feb., 392; 30
June, 2072
Thomas, Arthur H., Co.
1961: 22 Sept., BC

Will Corp. 1961: 20 Jan., 236

Chromatographs, Thin Layer

Brinkmann Instruments, Inc. 1961: 19 May, 1638; 16 June, 1939; 21 July, 211; 18 Aug., 422; 15 Sept., 694 Research Specialties Co. 1961: 8 Sept., 684; 29 Sept., 955

Chromatography Drying Ovens

New Brunswick Scientific Co., Inc. 1961: 27 Jan., 289; 31 Mar., 1023

Chromatography Paper Sample Applicator

Research Specialties Co. 1961: 30 June, 2072

Chromatography Tubes, Disposable

Laboratory Construction Co. 1961: 17 Feb., 537

Clamps, Joint

Fisher Scientific Co. 1961: 7 Apr., 1039 Greiner, Emil, Co. 1960: 2 Dec., 1686

Cleansers, Glassware

Alconox, Inc.

1960: 21 Oct., 1190

1961: 24 Mar., 906

Greiner, Emil, Co.

1960: 11 Nov., 1432

1961: 18 Aug., 414

Meinecke & Co., Inc.

1960: 21 Oct., 1174; 2 Dec., 1720

1961: 17 Feb., 534; 24 Mar., 904; 21

Apr., 1292; 16 June, 1964; 22 Sept., 868

Cobalt Sources

Atomic Energy of Canada Limited 1960: 11 Nov., 1354 1961: 20 Jan., 217; 24 Mar., 836; 19 May, 1516; 18 Aug., 481; 22 Sept., 874

Colony Counters

See Counters, bacteriological

Colorimeters, Photoelectric

Beckman Instruments, Inc., Spinco Div. 1961: 23 June, IFC
Bausch & Lomb Optical Co. 1961: 5 May, 1394; 22 Sept., 802
Coleman Instruments, Inc. 1961: 16 June, 1879
Engis Equipment Co. 1961: 20 Jan., 216
Klett Manufacturing Co. 1961: 5 May, 1433
Leitz, E., Inc. 1961: 20 Jan., 131; 3 Feb., IFC; 7 Apr., IFC; 21 Apr., IFC

AN ACCURATE, ECONOMICAL AND COMPACT FLOW RATE TEST KIT FOR MEASURING LIQUIDS AND GASES. COMPLETELY SELF-CONTAINED. MAXIMUM INTERCHANGEABILITY OF METERING TUBES PROVIDES A GREAT RANGE OF APPLICA-TION, GIVING THE EQUIVALENT TO SEVERAL STANDARD FLOW METERS. For low flow rates from 10cc/min. to 40,000cc/ -min. for gas, and 0.1cc/-min. to 1,400cc/min. for water. Safe Pressure rate 100 lbs. Maximum corrosion resistance. Float and Tube Replacement are guaranteed interchangeable. Packed in attractive mahogany case for easy storage when not in use. Model A This illustrates the Complete Kit. Model C Ace Standard Spherical Ground Joints. Tube sizes 1-4 have size 12/5 and 6 has 18/7 Not Illustrated: Model B— Equipped with Ace Standard Tapered Joints ₹ 12/30. Model D- Equipped with 1/2" standard Assembled conical pipe flanges. No. 3575 Ready for Use Model E- Plain ends for hose connection. Inasmuch as all tubes are interchangeable within + or - 2%, all data is compatible with data previously determined. Flow data established by initial calibration can be easily estrapolated for new gravities, temperatures and pressures. Each metering tube is provided with two spherical ball floats; pyrex brand glass, and stainless steel. The radial compression O-Ring Seal eliminates many of the leakage problems common in standard compression type stuffing boxes. Calibration brochure for liquids and gases is included with See New ACE CATALOG 60 for complete details, or Write Dept. S ACE GLASS INCORPORATED VINELAND 🏚 NEW JERSEY LOUISVILLE, KY., Box 996 A PROPERTY OF THE SECOND Circle No. 1265 on Readers' Service Card

Colorimeters, Photoelectric Reflectional

Zeiss, Carl, Inc. 1961: 8 Sept., 640

Combustion Analyzers

Coleman Instruments, Inc. 1961: 17 Feb., 422; 17 Mar., 726; 19 May, 1546
Lindberg Engineering Co. 1961: 17 Feb., 529

Comparators, Optical

Nikon, Inc. 1961: 16 June, 1857; 21 July 150; 22 Sept., 758

Computers, Analog

Philbrick, George A., Researches, Inc. 1961: 17 Mar., 772

Computers. Digital

Bendix Corp.

1960: 21 Oct., 1068; 11 Nov., 1353
1961: 3 Feb., IBC

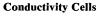
Burroughs Corp.
1961: 24 Mar., 792

Mnemotron Corp.
1961: 2 June, 1734; 30 June, 2034; 22

Sept., 795

Royal McBee Corp.

1961: 19 May, 1511; 16 June, 1867; 7 July, 11



Industrial Instruments, Inc. 1960: 2 Dec., 1716 1961: 20 Jan., 198

Conductivity Meters

Industrial Instruments, Inc. 1960: 21 Oct., 1192; 2 Dec., 1716 1961: 20 Jan., 198; 24 Mar., 958; 19 May, 1650; 16 June, 1962; 18 Aug., 508 Leeds & Northrup Co. 1960: 21 Oct., 1040 London Co. 1961: 21 Apr., 1178

Controllers, Electronic

Smith, Arthur F., Inc. 1960: 7 Oct., 968; 2 Dec., 1680

Counters, Bacteriological

American Optical Co. 1961: 3 Mar., BC; 21 July, 153 New Brunswick Scientific Co., Inc. 1961: 17 Feb., 517; 26 May, 1721; 29 Sept., 953

Counters, Blood Cell See Blood cell counters

Counters, Drop

See Drop counters

Counters, Flow Radiation See Flow counters, radiation

Counters, Liquid Scintillation, Automatic

Baird-Atomic, Inc. 1961: 3 Mar., 608; 17 Mar., 789; 21 Apr., 1155; 19 May, 1539

Counters, Radiation, Automatic Sample Changing

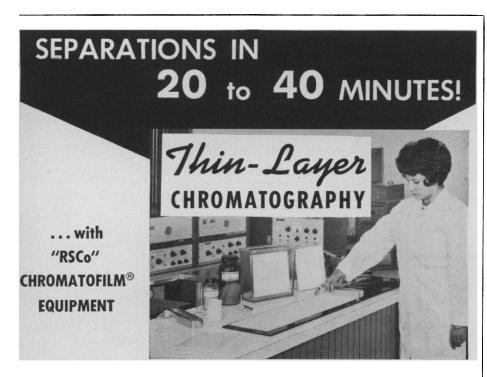
Baird-Atomic, Inc. 1961: 20 Jan., 139; 1 Sept., 584
Packard Instrument Co., Inc. 1960: 14 Oct., 990; 11 Nov., 1368
1961: 6 Jan., 12; 24 Mar., 794; 14 Apr., 1104; 21 Apr., 1165; 23 June, 1980; 7 July, 14; 5 Aug., 304; 1 Sept., 586
Technical Associates
1961: 24 Mar., 822

Counters, Whole Body

Packard Instrument Co., Inc. 1961: 6 Jan., 12; 3 Feb., 302; 17 Feb., 442; 3 Mar., 612; 31 Mar., 789; 21 Apr., 1165; 12 May, 1454; 9 June, 1794; 21 July, 160; 8 Aug., 440; 15 Sept., 702 Nuclear-Chicago Corp. 1961: 7 Apr., BC; 2 June, BC; 30 June, BC; 28 July, BC; 25 Aug., BC

Counters and Scalers, Gamma Radiation

Atomic Accessories Inc. 1960: 21 Oct., 1202
Baird-Atomics, Inc. 1961: 16 June, 1853; 22 Sept., 799
Hamner Electronics Co., Inc. 1961: 22 Sept., 892
Lionel Electronic Laboratories (formerly Anton Electronic Laboratories, Inc.) 1961: 20 Jan., 205; 16 June, 1953



This new Chromatofilm equipment makes the Thin-Layer method* of producing chromatograms easier than ever. It's fast . . . convenient . . . simple . . . reliable . . . and has a wide quantitative range. The technique can be learned quickly—even by inexperienced personnel.

Thin-Layer chromatography uses open glass plates layered with a thin film of adsorbent in place of conventional closed columns. Instead of taking hours

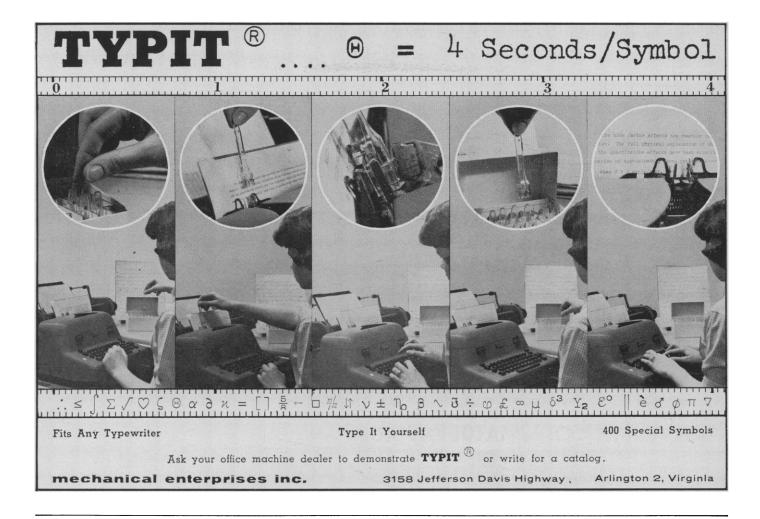
to complete a separation, only 20 to 40 minutes are required. And up to 20 determinations can be made at one time. Better resolution and easy recovery of sample components for further study are other advantages offered by this new method.

You may order the individual components of the *Chromatofilm*—or the complete assembly, including chemicals. Ask us for the entire *Chromatofilm* story.

*Stahl



Branch Sales Offices: Albany 5, N. Y. • Beston 16, Mass. • Elk Grove Villago, III. • Philadelphia 43, Pa. • Silver Spring, Md. Branch Warehouse: Elk Grove Village, III.





Students at Texas College of Arts and Industries find it easy to visualize problems in equatorial motion with the aid of their 4-inch UNITRON.

In this space age, astronomy is regaining its rightful place in the school curriculum. But your students deserve more than an opportunity to just read about the UNIVERSE—let them see for themselves the moons of Jupiter, the rings of Saturn, the craters of the Moon, and the many other celestial wonders.

UNITRON telescopes are America's largest selling refractors. They offer professional quality at prices well within the reach of school budgets. UNITRON Refractors are portable, easy to operate and, unlike other types, require no mainten-ance. Take advantage of your NDEA funds to invest in a UNITRON — the telescope with the proven reputation; the choice of leading schools and universities.

16 UNITRON Models to Choose from . . . including

1.6"	Altazimuth	Refractor	\$75
2.4"	Equatorial	Refractor	\$225
			\$265
			\$435
			\$465
			\$785 to \$1280
			\$5125 to \$6075

GET UNITRON'S FREE 50-PAGE OBSERVER'S GUIDE and CATALOG..

contents include -

- Observing the sun, moon, planets and sky wonders
- Constellation map
- Hints for observers . Glossary of telescope terms
- . How to choose a telescope



UNITRON'S 2.4" Altazimuth Refractor is a typical value . . .

Complete with Altazimuth Mounting and slow motion controls for both altitude and azimuth; tripod; 5X-16mm. viewfinder; rack and pinion focusing; 4 eyepieces and Achromatic Amplier to double eyepiece powers giving magnification range of 35-200X; UNIHEX Rotary Eyepiece Selector; \$125 sunglass; cabinet; and instructions.

L	INITRON
	TRUMENT COMPANY • TELESCOPE SALES DIV. NEEDHAM ST., NEWTON HIGHLANDS 61, MASS.
	Please rush to me, FREE of charge, UNITRON'S
	RVER'S GUIDE and TELESCOPE CATALOG # 4-U-3
OBSER Name	

20 OCTOBER 1961 1267

THERMAL CONDUCTIVITY DETECTORS AVAILABLE FROM ALL 16 CHROMATOGRAPH MAKERS

See Chemical & Engineering News, July 3, 1961 Issue

GOW-MAC MODEL 9285 (PRETZEL SPECIAL)



Gow-Mac Hot Wire

ARE IN LABORATORY CHROMATOGRAPHS BY 12 OF THESE 16 MANUFACTURERS!

> For YOUR best GC detector performance around the clock insist on GOW-MAC for quality, experience and fast delivery. New Gow-Mac Bulletins on Chromatograph Components:

- TCTH Hot Wire and Thermistor Detectors
- Tungsten and Teflon Clad Tungsten FIL **Hot Wires**
- GADE Gas Density Detector
- SPPS Power Supply Control Units
- MICE Micro-Cells

Visit Booth 33, Eastern Analytical Symposium -Nov. 15-17, Hotel Statler-Hilton, New York City

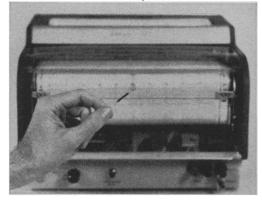
GOW-MAC INSTRUMENT COMPANY

100 KINGS ROAD, MADISON, N. J., U. S. A. . Telephone: FRontier 7-3450

GAS ANALYSIS INSTRUMENTS SINCE 1935

New from

GERMANIUM CRYOMETER SYSTEM



- Sustained Absolute Accuracy
- Complete Indicating and **Recording System**

The TI Cryometer System combines a newly developed germanium probe and a special "servo/riter"* recorder to pro-

vide continuous indication and recording of temperatures in the cryogenic range. TI Germanium Cryometers offer fast response, unexcelled reproducibility and withstand continued cycling to room temperature without restandardization.

Two standard systems are offered. One specifically covers the liquid hydrogen range reading directly in degrees Kelvin. The second covers the 1°-40° Kelvin range in five steps.

Write for complete information

APPARATUS DIVISION



IEXAS INSTRUMENTS INCORPORATED

3609 BUFFALO SPEEDWAY . HOUSTON 6, TEXAS

* A trademark of Texas Instruments Incorporated

Nuclear-Chicago Corp.

1961: 19 May, BC

Nuclear Measurements Corp.

1961: 24 Mar., 916; 19 May, 1653

Packard Instrument Co., Inc.

1960: 14 Oct., 990; 25 Nov., 1522

1961: 6 Jan., 12; 3 Feb., 302; 24 Mar., 794; 14 Apr., 1104; 21 Apr., 1165; 26 May,

1678: 7 July, 14 Picker X-Ray Corp.

1960: 18 Nov., 1447

1961: 24 Mar., 828; 16 June, 1868; 21

July, 154; 18 Aug., 435

Radiation Counter Laboratories, Inc.

1961: 16 June, 1845

Radiation Equipment & Accessories Corp.

1961: 24 Mar., 956

Radiation Instrument Development

Laboratory, Inc.

1960: 21 Oct., 1042

Technical Associates

1960: 21 Oct., 1036

1961: 19 May, 1552

Technical Measurement Corp.

1961: 21 Apr., 1194; 12 May, 1452; 16

June, 1882

Tracerlab, Inc.

1960: 21 Oct., 1080

1961: 31 Mar., IFC

Victoreen Instrument Co.

1960: 21 Oct., 1079

Counters and Scalers, Low-Level Radiation

Atomic Accessories Inc.

1960: 2 Dec., 1673 Baird-Atomic, Inc.

1961: 16 June, 1853

General Measurements

1961: 22 Sept., 885

Hamner Electronics Co., Inc.

1961: 22 Sept., 892

Isotopes, Inc.

1960: 21 Oct., 1186

Lionel Electronic Laboratories (formerly

Anton Electronic Laboratories, Inc.) 1961: 24 Mar., 955; 16 June, 1953

Nuclear-Chicago Corp.

1961: 19 May, BC

Packard Instrument Co., Inc.

1961: 6 Jan., 12; 3 Feb., 302; 21 Apr.,

1165

Picker X-Ray Corp.

1960: 18 Nov., 1A; 2 Dec., 1595

1961: 16 June, 1868; 21 July, 154; 18

Aug., 435

Radiation Counter Laboratories, Inc.

1961: 16 June, 1845

Radiation Equipment & Accessories Corp.

1961: 24 Mar., 956

Radiation Instrument Development

Laboratory, Inc.

1960: 21 Oct., 1042

Sharp Laboratories, Inc.

1960: 21 Oct., 1185 **Technical Associates**

1960: 21 Oct., 1036 1961: 19 May, 1552

Tracerlab, Inc.

1960: 21 Oct., 1080

1961: 31 Mar., IFC; 19 May, 1524

Victoreen Instrument Co.

1960: 21 Oct., 1079

Crucibles, Porcelain

Coors Porcelain Co. 1960: 21 Oct., 1199

1961: 24 Mar., 936

Crystal Growing Kits

Edmund Scientific Co. 1961: 24 Mar., 829

Crystals, Infrared

Isomet Corp. 1960: 2 Dec., 1699

Crystals, Optical

Harshaw Chemical Co. 1960: 7 Oct., 965 1961: 24 Feb., 591; 14 Apr., 1139; 16 June, 1933

Crystals, Scintillation

Harshaw Chemical Co. 1960: 7 Oct., 965; 9 Dec., 1775 1961: 24 Feb., 591; 14 Apr., 1139; 16 June, 1933; 25 Aug., 525

Culture Apparatus, Bacteriological

American Sterilizer Co. 1960: 11 Nov., 1351 1961: 20 Jan., 129; 24 Mar., 839; 22 Sept., 763
Bellco Glass, Inc. 1960: 18 Nov., 504
Delmar Scientific Laboratories 1961: 17 Feb., 534; 21 Apr., 1278
Kontes Glass Co. 1961: 21 July, 214

Culture Flasks

Bellco Glass, Inc. 1960: 4 Nov., 1321; 18 Nov., 1507 1961: 21 Apr., 1299 Kontes Glass Co. 1961: 21 July, 214

Culture Media

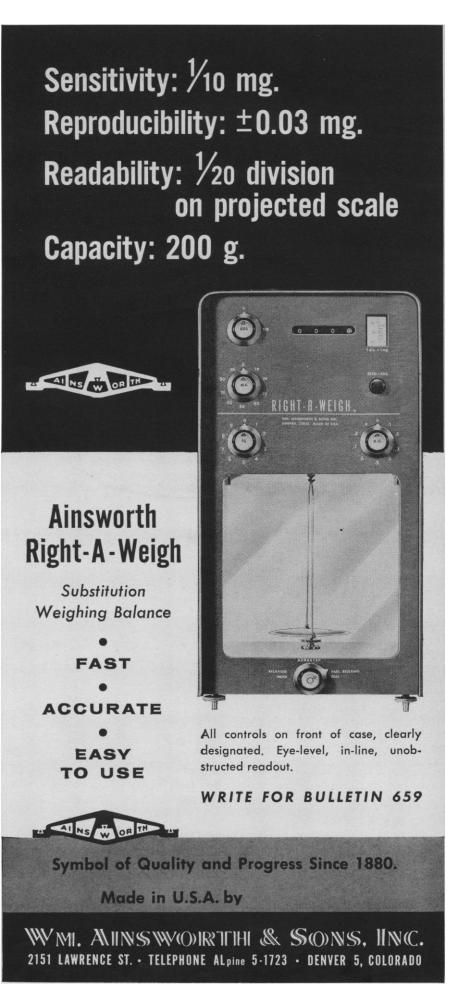
Difco Laboratories
1960: 21 Oct., 1167; 11 Nov., 1409; 2
Dec., 1691
1961: 20 Jan., 215; 17 Feb., 503; 24
Mar., 901; 21 Apr., 1294; 19 May, 1629;
16 June, 1945; 21 July, 219; 18 Aug., 493;
22 Sept., 863
Hyland Laboratories
1960: 21 Oct., 1153; 11 Nov., 1429; 23
Dec., 1899
1961: 20 Jan., 218; 17 Feb., 524; 24
Mar., 924; 22 Sept., 878

Culture Tube Closures

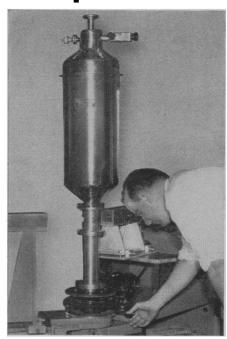
Bellco Glass, Inc. 1960: 4 Nov., 1321; 18 Nov., 1507; 2 Dec., 1713 1961: 20 Jan., 236; 3 Mar., 655; 24 Mar., 944; 14 Apr., 1140; 29 Sept., 954 Bio-Tech, Inc. 1961: 6 Oct., 1020

Demonstration Equipment, Nuclear

Lionel Electronic Laboratories 1961: 18 Aug., 418; 22 Sept., 765 Nuclear-Chicago Corp. 1961: 8 Sept., 635 Picker X-Ray Corp. 1960: 18 Nov., 1A 1961: 17 Feb., 413



Researching at Liquid Helium Temperatures?



New Dewar Keeps Helium Over 280 Hours Without Refilling

This stainless steel dewar was designed for neutron diffraction studies at low temperatures for the U. S. Naval Research Laboratory. The application required that the sample under study be held at liquid helium temperatures for many days. In initial performance tests $4\frac{1}{2}$ liters of liquid helium were used. Data resulting from the tests showed that over 100cc of helium still remained in the Hofman dewar after 280 hours.

SEND FOR NEW CATALOG

Also: Containers for Liquid Oxygen, Nitrogen, Hydrogen and Helium. Accessory Low Temperature Equipment.



LABORATORIES, INC. 5 Evans Terminal, Hillside, N. J.

Representatives in principal industrial and military centers.

Demonstration Equipment, Physics

Central Scientific Co. 1960: 16 Dec., 1847 1961: 20 Jan., 147; 7 Apr., 1088 Macalaster Bicknell Corp. 1961: 6 Oct., 1019

Densitometers, Micro

National Instrument Laboratories, Inc. 1960: 21 Oct., 1120
Photovolt Corp. 1960: 11 Nov., 1419
Welch, W. M., Scientific Co., Inc. 1960: 7 Oct., 967

Desalters

Kensington Scientific Corp. 1960: 28 Oct., 1265; 11 Nov., 1428 1961: 21 July, 209; 22 Sept., 879 Research Specialties Co. 1961: 30 June, 2072

Desiccators

Ace Glass, Inc. 1960: 21 Oct., 1189 Precision Scientific Co. 1961: 21 July, 151

Detectors, Gas Density

Gow-Mac Instrument Co. 1961: 21 July, 202

Detectors, Infrared

Williamson Development Co., Inc. 1961: 20 Jan., 232

Detectors, Radiation

Lionel Electronic Laboratories 1961: 17 Feb., 519

Dewar Flasks

Hofman Laboratories, Inc. 1961: 16 June, 1954

Diamond Knives

Du Pont, E. I., de Nemours & Co., Inc. 1961: 18 Aug., 511

Diffraction Gratings

Bausch & Lomb Optical Co. 1961: 8 Sept., 642

Diluters, Automatic

National Instrument Co., Inc. 1961: 18 Aug., 493

Disintegrators, Ultrasonic

Brinkmann Instruments, Inc. 1960: 11 Nov., 1435 1961: 20 Jan., 208

Heat Systems Co. 1961: 19 May, 1640; 22 Sept., 884

Instrumentation Associates 1961: 24 Mar., 920; 28 Apr., 1374

Scientific Glass Apparatus Co., Inc. 1961: 18 Aug., 500

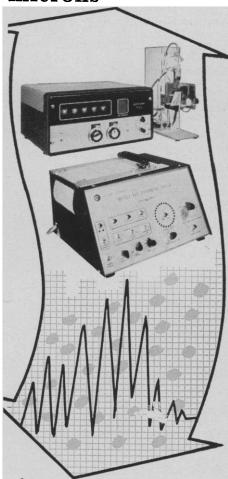
Will Corp.

1961: 18 Aug., 511; 22 Sept., 882

The

COULTER COUNTER®

automatically counts and sizes living cells small as 0.065 cubic microns



At present there are more than 2,000 biological and industrial Coulter Counter installations. Among the Coulter Counter's unique achievements; the capability to plot a size distribution curve in 100 seconds...less time than required for a Mean Cell Volume. Extensively used for 1 by 1 counts (50,000 in 13 seconds) of red blood cells... white blood cells... tissue culture cells... bacteria ... protozoa ... spermatozoa.*

*as well as contaminants, ceramics, foods and other particles for industrial needs.

Patented throughout the world.

for complete information write: COULTER ELECTRONICS, INC.

