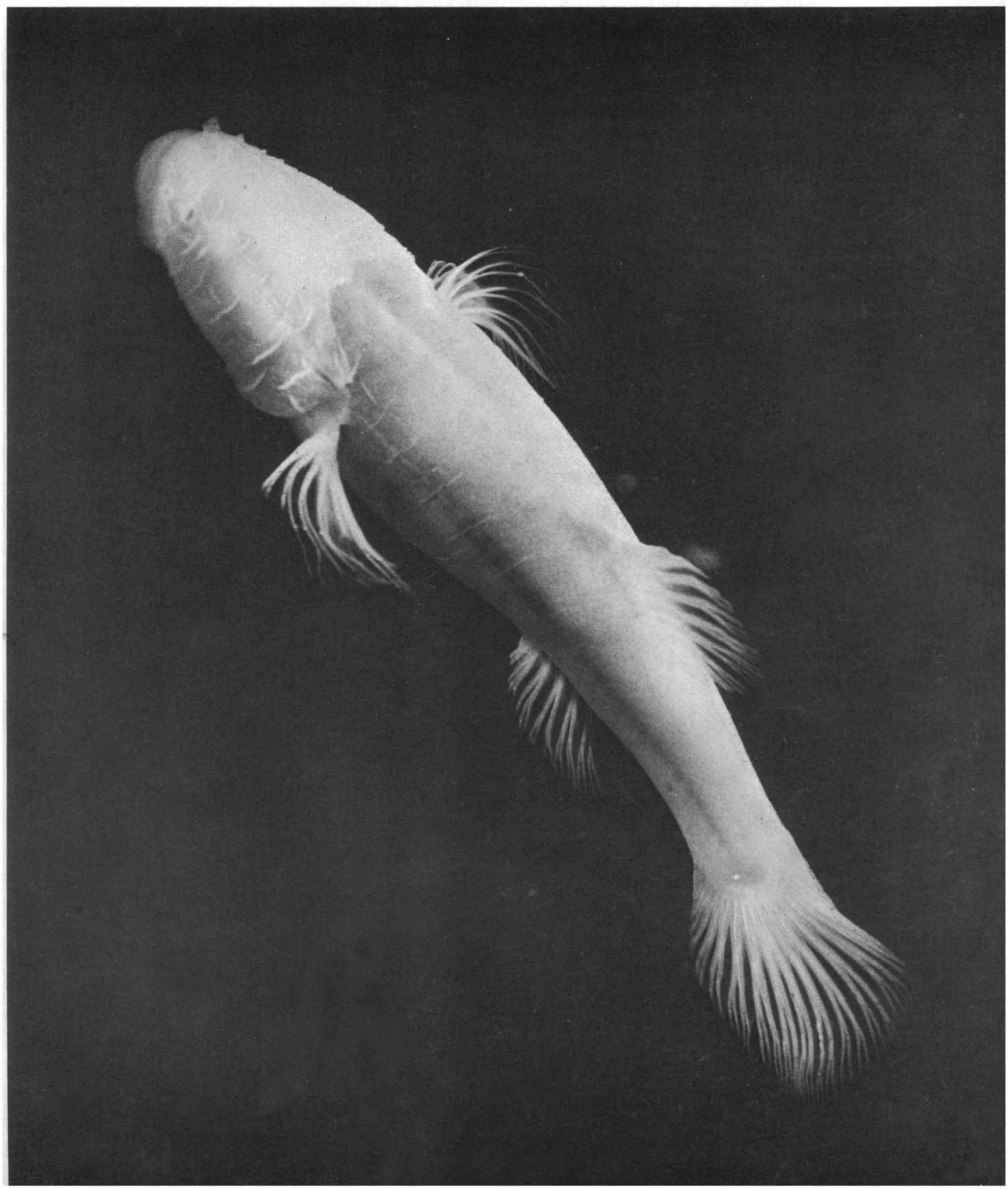
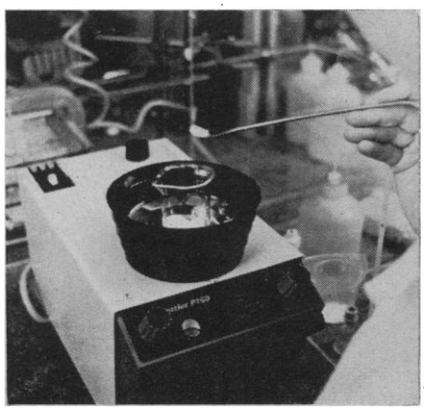
SCIENCE
5 September 1969
Vol. 165, No. 3897
AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE



Mettler fits economy plus performance into your balance budget.

Want weighing performance, but worried about exceeding your budget? Here are 38 solutions to the balance buyer's dilemma. Mettler's 16 top-loading and 22 analytical balances.



SPEED + PRECISION = PERFORMANCE

Our top-loaders are tops when it comes to speed and weighing ease. Put the sample on the pan. Then read the weight. If you are filling a container to a target weight, Mettler's helpful filling guide shows the approximate weight on the pan throughout the filling . . . without interruptions.

Newest of the Mettler top-loaders is Model P162. It weighs up to 160 g with a precision of ±1 mg and features 10-g taring ability. Like other Mettler top-loaders, it provides digital and analog readout. Your new personnel will get the same precise results as the old hands in the department.

MANY TO CHOOSE FROM

Select the balance you need for your work from one of our top-loaders. We have one that weighs to 10 kg; another that takes arithmetic out of weight loss studies. Some automatically compensate for changes in level. All will carry out five types of weighings. Weighing unknowns. Check-weighing. Weighing-in. Batching. Weighing objects below the balance.

THE ECONOMICAL ANALYTICALS

One of the major features of all Mettler analytical balances is the impressive precision-capacity ratio. Take our low-cost Model H10. It weighs to 0.1 mg over the 0 to 160-g range. That's one part in 1,600,000.

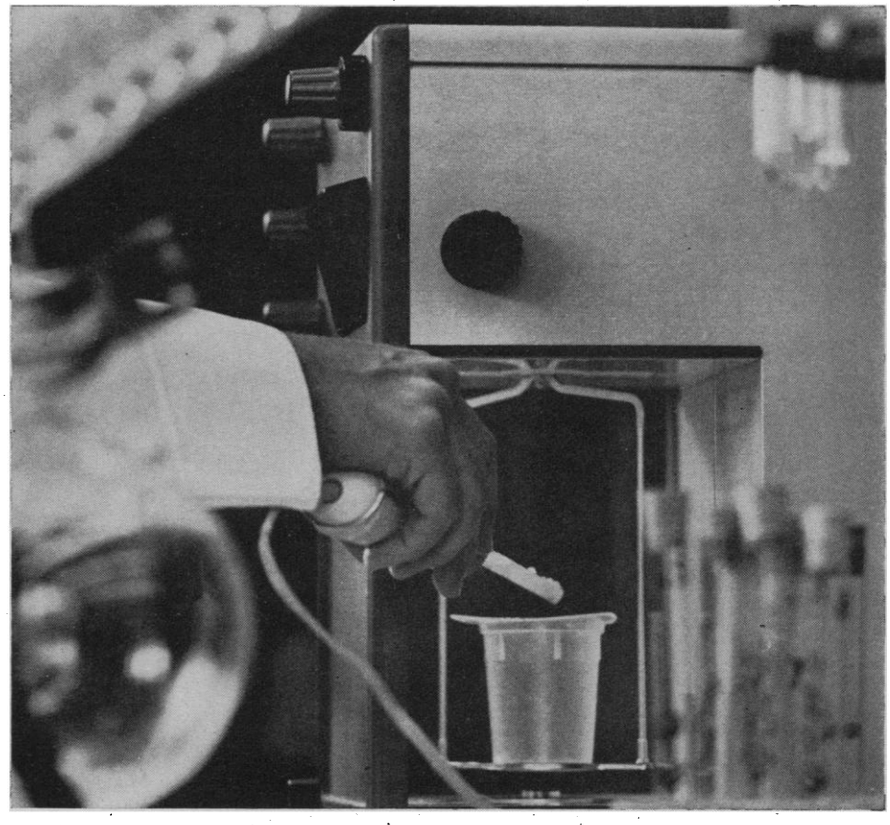
You get two balances for the price of one with our Mettler Model H20. It combines the capacity of a macro analytical with the precision of a semi-micro. Some Mettler analyticals give an instant reading of the approximate weight on the pan. We call this feature preweighing.