2525 N. Sheffield • Chicago 14, Illinois New York, Los Angeles, London, Rio De Janeiro SCIENCE, VOL. 134

Dispensers, Tilting

Kontes Glass Co. 1961: 18 Aug., 506

Drop Counters

National Instrument Laboratories, Inc. 1960: 2 Dec., 1672

Dry Box Gloves See Gloves, dry box

Dry Boxes

American Sterilizer Co. 1960: 11 Nov., 1351 1961: 20 Jan., 129; 16 June, 1855; 22 Sept., 763 Blickman, S., Inc. 1960: 21 Oct., 1177 1961: 21 Apr., 1254; 16 June, 1936

Kewaunee Scientific Equipment

1960: 21 Oct., 1170

Drying Apparatus, Glass

Corning Glass Works 1961: 24 Mar., 838

Egg Punch

Tri-R Instruments 1960: 21 Oct., 1203 1961: 24 Mar., 944

Electrometers, Vibrating Reed

Applied Physics Corp. *i960*: 11 Nov., 1348 1961: 19 May, 1542

Electron Microscopes

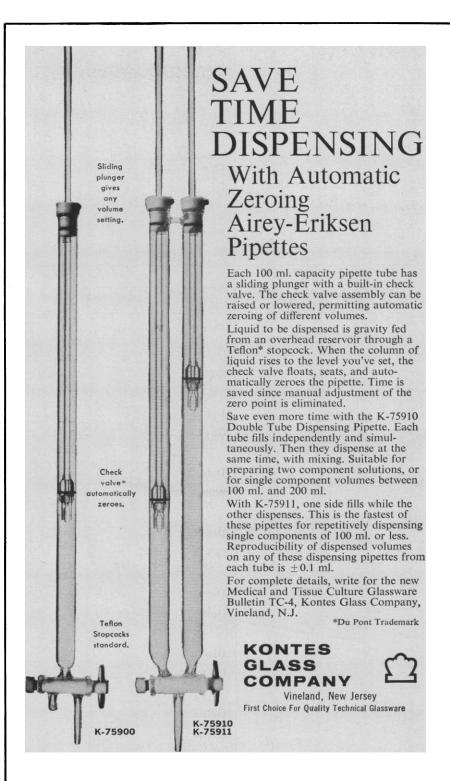
Bendix Corp. 1960: 11 Nov., 1425 1961: 13 Jan., 114; 10 Mar., 715 Erb & Gray Scientific, Inc. 1960: 21 Oct., 1173; 9 Dec., 1777 1961: 24 Mar., 953; 23 June, 2023 Fisher Scientific Co. 1961: 21 July, 156; 22 Sept., 772 Hitachi, Ltd. 1960: 28 Oct., IBC; 9 Dec., 1730 1961: 20 Jan., 148; 17 Feb., 421; 3 Mar., 649; 21 Apr., 1227; 28 Apr., 1320; 19 May, 1547; 16 June, 1854; 21 July, 132; 18 Aug., 429; 22 Sept., 766 National Instrument Laboratories, Inc. 1961: 24 Mar., 797; 12 May, 1447; 19 May, 1508; 16 June, 1850 Philips Electronic Instruments 1961: 18 Aug., 483; 8 Sept., 681; 22 Sept., 875; 6 Oct., 1016 Picker X-Ray Corp. 1960: 21 Oct., 1073

Electron Paramagnetic Resonance Equipment

Varian Associates 1960: 7 Oct., 920 1961: 13 Jan., 109; 24 Mar., 804; 19 May, 1520; 30 June, 1A

Electron Probe Microanalyzers

Philips Electronic Instruments



The apparatus

shown above, together with a new, adjustable volume tilting dispenser, a magnetic stirrer and spinner flask, and other interesting items, is described in a newly available bulletin

To receive a copy FREE, just drop a note to KONTES GLASS COMPANY, VINELAND, N. J. and ask for TC-4.

covering Kontes Medical and Tissue Culture Products.

1961: 18 Aug., 432; 22 Sept., IBC

Electron Spin Resonance Equipment

Ridgefield Instrument Group 1961: 24 Mar., 935

Electrophoresis, Disc

Canal Industrial Corp. 1961: 30 June, 2074; 14 July, 114; 25 Aug., 571

Electrophoresis, Liquid

Beckman Instruments, Inc., Spinco Div. 1960: 11 Nov., IFC; 25 Nov., IFC 1961: 10 Feb., IFC; 25 Aug., IFC Brinkmann Instruments, Inc. 1961: 19 May, 1532

E-C Apparatus Co. 1960: 21 Oct., 1167 1961: 20 Jan., 217 Fisher Scientific Co. 1961: 12 May, 1493; 25 Aug., 569 Gilson Medical Electronics 1961: 1 Sept., 622 JKM Instrument Co., Inc. 1961: 19 May, 1525 Kern Co. 1960: 7 Oct., 964

LKB Instruments, Inc. 1961: 21 Apr., 1158

National Instrument Laboratories, Inc. 1960: 21 Oct., 1121 Servonuclear Corp. 1961: 26 May, 1726

Electrophoresis, Paper

Beckman Instruments, Inc., Spinco Div. 1961: 26 May, IFC Buchler Instruments, Inc. 1961: 5 May, 1434; 22 Sept., 762 JKM Instrument Co., Inc. 1961: 22 Sept., 889 Photovolt Corp. 1961: 16 June, 1955 Thomas, Arthur H., Co. 1961: 22 Sept., BC

Electrophoresis, Paper Strip Scanners

Gilson Medical Electronics 1961: 7 Apr., 1036 Photovolt Corp. 1961: 20 Jan., 207; 17 Feb., 509; 19 May, 1641; 16 June, 1955 Servonuclear Corp. 1960: 21 Oct., 1156

Electrophoresis, Solid Media

Buchler Instruments, Inc. 1961: 3 May, 1434; 16 June, 1950 Canal Industrial Corp. 1961: 31 Mar., 974; 21 Apr., 1150 National Instruments Laboratories, Inc. 1961: 21 July, 228

Electroplating Analyzers

Greiner, Emil, Co. 1961: 21 Apr., 1264

Environmental Chambers

Electric Hotpack Co., Inc. 1960: 11 Nov., 1435 1961: 17 Feb., 525 Lehigh Valley Electronics 1961: 22 Sept., 868

Evaporators, Flash

Buchler Instruments, Inc. 1960: 2 Dec., 1600

Evaporators, Rotary

Buchler Instruments, Inc. 1960: 2 Dec., 1600 1961: 19 May, 1538 Nester & Faust 1961: 21 Apr., 1276; 21 July, 210 VirTis Co. 1961: 16 June, 1872

Evaporators, Vacuum Coating

Mikros Inc.

1961: 22 Sept., 851 National Research Corp. 1961: 18 Aug., 481

Exposure Meters, Photomicrographic See Photomicrographic exposure meters

Extractors, Fat

Delmar Scientific Laboratories 1961: 17 Feb., 534; 21 Apr., 1278

Feed, Animal See Animal food

PATHOLOGY

MICROBIOLOGY

BIOCHEMISTRY

PHARMACOLOGY

HIGH INTENSITY **SONIFIER***

New Research **Processing Tool**



- Homogenizing tissue
- Cell and bacteria breakdown
- Emulsifying difficult combinations

extreme intensity, power selection portable, easy to use, 20 kc various tip shapes

EXAMPLES: yeast cells (Histoplasma Capsulatum) completely disrupt in 10 min.

Actinomyces & Corynebacterium, good disruption with 50% protein release & excellent enzyme activity in 5 min. Chlorella disrupts in 2 min. Micrococci in 15 min.

HEAT SYSTEMS CO. 777 Northern Blvd., Great Neck, L.I., N.Y.

* trademark Branson Instruments, Inc., Conn.

1272





THIN LAYER **CHROMATOGRAPHY APPARATUS**

The New **KENSCO Apparatus** is Simple to Use, Reliable. and

Send for descriptive literature.

Inexpensive.

Advantages of Thin-layer Chromatography

Simplicity of technique.

Rapid separations on a micro scale of compounds such as lipids, alkaloids, steroids, etc.

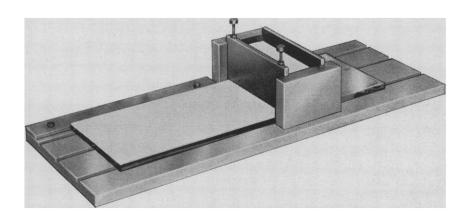
High sensitivity with sharper separations.

Applicable to a wide range of different compounds.

Corrosive spray agents may be safety applied.

Experiments with different solvent systems may serve as a guide for application to columns on a preparative scale.

Bibliography on request.



KENSINGTON SCIENTIFIC CORPORATION BERKELEY 10, CALIF.

1717 FIFTH STREET

1273

NATIONAL APPLIANCE

Model 3221 (Stainless Steel) National offers nine models of CO2 incubators. National Appliance Co. 7634 S.W. Capitol Hy. • Portland 19, Ore. Eastern Sales: H. Reeve Angel & Co., Inc. 9 Bridewell Pl. • Clifton, N. J.

STAINLESS STEEL Water-Jacketed CO2 INCUBATORS

National Appliance offers a complete line of apparatus from small, specially designed research models to large, custom-built incubation

CO₂ tension is obtained by continuous flow, vacuum and batch displacement methods. These versatile incubators quickly reach and accurately maintain any required incubating condition. National's high quality controls and easy-to-read calibrations make operation simple and efficient. These incubators are designed for use as wet or dry chambers, paraffin embedding units as well as anaerobic applications. They can be equipped with CO2 sampling and supply systems for measuring and maintaining desired atmospheres with extreme sensitivity. There is a National incubator ideally suited to your purpose.

FREE: Send now for a free copy of Bulletin No. 6051, "Carbon Dioxide Incubation." contains a complete description of applications, methods and advantages in the use of CO. incubation, as well as National's complete line of CO2 incubators, accessories and price lists.

NATIONAL APPLIANCE



An ideal bench-scale reactor with numerous uses for pressures to 1000 psig. and temperatures to 350°C.

Reactions are conducted in interchangeable 1 and 2 liter, stirrer-type bombs with all wetted parts made of T316 stainless steel, Monel, Nickel, Hastelloy B or C, Carpenter 20 and other corrosion resistant alloys. Internal cooling coils, glass liners and other accessories are available.

Ask for Specification 4500



INSTRUMENT COMPANY MOLINE, ILLINOIS



2-Hydroxy-3-Naphthaldehyde Protein bound amino groups

Neutral Buffered Formalin Fixation

 β -Naphthyl Acetate, 6-Bromo-2-Naphthyl Acetate Acetyl choline esterase

Sodium-6-benzoyl-2-Naphthyl Phosphate, Sodium lpha-Naphthyl Phosphate Phosphatase

2-[4'-Hydroxybenzeneazo] Benzoic Acid (HABA)

Albumin in blood plasma

Carbonaphthoxy Choline lodide Serum choline esterase

6-Bromo-2-Naphthyl B-D-Glucuronide β -Glucuronidase

Naphthyl AS Acetate, Indoxyl Acetate Esterase and acetyl choline esterase

Tetraxolium Salts

Redox enzyme systems

Write for catalog today.

Custom Syntheses Invited.

THE *Borden* CHEMICAL COMPANY 5000 LANGDON STREET + P. O. BOX 9522 PHILADELPHIA 24, PA

Fermentation Equipment

New Brunswick Scientific Co., Inc. 1960: 21 Oct., 1163 1961: 3 Feb., 335; 9 June, 1837; 6 Oct.,

Filiments. Wire

Gow-Mac Instrument Co. 1961: 17 Feb., 512

Film, Transparencies

Polaroid Corp. 1961: 19 May, 1549

Filter Funnels

Ace Glass, Inc. 1961: 17 Feb., 527

Filter, Gel

Pharmacia 1961: 3 Feb., 298; 24 Feb., IBC; 17 Mar., 728; 14 Apr., IBC; 8 Sept., 636

Filter Papers

Eaton-Dikeman Co. 1960: 21 Oct., 1178; 2 Dec., 1696 1961: 17 Feb., 514; 24 Mar., 908; 21 Apr., 1296; 19 May, 1551; 21 July, 131; 22 Sept., 759 Schleicher, Carl, & Schuell Co. 1960: 21 Oct., 1154 1961: 21 Apr., 1262; 12 May, 1496 Reeve Angel 1961: 20 Jan., 127; 17 Feb., 436; 19

May, 1507; 21 July, 147; 22 Sept., 754

Filters, Bacteriological

Custom Scientific Instruments, Inc. 1961: 16 June, 1862; 18 Aug., 497 Millipore Filter Corp. 1961: 18 Aug., 502

Filters, Interference

Baird-Atomic, Inc. 1960: 21 Oct., 1151 1961: 20 Jan., 203; 24 Mar., 907; 21 Apr., 1172; 5 May, 1389; 19 May, 1527; 15 Sept., 698 Bausch & Lomb Optical Co. 1961: 2 June, 1738; 8 Sept., 642 Fish-Schurman Corp. 1960: 21 Oct., 1152; 2 Dec., 1682 1961: 17 Feb., 517; 21 Apr., 1268 Mearl Corp. 1961: 22 Sept., 787 Photovolt Corp. 1961: 10 Feb., 393; 11 Aug., 398

Filters, Membrane

Millipore Filter Corp. 1961: 21 July, 234; 5 Aug., 300; 18 Aug., 502; 1 Sept., 624; 15 Sept., 744; 29 Sept., Schleicher, Carl, & Schuell Co. 1960: 2 Dec., 1716

Filters, Polarizing

Pioneer Scientific Corp. 1960: 14 Oct., IBC; 9 Dec., 1734

Filters, Porcelain

Brinkmann Instruments, Inc. 1961: 7 Apr., 1087; 21 Apr., 1285

Flame Photometers

Baird-Atomic, Inc. 1960: 21 Oct., 1198; 11 Nov., 1408; 2 Dec., 1684 1961: 17 Feb., 502; 24 Mar., 928; 31 Mar., 968; 19 May, 1605; 16 June, 1880; 28 July, 246 Beckman Instruments, Inc., Scientific and Process Instruments Div. 1961: 23 June, 2024 Brinkmann Instruments, Inc. 1961: 31 Mar., 1028 Coleman Instruments, Inc. 1960: 2 Dec., 1609 1961: 16 June, 1879; 18 Aug., 428 Zeiss, Carl. Inc. 1961: 31 Mar., 1028

Flasks, Culture

Bellco Glass, Inc. 1961: 21 Apr., 1299

Flasks, Spinner

Bellco Glass, Inc. 1960: 7 Oct., 970; 16 Dec., 1848

Flasks, Volumetric

Corning Glass Works 1961: 20 Jan., 144; 18 Aug., 426

Flow Counters, Radiation

Technical Associates 1961: 24 Mar., 822 Tracerlab, Inc. 1961: 24 Mar., 806

Flowmeters

Corning Glass Works
1961: 24 Mar., 838; 19 May, 1536
Gilmont, Roger, Instruments, Inc.
1961: 19 May, 1530
Ohio Chemical & Surgical Equipment Co.
1961: 24 Mar., 931
Phipps & Bird, Inc.
1961: 17 Mar., 773
Precision Scientific Co.
1961: 20 Jan., 198

Fluid Dispensers

Palo Laboratory Supplies, Inc. 1961: 21 Apr., 1300

Fluorometers, Photoelectric

Baird-Atomic, Inc.
1961: 16 June, 1880
Beckman Instruments, Inc., Scientific and Process Instruments Div.
1961: 23 June, 2024
Coleman Instruments, Inc.
1960: 2 Dec., 1609
1961: 10 Feb., 354; 24 Mar., 831; 16
June, 1879; 21 July, 135
Farrand Optical Co., Inc.
1960: 2 Dec., 1697
Harshaw Scientific
1961: 13 Jan., 115



Optically and mechanically, the M-5 offers unequalled precision, convenience and versatility for the most diverse research applications. Uniform, maximum sharpness throughout the field, with no change in accommodation, is one of the many exclusive features of the instrument.

With a constant working distance of 96 mm., standard magnifications are 6x, 12x, 25x, and 50x, conveniently selected on the rotatable horizontal drum. Using 8x, 10x, 15x, and 20x eyepieces and attachment objectives, a total power range of from 5x to 200x is obtainable. Accessories not illustrated include other wide field eyepieces, various light sources, stages and polarizing, photographic and measuring attachments.

Your own evaluation of this superb stereomicroscope will prove most rewarding. Write for Booklet M-5.

*the FIRST name in a complete line of Surveying Instruments, Photogrammetric Equipment and Microscopes.



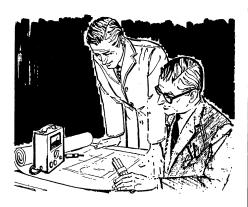
the most complete line of

CONDUCTIVITY EQUIPMENT

Industrial Instruments Inc., since its inception more than 20 years ago, has devoted itself to the design and manufacture of



electrolytic conductivity bridges and conductivity cells. Industrial Instruments catalog No. 23 presents the most complete line of conductivity equipment in the world. A copy is available on request.



In addition to its extensive line of cataloged industrial and laboratory bridges and cells, Industrial Instruments is pleased to work with researchers in the design and construction of special test equipment in this and related fields.

Typical conductivity bridges and cells are illustrated below. Contact us if you have an application for standard or special electrolytic conductivity apparatus.



Klett Manufacturing Co. 1960: 21 Oct., 1152; 11 Nov., 1427 1961: 13 Jan., 117; 17 Mar., 773; 5 May, 1433; 25 Aug., 567; 6 Oct., 1025 Photovolt Corp. 1960: 14 Oct., 1025; 18 Nov., 1507; 30 Dec., 1949 1961: 13 Jan., 113; 24 Feb., 591; 31

1961: 13 Jan., 113; 24 Feb., 591; 31 Mar., 1023; 9 June, 1839; 14 July, 116; 25 Aug., 567; 15 Sept., 741 Will Corp.

1961: 21 July, 231

Fractionators, Counter Current

E-C Apparatus Co. 1960: 21 Oct., 1167 1961: 20 Jan., 217; 24 Mar., 790

Fraction Collectors, Gas

Hamilton Co., Inc. 1961: 5 May, 1448; 19 May, 1655 Packard Instrument Co., Inc. 1960: 21 Oct., 1054; 23 Dec., 1860 1961: 20 Jan., 164

Fraction Collectors, Liquid

Buchler Instruments, Inc. 1960: 2 Dec., 1600 1961: 21 Apr., 1273; 21 July, 219; 22 Sept., 762 Gilson Medical Electronics 1960: 25 Nov., 1567 Hamilton Co., Inc. 1960: 21 Oct., 1194 Research Specialties Co. 1961: 17 Feb., 496; 21 Apr., 1298 Vanguard Instrument Co. 1960: 11 Nov., 1350 1961: 24 Mar., 830; 21 July, 136; 22 Sept., 774

Freeze Drying Equipment

American Sterilizer Co.

1960: 21 Oct., 1071

1961: 20 Jan., 129; 19 May, 1517; 16

June, 1855; 18 Aug., 417; 22 Sept., 763

Instrumentation Associates, Inc.

1961: 2 June, IBC

Repp Industries, Inc.

1961: 21 July, 134

VirTis Co.

1960: 14 Oct., 984; 21 Oct., 1056; 11

Nov., 1344; 2 Dec., 1598

1961: 20 Jan., 138; 21 Apr., IBC; 19

May, 1638; 18 Aug., 501; 22 Sept., 769

Frequency Analyzers

General Applied Science Laboratories, Inc. 1961: 21 Apr., 1300; 19 May, 1634; 16 June, 1958

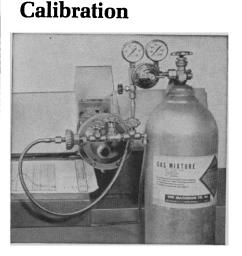
Furnaces, Combustion Tube

Lindberg Engineering Co. 1961: 17 Feb., 529

Furnaces, Laboratory, General Purpose

Curtiss-Wright Corp. 1961: 21 Apr., 1274 Burrell Corp. 1961: 26 May, 1719 Lindberg Engineering Co. 1961: 17 Feb., 529; 21 Apr., 1273

MATHESON GAS MIXTURES for Instrument



In addition to all of the calibration mixtures, Matheson supplies custom gas mixtures of every type, including radioactive gas mixtures. Extremely close tolerances on specifications can be held. Exact analysis of mixtures is available. Here are a few of the instruments for which calibration mixtures are offered:

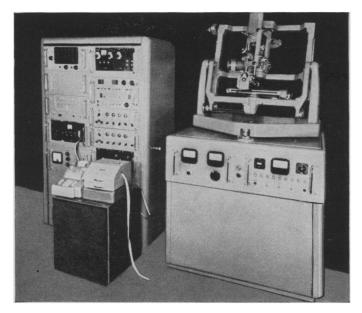
Oxygen Analyzers
Gas Chromatography
Infra Red
Mass Spectrometer

Practically any mixture of the 85 gases listed in the Matheson Compressed Gas Catalog can be supplied, to your specifications. This Catalog contains information on the world's most complete line of compressed gases, and gas regulating and handling equipment.

Write for catalog

THE MATHESON COMPANY, INC.

East Rutherford, N. J.; Joliet, Ill.; Newark, Calif.



LINEAR X-RAY DIFFRACTOMETER

for crystal structure analysis

The Y-190 Linear X-ray Diffractometer provides automatic measurement of X-ray reflections from single crystals—recorded in logical order on reciprocal lattice lines. After each recording, one adjustment sets the instrument for the next level.

It permits an accurate, fast and automatic method of measuring the large numbers of diffraction spectra in the study of complex, involved substances.

3 to 4 analyses per minute

The instrument is provided with recording rate-of-count meter and printing scaler. Performance depends upon the type of crystal under examination. In most cases, measurement of three to four reflections per minute is possible, with an accuracy of 2-3% by the point-by-point method; the less accurate method of continuous scanning allows even greater speeds.

The Linear Diffractometer was developed by Doctors Arndt and Phillips at the Royal Institution, London.

For complete information concerning the Y-190 ask for catalog CH-412

ENGIS EQUIPMENT COMPANY

431 SOUTH DEARBORN ST. • CHICAGO 5, ILL.,
TELEPHONE: HARRISON 7-3223
AFFILIATED WITH HILGER & WATTS, INC



New Honeywell portable humidity indicator with direct read-out

This indicator is completely self-contained. Power from integral long-life mercury batteries. Provides approximately 100 hours of service, enough for thousands of readings. Overall relative humidity indicating range of 10 to 100% R-H. Responds and indicates changes in relative humidity with accuracies to 1½% R-H. Supplied with each indicator are six indicating dials used in conjunction with six sensing elements of the corresponding ranges.

Direct R-H Read-Out ● Temperature Compensating Thermister ● Portable ● Transistorized ● Wide Indicating Range ● Accurate

*Price includes one sensing element. (select from those listed in coupon) Additional five elements available for complete range at \$20.00 each. Cowhide carrying case shown, extra. Specify #117029, \$15.00.

Honeywell

		•			
First in Control					
HONEYWE	LL • Dept.	S-101, M	inneapolis 8	, Minn.	
Attached	is our Pur	chase Orde	er for	_ Portable	e Humidity
Indicators	. Please e	quip indic	ator(s) wit	h sensing	element(s)
for range(s) indicate	ed.		•	
			50-75%	65-90%	80-100%
R-H	R-H	R-H	R-H	R-H	R-H
☐ Please send additional information on the Portable Humidity Indicator					
NAME					
ADDRESS					
СІТҮ			STATE		

20 OCTOBER 1961 1277

Pure Research

... with impure biochemicals?

Make sense? No. That is why, for over 35 years, Pfanstiehl has been producing the best, rather than the longest list, of rare sugars, amino acids, and other biochemicals. During these years, many leading laboratory supply houses have listed and furnished biochemicals bearing the **Pfanstieh**l label because they can depend on the Pfanstiehl name.

Some of our newer items are: L-Xylose, stachyose, Nacetylgalactoseamine, Lyxosimine, Tyrosine C.P. and practical, Zinc and magnesium glucoheptonates.

The Pfanstiehl 1961 Catalog with specifications, structural formulas, and prices is available on request. You may order Pfanstiehl products direct or through your favorite supply house. Special prices are available for bulk quantities. Listed below are some of the laboratory supply houses that carry Pfanstiehl

ANN ARBOR, MICH. Eberbach & Son BOSTON, MASS. Howe & French, Inc. Howe & French, Inc.
CHICAGO, ILL.
Central Scientific Co.
Chicago Apparatus Co.
A. Daigger
A. S. LaPine
E. H. Sargent
Schaar & Company
Wilkins-Anderson
CINCINNATI, OHIO
Laboratory Services, Inc.
COLUMBIA, S. C.
Southestern Biochemicals, Inc.

DOMESTIC DISTRIBUTORS

DOMESTIC DISTRIBUTORS
EVANSTON, ILL.
American Hospital Supply Co.
JAMAICA, NEW YORK
Lisseo Scientific Co.
LOS ANGELES, CALIF.
Braun Chemical Co.
MEMPHIS, TENN.
Technical Products Co.
MINNEAPOLIS, MINN.
Geo. T. Walker Co.
NEW YORK, N. Y.
Amend Drug & Chemical Co.
New YORK, N. Y.
Amend Drug & Chemical Co.
New YORK, N. Y.
Arthur II. Thomas
Edward P. Dolbey Co.
Arthur II. Thomas

PORTLAND, ORE. Scientific Supply Co. PROVIDENCE, R. I. Eastern Scientific Co. ROCHESTER, N. Y. Will Corp.

ST. LOUIS, MO.

SAN FRANCISCO, CALIF. Braun-Knecht-Heiman SEATTLE, WASH. Scientific Supply Co. WASHINGTON, D. C. Z. D. Gilman, Inc.

FOREIGN DISTRIBUTORS
Many supply houses abroad distribute Pfanstiehl chemicals, either under our own label or theirs.

A few are: ARGENTINA ARGENTINA
M. Godfrid
AUSTRALIA
Watts Winter
BELGIUM
Lab. Pharmaceutica BRAZIL
B. Herzog
CANADA
Can. Lab. Supply
CUBA
Casaturull

GERMANY
Munich Med. Assoc.
INDIA
B.N. Bose Co.
ITALY
Agrar

MEXICO Hoffman-Pinther SWITZERLAND Fluka A.G.



Pfanstiehl Laboratories, Inc.

1217 Glen Rock Avenue ● Waukegan, Illinois



CRYOBIOLOGY

LONG TERM PRESERVATION OF BIOLOGICAL SPECIMENS IN LIQUID N₂ AT -320° F.



Today, liquid nitrogen is used for storage of viruses, bacteria, cancer cells, tissue, sperm and blood. CRYENCO specializes in providing equipment for your low temperature investigation and work.

work.

Now, we are producing a complete line of low temperature biological storage dewars (Biostats)—from 325 cu. in. to 17.5 cu. ft. Ease of operation and convenience are featured. Operation is economical with safe, long storage time—you fill only every 30 to 90 days, depending on unit and use

Write for our complete catalog on CRYENCO BIOSTATS, company letterhead, please.



CRYOGENIC ENGINEERING COMPANY
217 WEST 48th AVENUE • DENVER 16, COLORADO
Low Temperature, High Vacuum Equipment
and Engineering

Thermolyne Corp.