WEIGHT WATCHING MADE EASY

With digital readout — standard on many Mettler analyticals — you'll weigh with unsurpassed speed, convenience and accuracy. A filling guide cuts your weighing-in time by 50 percent. Optical taring allows you to compensate for container weights.

Need clearly printed records of your weighings? Check our Models H10P and H20P which print out results on adhesive-backed paper. Then there's our sophisticated H20E electronic. As it weighs, it generates an analog signal which can be fed to compatible instrumentation such as recorders. The H20E can also be interfaced with computer or other control equipment to continuously monitor and keep weight changes within predetermined limits.

There are more: from our $550 basic balance that's ideal for classroom use to our $2,550 ultra-micro with ±0.1 microgram precision.



Write Mettler Instrument Corporation, 20 Nassau Street, Princeton, New Jersey 08540

Mettler®

5 September 1969
Vol. 165, No. 3897

SCIENCE

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AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

COVER

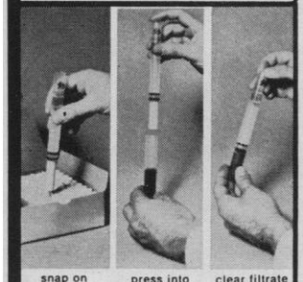
Amblyopsis spelaea, a specialized cave fish. The paired structures on the front of its head are olfactory sacs, not eyes. The lines visible on the head are rows of sense organs which detect water movement caused by swimming prey and by changes in water flow as the fish approaches obstacles. See page 971. [Thomas C. Barr, Jr., University of Kentucky]

Error Eliminators and $ Savers from L/I

1. L/I LABQUAKE™

1. L/I LABQUAKE™. A **silent, small, submersible** tube rocker and rotator for all sizes of tubes, ¼" to 1½" diameter. Occupies only 2½ x 10 x 4 inches when fully loaded with 14 tubes. LABQUAKE has 28 tube positions altogether that accommodate clips to hold tubes of varying sizes. Adjustable bracket holds LABQUAKE fully or partially submerged in water bath.

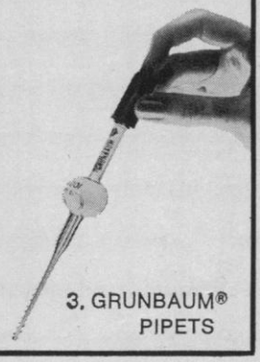
Price: LABQUAKE (patent pending), for 110-120 VAC, furnished with (14) 13 mm and (14) 16 mm clips, $59.50. Maximum capacity, 250 ml. Other clips may be substituted.



2. STAT-FILTER®

2. STAT-FILTER®. For **instant filtration** by high pressure or vacuum—in the palm of your hand. You get crystal clear filtrates within 3 seconds after precipitates form. All precipitates over 10 microns are retained with no possibility of remixing after separation. The versatile **STAT-FILTER** uses disposable polypropylene test tubes and plungers, making it suitable for **any** filtration. Inexpensive demonstration kits are available.

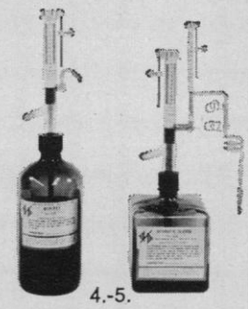
Price: complete **STAT-FILTER SYSTEM**, including 3 plungers, 100 disposable polyethylene filters and test tubes, and 25 test tube closures, $38. Demonstration **STAT-FILTER** kit with 1 plunger, 10 filters, 7 test tubes and 3 closures, $9.00.



3. GRUNBAUM® PIPETS

3. GRUNBAUM® PIPETS (The Perfect Pipet). The versatile **GRUNBAUM** micro-pipet aliquots, dilutes, transfers, and stores reagents. It's self-adjusting, self-filling, non-dripping and self-cleaning (sample B washes out sample A). Guaranteed accuracy: 5 μl, ±3%, 10 and 20 μl, ±2%; 25 μl and larger, ±1%. Guaranteed reproducibility: 0.1% at 100 μl. Sizes stocked for immediate delivery: 1, 2, 3, 4, 5, 10, 15, 20, 25, 50, 75, 100, 150, 200, 250, 300, 400, and 500 μl. Other sizes on request.

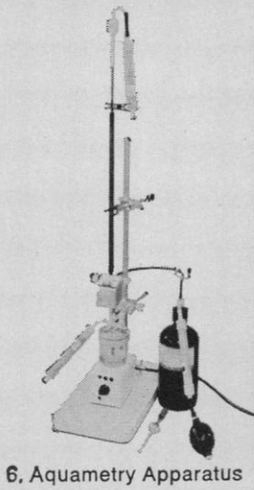
Prices: 1 through 5 and 75 μl, $7. All others $6.



4.-5. Automatic REPIPETS® and Dilutors

4.-5. Automatic REPIPETS® and Dilutors. These unique instruments pipet, dilute and dispense with a *guaranteed* accuracy of 1% and a reproducibility of 0.1%. **PYREX® L/I REPIPETS** and Dilutors are of one-piece fused glass construction with no connections—eliminating any chance for leaks. L/I's instruments fit directly on your reagent bottles, ½ ounce and larger. Any reagent can be handled. All amber instruments are supplied for your labile reagents. Use L/I **LAMBDA-DIALS®** to increase precision to 1% at 10 lambdas! L/I stocks **REPIPETS** and Dilutors in ½, 1, 5, 10, 20, and 50 ml sizes, each adjustable from zero to full capacity. Square amber liter bottles optional at N/C.

Prices: REPIPETS, $52.50; Dilutors, $99.50. Micro and Macro Teflon® tips included.



6. Aquametry Apparatus

6. Aquametry Apparatus. L/I's inexpensive Karl Fischer Aquametry Apparatus precisely determines water content of most materials in 4 minutes (1 ppm to 100% water). L/I's versatile apparatus uses the original stock K-F reagent bottle as a reservoir. The "reaction vessel" is an ordinary 4 oz., commonly available, disposable "cream" jar. It is interchangeable with a micro-reaction vessel requiring less than 2 cc total reaction volume for micro-aquametry applications.

No false end points are possible with L/I's color-coded meter indicator. A two-lambda excess of K-F reagent in a 100 ml reaction volume is detectable. The apparatus includes a 1 and 25 ml dual buret with .01 ml divisions in the micro range for high accuracy.

Price: $340 complete. Components available separately.

Order from Labindustries or your distributor.

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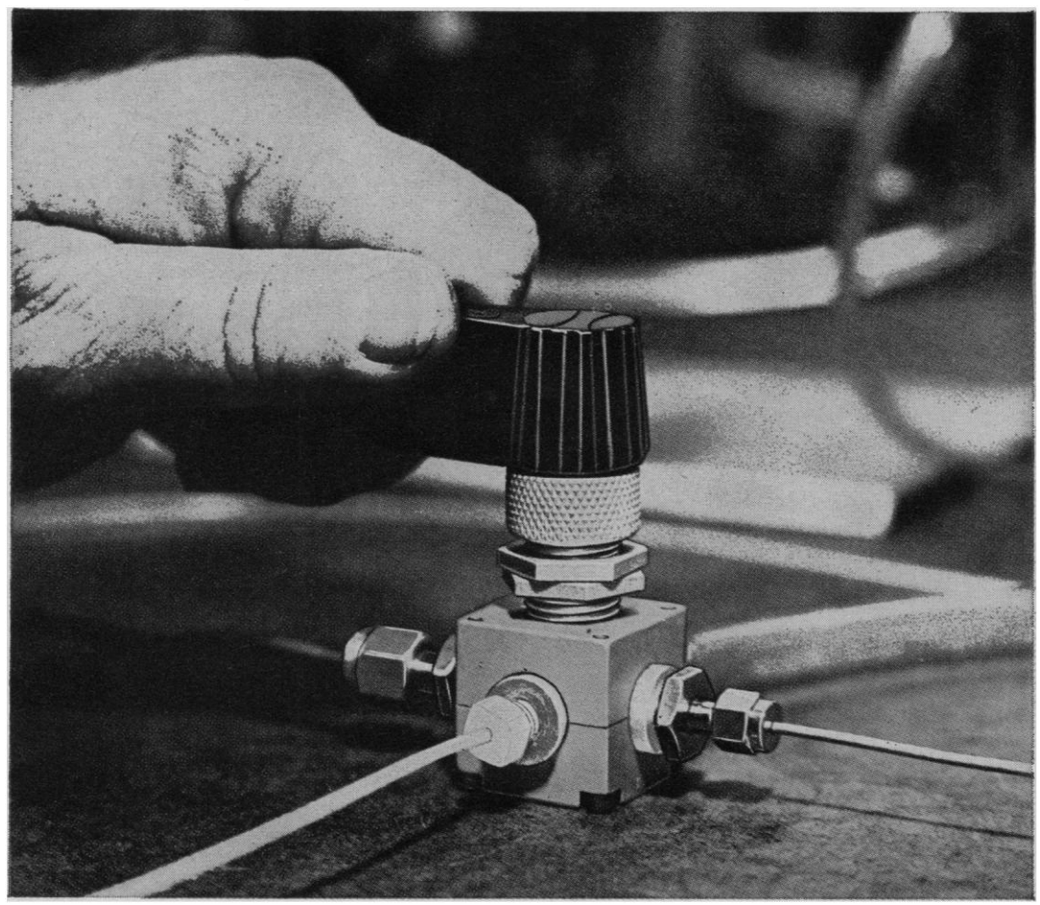
Repeatable Precision: Hamilton's 2X Valve



HAMILTON

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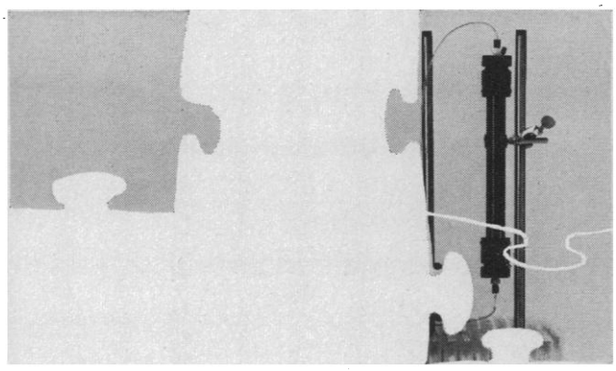
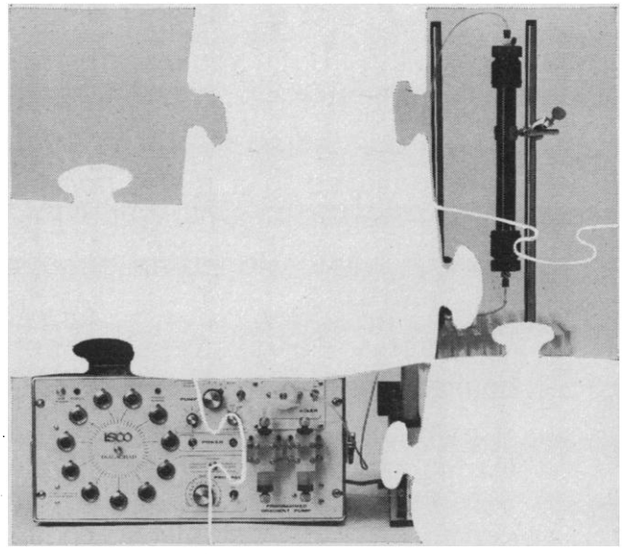
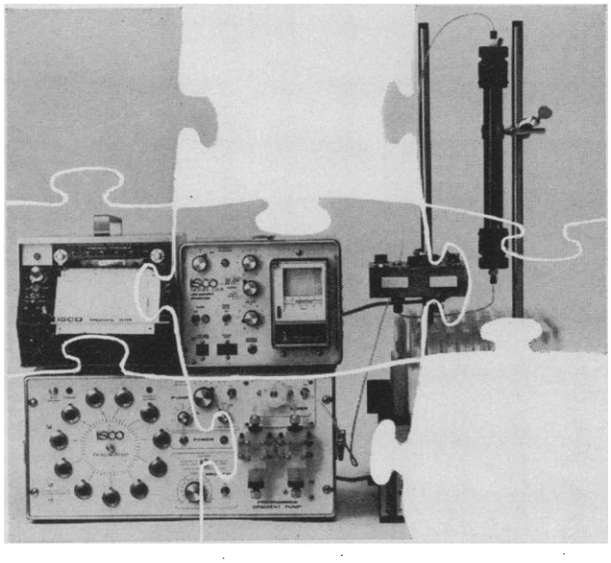
Complete the picture



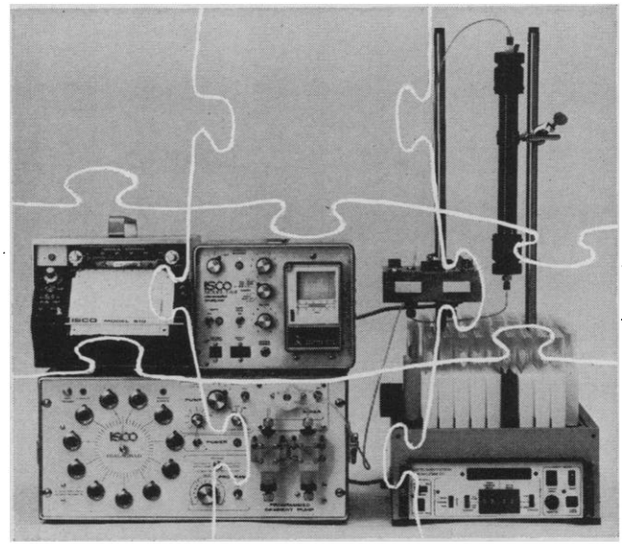
Start out with precision Glenco columns and accessories, available from ISCO in a wide range of sizes and types suited to almost any application.



Elute the column with a concentration or pH gradient generated by a Dialagrad Programmed Gradient Pump. Linear, concave, or convex, convoluted and spiked gradients can be reproduced at flow rates from 1 to 3,200 ml/hr.