1961: 24 Mar., 908; 21 Apr., 1306; 21 July 220; 18 Aug., 492; 22 Sept., 886

Furnaces, Ultra-High Temperature

Curtiss-Wright Corp. 1961: 18 Aug., 510

Furniture, Laboratory

Ajusto Equipment Co. 1961: 22 Sept., 852

Aloe Scientific

1961: 19 May, 1652; 22 Sept., 887

Duralab Equipment Corp.

1960: 21 Oct., 1193; 2 Dec., 1686

1961: 24 Mar., 910

Equipto

1961: 24 Mar., 947; 21 Apr., 1289; 19

May, 1647

Fisher Scientific Co. 1960: 21 Oct., 1086 1961: 5 May, 1387

Kewaunee Manufacturing Co.

1961: 19 May, 1610

Funnels, Separator

Kimble Glass Co. 1961: 24 Mar., 803

Galvanometers, Teaching

Central Scientific Co. 1961: 3 Feb., 338

Gas Containers, Liquid

Hofman Laboratories, Inc. 1961: 24 Mar., 942 Linde Co. 1960: 7 Oct., 962

Gases, Compressed

Matheson Co., Inc.

1961: 21 Apr., 1269; 16 June, 1956; 18

Aug., 419

Ohio Chemical & Surgical Equipment Co.

1961: 16 June, 1936

Gauges, Vacuum

Gilmont, Roger, Instruments, Inc. 1961: 22 Sept., 897 Greiner, Emil, Co. 1961: 22 Sept., 760

Gaussmeters

Harvey-Wells Corp. 1961: 18 Aug., 425

Generators, Signal

Strand Labs., Inc. 1961: 6 Oct., 1018

Germ-Free Apparatus

American Sterilizer Co. 1960: 11 Nov., 1351 1961: 16 June, 1855

Glass Blowing Equipment

Bethlehem Apparatus Co., Inc. 1960: 21 Oct., 1157; 2 Dec., 1704 1961: 22 Sept., 784

Glassware Coating, Plastic

Ace Glass, Inc. 1961: 24 Mar., 923

Glassware, Laboratory

Ace Glass, Inc. 1961: 19 May, 1643 Corning Glass Works

1960: 4 Nov., 1281; 11 Nov., 1420; 2

Dec., 1606

1961: 20 Jan., 144; 21 Apr., 1170; 21 July, 145; 18 Aug., 426; 22 Sept., 780; 6

Oct., 967

Delmar Scientific Laboratories

1961: 25 Aug., 571 Doerr Glass Co. 1960: 21 Oct., 1A Greiner, Emil, Co. 1961: 19 May, 1534 Kimble Glass Co.

1960: 11 Nov., 1357; 9 Dec., 1731

1961: 21 Apr., 1173; 18 Aug., IBC

Kontes Glass Co. 1961: 24 Mar., 899 Thomas, Arthur H., Co. 1961: 5 May, BC

Glassware, Micro

Ace Glass, Inc. 1961: 19 May, 1643
Corning Glass Works
1961: 19 May, 1536
Delmar Scientific Laboratories
1961: 25 Aug., 571
Kontes Glass Co.
1961: 24 Feb., 595; 24 Mar., 899; 21
Apr., 1269

Glassware Washers

Chemical Rubber Co. 1961: 24 Mar., 958
Fisher Scientific Co. 1961: 31 Mar., 1027; 5 May, 1387

Gloves, Dry Box

Charleston Rubber Co. 1961: 24 Mar., 945; 19 May, 1645 Wilson Rubber Co. 1961: 6 Jan., IBC; 24 Mar., IBC; 6 Oct., IBC

Glow Boxes

Instruments for Research and Industry 1960: 21 Oct., 1200; 11 Nov., 1430 1961: 20 Jan., 225; 24 Mar., 935; 16 June, 1937; 18 Aug., 503

Graduates, Plastic

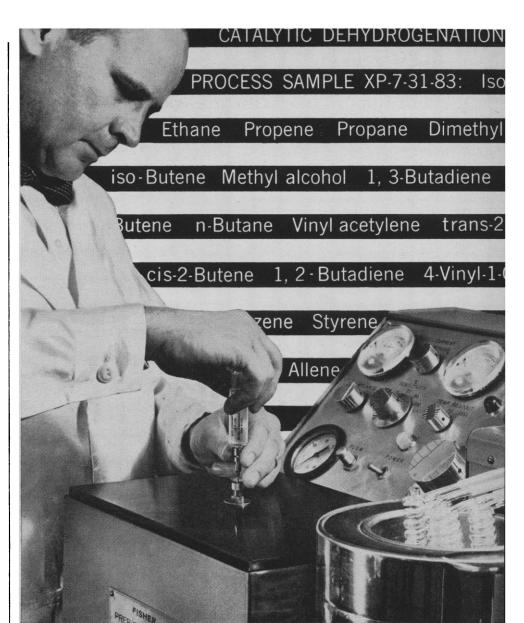
Nalge Co., Inc. 1961: 16 June, 1960; 18 Aug., 489

Growth Chambers, Plant

National Appliance Co. 1961: 19 May, 1609 Sherer-Gillett Co. 1961: 19 May, 1633

Heating Mantles

Glas-Col Apparatus Co. 1961: 26 May, 1671



PUT IN COMPLEX SAMPLES...GET BACK PURE COMPONENTS WITH FISHER'S NEW, LOW-COST PREP/PARTITIONER*

This <u>preparative</u> gas chromatograph separates complex liquid mixtures of up to 10 ml quickly, cleanly, completely—recovers purified components for study and use. Recovery yield: 85% to 95%. Column length can be varied, columns and packings changed; carrier gas is nitrogen; injection inlet has built-in needle, detachable syringe. Price? With all auxiliaries, Fisher's new Prep/Partitioner costs a third of comparable apparatus. **More facts?** Call your Fisher branch for free Bulletin FS-239, or write Fisher Scientific Company, 139 Fisher Building, Pittsburgh 19, Pa.

*Fisher Scientific Company Trademark



FISHER SCIENTIFIC

World's Largest Manufacturer-Distributor of Laboratory Appliances & Reagent Chemicals

Boston • Chicago • Fort Worth • Houston • New York • Odessa, Texas

Philadelphia • Pittsburgh • St. Louis • Washington • Montreal • Toronto

Heating Tapes

Glas-Col Apparatus Co. 1961: 23 June, IBC; 25 Aug., 522 Standard Scientific Supply Corp. 1960: 11 Nov., 1434

Hematocrits, Micro

Yellow Springs Instrument Co., Inc. 1961: 28 Apr., 1372; 19 May, 1630; 22 Sept., 850

Homogenizers, Tissue

Brinkmann Instruments, Inc. 1961: 20 Jan., 208

Gifford-Wood Co.
1961: 24 Mar., 954
Heat Systems Co.
1961: 19 May, 1640
Instrumentation Associates, Inc.
1960: 11 Nov., 1406
Kontes Glass Co.
1960: 21 Oct., 1193; 11 Nov., 1410
1961: 20 Jan., 232; 19 May, 1634
Smith, Arthur F., Inc.
1960: 14 Oct., 1021
Sorvall, Ivan, Inc.
1961: 19 May, 1607; 18 Aug., 479
Tri-R Instruments
1961: 21 Apr., 1309
VirTis Co.

1961: 24 Mar., 796

Hoods, Fume

Blickman, S., Inc.

1960: 21 Oct., 1177

1961: 17 Feb., 525; 21 Apr., 1254; 18

Aug., 507

Kewaunee Scientific Equipment

1961: 21 July, 232

Laboratory Construction Co.

1961: 22 Sept., 873

Hoods, Microbiological

Blickman, S., Inc. 1960: 21 Oct., 1177 1961: 17 Feb., 525

Hoods, Radioactivity

Blickman, S., Inc. 1961: 17 Feb., 525; 16 June, 1936

Hot Plates

Harshaw Scientific 1961: 24 Mar., 952; 21 Apr., 1284 Lindberg Engineering Co. 1960: 11 Nov., 1425 1961: 24 Mar., 953; 19 May, 1618 New York Laboratory Supply Co. 1960: 2 Dec., 1719 Precision Scientific Co. 1960: 2 Dec., 1687 Standard Scientific Supply Corp. 1961: 21 Apr., 1258 Thermolyne Corp. 1960: 21 Oct., 1192; 2 Dec., 1678 1961: 20 Jan., 206; 17 Feb., 520; 16 June, 1942 Thomas, Arthur H., Co. 1961: 6 Oct., BC Will Corp. 1960: 2 Dec., 1707

Hydrogen Determinaters

Coleman Instruments, Inc. 1961: 19 May, 1546 Fisher Scientific Co. 1961: 9 June, 1788

Hydrogenation Apparatus

Parr Instrument Co. 1961: 21 July, 216

Incubators, Co2

National Appliance Co. 1960: 21 Oct., 1170 1961: 20 Jan., 213; 24 Mar., 946; 22 Sept., 856

Incubators, Dubnoff

Harshaw Scientific 1961: 13 Jan., 115

Insurance

Teachers Insurance and Annuity Assoc. 1961: 13 Jan., 116

Interferometers

Central Scientific Co. 1960: 16 Dec., 1849 Ercona Corp. 1960: 2 Dec., 1586 1961: 18 Aug., 412

CLEANEST CLEANEST CLEANEST CLEANEST CLEANEST CLEAN EANEST CLEANEST CLEANEST C **IEST** IST CLEANEST CLEANEST CLEANEST CLE T CLEANEST CLEANEST CLEANEST CLEAN CLE> IT CLEANEST CLEAN TOT CLEANEST CLEAP IEST CLEAN? EST CLEANEST C IT CLEANS CLEANEST CLE CLEANEST CLEAR CLEANEST CLEA COLANEST CLEANEST CLEANEST CLE IEST CHARAMA CLEANEST CLEANE CLEANEST C CLEANEST CLEANEST CLEAP ST CLEANEST CLEANEST CL ÆST CLE JEST CLEANEST CLEANEST CLEA CÉANEST C CLEANEST CLEANEST CLEANEST CLEANEST CLEANEST CLEAN EST CLEANEST CLEAR CLEANEST CLEANEST CL EANEST CLEAR CLEANEST rleanest c JEST C ANEST CLE it clea **CLEANES** ANEST CLEA -ANEST CLEAN T. Fre



Proven the world's finest and most economical detergent for the exacting requirements of Hospital, Medical and Laboratory use.

MEETS HIGHEST U.S. GOVERNMENT SPECIFICATIONS

MORE WETTING POWER!
MORE SEQUESTERING POWER!
MORE EMULSIFYING EFFECT!
QUICKLY, COMPLETELY
SOLUBLE AND RINSABLE!

More effective than any known detergent in powder form or any liquid detergent that costs four times as much!

Sold Throughout the World by

ALL LEADING LABORATORY, HOSPITAL and SURGICAL DEALERS

Also makers of ALCOJET for all equipment washed by machine and ALCOTABS in tablet form for all pipette washers.

ere ere

Meets Highest Government Specifications

Ask your supplier for a copy of the remarkable Alconox Cleaning Guide which may be reproduced for all your students.

ALCONOX, INC., 853 BROADWAY, NEW YORK 3, N.Y.



PACKAGED PUMPING SYSTEMS PRODUCE AND MEASURE VACUUM TO 10⁻⁷ mm. HG.

Here's what you get with the new NRC Series 3300 line of portable pumping systems: unmatched effective pumping speeds over a wide pressure range ... top performance and efficiency ... dependable low ultimate pressure ... adaptability for ultra-high vacuum ... no contamination by condensable vapors ... low first and operating costs ... wide range of sizes, including 2, 4, 6 and 10 inch systems.

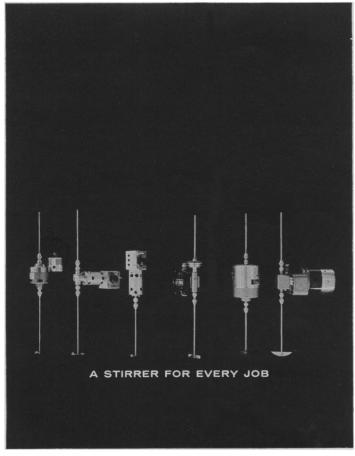
This NRC line of systems assures you an easy, low cost source of high vacuum pumping and

Write today for technical details on the Series 3300 line.

A Subsidiary of National Research Corp. 160 Charlemont Street, Dept. 25-1 Newton 61, Massachusetts measurement. All you need for operation is power, water and vacuumtight container. Use the 3300's as portable pumping systems to move from job to job, or as a low cost building block for a high performance vacuum installation.





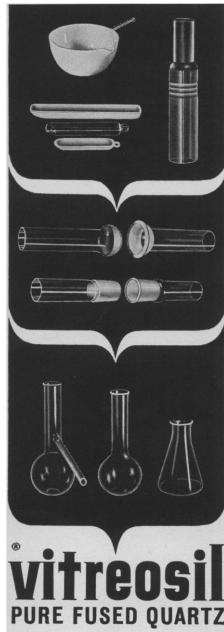


There is an Eberbach Corporation STIRRER for every laboratory stirring application, and every laboratory should have one or more Eberbach stirrers. There are continuous duty stirrers, intermittent duty stirrers, low speed stirrers, high speed stirrers, single speed and variable speed stirrers, con-torque stirrers, universal stirrers and stirrers with governor. Speeds are available from 90 r.p.m. to 12,000 r.p.m. Horsepower ratings vary from 1/150 to 1/10. Maximum capacities are provided from 1 quart to 20 gallons. Hollow spindles on most models permit you to adjust stirring level quickly, easily. Prices . . . \$22.50 to \$185.00. If you have a stirring requirement or problem send for our catalog 60G which is fully illustrated and contains complete details on every Eberbach Corporation STIRRER and the complete line of ACCESSORIES.

P.O. Box 1024



Ann Arbor, Michigan

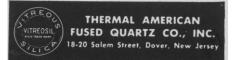


LABORATORY WARF OF HIGHEST PURITY

- · For excellent thermal shock resistance, and inertness
- · For guarding the real purity of your compounds in crucibles, retorts, muffles, dishes, tanks, pots, trays
- For outstanding electrical properties, strength, impermeability in ball & socket joints, standard taper joints, graded seals
- · Quartz to metal seals

A wide variety of laboratory ware is available in all types and sizes. Also, we fabricate to your specifications. See our ad in Chemical Engineer-ing, Electronic Engineers Master and Electronic Designers' Catalogues.

Write for complete, illustrated catalog.



Ion Exchangers

Reeve Angel 1960: 2 Dec., 1587 1961: 24 Mar., 823 Pharmacia 1961: 10 Mar., 668; 7 Apr., 1042; 19 May, 1548 Schleicher, Carl, and Schuell Co. 1961: 21 Apr., 1262; 12 May, 1496; 16 June, 1954; 15 Sept., 743

See Chemicals, radiation

Jacks, Laboratory

Central Scientific Co.

1961: 16 June, 1939; 21 July, 212; 18 Aug., 501 New York Laboratory Supply Co. 1960: 21 Oct., 1205; 11 Nov., 1423 Precision Scientific Co. 1960: 11 Nov., 1424 1961: 21 July, 151 Standard Scientific Supply Corp. 1961: 24 Mar., 912

Kinetic Theory Apparatus

Central Scientific Co. 1960: 11 Nov., 1359

Kjeldahl Apparatus

Glas-Col Apparatus Co. 1961: 26 May, 1671 Laboratory Construction Co. 1960: 21 Oct., 1197

Kymograph Cameras

Phipps & Bird, Inc. 1961: 24 Mar., 949

Kymographs

Harvard Apparatus Co. 1960: 2 Dec., 1681 Phipps & Bird, Inc. 1960: 7 Oct., 967; 21 Oct., 1191; 28 Oct., 1267 1961: 10 Feb., 390; 31 Mar., 1023; 21 Apr., 1305

Labels, Microscope Slide

See Microscope slide labels

Labels, Pressure Sensitive

Professional Tape Co., Inc. 1960: 7 Oct., 972; 21 Oct., 1151; 28 Oct., 1263, 1267; 4 Nov., 1329; 25 Nov., 1565; 2 Dec., 1681; 16 Dec., 1845 1961: 6 Jan., 49; 20 Jan., 210; 17 Feb., 529; 3 Mar., 655; 10 Mar., 712, 715; 17 Mar., 769; 24 Mar., 925, 944; 7 Apr., 1089; 26 May, 1723; 16 June, 1955; 15 Sept., 745

Laboratory Furniture

See Furniture, laboratory

Raytheon Co. 1961: 21 July, 133

■ New! A unique study of the—

PLANT LIFE of PALESTINE

Michael Zohary, Hebrew University of Jerusalem. Fresh insights into the problems concerning the flora and vegetation of Palestine. Book analyzes the geographical distribu-tion of over 2,000 native species of plants; discusses ecological factors, soil varieties, climatic conditions, etc. Chronica Botanica New Series of Plant Science Books, No. 33. 1961. 247 pp., illus.

PLANTS of the BIBLE

Harold N. Moldenke and Alma L. Moldenke. A complete survey of the plants and plant products mentioned in the Bible. Chronica Botanica New Series of Plant Science Books, No. 28. 1952. 364 pp., illus.

PHOTOGRAMMETRY and PHOTO-INTERPRETATION

Stephen H. Spurr, The University of Michigan. Second Edition of "Aerial Photographs in Forestry" discusses significant developments in the techniques of aerial photography, photogrammetry, and photo-interpretation. Covers vegetation mapping, forest inventory, forest management, etc. 2nd Ed., 1960, 472 pp., illus. \$12.00

The 19th Symposium of the Society for the Study of Development and Growth . . .

SYNTHESIS of MOLECULAR and CELLULAR STRUCTURE

Dorothea Rudnick, Albertus Magnus College and Yale University. A new compilation of the most recent studies on the chemical and cellular aspects of organic differentia-tion, from molecules to tissues and organs. 9 Contributors. 1961. 255 pp., illus.

-The 16th, 17th and 18th Symposia-

Developmental Cytology, Dorothea Rudnick, Ed.; 10 Contributors. 1959. \$8 Contributors. 1959. \$8
Cell, Organism, and Milieu, Dorothea Rudnick, Ed.;
12 Contributors. 1959. \$8
Developing Cell Systems and Their Control, Dorothea
Rudnick, Ed.; 10 Contributors. 1960. \$8

The 6th annual symposium publication of the Society of General Physiologists—

MACROMOLECULAR COMPLEXES

M. V. Edds, Jr., Brown University. Original studies representative of recent efforts to analyze complex macromolecular aggregates. 14 Contributors. 1961. 257 pp., illus.

–Other S. G. P. Symposia–

Subcellular Particles, Teru Hayashi, Ed.; 20 Contributors. 1959. \$8.50

Physiological Adaptation, C. Ladd Prosser, Ed.; 14 Contributors. 1958. \$4

Influence of Temperature on Biological Systems, Frank H. Johnson, Ed.; 24 Contributors. 1957. \$4.50

Physiological Triggers and Discontinuous Rate Processes, Theodore H. Bullock, Ed.; 16 Contributors. 1958.

Electrolytes in Biological Systems, Abraham M.
Shanes, Ed.; 11 Contributors. 1955.

Publishers of the Chronica Botanica Books

THE RONALD PRESS COMPANY 15 East 26th St., New York 10

Lathe, Metal Working

American Edestaal, Inc. 1960: 21 Oct., 1188; 2 Dec., 1703 1961: 24 Mar., 942; 21 Apr., 1300; 19 May, 1637; 16 June, 1945; 21 July, 202; 18 Aug., 502; 22 Sept., 880

Light Meters, Photoelectric

Photovolt Corp. 1960: 7 Oct., 967 Welch, W. M., Scientific Co. 1960: 7 Oct., 967

Liquid Scintillation Counters

See Counters, liquid scintillation, automatic

Logic Kits, Electronic

Digital Equipment Corp. 1960: 2 Dec., 1715

Magnetic Resonance Equipment, Nuclear See Nuclear magnetic resonance equipment

Magnets, Electromagnetic

Harvey-Wells Corp. 1961: 16 June, 1851; 22 Sept., 757

Manometers

Corning Glass Works
1961: 24 Mar., 838; 19 May, 1536
Gilmont, Roger, Instruments, Inc.
1961: 24 Mar., 913
Greiner, Emil, Co.
1961: 19 May, 1614; 22 Sept., 760

Mass Spectrometers

Bendix Corp.

1960: 25 Nov., 1561

1961: 27 Jan., 287; 24 Mar., 933

High Voltage Engineering Corp.

1961: 20 Jan., 162

Picker X-Ray Corp.

1960: 21 Oct., 1073

Melting Point Apparatus

Gilford Instrument Laboratories, Inc. 1961: 6 Oct., 1022
Stoelting, C. H., Co. 1961: 17 Feb., 501
Thomas, Arthur H., Co. 1960: 21 Oct., 1075

Mercury Sweepers

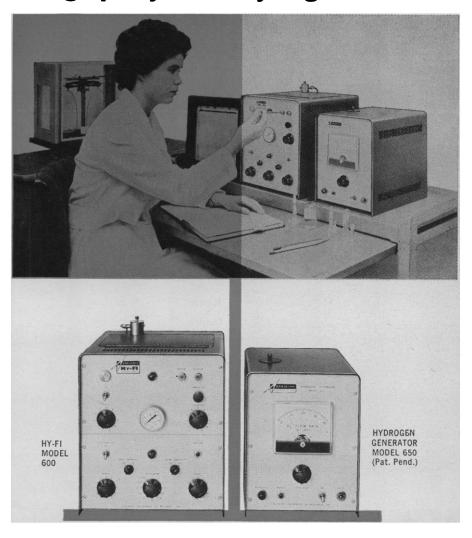
Will Corp. 1961: 12 May, 1491 1961: 20 Jan., 124

Micromanipulators

Aloe Scientiflc
1960: 21 Oct., 1201
1961: 24 Mar., 917; 21 Apr., 1261
Brinkmann Instrument Co.
1960: 16 Dec., 1845
Ercona Corp.
1960: 21 Oct., 1162
1961: 19 May, 1522
Leitz, E., Inc.

A NEW PRODUCT – A NEW LOOK

Aerograph Hy-Fi and Hydrogen Generator



the really COMPLETE ionization detector

The Aerograph Hy-FI is a high temperature programming Gas Chromatograph with Hydrogen Flame Ionization detector. With the new Aerograph hydrogen generator, the hydrogen tank, reducing valve, compressed air, filters and complex piping are completely eliminated. Only nitrogen for carrier gas is required to operate this complete high temperature ultra sensitive gas chromatograph—The Hy-FI.

HY-FI FEATURES

- High temperature oven 400°C with fan for air circulation.
- Great sensitivity and high temperature operation permits analysis of large complex molecules as steroids, antioxidants, waxes, sesquiterpenes, etc.
- Tremendous sensitivity with accurate attenuation over a wide dynamic range.
- Insensitivity to water makes the Hy-FI especially useful for biological analysis, as spirits, beer, ferments, vanilla, etc.

Price complete \$895.00

HYDROGEN GENERATOR FEATURES

- Adjustable flow rate accurately measured by meter.
- Baseline stability is equal in all respects to tank hydrogen.
- Eliminates hazards and problems of tank hydrogen.
- Continuous operation is recommended simply add distilled water twice each month.

Price complete \$225.00

PLEASE SEND YOUR SAMPLES FOR FREE ANALYSIS. ALL ORDERS FOR THE HY-FI AND THE HYDROGEN GENERATOR WILL BE PROMPTLY PROCESSED.



WILKENS INSTRUMENT & RESEARCH INC.

P.O. Box 313, Walnut Creek, Calif. Phone ATlantic 4-7166

1960: 18 Nov., IFC



GAS CHROMATOGRAPH

APPLICATION COVERAGE

Loenco Instruments Feature:

- ▲ Wide Temperature Range
- **▲** Choice of Highest Performance Thermal Conductivity and Ionization Type Detectors
- ▲ Independent Injection Port Temperature Control
- ▲ Reproducible Sampling For Gases and Liquids

▲ Prep Scale Attachments

- ▲ Electronic Detector Oven Temperature Control For Highest Stability
- ▲ Finest Quality Construction For Low Maintenance
- ▲ Convenient Design For Easy Operation

MODEL 70 HI-FLEX

Additional Features:

- ▲ Dual Column Programming With Column Vapor Pressure Compensation, Easy Column
- ▲ Radioactivity Detector For Simultaneous
- Tagged Component Chromatograms

 **Large Independent Detector Oven For a Variety of Detectors

 Flexible Linear Column Programmer

WRITE FOR ADDITIONAL INFORMATION



OENCO LOE ENGINEERING COMPANY

Analytical Control Instrumentation 2092 NORTH LINCOLN AVENUE, ALTADENA, CALIFORNIA

new concepts in scientific glassware

Delmar introduces

MITE-O-WARE

GREASE FREE MICRO-GLASS LAB WARE

- New unique joints are leakproof
- O-Rings made of Viton
- Eliminates contamination
- Fast easy assembly . . . no joints to grease
- Viton O-Rings hold pressures as low as 10-6, for temperatures from -40° F to $+500^{\circ}$ F.
- New design for O-Ring needle valve stop cocks



Write for new Mite-O-Ware catalog S61M on Micro-Glass lab ware and Catalog S60D for High Vacuum glass ware equipment.



Microprojectors

Bausch & Lomb Optical Co.

1961: 19 May, 1558; 14 July, 76; 25

Aug., 532

Elgeet Optical Co.

1961: 19 May, 1611

Hacker, William J., & Co., Inc. 1960: 2 Dec., 1604

Leitz, E., Inc.

1960: 7 Oct., IFC; 2 Dec., IFC

Microscope Condensers

Brinkmann Instruments, Inc.

1961: 3 Mar., 650

Microscope Cover Glasses

1961: 24 Mar., 805; 21 July, 157

Thomas, Arthur H., Co.

1961: 11 Aug., BC

Microscope Evepieces

Brinkmann Instruments, Inc. 1961: 17 Mar., 770

Microscope Illuminators

American Optical Co.

1961: 3 Feb., BC; 17 Feb., BC

Hacker, William J., & Co., Inc.

1961: 20 Jan., 135; 21 Apr., 1259; 21

July, 226

Unitron Instrument Co.