An ISCO UV monitor and recorder will locate and quantitate absorbance (O. D.) peaks at two wavelengths simultaneously, and can index a fraction collector in such a way as to deposit different peaks into different tubes.



Your faithful Golden Retriever Linear Fraction Collector can retrieve up to 210 tubes in removable racks by time, volumetric, or counted drop increments.

For the solutions to your other biochemical instrumentation puzzles, send for our catalog.

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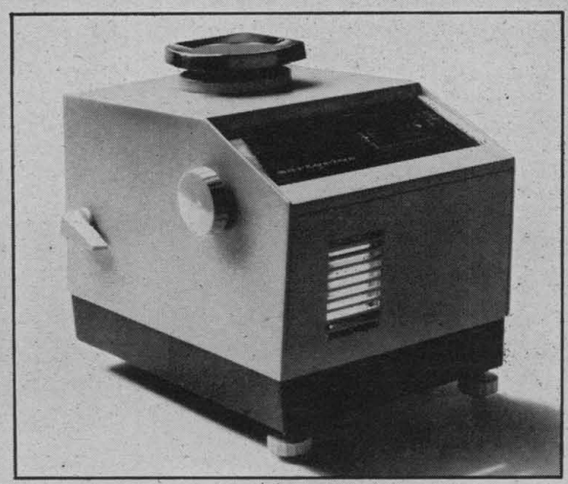
Wouldn't it be great if someone designed a 160 g top-loader with 1 mg accuracy and all-digital readout?

Someone has. Sartorius.



There are other top-loading balances with 160g capacity, but none is as accurate and easy to read as the new Sartorius 2255... and none is as stable.

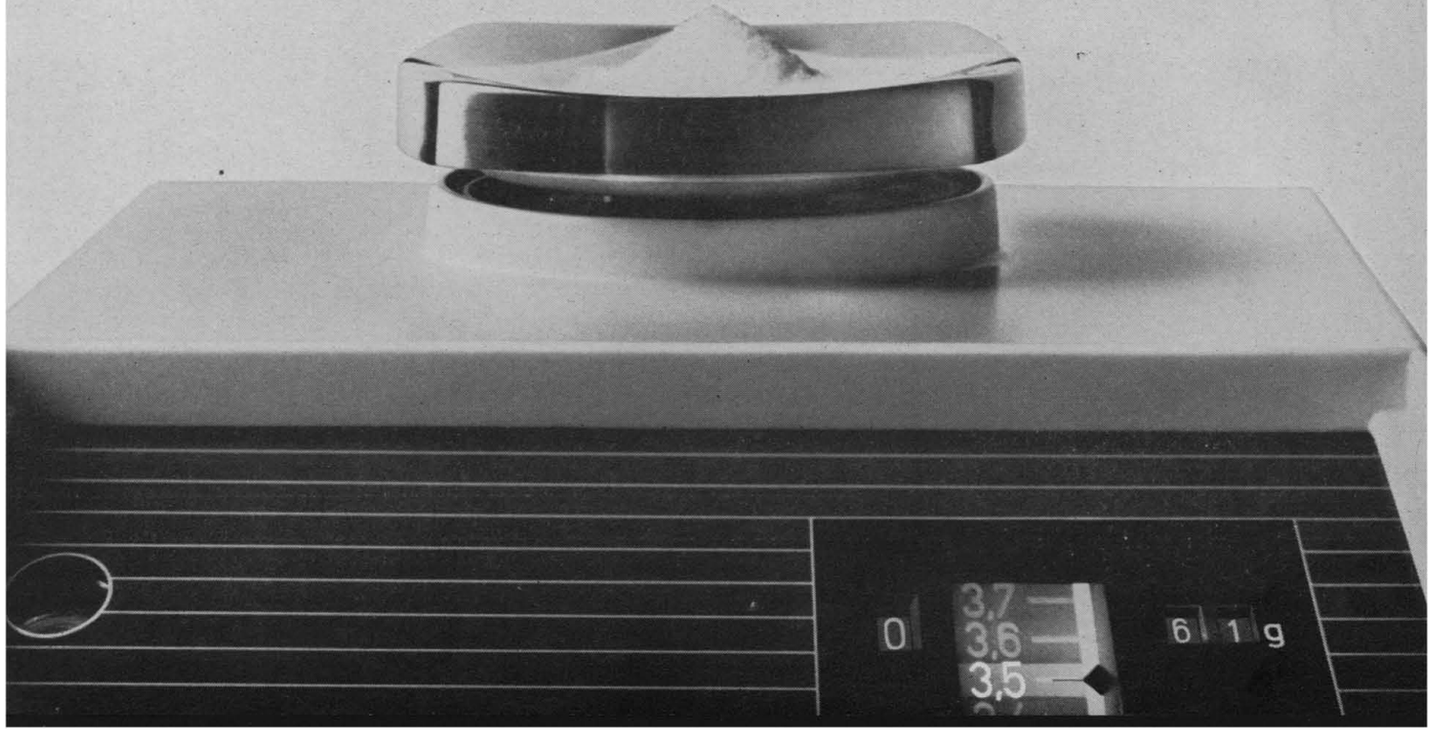
To eliminate interpolation error with 'between the line' results, the Model 2255 provides all-digital readout to 1 mg. To further insure accuracy, there is absolutely no discernible swing—this balance stays at the indicated weight. There's no need to squint, either. Its huge new optical scale is a pleasure to read, even under the most adverse lighting conditions.

At only $725, the above features alone would make the 2255 a great buy, but there are more. The Taramatic® single knob taring system and below-balance weighing accessories are included at no extra cost.

For research, quality control, student use, or any other application requiring 1 mg weighing accuracy at loads up to 160g, this is the simplest, yet most advanced top-loading balance available.

Sartorius all-digital top-loaders also come with higher capacities. Our 40-page catalog describes them all. For your copy, just write: Sartorius Division, Brinkmann Instruments, Cantiague Road, Westbury, N.Y. 11590.