1960: 11 Nov., 1138; 30 Dec., 1908 1961: 24 Mar., 784

Microscope Objectives

Brinkmann Instruments, Inc.

1961: 12 May, 1496

Zeiss, Carl, Inc.

1960: 4 Nov., 1282

Microscope Slides

Clav-Adams

1961: 24 Mar., 805; 21 Apr., 1185; 19

May, 1529

Microscope Slide Labels

Professional Tape Co., Inc.

1960: 14 Oct., 1022; 18 Nov., 1509; 9

Dec., 1775

1961: 6 Jan., 49; 3 Feb., 341; 5 May, 1436; 19 May, 1641; 23 June, 2023; 25 Aug., 567; 1 Sept., 625; 22 Sept., 849; 6 Oct., 1015

Microscopes, Electron

See Electron microscopes

Microscopes, Fluorescent

American Optical Co.

1960: 7 Oct., BC

1961: 20 Jan., BC

Brinkmann Instruments, Inc.

1960: 30 Dec., IBC

Galileo Corporation of America 1961: 22 Sept., 890

Leitz, E., Inc.

Modernize your laboratory with Cenco

QUALITY EQUIPMENT



HOT PLATE MAGNETIC STIRRER

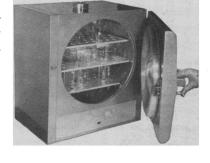
Combines an electric hot plate and magnetic stirrer which can operate independently or simultaneously. Variable speed stirring is powerful enough to stir 250 ml beaker of pure glycerin. Heat controlled thermostatically. Top plate is 7¾" of cast aluminum.

No.16632.....\$64.50

CYLINDRICAL OVEN

An all-purpose, economical, three-shelved oven for incubation, drying, sterilization or baking. Precise control of temperatures from 37° to 200°C, with variations as slight as 0.25° sensed by built-in thermoregulator. Chamber dimensions are 14¾" diameter, 11½" depth. Specify either 115 or 230 volts.

No. 95051.....\$201.75



CENCO-LERNER LAB JACK

This precise, utility support quickly adjusts through an elevation range of seven inches and will support 100 pounds. Particularly useful for supporting hot plates, oil baths, and for accurate positioning of ground glass joints. A removable auxiliary platform, eight inches square, increases work area. Comes with 17%" support rod.

No. 19089.....\$38.75

For further information on Cenco's complete line of laboratory equipment, teaching aids and scientific apparatus, contact your nearest Cenco salesman, or write.



Quality

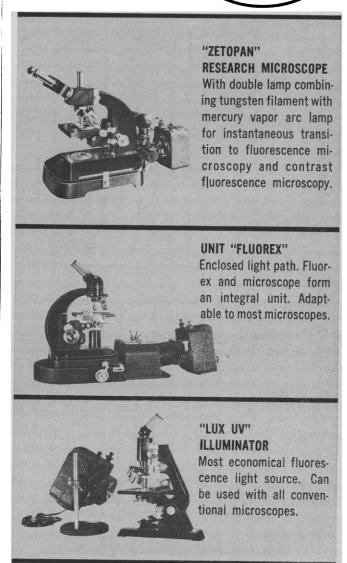
since 1889

CENTRAL SCIENTIFIC
A Division of Cenco Instruments Corporation
1700 Irving Park Road • Chicago 13, Illinois
Mountainside, N. J. Montreal Santa Clar

Mountainside, N. J. Montreal Santa Clars Somerville, Mass. Toronto Los Angele Birmingham, Ala. Ottawa Vancouver Housto. Cenco S.A., Breda, The Netherlands Tuls

FLUORESCENCE MICROSCOPY MICROSCOP

by REICHERT



The precision and quality of REICHERT Fluorescence Microscopy Instruments are based on nearly a century of experience by REICHERT in the optical field.

Featuring the OSRAM HBO 200 Mercury Arc Lamp, all units have fingertip controlled illumination including centering device, quartz collector and field iris diaphragm. Lamp housings are reinforced cast aluminum and air-ventilated. Built-in slides accommodate ALL filters for general fluorescence microscopy and the Antigen-Antibody Technique. A/C - D/C constant current power supply for increased light intensity.

Ask for a demonstration or write for full particulars.

Please inquire about our new—and still further improved—power-pack.

WILLIAM J. HACKER & CO., INC.
BOX 646 • WEST CALDWELL, N. J. • CAPITAL 6-8450

new electronic hematocrit gives direct readings instantly



YSI Model 30

Price \$250.00

The YSI electronic micro-hematocrit is a complete, portable measuring system for a single instantaneous hematocrit measurement. You will also find it a useful and versatile auxiliary to your laboratory-bound centrifuge equipment.

The YSI Model 30 is particularly suited to emergency and operating room use and for bedside or outpatient analyses. It's ideal for those situations requiring a series of accurate hematocrit readings in rapid succession.

Based on the insulating characteristics of red blood cells, it uses a four transistor circuit powered from self-contained batteries to give direct reading hematocrit on .02 cc. of whole or heperinized blood.

Weighs $2\frac{1}{2}$ lbs. $4'' \times 5\frac{1}{2}'' \times 6\frac{1}{2}''$.

Get complete specifications from your YSI dealer or write:



Microscopes, Infrared

Erb & Gray Scientific, Inc. 1961: 25 Aug., 528

Microscopes, Interference

American Optical Co. 1961: 26 May, BC Brinkmann Instruments, Inc. 1961: 28 Apr., 1375 Hacker, William J., & Co., Inc. 1961: 21 July, 234 Sobotka, Eric, Co. 1961: 20 Jan., 213

Microscopes, Medical

American Optical Co. 1961: 7 July, BC; 4 Aug., BC; 15 Sept., Cooke, Troughton & Simms, Inc. 1960: 21 Oct., 1061; 11 Nov., 1347; 18 Nov., 1453; 2 Dec., 1601 1961: 20 Jan., 133; 17 Feb., 489; 24 Mar., 897; 26 May, 1717 Elgeet Optical Co., Inc. 1960: 7 Oct., 914; 21 Oct., 1052; 4 Nov., 1278 Ercona Corp. 1960: 21 Oct., 1162 Graf-Apsco Co. 1960: 21 Oct., 1156 Hacker, William J., & Co., Inc. 1961: 24 Mar., 933 Leitz, E., Inc. 1960: 4 Nov., 1338 1961: 3 Feb., 299; 17 Feb., IFC; 3 Mar., IFC; 17 Mar., IFC; 5 May, IFC; 4 Aug., IFC; 22 Sept., 845 Technical Instrument Co. 1960: 21 Oct., 1206 Unitron Instrument Co. 1960: 11 Nov., 1338; 30 Dec., 1908 1961: 24 Mar., 784; 28 July, 244 Wild Heerbrugg Instruments, Inc. 1961: 16 June, 1935 Zeiss, Carl, Inc. 1961: 24 Mar., 817

Microscopes, Metallurgical Bausch & Lomb Optical Co.

1960: 4 Nov., 1284
Cooke, Troughton & Simms, Inc.
1960: 18 Nov., 1453
Ercona Corp.
1961: 24 Mar., 841; 22 Sept., 789
Hacker, William J., & Co., Inc.
1961: 21 July, 234
Unitron Instrument Co.
1960: 21 Oct., 1208; 11 Nov., 1338; 25
Nov., 1566; 30 Dec., 1908
1961: 20 Jan., 124; 26 May, 1666; 23
June, 1974

Microscopes, Phase

Sept., 895

American Optical Co.

1960: 2 Dec., BC

1961: 14 Apr., BC

Brinkmann Instruments, Inc.

1961: 3 Mar., 650

Galileo Corporation of America

1961: 22 Sept., 890

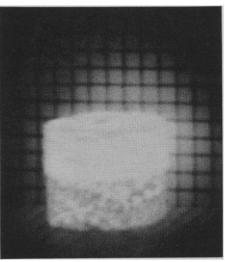
Hacker, William J., & Co., Inc.

1960: 2 Dec., 1604

1961: 21 July, 234; 18 Aug., 485; 22

ISOTOPES

for Your Development Work



Oak Ridge National Laboratory offers more than 300 radioactive and stable isotope products.

RADIOISOTOPES

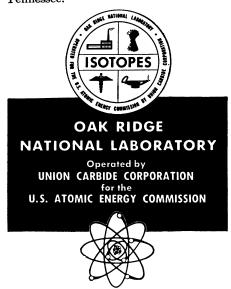
Processed Solutions—90 processed radioisotopes may be obtained, including many carrier-free and high specific activity products.

Now Available — Scandium-46 at \$150 a curie; sulfite-free I-131 at \$2 per mc.; technetium (as element or ammonium pertechnetate) \$100 a gram; calcium-47, with less than 5% Ca-45, \$200 per mc.; I-125 in research quantities.

STABLE ISOTOPES

More than 200 stable isotopes available from 50 elements.... Chemical processing and target fabrication services also offered.... Ultra-high isotopic purity in a number of isotopes.

For information or literature, write to: Isotopes Division, Oak Ridge National Laboratory, P. O. Box X, Oak Ridge, Tennessee.



Leitz, E., Inc. 1961: 18 Aug., IFC Unitron Instrument Co. 1960: 21 Oct., IBC; 11 Nov., 1338; 9 Dec., 1728; 30 Dec., 1908 1961: 17 Feb., 400; 24 Mar., 784; 14 Apr., 1096; 28 July, 244; 18 Aug., 408; 22 Sept., 752

Microscopes, Polarizing

American Optical Co. 1960: 16 Dec., BC 1961: 28 Apr., BC Hacker, William J., & Co., Inc. 1961: 24 Mar., 825; 18 Aug., 485 Leitz, E., Inc. 1960: 4 Nov., IFC 1961: 18 Aug., IFC Unitron Instrument Co. 1960: 21 Oct., IBC; 30 Dec., 1908, 1910 1961: 17 Feb., 400, 426; 12 May, 1492; 21 July, 216; 18 Aug., 568; 22 Sept., 752 Zeiss, Carl, Inc. 1961: 17 Feb., 426; 21 Apr., 1174; 6 Oct., 968

Microscopes, Projection

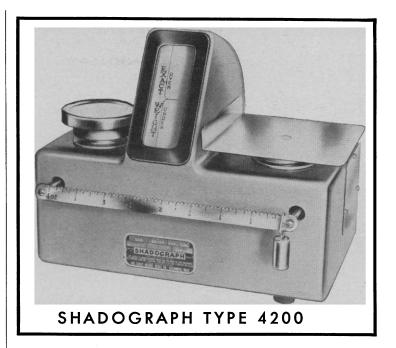
Brinkmann Instruments, Inc. 1961: 14 Apr., 1138 Elgeet Optical Co., Inc. 1961: 21 Apr., 1256 Hacker, William J., & Co., Inc. 1961: 21 Apr., 1259 Wild Heerbrugg Instruments, Inc. 1961: 24 Mar., 903; 21 Apr., 1303; 16 June, 1935; 18 Aug., 509

Microscopes, Research

American Optical Co. 1961: 14 Apr., BC; 7 July, BC; 4 Aug., Cooke, Troughton & Simms, Inc. 1961: 14 Apr., 1100; 16 June, 1861 Ercona Corp. 1961: 17 Feb., 434; 19 May, 1522 Galileo Corporation of America 1961: 22 Sept., 890 Hacker, William J., & Co., Inc. 1961: 13 Jan., 135; 17 Feb., 415; 21 Apr., 1191; 18 Aug., 485 Leitz, E., Inc. 1961: 6 Jan., IFC; 19 May, IFC; 2 June, 1732; 16 June, IFC; 6 Oct., IFC Unitron Instrument Co. 1961: 17 Feb., 400; 24 Mar., 784; 14 Apr., 1096; 18 Aug., 408 Wild Heerbrugg Instruments, Inc. 1961: 24 Mar., 903; 16 June, 1935; 21 July, 203 Zeiss, Carl, Inc. 1961: 21 Apr., 1174; 14 July, IBC

Microscopes, Stereo

American Optical Co. 1961: 3 Feb., BC; 23 June, BC; 1 Sept., Bausch & Lomb Optical Co. 1960: 21 Oct., 1090; 18 Nov., 1458 1961: 10 Feb., 356; 10 Mar., 667; 26 May, 1676 Cooke, Troughton & Simms, Inc. 1960: 7 Oct., 972; 18 Nov., 1453 Edmund Scientific Co. 1960: 21 Oct., 1078; 25 Nov., 1519 1961: 17 Feb., 410; 24 Mar., 829; 21 Apr., 1186; 22 Sept., 781



Unequalled for versatility, speed and visible accuracy . . .

SHADOGRAPH® BALANCE SAVES TIME IN COUNTLESS LABORATORY USES

FAST — The Shadograph comes to rest almost immediately.

EASY TO READ — Light-beam projection indication provides a sharp shadow-edge reading on a frosted glass dial. Parallax reading is eliminated.

WEIGHS OUT-OF-LEVEL — The Shadograph is easily moved from one location to another; it weighs accurately without leveling; and is unaffected by normal vibration.

RUGGED — The Shadograph is a precision instrument, sturdily constructed and designed for utmost dependability in day-in-day-out laboratory use.

Models are available with visible sensitivity from one milligram (2000 milligrams capacity) to two grams (35 kilos capacity). We will be glad to demonstrate the time-saving advantages of the Shadograph in your laboratory. No obligation, of course. Write for our laboratory catalog.

Exact

Weight

SCALLE

OTHER SHADOGRAPH **MODELS**



MODEL 4203B-TC-SA, SMALL ANIMAL BALANCE



MODEL 4142, TISSUE AND TUMOR BALANCE

THE EXACT WEIGHT SCALE CO. 901 W. FIFTH AVE., COLUMBUS 8, OHIO In Canada: 5 Six Points Road, Toronto 18, Ont.

Sales and Service Coast to Coast



Ercona Corp. 1960: 21 Oct., 1162 Leitz, E., Inc. 1960: 21 Oct., IFC Scientific Glass Apparatus Co., Inc. 1961: 17 Feb., 409 Sobotka, Eric, Co. 1960: 21 Oct., 1196; 18 Nov., 1505; 2 Dec., 1683 Unitron Instrument Co. 1960: 7 Oct., 970; 21 Oct., IBC; 11 Nov., 1338; 9 Dec., 1728; 16 Dec., 1847; 30 Dec., 1908 1961: 27 Jan., 286; 17 Feb., 400; 10 Mar., 717; 14 Apr., 1096; 21 Apr., 1292; 19 May, 1637; 9 June, 1837; 7 July, 64; 11 Aug., 400; 22 Sept., 752; 29 Sept., 954 Wild Heerbrugg Instruments, Inc. 1960: 21 Oct., 1165; 11 Nov., 1407 1961: 20 Jan., 223; 17 Feb., 507; 24 Feb., 593; 19 May, 1621

Microscopes, Stereoscopic, Zoom

Bausch & Lomb Optical Co. 1960: 21 Oct., 1090 1961: 10 Mar., 667; 21 Apr., 1196; 9 June, 1792; 16 June, 1884 Ercona Corp. 1961: 19 May, 1522 Harshaw Scientific 1961: 26 May, 1720 Scientific Glass Apparatus Co., Inc. 1961: 24 Mar., 948

Microscopes, Student

American Optical Co. 1961: 15 Sept., BC Bausch & Lomb Optical Co. 1960: 16 Dec., 1796 1961: 13 Jan., 72; 28 Apr., 1326; 19 May, 1558; 30 June, 2038; 28 July, 250

Cooke, Troughton & Simms, Inc. 1961: 26 May, 1717 Edmund Scientific Co. 1960: 25 Nov., 1519 Elgeet Optical Co., Inc. 1960: 7 Oct., 914; 21 Oct., 1052; 4 Nov., 1279 1961: 24 Mar., 813; 7 Apr., IBC; 16 June, 1870; 21 July, 138; 22 Sept., 792 Graf-Apsco Co. 1961: 13 Jan., 117; 17 Feb., 501 Harshaw Scientific 1961: 14 July, 117 Leitz, E., Inc. 1961: 2 June, 1732 Unitron Instrument Co. 1960: 14 Oct., 1024; 21 Oct., IBC; 28 Oct., 1268; 9 Dec., 1728 1961: 13 Jan., 111; 24 Feb., 594; 17 Mar., 768; 7 Apr., 1040; 21 July, 244; 15 Sept., 744

Microscopes, Television

Elgeet Optical Co., Inc. 1960: 18 Nov., 1455; 2 Dec., 1582; 19 Dec., 1793 1961: 20 Jan., 158; 17 Feb., 429

Microscopes, X-ray

Philips Electronics Instruments 1961: 18 Aug., 483

Microtome Knife Sharpener

American Optical Co. 1961: 6 Jan., BC; 9 June, BC

Microtomes, Bone

Bronwill Scientific, Div. of Will Corp. 1961: 24 Mar., 925

Microtomes, General Purpose

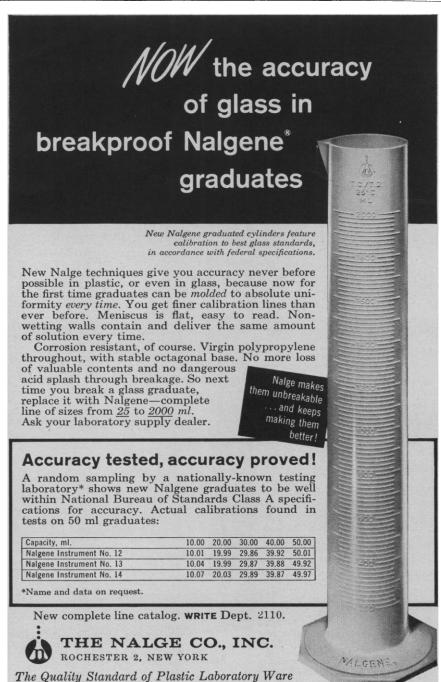
American Optical Co. 1961: 17 Feb., BC Brinkmann Instruments, Inc. 1960: 2 Dec., 1699 Hacker, William J., & Co., Inc. 1961: 17 Feb., 531

Microtomes, Refrigerated

Hacker, William J., & Co., Inc. 1960: 2 Dec., 1604 1961: 17 Feb., 531 International Equipment Co. 1960: 25 Nov., 1516; 2 Dec., 1579; 23 Dec., 1856 1961: 3 Feb., 296; 28 Apr., 1319; 26 May, 1669; 14 July, 74 National Instrument Laboratories, Inc. 1960: 21 Oct., 1121

Microtomes, Ultra

Cambridge Instrument Co., Inc. 1961: 19 May, 1641 Hacker, William J., & Co., Inc. 1960: 2 Dec., 1604 Leitz, E., Inc. 1960: 21 Oct., 1216 1961: 7 July, IFC; 21 July, IFC LKB Instruments, Inc. 1960: 2 Dec., 1591 1961: 20 Jan., 136; 17 Feb., 418; 19 May, 1553





Antisera and Antigens

E. coli Salmonella Shigella Klebsiella ENTEROPATHOGENIC

Bethesda-Ballerup

Proteus

Brucella

Tularense

RICKETTSIAL

Pneumococci

Meningococci

Streptococci B. pertussis

C. albicans

Trichinella

H. influenzae

Leptospira

C. Protein Antiserum and Standard

Infectious Mononucleosis Antigens and Standards Fluorescent Tagged Antibodies and Reagents

Potent

Stable

Specific

Descriptive literature available on request Specify

DIFCO LABORATORY PRODUCTS **CULTURE MEDIA BIOLOGICS REAGENTS**

FOR IRRADIATION RESEARCH

the famous

safe and simple, offer Cobalt 60 GAMMA RADIATION with dose rates up to 2 MILLION R/Hr., without altering your present Laboratory. Chamber sizes up to 6" in diameter and 8" in height. Solids, liquids or gasses can be irradiated. Your choice of 3 standard models or, have a Gammacell custom built for your particular requirements.

Now used by 30 Centers of Research in 12 different countries for basic and applied research in Chemistry, Food, Medicine, Agriculture, Biology, Electronics, Metals, Textiles, Glass, Plastics.

GAMMACELLS are compact, efficient and low in cost — Can be operated by technicians — No special skills required.

> Be ready for TOMORROW'S RESEARCH by writing for complete information TODAY.



ATOMIC ENERGY OF CANADA LIMITED mercial Products Division • P.O. Box 93 • Ottawa • Ca

61-2

Sales and service representation in over 100 countries.

LABAC



VARIABLE SOLID STATE POWER REGULATOR

... for manual or remote control of a-c power to electrical loads.

LABAC, a lab sized a-c power regulator, replaces either a variable transformer or saturable core reactor.

COMPACT— Weighs only 7½ pounds. Takes less space than a telephone.

VERSATILE — May be adjusted manually or by remote control. Signal variation from 0 to 5 ma proportions output from zero to full power (power gain: one million). Can also be used as a silent ON-OFF controller triggered by 5-ma signal.

DURABLE — No moving parts or vacuum tubes, just a magnetic amplifier and two silicon controlled rectifiers.

CONVENIENT — Operates on 115 or 230-volt 60-cycle line, rated for 20-amp. load.

FAST RESPONSE — Within one cycle of line frequency.

APPLICATIONS — Stage light dimming • Experimental apparatus • Laboratory ovens and kilns • Sales demonstrators.

Other R-I power regulators have capacities up to 800 amps.



Write P. O. Box 6164V, Minneapolis 24, Minn.

Schuco Scientific, Div. of Schueler & Co. 1960: 11 Nov., 1427 Sorvall, Ivan, Inc. 1961: 21 July, 148; 18 Aug., 479; 22

Microwave, Power Generator Systems

Raytheon Co.

Sept., 771

1960: 21 Oct., 1032; 11 Nov., 1336 1961: 20 Jan., 222; 17 Feb., 506; 24 Mar., 930; 16 Apr., 1277; 19 May, 1627; 16 June, 1952; 18 Aug., 498

Mills, Colloid

Gifford-Wood Co. 1961: 16 June, 1944

Mixers, Test Tube
See Test tube mixers

Models, Crystal Lattice

Bronwill Scientific, Div. of Will Corp. 1960: 18 Nov., 1505
1961: 21 Apr., 1270; 18 Aug., 493
Central Scientific Co.
1961: 19 May, 1649; 22 Sept., 847
Ealing Corp.
1961: 7 July, 58
LaPine, Arthur S., and Co.
1960: 21 Oct., 1160
Will Corp.
1961: 12 May, 1491; 22 Sept., 877

Moisture Determinators

Nuclear-Chicago Corp. 1960: 28 Oct., BC 1961: 27 Jan., BC Scientific Glass Apparatus Co., Inc. 1961: 19 May, 1506

Monitors, Radiation

Atomic Accessories, Inc. 1961: 22 Sept., 798
Lionel Electronic Laboratories (formerly Anton Electronic Laboratories, Inc.) 1960: 21 Oct., 1149
1961: 21 Apr., 1283
Technical Associates

Monochromators

1960: 21 Oct., 1036

Bausch & Lomb Optical Co. 1961: 8 Sept., 642
Farrand Optical Co., Inc. 1960: 7 Oct., 965
Photovolt Corp. 1961: 10 Mar., 712; 26 May, 1723
Rudolph, O. C., & Sons, Inc. 1961: 17 Feb., 512

Mortars and Pestles

Coors Porcelain Co. 1961: 21 July, 216

Motors, Variable Speed

Bel-Art Products
1961: 17 Feb., 521
Heller, Gerald K., Co.
1961: 20 Jan., 207; 17 Feb., 509; 21
Apr., 1281; 19 May, 1644; 16 June, 1941;
21 July, 209; 18 Aug., 481; 22 Sept., 871

data recorders expensive?



not any more

now, Mnemotron gives you a complete, easy-to-use 4-channel analog tape record/reproduce system with 0.2% precision for only \$2 405

Complete with 101/2 % reel tape transport, rack mounted.

Mnemotron offers a unique pulsed FM principle and fully transistorized, self-contained unit that records all analog data • data acquisition • storage, analysis and reduction • time scale contraction and expansion • programming • computer read IN and read OUT • dynamic simulation. With Mnemotron, you can do more with paper recorders . . . expanding frequency response and channel capacity, saving you from being deluged with data, permitting you to look at the same data at different time scales.

Model M204 features:

Any 2 adjacent speeds: 33/4, 71/2, 15 ips. Added low speed available on special order.

order.

Frequency Response:

DC—800 cps @ 15 ips

DC—400 cps @ 7½ ips

DC—200 cps @ 3¾ ips
Linearity: 0.2% full scale.

Noise: Less than —50 db full scale.

Crosstalk: below 70 db.

Extended range systems also available.

Write, wire, phone today for complete details.



precision analog data tape recorders and biological computers

39 South Main Street, Pearl River, N. Y.

• PEarl River 5-4015 (914)

• Cables: Mnemotron

Microwave Spectrometers

Strand Labs., Inc. 1961: 6 Oct., 1018

Multichannel Analyzers See Pulse height analyzers

Needle Valves, Teflon

Greiner, Emil, Co. 1961: 21 July, 140

Needles, Special Purpose

Hamilton Co., Inc. 1961: 12 May, 1448

Nephelometers

Coleman Instruments, Inc. 1961: 16 June, 1879; 21 July, 135 Klett Manufacturing Co. 1961: 5 May, 1433

Neutron Sources

Atomic Accessories, Inc. 1961: 20 Jan., 219 High Voltage Engineering Corp. 1960: 16 Dec., 1794 1961: 20 Jan., 162; 23 June, 1978 Lionel Electronic Laboratories (formerly Anton Electronic Laboratories, Inc.) 1961: 19 May, 1617; 21 July, 207 Nuclear-Chicago Corp. 1960: 25 Nov., BC; 23 Dec., BC 1961: 24 Feb., BC; 8 Sept., 634, 635

Nitrogen Analyzers

Coleman Instruments, Inc. 1961: 19 May, 1546 Fisher Scientific Co. 1960: 11 Nov., 1349 1961: 9 June, 1789

Nuclear Magnetic Resonance Equipment

Harvey-Wells Corp. 1961: 18 Aug., 425 Picker X-Ray Corp. 1960: 21 Oct., 1073

Operating Equipment, Animal

Aloe Scientific 1961: 18 Aug., 499

Oscilloscopes

Welch, W. M., Scientific Co. 1961: 2 June, 1779

Osmometers

Mechrolab, Inc. 1960: 21 Oct., 1148; 11 Nov., 1406; 9 Dec., 1776

Ovens, Laboratory, General Purpose

1961: 16 June, 1939 Despatch Oven Co. 1960: 21 Oct., 1186 1961: 20 Jan., 210; 19 May, 1624

Central Scientific Co.