sartorius balances



Collect the LARGEST Number of Samples in the LEAST Amount of Space

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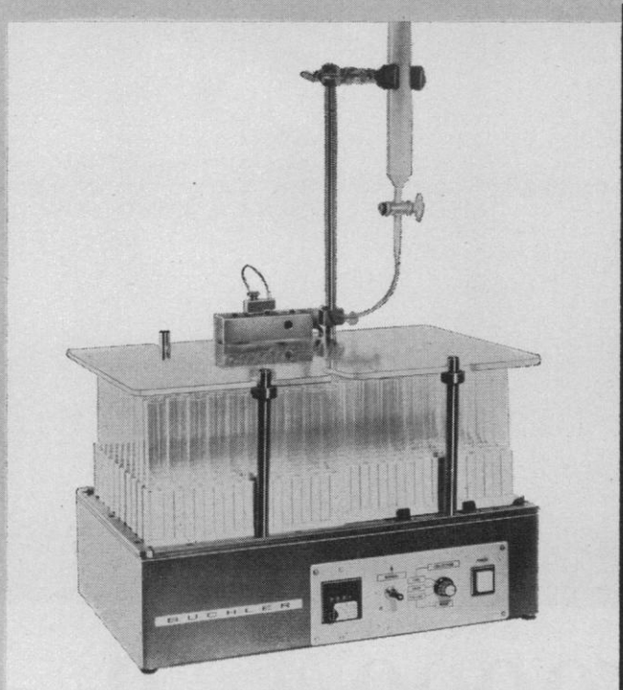
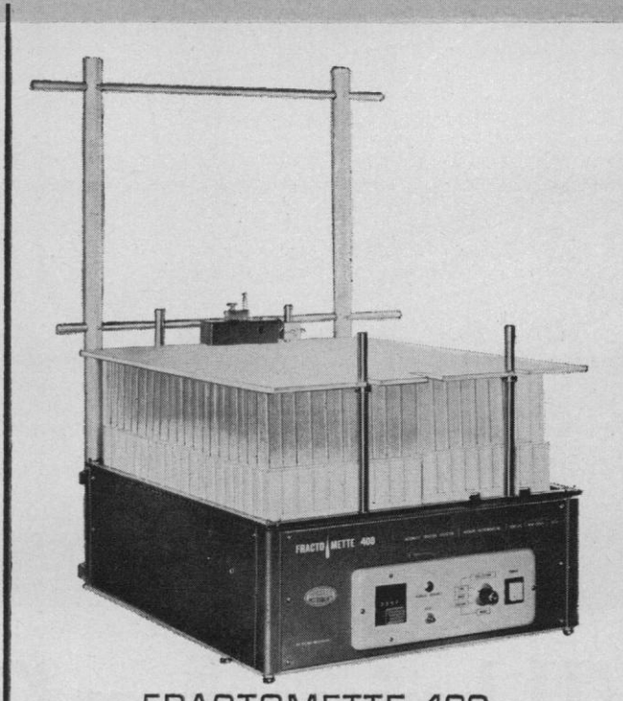
LINEAR FRACTION COLLECTORS



FRACTOMETTE 200



FRACTOMETTE 400

Here are two compact, versatile fraction collectors designed to do a big job in a small space. They both operate on the same principle, however, the "Fractomette 200" uses 200 18 MM test tubes while the "Fractomette 400" has a capacity of 400 tubes. Both fraction collectors provide drop, time and volume methods of collection. The fractions dispense directly into the tubes preventing cross-contamination. Automatic features include drop-stop which prevents stray drops or loss of sample and a shut-off device which is activated after a predetermined number of fractions are collected.

The "Fractomette 200" is 11½" x 17½" . . . small enough to operate in a household refrigerator. Although double the capacity, the "Fractomette 400" measures only 17½" x 24½".

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PROBLEM:

MOVE TWO MATCHES TO FORM FOUR EQUAL SQUARES.

SOLUTION:

One way is by hit-and-miss. It will work but it might take time. There are more than 60,000 possibilities.

Another way is to select and utilize the relevant facts from the available data base. Thus, there are exactly 16 matches in the puzzle. A square has four sides. Therefore no match can form a common side.

CCM Information Corporation is in the business of assembling data bases, and then applying advanced computer and microform processing techniques to make relevant facts available as they are needed. For instance:

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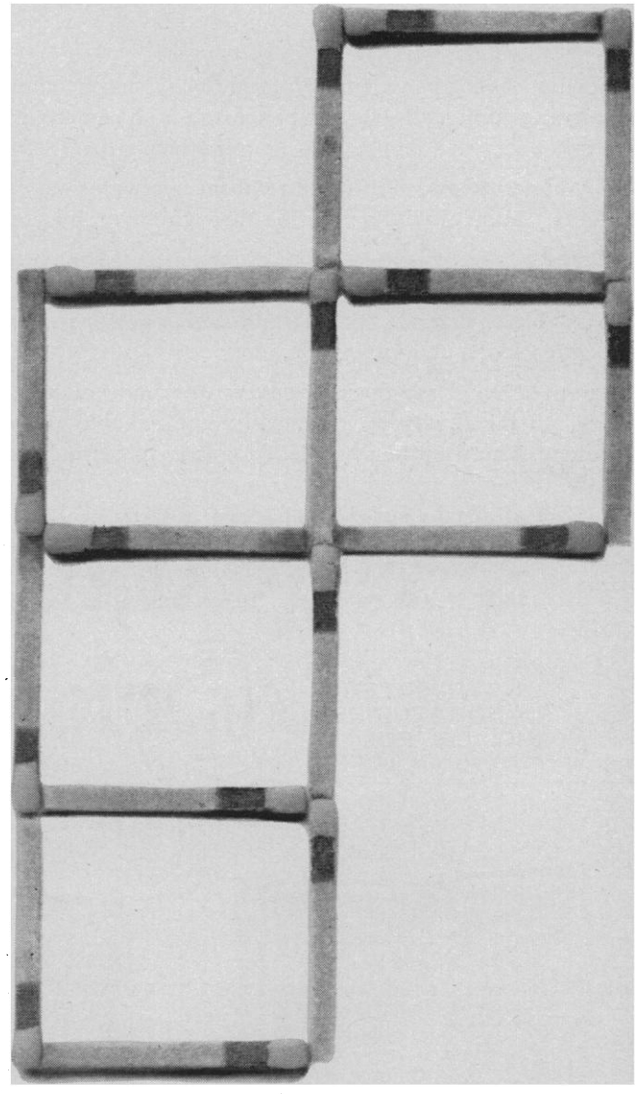
The COLLEGE BLUE BOOK. The most comprehensive collection of information on secondary education ever assembled. A new edition—comprehensively revised and containing all 1969 data—to be published in the fall of 1969.



If one of these services appears relevant to your needs, please write for more information. Also, should you require it, a solution to the puzzle.

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Low-priced NAPCO OVENS now have a high-priced stainless steel interior...

At no added cost!

Lifting the cover of a water bath used to be a messy chore ... water dripping all over the bench-top (and sometimes into the specimens) and a clean-up job afterward.

Now you don't have to lift a lid to observe a water bath's contents. With NAPCO's new see-through cover, all you do is look!

It's the latest improvement in the highly successful line of NAPCO Water Baths ... long noted for high performance, sleek good looks and buying economy.

The new NAPCO see-through covers are made of high-clarity, chemically inert, practically unbreakable polycarbonate. There's a neatly molded corner to permit use of a thermometer and the handle is centered for a better grip. Best of all, the see-through cover retards evaporation, so that the water level remains more constant.

NAPCO Water Baths come in three sizes: 1½, 3½ and 6 gallons. Tanks are leakproof, solderless welded, with a perfectly smooth interior to reduce possibilities of contamination. Water temperatures are controlled to within ±0.5°C and a built-in safety thermostat is standard. The unique warm air jacket surrounding the tank protects against overheating even if the tank runs dry. Add to these advantages the new see-through gable cover ... and there's no better water bath available!

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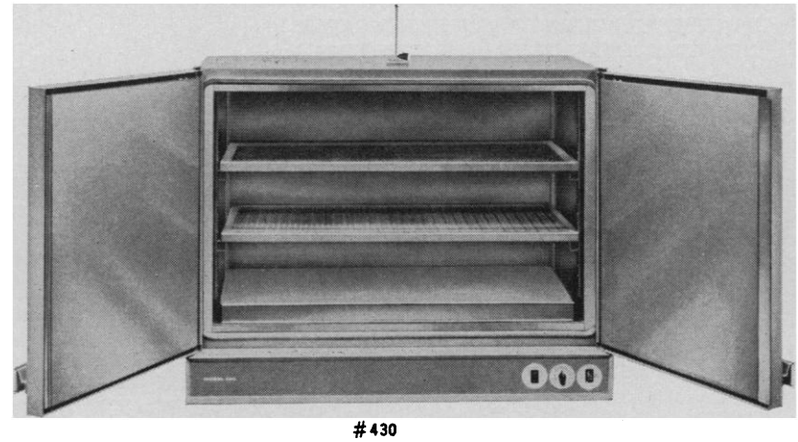


#430

From counting vial to finished form— a liquid scintillation system that begins where others stop.