Electric Hotpack Co., Inc. 1961: 20 Jan., 227; 24 Mar., 925

20 OCTOBER 1961



New colloid mill for 25 to 75 ml batches

MINI-MILL macerates, homogenizes, emulsifies . . . for research in cosmetics, pharmaceuticals, paint, resins, coatings, polish, ink, soap . . . also bacteria, tissues, cells.

MINI-MILL provides intense mechanical shear by blades on the bottom of the rotor (see drawing) and cutting edges of serrations on rotor and stator, also hydraulic shear as material is forced through a fine gap, 3 to 125 mils, adjustable while running. Self circulating. Also used with 120 µ diam. glass beads for further breakdown.

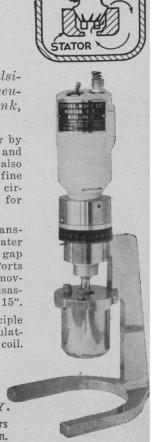
Rotor speed: 0 to 22000 rpm with variable transformer. Mixing cups are immersed in cooling water in a steel container (not illustrated). Micrometer gap adjustment. Contact surfaces are stainless steel. Ports for introducing or removing material without removing cup . . . also for steam or inert gas. Quickly disassembled for sterilization. Overall height-approx. 15".

MICRO-MILL for 150 ml to 2 liters. Same principle as MINI-MILL but with 1 gal. hopper with recirculating pipe, jacket and removable internal cooling coil.

Send for free catalogs

Dept. S10 . Eppenbach Division . Hudson, N. Y.

Eppenbach colloid mills, homogenizers, homogenizer-mixers ... for laboratory, pilot-plant and large-scale production.





UNICAM SPECTROPHOTOMETERS

We are proud to introduce the most reliable spectrophotometers ever designed—UNICAM. There is a range of models for the ultra-violet, visible and infra-red regions, as well as flame-emission.

The accuracy and versatility of UNICAM is unequaled. Finest parts, optical systems and wiring circuits have been assembled by skilled English craftsmen under rigid supervision. You get steady, consistent operation never before combined with such pin-point accuracy. Here at WACO we now have the parts, accessories and the service to offer you the world's finest spectrophotometers.

Write for UNICAM Booklet N describing All Models.

Exclusive Midwest Distributors

WILKENS - ANDERSON CO.

4525 W. Division Street Chicago 51, Illinois Fisher Scientific Co. 1960: 2 Dec., 1588
Precision Scientific Co. 1960: 21 Oct., 1164
Scientific Glass Apparatus Co.. Inc. 1960: 21 Oct., 1059
Temperature Engineering Corp. 1961: 21 July, 214

Ovens, Paraffin

Will Corp. 1961: 12 May, 1491

Ovens, Vacuum

National Appliance Co. 1960: 11 Nov., 1416 Temperature Engineering Corp. 1961: 19 May, 1650

Oxygen Analyzers

Beckman Instruments, Inc. 1960: 14 Oct., 1018 1961: 6 Jan., 56; 28 Apr., IFC Fisher Scientific Co. 1960: 11 Nov., 1349 1961: 9 June, 1788 Gilson Medical Electronics 1960: 30 Dec., 1947 1961: 19 May, 1654; 29 Sept., 904

Paint, Heat Sensitive

Curtiss-Wright Corp. 1960: 2 Dec., 1672

Particle Size Analyzers

Coulter Electronics, Inc. 1961: 24 Mar., 958
Dietert, Harry W., Co. 1960: 21 Oct., 1200
1961: 17 Feb., 500
Zeiss, Carl, Inc.
1960: 21 Oct., 1043
1961: 6 Jan., 6; 19 May, 1518

Perimeters

Phipps & Bird, Inc. 1961: 18 Aug., 511; 22 Sept., 879

Petri Dishes, Plastic

Falcon Plastics
1960: 21 Oct., 1037
Scientific Products, Div. of American
Hospital Supply Corp.
1961: 24 Mar., 798

pH Electrodes

Beckman Instruments, Inc., Scientific and Process Instruments Div. 1960: 11 Nov., 1430

pH Meters

Analytical Measurements, Inc. 1961: 6 Oct., 1016
Beckman Instruments, Inc., Scientific and Process Instruments Div. 1960: 18 Nov., 1451
1961: 17 Feb., 492; 10 Mar., 672; 21 Apr., 1279

Brinkmann Instruments, Inc. 1960: 14 Oct., 980; 4 Nov., 1276

1961: 22 Sept., 847

OXFORD BOOKS

OF EXCEPTIONAL INTEREST

THEORY OF DIRECT NUCLEAR REACTIONS

By WILLIAM TOBOCMAN. Here is a detailed and coherent presentation of the theory of direct nuclear reactions at intermediate energies. The bulk of the discussion is based on the Born approximation and distorted wave Born approximation treatments. 18 text figures. (Oxford Library of the Physical Sciences) \$2.40

AN INTRODUCTION TO THE THEORY OF VIBRATING SYSTEMS

By WILLIAM G. BICKLEY. This is a description of the principles which underlie the behavior of systems exhibiting vibratory or wave motion and an explanation of the mathematical concepts and techniques that are useful for the study of these systems. \$4.80

APPLIED ANISOTROPIC ELASTICITY

By R. F. S. HEARMON. A study of phenomena having applications to such materials as wood, plywood, laminated plastics, and stiffened plates under such headings as Fundamentals, Elastic Constants of Single Crystals, Sheet Materials and Polycrystalline Aggregates, Some Simple Stress Systems, Wave Propagation, and Anisotropic Plates. 4 plates. \$5.60

THE THIRD LAW OF THERMODYNAMICS

By JOHN WILKS. This is a concise examination of the Third Law of Thermodynamics and its wide range of applications in low temperature physics and chemistry, including a treatment of the necessary statistical mechanics. 41 text figures; indices. \$2.40

At all bookstores

OXFORD UNIVERSITY PRESS

417 Fifth Avenue, New York 16

Cambridge Instrument Co., Inc.
1960: 2 Dec., 1682
1961: 17 Feb., 494
Coleman Instruments, Inc.
1960: 21 Oct., 1082; 11 Nov., 1355
1961: 20 Jan., 154; 21 Apr., 1189; 22
Sept., 779
Harshaw Scientific
1960: 28 Oct., 1266
Leeds & Northrup Co.
1960: 21 Oct., 1040
Photovolt Corp.
1960: 21 Oct., 1179
1961: 18 Aug., 491; 22 Sept., 849
Radiometer

1960: 11 Nov., 1345 1961: 22 Sept., 786

Riseman Development Laboratory

1960: 21 Oct., 1166

Photometers, Light-Scattering

Phoenix Precision Instrument Co. 1960: 21 Oct., 1186; 9 Dec., 1781

Photometers, Multiplier

Beckman Instruments, Inc., Scientific and Process Instruments Div. 1961: 23 June, 2024
Farrand Optical Co., Inc. 1960: 21 Oct., 1183
Photovolt Corp. 1960: 7 Oct., 967; 9 Dec., 1775
1961: 30 June, 2075; 28 July, 289; 8
Sept., 683

Photomicrographic Equipment

American Optical Co. 1960: 21 Oct., BC; 18 Nov., BC; 2 Dec., BC; 16 Dec., BC 1961: 17 Feb., BC; 17 Mar., BC; 31 Mar., BC; 14 Apr., BC; 7 July, BC; 15 Sept., BC Hacker, William J., & Co., Inc. 1960: 2 Dec., 1604 1961: 18 Aug., 485 Kling Photo Corp. 1960: 21 Oct., 1184 Leitz, E., Inc. 1960: 14 Oct., 986 1961: 15 Sept., IFC; 6 Oct., IFC Photovolt Corp. 1961: 27 Jan., 287 Rosenthal, Paul 1961: 24 Mar., 926 Unitron Instrument Co. 1960: 21 Oct., IBC 1961: 10 Feb., 388 Wild Heerbrugg Instruments, Inc. 1960: 2 Dec., 1675 1961: 21 July, 203; 22 Sept., 857 Zeiss, Carl, Inc. 1961: 24 Mar., 817; 14 July, IBC

Photomicrographic Exposure Meters

Leitz, E., Inc. 1961: 1 Sept., IFC Photovolt Corp. 1960: 21 Oct., 1265 1961: 17 Feb., 769; 5 May, 1433; 23 June, 2027

Photomicrography, Stereo

American Optical Co. 1960: 4 Nov., BC



Zone

Photomultiplier Tubes

CBS Laboratories 1960: 21 Oct., 1160 1961: 20 Jan., 199; 22 Sept., 896 Radio Corporation of America 1960: 30 Dec., BC

Physiological Teaching Equipment

Harvard Apparatus Co. 1960: 11 Nov., 1413

Pipette Fillers

Instrumentation Associates 1961: 2 June, 1778

Pipette Jars, Plastic

Nalge Co., Inc. 1961: 24 Mar., 921

Pipette Pluggers

Bellco Glass, Inc. 1961: 21 July, 231; 4 Aug., 347; 18 Aug., 491; 22 Sept., 871; 6 Oct., 1021

Pipettes, Automatic

Kimble Glass Co. 1961: 17 Feb., IBC Lapine, Arthur S., & Co. 1960: 2 Dec., 1683 1961: 17 Feb., 534; 21 July, 222

Schuco Scientific, Div. of Schueler & Co. 1960: 25 Nov., 1563 Scientific Industries, Inc. 1960: 2 Dec., 1708 1961: 19 May, 1659

Pipettes, Hand

Bellco Glass, Inc. 1961: 3 Feb., 335; 17 Feb., 532; 10 Mar., 713; 7 Apr., 1085; 19 May, 1610 Hamilton Co., Inc. 1961: 16 June, 1930 Kimble Glass Co. 1961: 17 Feb., IBC; 19 May, IBC; 16 June, IBC; 21 July, IBC; 15 Sept., IBC Thomas, Arthur H., Co. 1961: 16 June, BC

Pipettes, Micro

Hamilton Co., Inc. 1961: 12 May, 1448 LaPine Scientific Co. 1961: 21 July, 222 Research Specialties Co. 1961: 12 May, 1495 Thomas, Arthur H., Co. 1961: 14 July, BC

Plant Growth Chambers

Percival Refrigeration & Manufacturing Co. 1961: 24 Mar., 914; 22 Sept., 854

Sherer-Gillett Co. 1961: 24 Mar., 949

Plastic Ware, Laboratory

Falcon Plastics 1960: 21 Oct., 1037 Nalge Co., Inc. 1960: 21 Oct., 1072 U.S. Stoneware 1961: 24 Mar., 916; 19 May, 1615; 22 Sept., 864

Polariscopes

Bethlehem Apparatus Co., Inc. 1960: 21 Oct., 1187

Polarimeters

1960: 7 Oct., 964 Zeiss, Carl, Inc. 1961: 11 Aug., IBC

Polarographic Analyzers

American Optical Co. 1961: 12 May, BC Leeds & Northrup Co. 1960: 21 Oct., 1040 London Co. 1961: 19 May, 1550 Sargent, E. H., & Co. 1960: 11 Nov., 1365 1961: 20 Jan., 153; 24 Mar., 814; 21 July, 142 Standard Scientific Supply Corp. 1961: 21 July, 230

Polaroid Filters

Pioneer Scientific Corp. 1960: 14 Oct., IBC; 11 Nov., 1358





Sigma is pleased to announce

SIALIC ACID

(N-ACETYL NEURAMINIC ACID)

Subject to availability, we offer limited amounts of this interesting compound.

PEROXIDASE GLUCOSE OXIDASE

Sigma offers many purities and activities at prices guaranteed to please.

Our Peroxidase is offered in purities from approximately 1500 units per gram to 100,000 units per gram. (one gram = one micromole of glucose converted to gluconic acid per minute at 35° C.)

RIBONUCLEASE

5 x Crystalline and Chromatographed

Inquiries are invited for high purity preparations. We believe that Sigma Ribonuclease is generally acknowledged to be the finest available for the current studies of structure and ultimate purification.

Your assistance will help us continuously improve the homogeneity of our Ribonuclease.

Our April 1961 Catalog has been distributed. Let us know if you did not receive a copy. Be sure to give the name of your laboratory.

CALL US COLLECT AT ANY TIME, JUST TO GET ACQUAINTED

Day, Station to Station, PRospect 1-5750 Night, Person to Person, Dan Broida, WYdown 3-6418



The Research Laboratories of

SIGMA CHEMICAL COMPANY

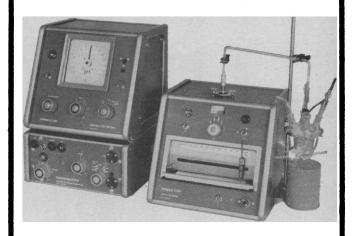
3500 DEKALB ST., ST. LOUIS 18, MO., U. S. A.

MANUFACTURERS OF THE FINEST BIOCHEMICALS AVAILABLE



pH STAT

...AND
TITRATION CURVES



Fully automatic recording of titrant volume as a function of time, and only new Metrohm equipment has these

EXCLUSIVE FEATURES:

- 1) Micro and macro assemblies including interchangeable burette cylinders with capacities from 1.0 to 50.0 ml.
- 2) Dosaging sensitivity 0.001 pH
- 3) Switch-over system for different recorder speeds
- 4) Built-in magnetic stirrer
- 5) Temperature controlled titration vessels for minimum volumes of 0.5 ml.
- 6) Complete line of micro and macro electrodes
- 7) Recording on single sheets or strip chart

Write for descriptive catalog No. T78TC



PHILADELPHIA CLEVELAND HOUSTON MIAMI MENLO PARK, CAL. - ST. LOUIS



Latest information, illustrations, current prices on

* EQUIPMENT

* INSTRUMENTS

* APPLIANCES

- ... GENERAL RESEARCH
- ... QUALITY CONTROL
- ... BIOCHEMISTRY
- ... CLINICAL ANALYSIS
- ... PILOT PLANT AND **PRODUCTION OPERATIONS**

New ... filled with facts! ... easy to use! Organized to meet your needs quickly, accurately. Shows latest designs, newest improvements and modifications-provides exceptionally detailed specifications on items you need. It's a "must" for your reference shelf!

Send for your FREE Scientific Equipment Catalog, today!

COLE-PARMER INSTRUMENT & EQUIPMENT CO.

7330 N. Clark Street • Chicago 26, Illinois

MAY BETHLEHEM GLASSBLOWING KIT with MANUAL

for Chemists, Physicists, Engineers and Others To Construct, Repair, Modify Apparatus Systems, Glass to Metal Seals

FROM YOUR **DEALER**



Write for Bul. K-60

The Bethlehem Glassblowing KIT Contains

Asbestos Work Board Hot Glass Rest Sharp Flame Hand Torch Torch Stand Blowhose (2 extra mouthpieces) Spandle Carbon Flat

Twin Tubing (2 sizes) Didymium Goggles Vernier Calipers

Didymium Goggles Asbestos Paper (2 sizes)
Vernier Calipers Carbon Rods (2 sizes)
Tungsten Carbide Knife
Carbon Hex (2 sizes)
Rollers (dual purpose)
Crayon (2)

Assorted Corks
Asbestos Paper (2 sizes)
Wire Screen (3 pieces)
Tweezers (2 sizes)
Ribbon Fire (gas-oxygen)
Ruler **Assorted Corks**

Brass Shaper Beeswax Tungsten Tool Sodium Nitrite Pluro Stopper Metal Kit Box Manual



BETHLEHEM APPARATUS COMPANY, INC.

HELLERTOWN, PA.

Polishers, Electrolytic

Ercona Corp.

1961: 24 Mar., 841; 22 Sept., 789

Porcelain Ware, Laboratory

Coors Porcelain Co. 1961: 20 Jan., 200; 19 May, 1656; 22 Sept., 868

Potentiometers

Leeds & Northrup Co. 1960: 21 Oct., 1040

Power Supplies, High Voltage

Harvey-Wells Corp. 1961: 19 May, 1523 Mikros Inc.

1961: 21 July, 236 Servonuclear Corp. 1960: 21 Oct., 1156 1961: 26 May, 1726 Zeiss, Carl, Inc.

1960: 7 Oct., IBC 1961: 16 June, 1873

Power Supplies, Low Voltage

National Instrument Laboratories, Inc. 1960: 21 Oct., 1121 Philbrick, George A., Researches, Inc. 1961: 18 Aug., 478 Phipps & Bird, Inc. 1961: 21 Apr., 1305; 28 Apr., 1371

Precipitators, Thermal

Ficklen, Joseph B., III 1961: 6 Oct., 1018

Projectors, Opaque

Edmund Scientific Co. 1961: 20 Jan., 151

Protein Analyzers

Bausch & Lomb Optical Co. 1961: 17 Feb., 550; 24 Mar., 848; 5 May, 1394; 4 Aug., 302 Laboratory Construction Co. 1960: 21 Oct., 1197 Technicon Chromatography Corp. 1961: 24 Mar., 905; 21 July, 226

Protein Meters

Bausch & Lomb Optical Co. 1960: 30 Dec., 1912 1961: 22 Sept., 802; 6 Oct., 972

Pulse Generators

Radiation Instrument Development Laboratory, Inc. 1960: 21 Oct., 1042

Pulse Height Analyzers

Baird Atomic, Inc. 1960: 21 Oct., 1083 1961: 16 June, 1853 Hamner Electronics Co., Inc. 1961: 22 Sept., 892 Nuclear-Chicago Corp. 1961: 19 May, BC

Radiation Counter Laboratories, Inc. 1961: 16 June, 1A



RUDOLPH INSTRUMENTS

P. O. Box 265





LITTLE FALLS

ENGINEERING

NEW JERSEY

OFFICE:

61 Stevens Ave. at Walnut St.

INC.

TELEPHONE:

CLifford 6-1491

U. S. A.

HIGHLY ACCURATE

MOISTURE **ANALYSIS**



The new compact Moisture Teller No. 277 reaches a preset drying temperature faster than any similar unit available today. High static pressure from a high speed blower removes free moisture in any material-solid, granular, liquid or semi-liquid. Produces an absolute analysis. No calibration required. A real aid to quality and cost control in processing foodstuffs, fibres, chemicals, soaps and many other materials.



12 Page Catalog

sent on request. Ask for bulletin SL-1. Describes complete line of moisture tellers, drving ovens. speed desiccators, etc.

HARRY W. DIETERT CO
CONTROL EQUIPMENT
9330 Roselawn • Detroit 4, Mich.

Send me Moistui	e Teller Bulletin SL-1
Name	
Address	
City	State

Radiation Instrument Development

Laboratory, Inc. 1960: 21 Oct., 1042 1961: 24 Mar., 820

Technical Measurement Corp.

1960: 7 Oct., 922; 21 Oct., 1088; 18 Nov., 1456; 2 Dec., 1614

1961: 13 Jan., 70; 17 Feb., 440; 10 Mar., 670; 21 Apr., 1194; 12 May, 1452; 16 June, 1882; 21 July, 158; 25 Aug., 530; 15 Sept., 700; 6 Oct., 970

Victoreen Instrument Co. 1960: 21 Oct., 1079

Pumps, Infusion

Harvard Apparatus Co.

1960: 21 Oct., 1179 1961: 17 Feb., 501; 21 Apr., 1164

Phipps & Bird, Inc. 1960: 2 Dec., 1703 1961: 2 June, 1722 Sigmamotor, Inc. 1961: 22 Sept., 863

Will Corp.

1960: 11 Nov., 1419

Pumps, Liquid, Constant Volume

Randolph Co.

1961: 19 May, 1659

Scientific Glass Apparatus Co., Inc. 1961: 22 Sept., 888

Sigmamotor, Inc.

1960: 21 Oct., 1167; 2 Dec., 1682 1961: 17 Feb., 517; 21 Apr., 1270

Pumps, Peristaltic

Harvard Apparatus Co.

1961: 17 Feb., 501; 21 July, 209

Pumps, Respiratory

Harvard Apparatus Co.

1961: 17 Feb., 501; 24 Mar., 907; 21 July, 209

Phipps & Bird, Inc.

1960: 11 Nov., 1414 1961: 24 Feb., 591; 3 Mar., 657; 7 Apr., 1089; 14 Apr., 1138; 12 May, 1494;

19 May, 1648

Pumps, Vacuum

Central Scientific Co.

1960: 21 Oct., 1051

Kinney Vacuum Div., New York Air

Brake Co.

1960: 21 Oct., 1177; 2 Dec., 1719

LaPine Scientific Co. 1961: 24 Mar., 920

Precision Scientific Co.

1961: 24 Mar., 909

Standard Scientific Supply Corp.

1961: 6 Oct., 1024

Welch, W. M., Scientific Co.

1961: 7 Apr., 1084; 7 July, 63; 6 Oct.,

Pumps, Vacuum, Diffusion

NRC Equipment Corp. 1961: 21 Apr., 1268

Pumps, Vacuum, Ionic

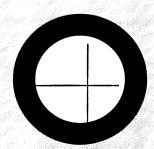
Hughes, Vacuum Tube Products Div.

1960: 21 Oct., 1195

1961: 20 Jan., 203; 24 Mar., 941

It takes all kinds...

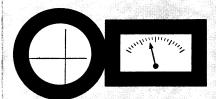
Precise Length and Angle Measurement May Require...



OPTICAL INSTRUMENTS K&E makes them



ELECTRONIC INSTRUMENTS K&E makes them



OPTICAL AND ELECTRONIC **INSTRUMENTS COMBINED**

K&E makes them

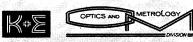


A NEW APPROACH **ENTIRELY**

We bring to every project over 75 years' experience in serving the needs of industry, science and the government. If the products needed must be new,

K&E can make them too.

When your projects require instruments for highly accurate measurement of lengths or angles — especially on large equipment over sizeable distances — we can produce — precisely — the products you need. For more information, write:



EUFFEL & ESSER CO. Hoboken, N.J. 403

Pycnometers

Scientific Glass Apparatus Co., Inc. 1961: 17 Feb., 409

Pyrometers

Thermolyne Corp. 1961: 19 May, 1651

Quartz Ware, Laboratory

Thermal American Fused Quartz Co., Inc. 1961: 17 Feb., 526; 24 Mar., 934; 21 Apr., 1306; 16 June, 1938; 18 Aug., 504

Radiation Counters, Scalers and Rate Meters

See Counters, liquid scintillation, automatic; Counters and scalers, gamma radiation; Counters and scalers, low-level radiation

Radiation Detectors

See Detectors, radiation

Radiation Monitors

See Monitors, radiation

Radiation Shields

See Shields, radiation

Radioisotopes

See Chemicals, radiation

Ratemeters, Nuclear

See Counters and scalers, gamma radiation; Counters and scalers, low-level radiation

Rats, Laboratory

Charles River Breeding Laboratories 1960: 7 Oct., 974 Sprague Dawley, Inc. 1960: 4 Nov., 1324; 18 Nov., 1505

Reaction Vessels, Laboratory

Ace Glass, Inc. 1961: 20 Jan., 224 Parr Instrument Co. 1961: 24 Mar., 904

Reactors, Nuclear Training

Nuclear-Chicago Corp. 1960: 28 Oct., BC 1961: 8 Sept., 635

Recorder Controllers

Research, Inc.

1961: 16 June, 1934; 22 Sept., 872

Recorders, Graphic

American Optical Co. 1961: 21 July, BC
Atomic Accessories, Inc. 1961: 16 June, 1852
Beckman Instrument, Inc., Scientific and Process Instruments Div. 1960: 16 Dec., 1846
1961: 17 Feb., 492; 29 Sept., 910
Curtiss-Wright Corp.
1961: 17 Feb., 494; 19 May, 1629; 21
July, 205

Cary Recording 5 Spectrophotometer



Recording accurate, reliable spectra with operating ease. For details ask for Data File E28-101.

Another fine instrument in the Cary tradition of highest quality is the new Model 15 Recording Spectrophotometer. Significant design advancements contribute to its outstanding, versatile performance. Instrument operating limits, 1750-8000 A, extend precision usefulness over a broader range. Reduced beam size $(1.0 \times 0.3 \text{ cm})$ assures maximum reliability with minimum samples. Coupled scan and chart drive affords extreme operating simplicity with single variable speed control.

APPLIED PHYSICS CORPORATION 2724 SOUTH PECK ROAD MONROVIA, CALIFORNIA

INSTRUMENTS

Raman/UV/IR Recording Spectrophotometers • Vibrating Reed Electrometers





Multi-layer Interference Films

for dichroic and achromatic beam splitters and filters. High efficiency. Relatively wide band.

MULTI-LAYER HEAT DEFLECTORS

XUR-96. Reflects substantial portion of infrared spectrum while transmitting nearly all of the visible radiation.

#6143. Colorless, non-absorbing filter. Completely removes the ultra-violet and reflects the infrared. Transmits about 90% from 425 to 700mu reflecting longer wavelengths. Half transmission points at 412mu and 725mu.

Cold Mirror IRT-211. To reflect visible radiation from 400 to 700mu and transmit from 725 to 1200mu and longer.

Ask for Bulletin MI-318

LOW REFLECTING COATING

Double and triple layer with minimum reflection. Increases transmission to 9 micron on Germanium and Silicon.

ELECTRICALLY CONDUCTING COATING

Colorless, transparent. Resistance of 800 ohms per square while maintaining over 95% light transmission.

ANTI-STATIC FILMS

RF SHIELDING FILMS

Colorless, 97% transmission. Write for further information

Fish-Schurman Corp., 74 Portman Road, New Rochelle, N.Y.