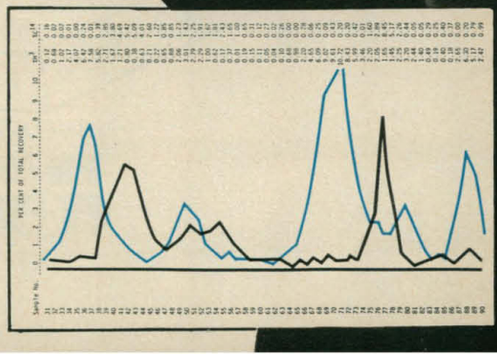
With its core memory computer our SL-40 Liquid Scintillation Spectrometer can provide a variety of complete data presentations like the one illustrated below. In addition it provides true computed DPM utilizing the external standard ratio method. Where self-absorbtion is the source of quenching,DPM is computed by the channels ratio method. Single, dual and even triple label DPM are provided automatically.

Percent standard deviations are accurately computed from the gross counts in each channel as well as CPM and isotope ratios (dual label experiments). These are only a few of the standard computations provided with each printout.

One control selects any of seven standard printout formats. What's more, SL-40 systems accept special programs to fit your specific needs.

"User Oriented" is the best way to describe the SL-40. It features • three separate channels of pulse height analysis plus two additional channels for external standardization • instant channel setup with pre-calibrated channel settings for single and dual label samples • controlled temperature operation • 200 sample capacity • push button sample handling . . . and more.

For more information plus sample graph printouts, contact your Intertechnique representative or Intertechnique Instruments, Inc., Randolph Industrial Park, Dover, New Jersey 07801. Telephone: (201) 361-5550.



Assay showing percent recovery of H^3 and C^{14} printed out and plotted *. . . on line*

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It pays to listen to everybody.

Like the time Danish physicist Dr. Niels Bohr let the air out of Professor Einstein's objection to the Heisenberg uncertainty principle. You may recall how the Professor postulated a box lined with perfect mirrors having an alarm clock inside, the entire device suspended from a balance.

The contrivance suggested the Heisenberg principle wouldn't work in a 4-dimensional universe. That had Dr. Bohr stumped. Until he recollected having listened to Einstein's theory making the rate of the clock a function of gravity and saw that the clock's rate of operation must depend on its position in the gravitational field of the earth.

" 'Twas sport to have the master hoist with his own petard."

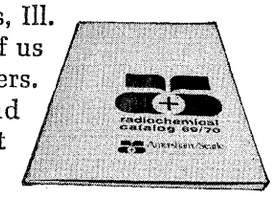
We listen to everybody, too. We draw on the experience and know-how of The Radiochemical Centre at Amersham, England, and G. D. Searle & Co.

Now we're listening to you and learning more every day. Which is why we can serve you so well.

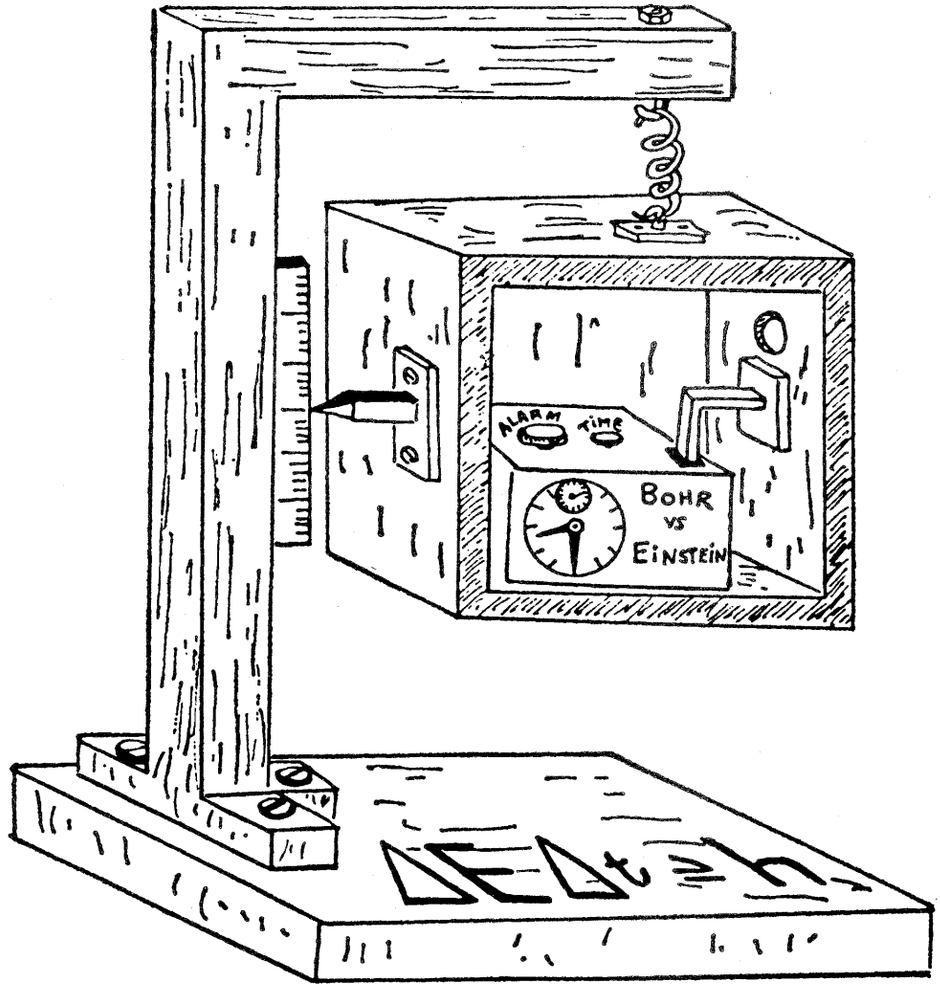
Which is just as satisfying as winning a joust with Professor Einstein.

Need technical assistance? Call our Customer Service Dept. in Des Plaines, Ill. We're all of us good listeners.

And send for our first edition.



how the great Dane helped old mc^2 box himself in



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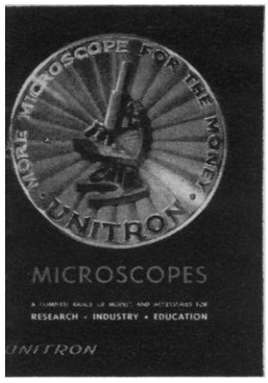

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Shown here in miniature are just some of the informative brochures which comprise the UNITRON Catalog . . . your buying guide to quality microscopes at prices within your budget. Whether your application is routine laboratory analysis, advanced biological research, or industrial quality control, you will find the instrument you need in UNITRON's complete line.

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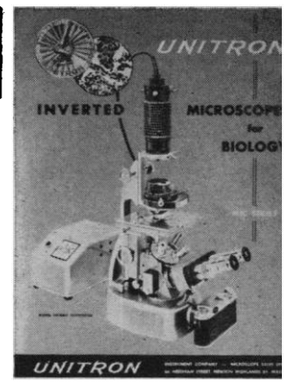

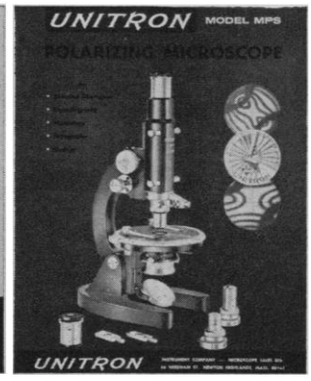

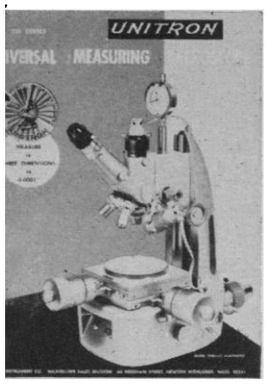

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A salesman's demonstration gives you only about 30 minutes to examine a microscope, hardly the best conditions for a critical appraisal. But UNITRON's Free 10 Day Trial gives you the opportunity to evaluate any model in your own laboratory and prove its value in your own application before you decide to purchase. See for yourself, as have thousands of other buyers, why . . .