LIFE SCIENCE TITLES A



METABOLIC MAPS, Volume II

Wayne W. Umbreit, Rutgers University

For both advanced research worker and student, these maps promote the understanding of metabolic pathways and present at a glance experimental information about the reactions which occur in living cells. 1960; 287 pages; \$6.00

MANOMETRIC TECHNIQUES

Wayne W. Umbreit, Rutgers University; R. H. Burris and J. F. Stauffer, University of Wisconsin

Covers thoroughly the theory and practical application of manometric techniques and describes chemical radioisotopic and electrometric methods; preparation of tissues, homogenates and particulate fractions from cells. 1957; 342 pages; \$6.50

BEHAVIOR OF ENZYME SYSTEMS: An Analysis of Kinetics and Mechanism

John M. Reiner, Emory University

This is a practical handbook for the diagnosis and analysis of enzyme behavior. Written for research workers who need mathematical tools for quantitative interpretation of their work, the book is also adaptable for a one semester course in enzyme kinetics or enzymology. 1959; 329 pages; \$6.50

NUCLEIC ACID OUTLINES, Volume I

Van R. Potter, University of Wisconsin

Structure, metabolism, biosynthesis and the function of the nucleic acids are among the topics covered in this volume. There are many references to current literature for those who wish to make a more intensive study. 1960; 297 pages; \$5.00

ELEMENTARY BIOCHEMISTRY

Edwin T. Mertz, Purdue University

Emphasis in this book is on comparative biochemistry of animals, plants and microorganisms, making it attractive to teachers in widely differing fields. Usable at the second semester sophomore or higher levels. 1959; 300 pages; spiral bound, \$5.50; cloth bound, \$6.50

BURGESS PUBLISHING COMPANY

426 South Sixth Street Minneapolis 15, Minnesota



Production experience guarantees

RELIABIL

Order with confidence, the quality and dependability your laboratory and research needs demand. Prompt service. All correspondence and inquiries answered immediately.

- bloods
- ultrafiltrates
- complement globulins
- fluorescent materials
- diagnostic reagents
- tissue culture reagents

We maintain a variety of our own laboratory animals under the finest conditions. COLORADO



SERUM CO. **LABORATORIES**

Laboratory and General Office

4950 YORK STREET . DENVER 16, COLORADO . MAin 3-5373

PEAK OF QUALITY

Esterline-Angus Co. 1960: 21 Oct., 1184; 11 Nov., 1410; 2 Dec., 1706 1961: 20 Jan., 149; 24 Mar., 799; 19 May, 1554; 21 July, 210; 5 Aug., 437 Fisher Scientific Co. 1960: 9 Dec., 1736 1961: 21 Apr., 1297 Gilford Instrument Laboratories, Inc. 1961: 6 Oct., 1022 Houston Instrument Corp. 1960: 21 Oct., 1175 1961: 20 Jan., 230; 17 Feb., 532; 24 Mar., 938; 21 Apr., 1299; 19 May, 1642; 16 June, 1930; 21 July, 206; 22 Sept., 880 Leeds & Northrup Co. 1960: 21 Oct., 1040 Minneapolis-Honeywell, Heiland Div. 1961: 20 Jan., 128; 17 Feb., 439; 24 Mar., 832; 21 Apr., 1184; 19 May, 1540; 16 June, 1876; 21 July, 149; 18 Aug., 430; 22 Sept., 793 Photovolt Corp. 1960: 25 Nov., 1563; 23 Dec., 1901 1961: 6 Jan., 49; 3 Feb., 338; 7 Apr., 1084; 12 May, 1495; 2 June, 1776; 7 July, 64; 4 Aug., 347; 1 Sept., 623; 29 Sept., 954; 6 Oct., 1016 Sanborn Co. 1961: 17 Feb., 414; 14 Apr., 1135; 29 Sept., IFC Sargent, E. H., & Co. 1960: 21 Oct., 1046 1961: 17 Feb., 420; 16 June, 1858; 6 Oct., 969 Scientific Products, Div. of American Hospital Supply Corp. 1960: 2 Dec., 1594 Smith, Arthur F., Inc. 1960: 7 Oct., 968; 4 Nov., 1326; 2 Dec., Standard Scientific Supply Corp. 1961: 19 May, 1636 Stoelting, C. H., Co. 1960: 7 Oct., 970; 2 Dec., 1705 1961: 21 Apr., 1268 Texas Instrument Co. 1960: 21 Oct., 1053; 2 Dec., 1583 1961: 24 Mar., 809; 19 May, 1515; 21 July, 155 Thomas, Arthur H., Co. 1960: 14 Oct., BC Varian Associates 1961: 6 Jan., 52 Yellow Springs Instrument Co. 1961: 20 Jan., 225

Recorders, Integrating

Atomic Accessories, Inc. 1961: 16 June, 1852 Fisher Scientific Co. 1961: 21 Apr., 1297; 23 June, 2025 Ridgefield Instrument Group, a Schlumberger Div. 1961: 18 Aug., 484 Texas Instruments, Inc. 1961: 22 Sept., 767

Recorders, Tape

Mnemotron Corp. 1961: 2 June, 1734 Precision Instrument Co. 1960: 7 Oct., 963; 21 Oct., 1055; 4 Nov., 1323; 11 Nov., 1433; 2 Dec., 1693 1961: 6 Jan., 53; 3 Feb., 339; 24 Mar., 943; 14 Apr., 1136 Sanborn Co. 1961: 18 Aug., 410

NEARLY 1,000 PAGES

OF APPARATUS. **INSTRUMENTS** AND EQUIPMENT **FOR SCIENTIFIC LABORATORIES**



LaPine Catalog "C" is designed to give scientists and purchasing personnel all the information needed to make correct decisions and purchases.

Catalog "C" is clearly written, fully illustrated. Prices are current with the printing

An alphabetical listing and ascending numbering system is used for maximum speed and ease. The comprehensive, extensively cross-referenced subject index pinpoints the location of every item.

SERVICE

LaPine Scientific Company stocks most items listed for immediate shipment from the centrally located Chicago warehouse. If the order originates in the east, shipment is from the New York warehouse.

CATALOG "C" DISTRIBUTION

Catalog "C" is now being mailed to laboratories and purchasing personnel all across the nation and throughout the world. Please let us know the catalog requirements of your laboratory or department.



LAPINE SCIENTIFIC COMPANY 6001 SOUTH KNOX AVENUE, CHICAGO 29, ILLINOIS, U.S.A.

MANUFACTURERS • DISTRIBUTORS

LABORATORY SUPPLIES • EQUIPMENT • REAGENT AND INDUSTRIAL CHEMICALS

IN THE EAST: LAPINE SCIENTIFIC COMPANY (NEW YORK) SOUTH BUCKHOUT STREET, IRVINGTON-ON-HUDSON, NEW YORK



This simple, reliable unit answers the needs for both high and low temperatures. It is easy to use. Needs only to be plugged into 115V outlet for full operation. Holds temperatures to $\pm 3^{\circ}F$ or better over full range. Uniform temperatures provided thoughout workspace by forced air circulation. One cubic foot workspace with full opening door. Overall dimensions 35"W x 24"D x 45"H. Includes indicating thermoregulators. Models also available in full line of sizes, temperature ranges, tolerances and instrumentation. Write for Bulletins # FT3601 and 8601 and price lists

\$1350 fob Los Angeles add \$35.00 for caster base



3739 San Fernando Road / Glendale 4, California / CHapman 5-8471

Refractometers, Differential

Ercona Corp.

1960: 2 Dec., 1586 1961: 18 Aug., 412

Phoenix Precision Instrument Co.

1960: 21 Oct., 1199

1961: 20 Jan., 210; 22 Sept., 852

Waters Associates

1961: 24 Mar., 919

Refrigerators, Sub-Zero

Cyrogenic Engineering Co. 1961: 22 Sept., 876

Custom Scientific Instruments, Inc.

1960: 21 Oct., 1196

1961: 17 Feb., 432; 21 Apr., 1180

Instrumentation Associates, Inc. 1961: 2 June, IBC

Linde Co.

1960: 7 Oct., 962; 2 Dec., 1694 1961: 13 Jan., 110; 24 Mar., 950; 21

Apr., 1290; 16 June, 1943

Standard Scientific Supply Corp.

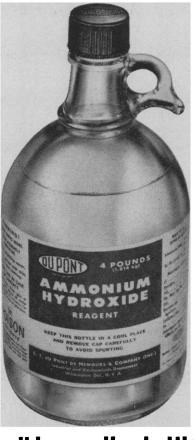
1961: 17 Feb., 508

Restrainers, Animal

Foringer & Co., Inc. 1960: 7 Oct., 971

Resuscitators

Ohio Chemical & Surgical Equipment Co. 1961: 19 May, 1644; 22 Sept., 852



Gives reproducible results, bottle after bottle

Take one set of results you got with Du Pont Ammonium Hydroxide Reagent. You can change bottles, shipments or locality, and you'll reproduce the same results-time after time! That's because Du Pont continuously runs this reagent through 113 separate analytical tests to keep it uniform for your most stringent requirements.

It's of uniformly high purity, too, exceeding American Chemical Society requirements. And you get the convenience of single-trip cartons, dripless sleeves, safety grips on 5-pint bottles and color-coded caps and labels.

Du Pont's family of reagents includes Nitric, Sulfuric, Hydrochloric and Glacial Acetic acids, and Ammonium Hydroxide. They're readily available all over the country. Ask your local laboratory supply house or write for list of suppliers. Industrial and Biochemicals Department, N-2545 S. Wilmington 98, Delaware.

BETTER THINGS FOR BETTER LIVING ... THROUGH CHEMISTRY

Safety Enclosures

Blickman, S., Inc. 1960: 21 Oct., 1177

Sample Changers, Isotope Automatic

Baird-Atomic, Inc.

1961: 21 July, 144; 18 Aug., 420

Sharp Laboratories, Inc. 1960: 21 Oct., 1185

Technical Associates

1960: 21 Oct., 1036 1961: 19 May, 1552

Tracerlab, Inc.

1961: 17 Feb., 438; 5 May, 1392

Exact Weight Scale Co.

1961: 24 Mar., 937; 22 Sept., 891

Pennsylvania Scale Co. 1961: 22 Sept., 849

Scalers, Nuclear

See Counters and scalers, gamma radiation; Counters and scalers, low-level radi-

Scanners, Chromatogram

See Chromatogram scanners

Schedule Boards

Graphic Systems

1960: 11 Nov., 1416

1961: 24 Mar., 920; 21 July, 202; 22

Sept., 856

Scintillation Counters

See Counters, scintillation

Scintillation Crystals

See Crystals, scintillation

Scintillation Probes

Atomic Accessories, Inc. 1960: 21 Oct., 1202 Picker X-Ray Corp. 1960: 18 Nov., 1447

Scintillation Well Detectors

Nuclear-Chicago Corp.

1960: 28 Oct., BC

1961: 27 Jan., BC

Packard Instrument Co., Inc.

1961: 26 May, 1678

Serums

Colorado Serum Co. 1961: 17 Feb., 509

Serums, Biological

Hyland Laboratories 1960: 2 Dec., 1702

Shakers, General Purpose

New Brunswick Scientific Co., Inc. 1960: 11 Nov., 1409; 18 Nov., 1507; 25 Nov., 1563

1961: 6 Jan., 49; 21 Apr., 1294





The Shadow Indicating Pennograph with Analytical Balance Accuracy

Model 501 Pennograph is a super-sensitive precision instrument expressly designed for laboratory use where sensitivity of the highest order is essential and where super speed is needed. This scale provides sensitivities as fine as 50 milligrams and capacities up to $3\frac{1}{4}$ pounds.

Pennsylvania Pennograph available in 52 models with wide choice of ca-pacities, sensitivities, in-dication, charts and beams...making it the perfect scale for countless laboratory applications.

SEND for Free Pennograph Literature

PENNSYLVANIA SCALE COMPANY **BAREVILLE (LEOLA), PENNSYLVANIA**

SHERER PACKAGED GROWTH ROOMS

versatile

convenient

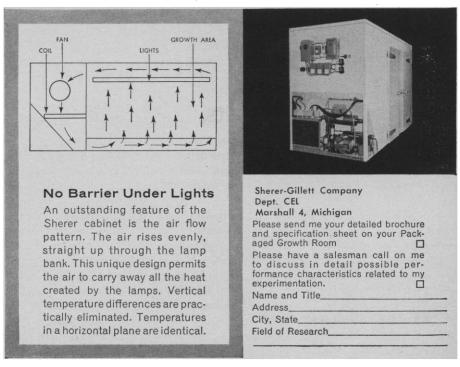
precise

Assembled, And Operating In One Day

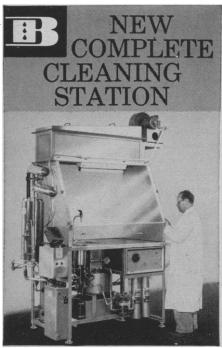
The entire power and control section are factory-assembled and mounted on one wall section. Two simple electrical and plumbing connections put the unit in operation fast. eliminate potential on-the-job errors, and reduce installation expense.

Designed by Scientists **Built by Experts**

The Sherer Controlled Environment Laboratory is the result of several years experimental work with scientists actively engaged in basic biological research. It is constructed by Sherer-Gillett, established in 1852 and involved exclusively in the manufacture of commercial refrigeration equipment for more than thirty years.



1303



FOR WASHING ELECTRONICS COMPONENTS

Here's your one-stop, one-location cleaning station for final washing and rinsing of transistors, diodes, crystals and other components. Eliminates need to maintain large "clean" areas which add to operating costs. Reduces transporting and handling while cleaning and rinsing costs are sharply reduced because the unit is largely regenerative. Illustrated unit can be modified to meet a wide variety of washing and rinsing requirements.

INEXPENSIVE TO OPERATE

Both ultra pure hot water and Freon rinsing systems are designed for continuous recirculation and repurification to keep operating costs low. A three gallon per hour Still supplies makeup water. Freshly distilled Freon is continuously fed into the Freon rinse chamber. Contaminated Freon returns by gravity to a Freon Recovery Still.

NEW BULLETIN

New Bulletin #166 describes the complete line of Barnstead Transistor Washers. Cut reject rate, provide more efficient final rinse, and save on pure water and heat. Write for your copy today.

Barnstead STILL AND STERILIZER CO.

49 Lanesville Terrace, Boston 31, Mass.

Shakers, Gyrotory

New Brunswick Scientific Co., Inc. 1960: 9 Dec., 1779

Shakers, Incubator

New Brunswick Scientific Co., Inc. 1960: 18 Nov., 1507 1961: 20 Jan., 215; 24 Mar., 919; 19 May, 1519; 1 Sept., 623; 22 Sept., 785

Shakers, Water Bath

New Brunswick Scientific Co., Inc. 1960: 2 Dec., 1705 1961: 21 Apr., 1294; 15 Sept., 741 Research Specialties Co. 1961: 19 May, 1608

Shields, Radiation

Technical Associates 1960: 21 Oct., 1036 1961: 19 May, 1552

Sieves, Laboratory

Custom Scientific Instruments, Inc. 1961: 16 June, 1862

Sinks, Laboratory, Porcelain

U.S. Stoneware 1961: 20 Jan., 211; 21 July, 233

Skeleton Models, Human

Welch, W. M., Scientific Co. 1961: 6 Jan., 55 Clay-Adams 1961: 21 July, 157

Soil Testing Kits

Edmund Scientific Co. 1961: 19 May, 1533

Sonic Oscillators

Raytheon Co. 1960: 2 Dec., 1689 1961: 21 Apr., 1277; 19 May, 1627; 21 July, 221; 22 Sept., 865

Spectral Lamps

Ealing Corp. 1961: 22 Sept., 872

Spectro Fluorometers

Farrand Optical Co., Inc. 1960: 11 Nov., 1413

Spectrographs

Baird-Atomic, Inc. 1961: 7 July, 4; 21 July, 124; 11 Aug., 356
Bausch & Lomb Optical Co. 1961: 17 Mar., 771; 11 Aug., 360

Spectrometers, Mass See Mass spectrometer

Spectrophotometers, Data Plotter

Connecticut Instrument Corp. 1960: 2 Dec., 1711

Spectrophotometers, Infrared

Baird-Atomic, Inc.

1961: 5 May, 1439; 19 May, 1510
Beckman Instruments, Inc., Scientific and Process Instruments Div.

1960: 21 Oct., 1039; 9 Dec., 1732

1961: 27 Jan., 250; 10 Feb., 348; 28
Apr., 1323; 26 May, 1673; 30 June, 2036; 21 July, 127; 25 Aug., 526
Perkin-Elmer Corp.

1960: 21 Oct., 1034; 18 Nov., 1448

1961: 13 Jan., 64; 10 Mar., 664; 25
Aug., 520; 29 Sept., BC

Spectrophotometers, Micro

Beckman Instruments, Inc., Spinco Div. 1961: 8 Sept., IFC
Brinkmann Instruments, Inc. 1961: 17 Feb., 520
Canal Industrial Corp. 1960: 21 Oct., 1171 1961: 17 Feb., 515
Coleman Instruments, Inc. 1961: 16 June, 1879; 21 July, 135
Standard Scientific Supply Corp. 1961: 16 June, 1932

Spectrophotometers, Visible and Ultraviolet

Applied Physics Corp.

1961: 20 Jan., 222; 31 Mar., 959; 7 July, 61; 18 Aug., 496; 22 Sept., 869. Bausch & Lomb Optical Co. 1960: 7 Oct., 924 1961: 27 Jan., 254; 7 Apr., 1044; 7 July, 12 Beckman Instruments, Inc., Scientific and Process Instruments Div. 1960: 7 Oct., 915; 9 Dec., 1732 1961: 13 Jan., 68, 69; 24 Mar., 845; 26 May, 1673; 25 Aug., 526; 22 Sept., 761 Coleman Instruments, Inc. 1960: 2 Dec., 1609 1961: 10 Feb., 354; 16 June, 1879; 21 July, 135 Harshaw Scientific 1961: 11 Aug., 399; 22 Sept., 862; 6 Oct., 1023 Perkin-Elmer Corp. 1961: 19 May, 1504; 16 June, 1846; 14 July, 72; 18 Aug., 415; 1 Sept., 580; 15 Sept., 692; 29 Sept., BC Sargent, E. H., & Co. 1961: 6 Oct., 969 Scientific Products, Div. of American Hospital Supply Corp. 1960: 21 Oct., 1076 1961: 17 Feb., 406; 21 Apr., 1162 Zeiss, Carl, Inc. 1960: 2 Dec., 1599

Spectropolarimeters

Rudolph Instruments Engineering Co. 1960: 21 Oct., 1064 1961: 24 Mar., 926

Spectroscopes

Bausch & Lomb Optical Co. 1961: 19 May, 1558 Ealing Corp. 1961: 16 June, 1965; 22 Sept., 872 Fisher Scientific Co. 1961: 24 Mar., 843

Automatic Protein and/or Peptide Analyses

(Either Individual Samples or Column Effluent)

Quantitate...

Total Nitrogen by Kjeldahl

Total Protein by Biuret

Total Protein by Folin-Ciocalteau (Lowry modification)

Amino Groups by Ninhydrin

Tyrosine by Folin-Ciocalteau

Histidine by Pauly Diazo Reaction

Arginine by Sakaguchi

Glutamic Acid by Decarboxylase

Lysine by Decarboxylase

Albumin by HABA Dye [2-(4' hydroxyazobenzene) benzoic acid]

$\mathbf{Analyze}...$

Biological Fluids directly

Effluent from DEAE or Resin Chromatographic Column

Effluent from Poraeth Electrophoretic Column

Electrophoretic Starch Block Fractions

Electrophoretic Paper Chromatogram Segments

Check point stages in Protein Fractionation

Counter Current Distributions

with the TECHNICON®



Any or all of these determinations may be run on the same AutoAnalyzer: Takes only two minutes to change from one type of analysis to another. Any combination may be run simultaneously from the same sample by adding additional standard AutoAnalyzer modules. The response time is such that most of the analyses may be run at 40 samples per hour.

for information, select area of interest and write to

TECHNICON CHROMATOGRAPHY CORP. 42 RESEARCH PARK • CHAUNCEY, NEW YORK This Lindberg quality LABORATORY FURNACE is available in

two sizes. Either is ideal for a variety of uses such as

ASH DETERMINATIONS, FUSIONS, ASSAYING and HEAT



THE DETAILS: In both furnaces shell is fabricated from heavy sheet steel and finished with high temperature gray baked enamel. Manually operated door is counter-weighted for easy operation. A built-in transformer and control circuit contactor for supplying and controlling the low voltage to the heating element are located in the lower section of the furnace housing. Work chamber is heavily insulated and equipped with a high temperature refractory hearth plate. Heat is provided by a heavy, one piece, rod type nickel chromium element, easy to remove and replace. Available with either Automatic Controller Pyrometer or Manual Input Control.

	Model B-2	Model B-6
Overall length	25"	301/4"
Overall width	19"	22"
Overall height	22"	26"
Chamber depth	101/4"	141/4"
Chamber width	41/4"	7½"
Chamber height	4"	5″
Power rating	1800 W	4000 W
Max. Temperature	2000°F.	2000°F.

Lindberg Laboratory Equipment is sold only through LABORATORY EQUIPMENT DEALERS. For full information on the B-2 and B-6 Furnaces ask your dealer for Lindberg Bulletin No. 1055. Laboratory Equipment Division, Lindberg Engineering Company, 2494 West Hubbard Street, Chicago 12, Illinois.



BEL-ART

PLASTIC LABORATORY WARE



AVAILABLE FROM YOUR LOCAL SUPPLY DEALER

The MOST COMPLETE line available from **ONE** source

From beakers to pumps, from tanks to valves. Stock or made to order. If you have a problem concerning plastic laboratory ware or its application, consult our technical department.

> FREE! Send for new 44-page catalog

BEL-ART PRODUCTS

PEQUANNOCK, N. J. OXbow 4-0500

PLASTICS

for Science and Industry

ELECTRON MAGNETIC RESONANCE SPECTROMETERS by Strand Labs For applications in · fundamental physical research · measurements of magnetic susceptibility studies of free radicals process control Microwave Spectrometers for operation at X, Ku, K and Ka Bands, with 200 and 1600 mc soon available. Write for complete information 294 Centre St., Newton 58, Mass. Tel: WOodward 9-8890 Manufacturers of Ultra-Stable Signal Generators and EMR Spectrometers



Sterilizers

American Sterilizer Co.

1960: 11 Nov., 1351 1961: 20 Jan., 129; 16 June, 1855

Wilmot Castle Co.

1960: 14 Oct., 982; 21 Oct., 1038; 2

Dec., 1597

1961: 20 Jan., 150; 24 Mar., 818; 21 Apr., 1190; 26 May, 1675; 16 June, 1860; 21 July, 126; 25 Aug., 1A; 22 Sept., 782

Stills, Vacuum

Greiner, Emil, Co. 1961: 20 Jan., 216 Smith, Arthur F., Inc.

1960: 21 Oct., 1188; 25 Nov., 1564

Stills, Water

Ace Glass, Inc.

1961: 21 July, 215

American Sterilizer Co.

1960: 11 Nov., 1351 1961: 20 Jan., 129; 16 June, 1855 Barnstead Still and Sterilizer Co.

1960: 21 Oct., 1168

1961: 20 Jan., 230

Bellco Glass, Inc.

1961: 19 May, 1624; 16 June, 1961; 30

June, 2073; 7 July, 63

Stokes, F. J., Corp.

1961: 19 May, 1612; 16 June, 1965; 21 July, 206; 18 Aug., 503; 22 Sept., 860

Wilmot Castle Co.

1960: 11 Nov., 1342; 25 Nov., 1571

1961: 17 Feb., 405

Stimulators, Electronic

American Electronic Laboratories, Inc. 1960: 11 Nov., 1428; 2 Dec., 1713 1961: 20 Jan., 235; 17 Feb., 513; 24 Mar., 898; 19 May, 1609; 16 June, 1957; 22 Sept., 861 Foringer & Co., Inc. 1960: 7 Oct., 971

Stirrers, Electric

Heller, Gerald K., Co. 1960: 21 Oct., 1186; 11 Nov., 1414; 25 Nov., 1566; 9 Dec., 1772 Scientific Industries, Inc. 1960: 18 Nov., 1505 1961: 20 Jan., 200 Smith, Arthur F., Inc. 1960: 14 Oct., 1021 Wilkins-Anderson Co. 1961: 24 Mar., 935

Stirrers, Magnetic

Central Scientific Co. 1961: 16 June, 1939 LaPine, Arthur S., and Co. 1960: 21 Oct., 1160 Thermolyne Corp. 1961: 16 June, 1942 Thomas, Arthur H., Co. 1961: 6 Oct., BC Tri-R Instruments 1960: 21 Oct., 1203 1961: 17 Feb., 537

Stools, Laboratory

Adjusto Equipment Co.

1960: 21 Oct., 1152; 2 Dec., 1685 1961: 24 Mar., 901; 22 Sept., 852

225 VARICK STREET, NEW YORK 14

Worthington

Lyophilized Alcohol

Dehydrogenase

The best commercially available.

YEAST ADH:

2 x crystallized according to Racker.

LIVER ADH:

1 x crystallized according to Bonnichsen and Brink.

Worthington now offers:

PHOSPHOLIPASE-C

(Lecithinase-C; a-toxin).

LUCIFERASE (BACTERIAL)

For information, write:

WORTHINGTON

Biochemical Corporation

Freehold 1, New Jersey



Stopcocks, Teflon

Corning Glass Works

1961: 17 Feb., 407; 21 Apr. 1170

Kimble Glass Co.

1960: 9 Dec., 1731 1961: 6 Jan., 4; 24 Mar., 803

Sulfur Determinators

Dietert, Harry W., Co. 1961: 19 May, 1630

Surface Tension Apparatus

Fisher Scientific Co. 1961: 9 June, 1789

Survey Meters, Radiation

See Monitors, radiation

Syringes, Constant Rate

JKM Instrument Co. 1961: 21 July, 137; 18 Aug., 431

Syringes, Infusion

Will Corp.

1960: 21 Oct., 1041 1961: 24 Mar., 956

Syringes, Micro, Gas

Hamilton Co., Inc.