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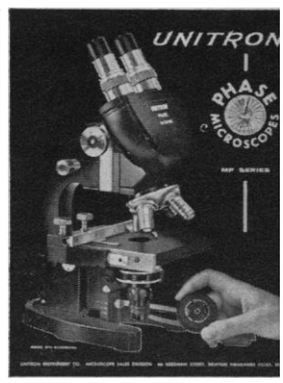

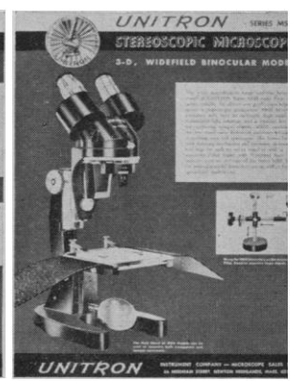

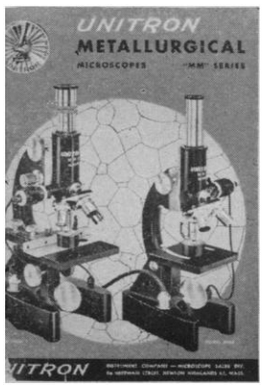

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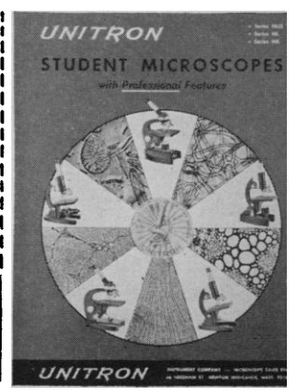

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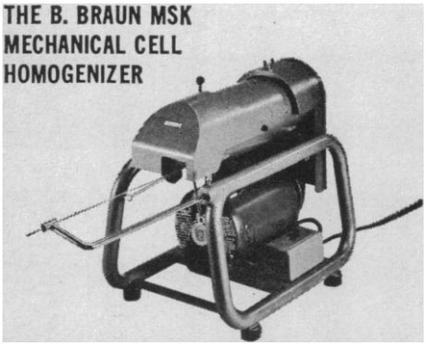

World's most popular mechanical cell disrupter. Heavy duty - disrupts 99% of all cells in 2-4 minutes at 4°C. Processes up to 10 grams of cells at one time. Safe, reliable, efficient. First choice for preparation of bacterial cell walls, bacterial and yeast extracts. Integral provision for sample cooling.

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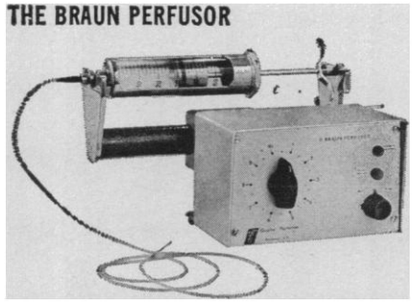
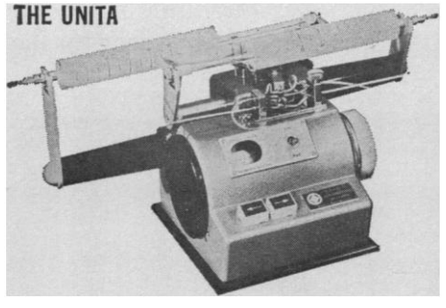


Safe, automatic way for infusion or withdrawal of small volumes of solution at constant, accurately reproducible rates — from 0.2 to 600 ml per hour. Operates at back pressures up to 1000 mm Hg. High versatility, — 70 different rates, choice of 3 glass syringe sizes or disposables, infusion or withdrawal, adjustable cutoffs and a large variety of accessory valves and fittings.

PRICE ONLY $485

THE UNITA



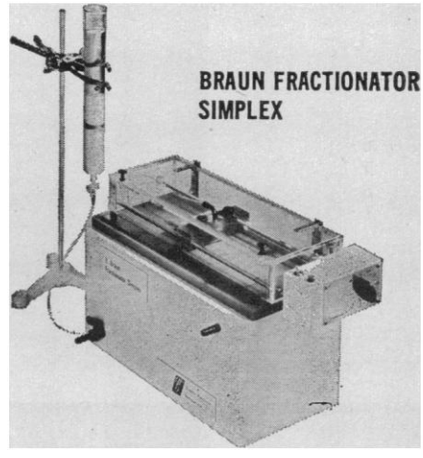
Time-tested instruments for accurate infusion. Unita I has 24 step plunger feed rates — 0.125 μl/min. up to 5 ml/min.; 39 infusion rates using 50 and 5 ml syringes; simultaneous operation of up to 6 syringes; front settings; adjustable limit switch with preset cutoff for unattended operation; pilot lamp signals end-of-run; and special clutch protects against back pressures above 400 mm Hg.

Unita II is similar but with two syringes operating simultaneously in opposite directions — one filling, the other discharging indefinitely for infusion of unlimited volumes. Variable 12 plunger feed rates.

UNITA I PRICE ONLY $645
UNITA II PRICE ONLY $795

ENZYME PURIFICATION:

BRAUN FRACTIONATOR SIMPLEX



The only fraction collector that can collect sterile and oxygen free samples in column chromatography. Integral cooling eliminates separate refrigerator. Takes less than one square foot bench space. Collects 102 fractions — from 50 fractions/hr. to 1 fraction/20 hrs. Instant analysis possible. Features a uniquely new, trouble-free operating design — no on/off cycles, no contacts, no mechanical relays, no solenoids.

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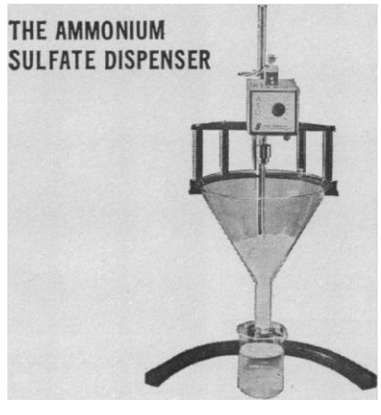
THE AMMONIUM SULFATE DISPENSER



A completely new apparatus for automatic dispensing of $(NH_4)_2SO_4$ in enzyme precipitation work. Auger-type device carries ammonium sulphate through a Teflon® pestle for slow, uniform dispensing. Rates may be adjusted by means of a variable speed motor. Also can be used as a very efficient laboratory stirrer.