1960: 30 Dec., 1907 1961: 21 Apr., 1167; 5 May, 1391; 22

Sept., 882

Syringes, Micro, Liquid

Hamilton Co., Inc. 1960: 14 Oct., 987; 11 Nov., 1415 1961: 28 Apr., 1321; 18 Aug., 486

Syringes, Radiation Shielded

Hamilton Co., Inc.

1961: 12 May, 1448; 21 July, 205

Tachometers

VirTis Co., Inc. 1961: 24 Mar., 796

Teaching Equipment, Physiological

Harvard Apparatus Co. 1960: 11 Nov., 1413

Teaching Equipment, Radiation

See Demonstration equipment, nuclear

Telescopes

Criterion Manufacturing Co.

1961: 20 Jan., 232; 17 Feb., 498; 24 Mar., 954; 21 Apr., 1264; 19 May, 1614

Edmund Scientific Co. 1960: 25 Nov., 1519

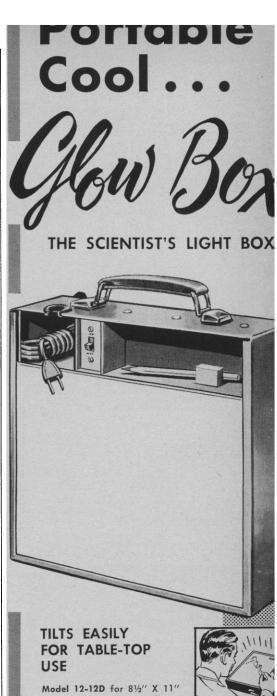
1961: 20 Jan., 151; 24 Mar., 829; 21 Apr., 1186; 19 May, 1533; 18 Aug., 434; 22 Sept., 781

Unitron Instrument Co.

1960: 4 Nov., 1324; 18 Nov., 1506; 2

Dec., 1714

1961: 6 Jan., 54; 28 Apr., 1374; 1 Sept.,



curves, charts, spectra, X-ray film, biological samples, etc. Model 12-20E for double size sheets 11" X 18".

FITS STANDARD DESK DRAWER FOR STORAGE OR USE

Keep GLOW BOX in desk drawer immediately available whenever you wish to examine, compare, or trace. It's so convenient!

STANDS UPRIGHT FOR DEMONSTRATIONS

The uniform, diffuse light focuses attention on displays of samples for lectures, demonstrations, etc.

SEND CARD FOR LITERATURE





Temperature Circulators

Brinkmann Instruments, Inc. 1960: 9 Dec., 1780 1961: 22 Sept., 875

Temperature Controllers, Liquid

Brinkmann Instruments, Inc. 1960: 18 Nov., 1508; 9 Dec., 1774; 30 Dec., 1946

Bronwill Scientific, Div. of Will Corp. 1960: 21 Oct., 1070

1961: 24 Mar., 934; 14 Apr., 1138; 19

May, 1620

Instruments for Research and Industry 1961: 17 Feb., 514; 21 Apr., 1296; 19 May, 1653; 21 July, 233; 22 Sept., 883 LaPine Scientific Co.

1961: 21 Apr., 1264

Schuco Scientific, Div. of Schueler & Co.

1960: 2 Dec., 1681 Wilkens-Anderson Co. 1961: 22 Sept., 880

Temperature Controllers, Low **Temperature**

Lauda Instruments, Inc.

1961: 19 May, 1655; 16 June, 1929; 16 June, 1946; 18 Aug., 483; 22 Sept., 867 VirTis Co.

1961: 18 Aug., 501

Temperature Indicators, Paint

Curtiss-Wright Corp. 1961: 24 Mar., 898

Temperature Programmers, Linear

F & M Scientific Corp. 1960: 21 Oct., 1196; 11 Nov., 1346 1961: 22 Sept., 770

Temperature Recorders, Cryogenic

Texas Instruments, Inc. 1961: 24 Mar., 946

Test Tube Closures

Bellco Glass Inc. 1960: 21 Oct., 1163 1961: 8 Sept., 681

Test Tube Mixers

Beckman Instruments, Inc., Spinco Div. 1961: 23 June, IFC; 8 Sept., IFC

Clay-Adams

1961: 16 June, 1849; 18 Aug., 413; 22

Sept., 791

Scientific Industries, Inc. 1960: 21 Oct., 1158

1961: 17 Feb., 498; 16 June, 1950

Thermometers, Electronic (Thermistor)

Greiner, Emil, Co. 1961: 16 June, 1958

Tri-R Instruments

1960: 21 Oct., 1203; 2 Dec., 1672

1961: 22 Sept., 889

VirTis Co.

1961: 18 Aug., 501

Yellow Springs Instrument Co., Inc.

1960: 2 Dec., 1688

Timers, Laboratory

Scientific Glass Apparatus Co., Inc. 1960: 25 Nov., 1562 Standard Scientific Supply Corp. 1960: 2 Dec., 1698

Tissue Culture Equipment

Bellco Glass Inc. 1960: 30 Dec., 1949 Kontes Glass Co. 1961: 16 June, 1959 New Brunswick Scientific Co., Inc. 1961: 17 Mar., 769; 12 May, 1495; 9 June, 1837; 8 Sept., 683

Tissue Grinders

See Homogenizers, tissue

Titrators, Automatic

Brinkmann Instruments, Inc.

1961: 14 Apr., 1137; 21 Apr., 1301; 22

Sept., 847

Buchler Instruments, Inc. 1961: 17 Feb., 521

Coleman Instruments, Inc.

1961: 28 Apr., 1318; 22 Sept., 779

Fisher Scientific Co.

1961: 24 Mar., 842; 26 May, 1725

Danube International Trade Corp.

1960: 21 Oct., 1148

Polarad Electronics Corp., Scientific Instruments Div.

1960: 21 Oct., 1045; 11 Nov., 1363

1961: 31 Mar., IBC Sargent, E. H., & Co.

1961: 18 Aug., 421

Standard Scientific Supply Corp. 1961: 20 Jan., 228; 22 Sept., 858

Welwyn International Inc. 1960: 21 Oct., 1050

1961: 20 Jan., 146

Titrators, Micro

Beckman Instruments, Spinco Div. 1961: 23 June, IFC; 8 Sept., IFC Cooke Engineering Co.

1961: 6 Oct., 1017

Intercontinental Scientific Corp.

1961: 16 June, 1941

Thomas, Arthur H., Co.

1961: 14 July, BC

Tubing Connectors

Beckman Instruments, Inc., Scientific and Process Instruments Div.

1960: 25 Nov., 1569

Tubing, Glass

Kimble Glass Co. 1960: 14 Oct., 983

Tubing, Plastic

Nalge Co., Inc.

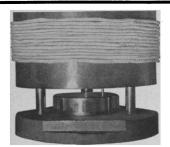
1961: 19 May, 1623; 18 Aug., 488 U.S. Stoneware

1961: 24 Mar. 916; 19 May, 1615; 22 Sept., 864

Typewriter Symbols, Scientific

Mechanical Enterprises Inc.

1961: 22 Sept., 854; 6 Oct., 1021



Electrothermal HERMOCOR

A rugged, flexible heating cable with glass fibre, braided insulation for

Temperatures up to 450° c from the fact that the 2' length, when close coiled round a 1" tubing, gives a wattage concentration of 26 watts per square inch. Alternatively, it can be traced or spiralled round the tubing at any predetermined open pitch to give the required energy input.

TEMPERATURE CONTROL

DESCRIPTION
The Thermocord consists of a pure nickel/chrome heating element insulated by inorganic fibres. Two feet of insulated, unheated, flexible lead are attached to each end of the heating section and the whole, including the unheated leads, is covered with a tough external sheath of braided glass fibre. Designed to operate with a loading of 5 watts per linear inch, element temperatures up to 450° C are attainable. The cable has an approximate outside diameter of 3/16".

APPLICATION
The versatility of the Thermocord can be iudaed DESCRIPTION

The high surface loading of the Thermocord makes it essential for a form of temperature control to be used at all times. Energy Regulators or Auto Transformers as listed will be found to meet any control requirement. the Thermocord can be judged
TYPE NO. | Length, ft. ersatility of CAT. NO. Length, ft. Volts Watts HC 101 110 HC 102 110 120 HC 103 HC 104 S-65112 4 110 240 110 480 HC 105 16 110

5-32837 S-55814 HC 106 32 220 ENERGY REGULATOR, Input 100/130 V

AUTO-TRANSFORMER, Input 110 V

Output 100/130 V 200/250 Output 0-130 V \$65.00 44111111

1920

LABORATORY APPARATUS REAGENTS AND CHEMICALS

Price

\$6.90

\$9.00

\$14.50

\$24.20

\$54.50

≣Just Published <u>----</u>

ANNUAL REVIEW OF

PHYSICAL CHEMISTRY

Volume 12

September 1961

ANNUAL REVIEW OF

MICROBIOLOGY

Volume 15

October 1961

Other ANNUAL REVIEWS

ENTOMOLOGY	Vol. 6	Jan. 1961
PSYCHOLOGY	Vol. 12	Feb. 1961
PHYSIOLOGY	Vol. 23	Mar. 1961
PHARMACOLOGY	Vol. 1	Apr. 1961
MEDICINE	Vol. 12	May 1961
PLANT PHYSIOLOGY	Vol. 12	June 1961
BIOCHEMISTRY	Vol. 30	July 1961
NUCLEAR SCIENCE	Vol. 11	Dec. 1961

\$7.00 postpaid (U.S.A.); \$7.50 postpaid (elsewhere)

ANNUAL REVIEWS, INC.

231 Grant Avenue,

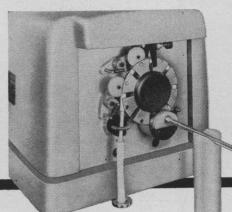
Palo Alto, California



NOW... MECHANICALLY, COTTON PLUG UP TO 2400 PIPETTES PER HOUR

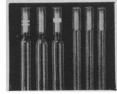
Bellco presents...the

PIPETTE PLUGGER



- Cotton plugs pipettes up to 2400 per hour
- Consistently uniform cotton plugs
- Versatile—accepts full range of standardized cotton plugging pipettes without adjustment
- Compact requires little floor space

NOTE UNIFORMITY OF COTTON PLUGS



The Harrison Pipette Plugger eliminates the slow, tedious job of hand stuffing cotton in pipettes. An experienced operator can plug pipettes up to 2400 per hour, with each cotton plug absolutely uniform in size. Cotton plugging speeds adjustable to 22, 30 or 40 pipettes per minute. The Harrison Pipette Plugger can be used over a full range of standardized cotton plugging type pipettes without adjustment, including the following pipettes: Bellco V.I.P. 12-334, Corning 7086, and Kimble 37034A. Other pipettes having identical top dimensions and tolerances as these will also be satisfactory. However, conventional pipettes can be reworked and shaped to the cotton plugging top dimensions . . . if they are of borosilicate glass. The Harrison Pipette Plugger is mounted on a sanitary work surface featuring

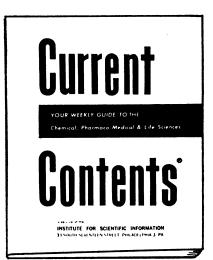
a semi-enclosed base. A shelf beneath the table holds the cotton roving, which is fed through a special opening in the table.

WRITE FOR BULLETIN NO. P-50-1 S

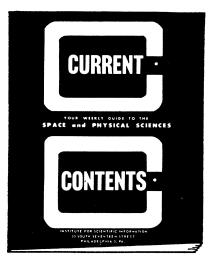
BELLCO GLASS INC. VINELAND, N. J.



TIME SAVERSI



CURRENT CONTENTS OF CHEMICAL, PHARMACO-MEDICAL & LIFE SCIENCES is a comprehensive weekly service that lists the tables of contents, most of them in advance, of more than 600 primary scientific journals. With this service, the scientist is given a unique, convenient method to scan the title pages of journals of interest to him without physically handling thousands of individual issues per year. Spending about one hour per week, he can easily check off articles of interest. CURRENT CONTENTS also provides, when possible, author addresses so scientists can write to colleagues for reprints. In addition, Original Article Tear Sheets are available.



CURRENT CONTENTS OF SPACE & PHYSICAL SCIENCES enables scientists to keep up with new developments in such fields as missiles and rockets, electronics, mathematics, computers, physics, nuclear energy and instrumentation. This new weekly service comprehensively reports the contents of more than 500 primary journals—over 100,000 individual articles per year. As a special bonus, all basic chemical journals are covered in this edition of CURRENT CONTENTS. Available only to CURRENT CONTENTS. Available only to CURRENT CONTENTS subscribers is our exclusive Original Article Tear Sheet service, OATS supplies the principal ingredient in the effective utilization of scientific information—prompt and convenient access to original documents. And cost of OATS is lower than hard-to-read photocopies.

Gratis review copies of the above listed services are available upon request.

INSTITUTE FOR SCIENTIFIC INFORMATION 33 SOUTH SEVENTEEN STREET, PHILADELPHIA 3, PA.

Ultrasonic Cleaners

Edmund Scientific Co. 1961: 19 May, 1533 Will Corp. 1961: 17 Feb., 531

Ultrasonic Disintegrators
See Disintegrators, ultrasonic

Ultraviolet Analyzers

Buchler Instruments Inc. 1961: 21 July, 219; 18 Aug., 486
Canal Industrial Corp. 1960: 21 Oct., 1171; 2 Dec., 1679
1961: 17 Feb., 515
Gilson Medical Electronics
1961: 7 July, 60
L K B Instruments, Inc. 1960: 16 Dec., 1791
1961: 24 Mar., 811; 21 Apr., 1158

Vacuum Distillation Equipment See Stills, vacuum

Vacuum Gauges

Central Scientific Co. 1960: 14 Oct., 1022
Gilmont, Roger, Instruments Inc. 1961: 21 Apr., 1299; 16 June, 1961; 22
Sept., 897
Greiner, Emil, Co.

1961: 22 Sept., 760 Hughes Aircraft Co., Vacuum Tube Products Div. 1961: 21 July, 224

Kinney Vacuum Div., New York Air Brake Co.

1960: 21 Oct., 1177; 2 Dec., 1719 1961: 17 Feb., 497

NRC Equipment Corp.

1961: 24 Mar., 949; 19 May, 1644; 16 June, 1949

Smith, Arthur F., Inc. 1960: 11 Nov., 1421; 2 Dec., 1680 1961: 24 Mar., 938

Vacuum Leak Controllers

Granville-Phillips Co. 1960: 7 Oct., 970

Valves, Needle, Teflon

Greiner, Emil, Co. 1961: 17 Feb., 498

Valves, Vacuum

Kinney Vacuum Div., New York Air Brake Co.

1961: 24 Mar., 905

Vapor Pressure Apparatus

Fisher Scientific Co. 1961: 9 June, 1789

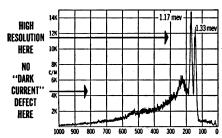
Viscometers

Ferranti Electric Inc. 1960: 21 Oct., 1159 Polarad Electronics Corp., Scientific Instruments Div. 1960: 21 Oct., 1045; 11 Nov., 1363

1961: 31 Mar., IBC

This AMG Gamma Spectrometer Eliminates "Dark Current" Defect

Combines Better Resolution With Greater Precision Over Wider Range Than Any Other System At Any Price

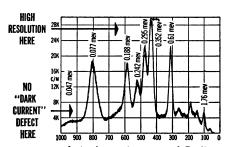


Actual spectrogram of Cobalt-60 made with a GSS-1. Window No. 3. Time constant: 2 sec.



A complete gamma spectrometer system NMC model GSS-1 (\$4,180 fob, Indianapolis)

This greatly simplified system features regulated high voltage supply as part of the counting ratemeter auto-scan system . . . all-transistorized probe amplifier and spectrometer circuits . . . and solid or well-type crystal. These points and the actual spectrograms shown here tell only part of the story. For full details, write or phone collect.



Actual spectrogram of Radium made with a GSS-1. Four runs over a period of 20 hours with no adjustment of instrument between runs, demonstrating utmost stability. Range: 30,000 C/M. Time constant: 3 sec.



Nuclear Measurements Corp.

2460 N. Arlington Ave. • Phone: Liberty 6-2415 INDIANAPOLIS 18, INDIANA

International Office: 13 E. 40th Street, New York 16, N. Y.

Warburg Apparatus

Bronwill Scientific, Div. of Will Corp. 1960: 21 Oct., 1070 1961: 17 Feb., 521; 10 Mar., 713; 7 Apr., 1085; 19 May, 1629; 16 June, 1941; 18 Aug., 507 Gilson Medical Electronics 1960: 21 Oct., 1182 1961: 24 Mar., 940; 5 Aug., 296 Scientific Glass Apparatus Co., Inc. 1961: 17 Feb., 409 Will Corp. 1960: 21 Oct., 1041

Washers, Glassware See Glassware washers

Waste Containers, Radioactive

Blickman, S., Inc. 1961: 16 June, 1936; 18 Aug., 507

Water Baths

Blue M Electric Co. 1960: 2 Dec., 1708 Hotpack 1961: 19 May, 1626 Precision Scientific Co. 1961: 17 Feb., 510; 21 Apr., 1286; 21 July, 151 Research Specialties Co. 1961: 24 Mar., 900 Schuco Scientific, Div. of Schueler & Co. 1961: 20 Jan., 236 Scientific Glass Apparatus Co., Inc. 1961: 23 June, 2026 Thermolyne Corp. 1961: 10 Mar., 714 Wilkens-Anderson Co. 1961: 19 May, 1646; 22 Sept., 880

Water Pressure Controllors

Buchler Instruments, Inc. 1961: 20 Jan., 140; 24 Mar., 904

Water Purifiers

Barnstead Still & Sterilizer Co. 1960: 2 Dec., 1720

Water Standard, Triple Point

Trans-Sonics, Inc. 1961: 19 May, 1642; 16 June, 1959; 22 Sept., 890

Weights, Balance

Ohaus Scale Corp. 1961: 22 Sept., 894

X-ray Diffraction Equipment

Engis Equipment Co. 1961: 24 Mar., 942; 22 Sept., 867 Erb & Gray Scientific, Inc. 1961: 1 Sept., 583 Radio Corporation of America 1961: 17 Feb., 408; 21 July, 146

Zone Refiners

20 OCTOBER 1961

Fisher Scientific Co. 1961: 10 Feb., 350; 7 Apr., 1038 TILLILLA Balance News

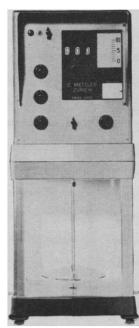
High Capacity and Remote

Highly precise weighings of radioactive, poisonous or explosive materials can be made safely and

materials can be made safely and easily on a new series of Mettler analytical balances which can be operated by remote control.

Added to the Mettler Line of more than 50 basic balance models are the W5/11 (capacity 5000g) and the W8/11 (Capacity 8000g). The well-known Mettler B5 is now also available with remote controls (med available with remote controls (model B5/11).

Boh high capacity balances (W5 and W8) have an optical scale range of 10g, sensitivity of 1 mg per vernier division and precision of ± 1mg. Readability is direct to 1mg and by estimation to 0.5mg. The weight sets are adjusted to well within U.S. Class S tolerances. Both the W5 and W8 are available Both the W5 and W8 are available without remote controls for manual operation. These balances, as well as the B5/11 can be operated manually even if equipped with remote controls.



TYPE W5

Errors Designed Out, Speed

Designed In . . .

As is the case with all Mettler Balances, the W5 and W8 models operate on the substitution principle, comparing sample and calibrated weights on the same beam arm. Thus only two knife edges are required, a lever-arm error cannot occur, and sensitivity is constant throughout the weighing range of

A unique mechanical system makes an automatic preliminary weighing to the nearest 10g. This eliminates the need to make step by step trial weighings in the partial release position. Once the rough weight has been determined, calibrated weights are quickly dialed and are lifted off of the suspension system simultaneously, thus reducing abrasive

wear on the weights to an absolute minimum.

A complete weighing (including zero point adjustment) can be made within three minutes. Zero point setting, preliminary weighing, weight selection, beam release and arrest, are all operated by remote control. Samples are placed on the pan by mechanical manipulators or through glove boxes; in some cases special conveyors are used.



REMOTE CONTROL PANEL

Safety and Convenience for the Operator . . .

Remotely operated balances insure safety when working with high levels of radioactivity such as are found in fuel cores or contaminated specimens. They also permit greater efficiency when concerned with threshold levels of radiation.

These fast and reliable remote control units can be used to deter-

control units can be used to determine the density of radioactive substances, and to measure density changes in radioactive fuel sources (in this way the life of a fuel supply can be determined.)

Explosive materials can be compounded behind thick protective

pounded behind thick protective shields. Should the protective barrier not permit use of glass windows, remote operation can be moni-tored and readings made by closed circuit television.

Poisonous chemical compounds and bacteriological substances can be effectively weighed in isolation chambers. Balances can be sterilized and

introduced in gnotobiotic systems.

The large optical scale of W5/11 and W8/11 balances makes it possible to read results from a distance of 14 feet without use of optical aids. On the B5/11 the optical scale and vernier can be read easily at distances of more than 15 feet with the aid of a telescope provided

Mettler has by far the greatest experience in the design and construction of two knife edge, single pan substitution balances. Mettler also leads the field in development of remote operating balances.

For complete information write

Meteler INSTRUMENT CORP. P.O. BOX 100A, PRINCETON, NEW JERSEY

ADVERTISERS APPEARING IN "THE MARKET PLACE"

7 October 1960 through 6 October 1961

Abrahams Magazine Service 56 E. 13 St., New York 3

Albino Farms P.O. Box 331, Red Bank, N.J.

Animal Research Center Bainbridge, N.Y.

Applied Science Laboratories, Inc. Box 140, State College, Pa.

Atkins Technical Inc. 1276 W. 3 St., Cleveland 13, Ohio

Badger Research Corp. P.O. Box 527, Madison 1, Wis.

Barr & Stroud, Ltd. Glasgow, W. 3, Scotland

Bio-Rad Laboratories 32nd and Griffin Ave., Richmond, Calif.

Canner's, Inc. 618 Parker St., Boston 20, Mass.

Cargille 117 Liberty St., New York 6

Charles River Breeding Laboratories 1018 Beacon St., Brookline 46, Mass.

Colorado Serum Co. 4950 York St., Denver 16, Colo. Curta Co. 14435 Cohasset St., Van Nuys, Calif.

Dimco-Gray Co. 214 E. 6 St., Dayton 2, Ohio

Electro-Medical Laboratory, Inc. South Woodstock 2, Vt.

Elite Chemical Co. 23 Elm St., Newark 2, N.J.

Food and Drug Research Laboratories, Inc. Maurice Ave. at 58 St., Maspeth, N.Y.

Hoeltge Bros., Inc. 1919 Gest St., Cincinnati 4, Ohio

Hormone Assay Laboratories 8159 S. Spaulding Ave., Chicago 29, Ill.

Hospital Supply Co. 304 E. 23 St., New York 10

Huntingdon Farms, Inc. 2548 N. 27 St., Philadelphia 32, Pa.

Isotopes Specialties Co. Box 688, Burbank, Calif.

Kern Co. 121 Nassau St., New York 38

Laboratory Plasticware Fabricators 714 Baltimore, Kansas City 5, Mo.

LaWall & Harrisson 1921 Walnut St., Philadelphia 3, Pa.

LaMotte Chemical Co. Chestertown, Md.

Museum of Comparative Zoology Harvard University, Cambridge, Mass.

Oxford Laboratories 961 Woodside Rd., Redwood City, Calif.

Regis Chemical Co. 1219 N. Wells St., Chicago 10, Ill.

Research Animals, Inc. 3401 Fifth Ave., Pittsburgh 13, Pa.

Riverton Laboratories, Inc. 852 Clinton Ave., Newark 8, N.J.

Sky and Telescope Cambridge 38, Mass.

Taconic Farms Germantown, N.Y.

Texas Inbred Mice Co. 305 Almeda-Genoa Rd., Houston 21, Tex.

United States Testing Co., Inc. 1415 Park Ave., Hoboken, N.J.

Wilkens Instrument & Research Inc. Box 313-A, Walnut Creek, Calif.

Wisconsin Alumni Research Foundation P.O. Box 2217, Madison 1, Wis.

Protect YOUR FAMILY

WITH THE LOW-COST



Radiation Measurement Kit For Nuclear Fallout

POCKET SIZE • EASY TO USE

THE ONLY UNIT
RECOMMENDED BY
U. S.
CIVIL DEFENSE

only \$2495 complete

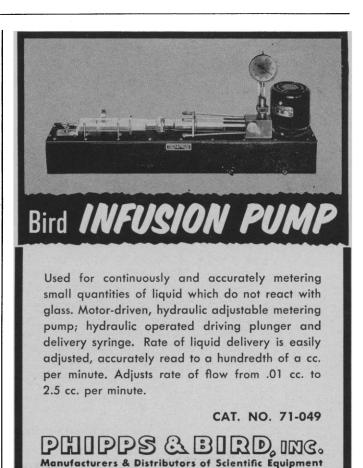
SHIPPED POST PAID

Please include check or money order.

Special discount for company and group orders.

For details write for Bulletin CDK- \$

ATOMIC occessories inc. SUBSIDIARY OF BAIRD-ATOMIC, INC. 817 W. Merrick Road, Valley Stream, N. Y.



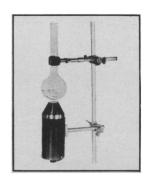
PB 6th & Byrd Streets - Richmond, Va.

TRI-R/ VERSATILE LABORATORY INSTRUMENTS



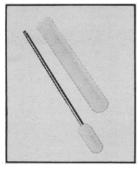
ELECTRONIC THERMOMETER

- Rapid, Accurate, Direct Reading
- Low Cost, Portable, Thermistor Type
- Many Ranges from -35 to +100° C.
- Interchangeable & Special Probes
- Controllers & Recorders
 Available



COMPACT MAGNETIC STIRRER

- Stir at Any Angle
- In Open or Closed Vessels
- Under Vacuum or Pressure
- With or without Hotplate



TEFLON TISSUE HOMOGENIZERS

- Interchangeable Teflon Pestles
- Precision Bore Pyrex Glass Tubes
- Notched for Quick Change Chuck
- Complete Apparatus Available



AUTOMATIC EGG-PUNCH

- For Opening Embryonated Eggs
- Open 60 Eggs Per Minute
- Clean 1" Circular Fracture
- One Hand Efficient Operation

Write for individual bulletins or complete catalog to Dept. S-10.

TRI-R INSTRUMENTS

Developers of Electronic and Mechanical Instruments for Scientific Research

144-13 JAMAICA AVENUE. JAMAICA 35, N. Y.

Introducing...

THE DEUTERIUM D-100B LAMP

New Ultra-Violet Spectrophotometer Source

ALL QUARTZ HIGH INTENSITY LONG LIFE . TROUBLE FREE

Spectral emission curve, closely approximates that of the hydrogen lamp, producing continuous ultraviolet radiation. Interchangeable with other standard ultraviolet sources now used with Beckman Models DU, DB and other equipment with similar power supply units.

ALL QUARTZ CONSTRUCTION allows emission range effective to 1800A.

TRIPLE THE INTENSITY of similarly designed hydrogen lamps without need of coolants.

MARROWER SLIT WIDTHS due to increased intensity.

RATED LIFE 500 HOURS after which emission decreases to about 50%.

Also available, Model D-100BS, same as above, but with special quartz 0.3 mm thick window for still shorter (1500 Angstrons) wavelength.

Write for literature

Pfaltz & Bauer, Inc.

EMPIRE STATE BUILDING, NEW YORK

SCIENTIFIC INSTRUMENTS . CHEMICALS BIOLOGICAL STAINS . ESSENTIAL OILS

SPECIALISTS IN BECKMAN INSTRUMENT SALES AND SERVICE, . MICROSCOPES, BALANCES AND ALLIED EQUIPMENT

INDEX OF ADVERTISERS-20 October 1961

Abrahams Magazine Service		Hacker, William J., & Co		Pergamon Press, Inc.	
Academic Press		Hamilton Co., Inc.	1289 1112	Perkin-Elmer Corp.	. 1092
Ace Glass Inc. Ainsworth, Wm., & Sons, Inc.	1269	Hamner Electronics Co., Inc. Harshaw Chemical Co.		Pfaltz and Bauer, Inc.	
Alconox, Inc.	1280	Harvard Apparatus Co., Inc.		Pfanstiehl Laboratories, Inc. Philbrick, George A., Researches,	. 12/0
Aloe Scientific	1237	Harvey-Wells Corp.		Inc.	1264
American Edelstaal Inc.	1246	Heat Systems Co.		Philips Electronic Instruments	1242
American Electronic Laboratories,		Heller, Gerald K., Co		Phipps & Bird, Inc.	1312
Inc	1259	Hitachi, Ltd.	1206	Picker X-Ray Corp.	
American Sterilizer Co.	1103	Hoeltge Bros., Inc.	1316	Phoenix Precision Instrument Co.	
Annual Reviews, Inc.	1309	Hofman Laboratories, Inc.	1270	Photovolt Corp.	. 1252
Applied Physics Corp. 1255,		Honeywell		Precision Scientific Co.	. 1121
Applied Science Laboratories, Inc.		Hospital Supply Co		Professional Tape Co., Inc.	. 1242
Atomic Accessories Inc.		Hyland Laboratories		Radiation Instrument Development	
Atomic Energy of Canada Limited	4.000			Laboratory, Inc.	1108
Atomium	105/	Industrial Instruments, Inc.		Radio Corporation of America	1132
Baird-Atomic, Inc. 1101,		Infotronics Corp. Institute for Scientific Information		Raytheon Co.	. 1124
Baker, J. T., Chemical Co.		Instruments for Research and Indus-		Radiation Counter Laboratories,	
Barnstead Still and Sterilizer Co.		try		Inc	
Basic Books, Inc.		International Equipment Co		Reeve Angel	
Bausch & Lomb Inc.		Isomet Corp.		Regis Chemical Co	
Bel-Art Products	1306	JKM Instrument Co., Inc.	1107	Research Animals, Inc.	
Bellco Glass Inc.	1309	Johns-Manville		Research, Inc. Research Specialties Co.	
Bethlehem Apparatus Co., Inc.	1296	Kaman Nuclear		Ronald Press Co.	
Borden Chemical Co.		Kensington Scientific Corp.		Rosenthal, Paul	1294
Brinkmann Instruments,		Keuffel & Esser Co.		Rudolph Instruments Engineering Co.,	. 12/-
Inc	1473	Kewaunee Manufacturing Co		Inc.	1297
Buchler Instruments, Inc.	1149	Keystone Plastics Co.			
Burgess Publishing Co.	1300	Klett Manufacturing Co		Sanborn Co.	
Canner's, Inc.		Kontes Glass Co.	1271	Sargent, E. H., & Co.	
CBS Laboratories		Laboratory Construction Co	1260	Schleicher, Carl, & Schuell Co. Schwarz BioResearch, Inc.	
Central Scientific Co. Charles River Breeding Laboratories		LaPine Scientific Co.		Scientific Glass Apparatus Co.,	. 1131
Clay-Adams	10-0	Lauda Instruments, Inc.		Inc.	1266
Coleman Instruments, Inc.	1152	Leeds & Northrup Co		Scientific Industries, Inc.	
Cole-Parmer Instrument & Equip-		Leitz, E., Inc.		Scientific Products, Div. of American	
ment Co.		Lehigh Valley Electronics		Hospital Supply Corp	. 1145
Colorado Serum Co	1316	Lindberg Engineering Co.	1305	Sherer-Gillett Co.	. 1303
Connecticut Instrument Corp.	1106	Lionel Electronic Laboratories	1245	Sigma Chemical Co	
Cooke Engineering Co.		LKB Instruments, Inc.		Sigmamotor, Inc.	. 1303
Corning Glass Works		Loe Engineering Co		Smith, Arthur F., Inc. 1246,	
Coulter Electronics, Inc.	1	Lourdes Instrument Corp.		Sorvall, Ivan, Inc. 1109,	
Cryogenic Engineering Co.				Standard Scientific Supply Corp. Stoelting, C. H.,	. 1308
Custom Scientific Instruments, Inc.		Maryland Plastics, Inc.		Co 1123, 1251, 1297,	1300
Delmar Scientific Laboratories		Matheson Co., Inc. Mearl Corp.	1143	Strand Labs, Inc.	
Despatch Oven Co. Dietert, Harry W., Co.		Mechanical Enterprises Inc.			
Difco Laboratories		Meinecke & Co., Inc.		Taconic Farms	
Dimco-Gray Co.		Metal Framing Aquarium Co.		Technical Measurement Corp.	
Disposable Laboratory Cages, Inc.	1136	Mettler Instrument Corp.		Technicon Chromatography Corp.	
Doubleday & Co., Inc.		Minneapolis-Honeywell, Heiland		Texas Instruments Inc. Thermal American Fused Quartz	. 1208
Du Pont, E. I., de Nemours & Co.,		Div		Co., Inc.	1282
Inc.		Missimers	1301	Thermolyne Corp.	1240
Eastman Kodak Co	1235	Mnemotron Corp.	1290	Thomas, Arthur H., Co.	
Eaton-Dikeman Co.	1115	Mosby, C. V., Ĉo		Tracerlab, Inc.	.1154
Eberback Corp.	1281	Nalge Co., Inc.		Trans-Sonics, Inc.	. 1254
E-C Apparatus Corp.	1113	National Appliance Co		Tri-R Instruments	
Edmund Scientific Co.		National Instrument Laboratories		Torsion Balance Co.	. 1161
Elgeet Optical Co., Inc.		New Brunswick Scientific Co., Inc.		Unitron Instrument Co. 1204, 1205,	1267
Engis Equipment Co		New England Nuclear Corp. Nikon Inc.			
Equipto		NRC Equipment Corp.	1281	Vactronic Laboratory Equipment, Inc.	1226
Esterline Angus Instrument Co.,		Nuclear-Chicago Corp. 1096,		Vanguard Instrument Co. 1128,	1217
Inc.		Nuclear Measurements Corp.		Varian Associates	
Exact Weight Scale Co		Oak Ridge National Laboratory		VirTis Co., Inc. 1142,	
Farrand Optical Co., Inc.	1251	Oak Ridge Technical Enterprises	1200	· · · · · · · · · · · · · · · · · · ·	
Finescale Co.		Corp	1236		.1129
Fisher Scientific Co.		Offner Div., Beckman Instruments,	1200	Welch, W. M., Scientific Co. 1239,	
Fish-Schurman Corp.	1300	Inc.	1248	Wild Heerbrugg Instruments, Inc. Wilkens-Anderson Co.	1202
F & M Scientific Corp.	1156	Ohaus Scale Co		Wilkens Instrument & Research Inc.	
Food and Drug Research Laborato-	1016	Ohio Chemical & Surgical Equip-		Will Corp.	
ries	1316	ment Co.		Wilmot Castle Co.	
Forro Scientific Co.		Ohio-Nuclear, Inc.		Winthrop Laboratories	
Gifford-Wood Co.		Oxford University Press		Wisconsin Alumni Research Founda-	
Gilmont, Roger, Instruments, Inc.		Pabst Laboratories		tion	
Gilson Medical Electronics		Packard Instrument Co., Inc.		Worthington Biochemical Corp.	
Glas-Col Apparatus Co	114/ 1268	Parr Instrument Co.		Yellow Springs Instrument Co.,	
Graf-Apsco Co.	1239	Pennsylvania Scale Co. Percival Refrigeration and Manufac-	1303	Inc	. 1286
Greiner, Emil, Co.	1094	turing Co	1257	Zeiss, Carl, Inc.	

MICROMETER SYRINGES and BURETS



- COMBINES HIGH PRECISION WITH ECONOMY OF COST
- ALL CORROSION RESISTANT PLASTIC PARTS
- PRECISION BORE GLASS, TEFLON* PLUNGER AND VITON* "O" RING

These syringes and burets represent the ultimate in simplicity of design and ease of operation. Just consider the following features:

- Liquid comes in contact with only
- glass and teflon*.

 2. Viton* "O" ring gives a vacuum tight seal.

 3. All other plastic parts of polypropylene and H.D. polyethylene—instrument may be autoclaved.
- 4. Available in two sizes, 0.2 ml. in .0002 ml. div. and 2.0 ml. in .002 ml. div.
- 5. Fills and delivers liquid with micrometer control.
- 6. Simple to clean and assemble.

\$1100 MICROMETER SYRINGE, 0.2
ML. CAPACITY IN .0002 ML. DIVISIONS, complete as illustrated with
Luer joint. \$20.00
\$1100 A MICROMETER BURET, SAME
AS S-1100 BUT WITH BURET GLASS
TIP INSTEAD OF LUER JOINT. \$18.75

MICROMETER SYRINGE, 2.0 ML. CAPACITY IN .002 ML. DIVI-SIONS. \$20.75 \$1200 A MICROMETER BURET, SAME AS S-1200 BUT WITH BURET GLASS TIP INSTEAD OF LUER JOINT. \$19.50

COGER ILMONT

See your Local **Laboratory Supply Dealer**

NSTRUMENTS, INC. 1 GREAT NECK ROAD . GREAT NECK, NEW YORK

How STABLE ISOTOPES can help in your research

No. 2 of a Series

T. C. Tso and R. N. Jeffery* of the U. S. Department of Agriculture supplied nicotine doubly labelled with C14 and N15 to Nicotiana rustica var brasilia by placing the roots in a nicotine solution. Much of the nicotine appears to have entered the plant as such, some remained unaltered and a larger proportion was metabolized. These results indicate that nicotine supplied as in this experiment takes an active part in the metabolism of a Nicotiana plant.

* T. C. Tso and R. N. Jeffery, Arch. Biochem. Biophys. 92, 253 (1961)

Send for free descriptive literature.



427 Commercial Ave.

Palisades Park, N. J.

PERSONNEL PLACEMENT

CLASSIFIED: Positions Wanted 25¢ per word, minimum charge \$4. Use of Box Number counts as 10 additional words. Payment in advance is required.

COPY for ads must reach SCIENCE 2 weeks before date issue (Friday of every week).

perore date issue (Friday of every week).
DISPLAY: Positions Open. Rates listed below—no charge for Box Number. Rates net. No agency commission allowed for ads under 4 inches. No cash discount. Minimum ad: 1 inch. Ads over 1 inch will be billed to the nearest quarter inch. Frequency rate will apply to only repeat of same ad. No copy changes. Payment in advance is required except where satisfactory credit has been established.

Single insertion.

Single insertion 4 times in 1 year

For PROOFS on display ads, copy must reach SCIENCE 4 weeks before date of issue (Friday of every week).

Replies to blind ads should be addressed as follows:

as follows:
Box (give number)
Science
1515 Massachusetts Ave., NW
Washington 5, D.C.

POSITIONS WANTED

Editor, formerly with Forest Service, seeks free-lance assignments by mail. Wendell Smith, Rock Harbor, Orleans, Mass. 10/20

(a) Plant Pathologist, Ph.D., desires academic assignment teaching and research; interested botany, microbiology, mycology, agricultural chemistry. (b) Blochemist, Ph.D., special work in electron microscopy, radiochemistry, nucleonics; interested research. Communicate Science Division, The Medical Bureau, Inc., Burneice Larson, Chairman, 900 North Michigan Avenue, Chicago 11, Illinois.

POSITIONS OPEN

Supervisor Clinical Pathology. Excellent oppor-Supervisor Clinical Pathology. Excellent opportunity for a male college graduate with a minimum of 5 years' experience in a clinical laboratory including at least 2 years in a supervisory capacity. Will supervise technicians performing procedures in hematology, urinalysis and parisitology. Please write giving details, including salary requirement, to Miss Anne V. Cronin, Personnel Director, New England Medical Center, 37 Bennet Street, Boston, Massachusetts.

VIROLOGISTS

and

BIOCHEMISTS ► Ph.D., M.D. or D.V.M.

. . . with experience in virology, microbiology, or related biological subjects. Virus and immunology research with substantial tissue culture experience.

BIOCHEMIST

B.S. or M.S.

. . . with strong background in organic or blo-chemistry. Write stating qualifications and salary desired to

PERSONNEL DEPT.

WYETH

Box 8299

Philadelphia 1, Pa.

POSITIONS OPEN

(a) Analytical Chemist, well-known pharmaceutical firm, background organic chemistry essential; Midwest. (b) Biochemist, emphasis enzymology, energetics, intermediary metabolism; to \$10,000; East. (c) Pharmacologists with CNS or cardiovascular background; East. (d) Chemistry Professor, \$7500 for 9 months; Midwest. (e) D.V.M., \$10-\$15,000, background experimental pathology; Midwest. (f) Research Physiologist, neurophysiology experience, to \$8995; West. (g) Clinical Biochemist, 210-bed hospital, \$8000-\$12,000; Midwest. (h) Immunologist, well-known research center, \$7000-\$8000 up; Midwest. (i) Faculty Appointments, physics, liberal arts college, noted health resort; West. Science Division, Medical Bureau, Inc., Burneice Larson, Chairman, 900 North Michigan Avenue, Chicago 11, Illinois.

PHARMACOLOGISTS

Three Ph.D.'s required for group leader positions

1. NEUROPHYSIOLOGY GROUP

Concerned with neuropharmacological & electro-physiological research & service functions.

2. GENERAL NEUROPHARMACOLOGY GROUP

Supervise CNS drug screening and evaluative programs.

3. AUTONOMIC PHARMACOLOGY GROUP

Research & drug evaluation primarily in areas of allergy & hypertension.

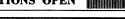
Send resume and Salary requirements To Personnel Department

SCHERING CORP.

60 Orange St.

Bloomfield, N.J.

POSITIONS OPEN



PHYSIOLOGIST

Ph.D. to assume newly created, interesting and challenging position in the Research Division of America's foremost manufacturer of medical products.

Our company offers an unparalleled opportunity to advance professionally in a congenial, ultramodern atmosphere in suburban New Jersey. runity to advance professionally in a con-genial, ultramodern atmosphere in suburban New Jersey. Interested candidates may apply by sending a complete resume with salary requirements to:

ETHICON, INC.

A Johnson & Johnson Co. Route 22

Somerville, N.J. An Equal Opportunity Employer

MICROBIOLOGIST

Imaginative research requirement. Florida location. Familiarity with virology and Ph.D. degree or equivalent in experience desired. Salary commensurate with training and experience. Please submit résumé

Box 203, SCIENCE

PHARMACOLOGIST

Ph.D. with special training in neuropharma-cology. Senior and responsible position. Ad-ministrative ability, for expanding research department of upstate New York pharma-ceutical company.

Box 200, SCIENCE

Ph.D. MICROBIOLOGIST

Creative individual with strong interest and training in immunology to investigate basic problems in host defense mechanisms and to develop and evaluate new diagnostic reagents. Will lead small group.

Send Resume to

William J. Sumner

WARNER-LAMBERT RESEARCH INSTITUTE

Morris Plains

New Jersey

FELLOWSHIPS

Postdoctoral Fellowship in Biochemistry, in-Postdoctoral Fellowship in Biochemistry, involving blood proteins, available immediately. \$6000 to begin, partially tax free, no tuition. For further information write to Assistant Director for Education, Office of Education,

The University of Texas

M.D. Anderson Hospital and Tumor
Institute

Texas Medical Center, Houston 25

BOOKS AND MAGAZINES

Your sets and files of scientific journals

are needed by our library and institutional customers. Please send us lists and description of periodical files you are willing to sell at high market prices. Write Dept. A3S, CANNER'S, Inc.

Boston 20, Massachusetts

SCIENTIFIC JOURNALS WANTED

Sets, Runs and Volumes bought at top prices.

— Your wants supplied from
our Back Files of over 3,000,000 periodicals.
Abrahams Magazine Service N. Y. 3, N. Y.

PROFESSIONAL SERVICES

CONSULTATION AND RESEARCH SINCE 1922

Food and Drug

Toxicology • Pharmacology

Nutrition • Biochemistry • Bacteriology

Research -__aboratories

BERNARD L. OSER, Ph.D., Director

Maurice Avenue at 58th Street Maspeth 78, New York City

TWining 4-0800

WHERE EXPERIENCE COUNTS

LABORATORY SERVICES

Applied Research and Development, Testing and Consultation • Food, Feed, Drug and Chemical Analyses, Animal Studies, Pesticide Screening, Pesticide and Additive Residue Analyses

For price schedule and specific work proposals, write **WARF**

P. O. Box 2217

Madison 5, Wisconsin

SUPPLIES AND EQUIPMENT

YOU NEED THIS FREE

CATALOG FOR YOUR FILES.

Serums, antiserums and bloods of all kinds for technicians and tissue culture laboratories. No salesman will call.

COLORADO SERUM CO. 4950 York St. • MAin 3-5373 • Denver 16, Colo.

GAS CHROMATOGRAPHY Supplies

and FATTY ACID STANDARDS

APPLIED SCIENCE LABORATORIES, INC. Dept. S, Box 140 State College, Penna

A NEW WAY TO MEASURE

A NEW WAY TO MEASURE

We invite you to take a new look at an old idea. There is so much interest in glamorous high-precision measuring instruments that there is danger of losing perspective. After all most of the world's measuring is still done with prosaic tools like tapes and meter sticks and machinist's steel scales. For smaller measurements the linen tester has been around for a long time, but in the last ten years that idea has been revived and refined. When a magnifer is combined with a transparent scale (reticle) in a clever way, it serves a surprising number of useful purposes accurately, conveniently and inexpensively. It's too long a story to tell here, but a post card to your favorite Laboratory Supply house or to us will bring you full information about FINESCALE MAGNIFYING COMPARATOR AND OVER 20 DIFFERENT RETICLES. Prices begin at \$15.50. FINESCALE CO. - 218 D, S. WESTERN AVE.

ELECTRIC

Giant 8" Dial

GRA LAB INTERVAL TIMER Automatic signalling and switching over unusually wide range of 3600 possible settings.
GRA LAB MICRO TIMER 1/10 sec. or 1/1000 min. stop clock. Remote start stop control. Write for catalog.

DIMCO-GRAY 214 E. SIXTH ST.,

COMPANY **DAYTON 2, OHIO**

SUPPLIES AND EQUIPMENT

Send for booklet TACONIC FARMS

GERMANTOWN NEW YORK

ANIMAL CAGES

BUY DIRECT FROM MANUFACTURER SHIPMENT OF STANDARD ITEMS FROM STOCK HOELTGE BROS., Inc.

1919 Gest St. Cincinnati 4, Ohio

Write for Illustrated Catalog
SERVICE SINCE 1856

RECTANGULAR & CYLINDRICAL ALL SIZES – ALL HEATS – 45 YEARS MFRS. WRITE FOR LITERATURE THE HOSPITAL SUPPLY CO., 304 E. 23 St., N.Y. 10

RESEARCH ANIMALS, INC.

3401 Fifth Avenue Museum 1-4156

Pittsburgh 13, Pa. Cable: RESEARCH

ALL Laboratory Animals Available Canine Blood for Heart-Lung Machine by Contract

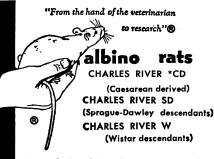
> Overnight delivery ANYWHERE State Your Needs For Quotations

SEROTONIN HYDROGEN OXALATE

5-Hydroxytryptamine as the Hydrogen Oxalate Salt Available from stock.

REGIS Chemical Company

1219 N. Wells Street Chicago 10, Illinois



HYPOPHYSECTOMIZED RATS

- Only Charles River CD animals used
- Rigidly controlled environment (same bldg.) birth to surgery.
- High speed surgery by graduate biologists.
- 10 years experience animal surgery. Overnight air service from Boston
 - * Trade Mark Reg. U. S. Patent Office

THE CHARLES RIVER BREEDING LABS

1018 Beacon St., Brookline 46, Mass. RE. 4-2000 Henry L. Foster, D.V.M., President

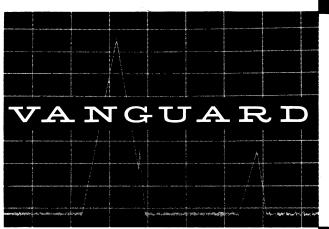
NEW

SENSITIVITY IN CHROMATOGRAM SCANNING...

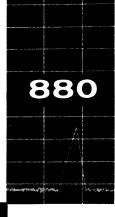
Vanguard 4 pi AUTOSCANNER reduces background to less than 10 c pm., revolutionizes counting of H3, C14, and S35

Vanguard's new, completely transistorized Model 880 Low Background AUTOSCANNER revolutionizes chromatogram scanning of low-energy, beta-emitting radioisotopes. Specially designed to meet the exacting requirements of medical, agricultural and pharmaceutical research, the AUTOSCANNER utilizes the most advanced electronic and mechanical design, integrated into a compact, one-piece console. With the Model 880, analyses can be performed with the highest possible degree of sensitivity—even when counting tritium, carbon-14 and sulphur-35.

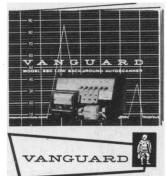
NEW STANDARD ACCESSORY, TOO! Also available is the new, exclusive Vanguard Model 880ADS, a completely automatic system for quantitative integration and digital presentation of radioactive zones. For complete details concerning either the Model 880 or Model 880ADS, please write or call.







REQUEST THIS BROCHURE—See how you can achieve the highest detection efficiency available for chromatogram scanning. Booklet outlines distinctive features and lists all operational characteristics of the Model 880 AUTOSCANNER.



Handles chromatograms 1½ to 4 cm. wide in lengths to 100 ft.

liable performance

Gas and power shut off automatically at end of scanning period

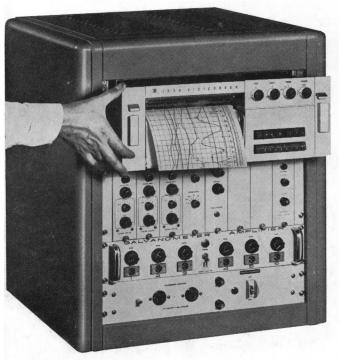
Features 4 pi scanning—counts radiation on both sides of strip simultaneously

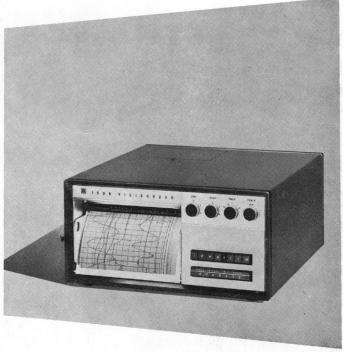
Completely transistorized for longer, more re-

Reduces background to less than 10 cpm.

- 10 scanning speeds, 5 rate meter time constants, 7 count rate ranges, 3 individual slit width collimations
- Automatically marks solvent fronts, leading and trailing edges of strips
- Windowless gas-flow, geiger detection
- Accuracy of better than 2% of count rate on all ranges
- Compact, completely integrated, one piece unit







In your case, or in ours

The new 1508 Visicorder should be your next oscillograph

The Model 1508 Honeywell Visicorder has been specifically designed to quickly and easily slide into your data reduction system. There it will serve as a direct information read-out device, recording DC to 5000 cps on from one to 24 channels; or it may serve as a monitor on other components in your system; or it may do both jobs, simultaneously if you wish.

You have no "data reduction system," as such? Then consider the trim, convenient 1508 as a bench instrument. Its push-button controls, selection of 12 chart speeds (metric, if desired), 8"

paper width, and direct writing speeds exceeding 50,000 in./sec. will help to make it one of your most useful tools. Its rigid, cast base assures constant alignment of optical components regardless of external stress on the instrument.

In your case . . . the 1508 needs only 7" of rack height. In ours . . . it arrives ready to go to work as a convenient, portable instrument. In any case, be sure to see the new 1508 Visicorder before you order your next oscillograph. Write for Catalog HC-1508 to Minneapolis-Honeywell, Heiland Division, 5200 East Evans, Denver 22, Colorado.

Honeywell