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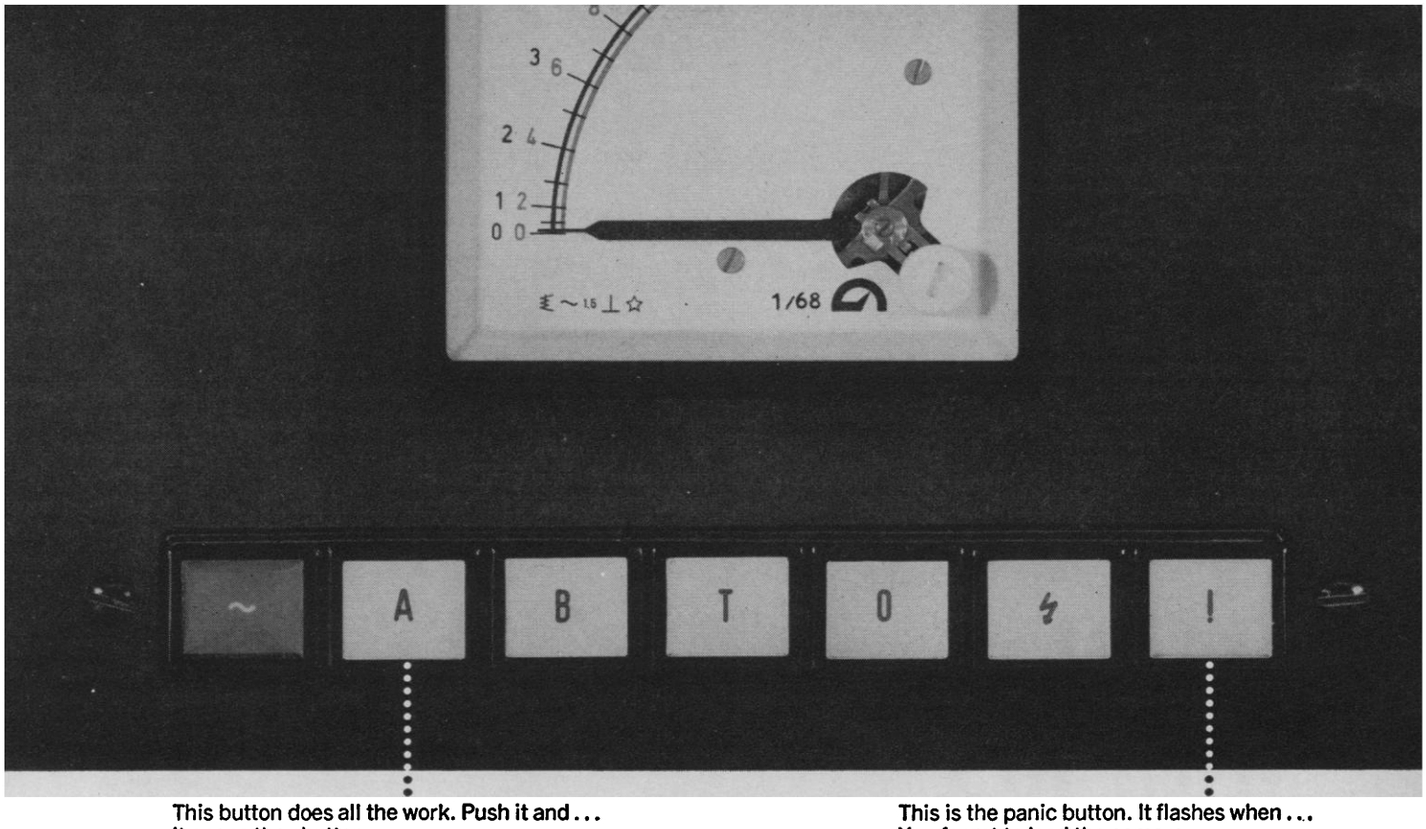
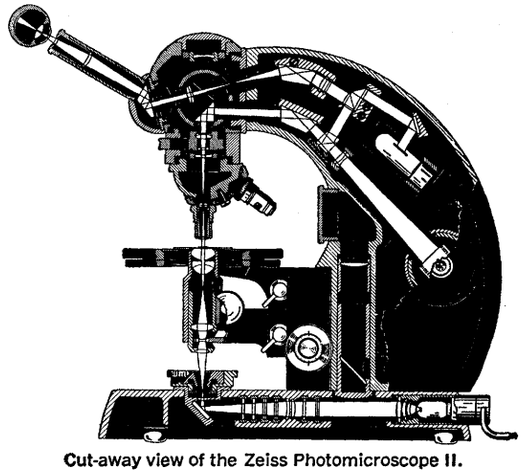


This button does all the work. Push it and . . .
It opens the shutter.
Exposes the film the proper length of time.
Closes the shutter.
Advances the film to the next frame.
Advances the frame counter.
Recocks the shutter ready for the next exposure.

This is the panic button. It flashes when . . .
You forgot to load the camera.
You've run out of film.
The film is torn.
You've reached the end of the roll.
You can't push button A while button ! is flashing.

Introducing the Photomicroscope II...

A tale of two buttons.



Cut-away view of the Zeiss Photomicroscope II.

What the other buttons do is give you added versatility. But there are more important things to talk about here.

Such as the stability between camera and microscope only an integrated system can offer.

Such as exposure times from 1/100 sec. to hours, if need be.

Such as automatic exposure control for all films rated from 2½ to 8000 ASA.

Such as a system specifically designed to take optimum advantage of the latest high speed color films.

Such as increased sensitivity for selected-area "spot" readings—particularly helpful for dark-field and fluorescence work.

Such as a whole lot more.

The new ZEISS Photomicroscope II makes photomicrography literally a snap—as easy as using any quality 35mm automatic amateur camera. But it's as professional an instrument as you can get.

For complete information, including what the other buttons do, write Carl Zeiss, Inc., 444 Fifth Avenue, New York, N.Y. 10018.

Nationwide service.

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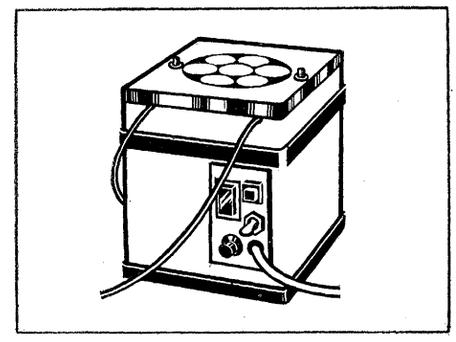
This compact pump is only 125×125×155 mm (5×5×6 in).
It can handle corrosive, sterile and dangerous materials
with complete safety.



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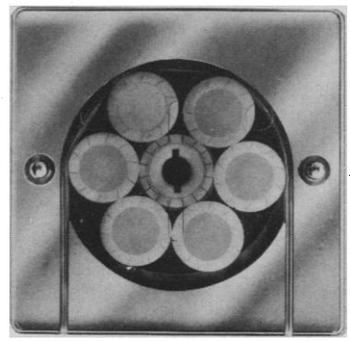
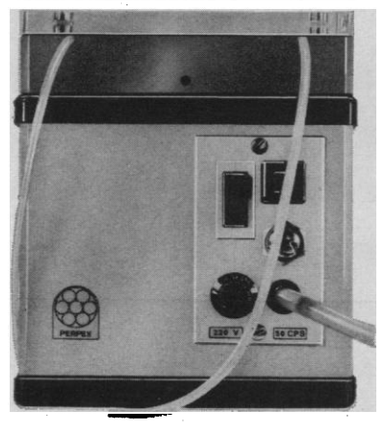
P P P's with lo P

Perpex **P**eristaltic **P**umps with low **P**ulsation.

The VarioPerpex has continuously variable flow rates within the wide range 1.6 to 200 ml per hour, for a standard gear box, and lower flow rates are possible by using other easily exchangeable gear boxes.
Fluctuations, due to mains voltage variations, have been reduced to a minimum by the employment of a step-motor.
The Vario Perpex has all the design advantages of the Perpex Pump.



The Perpex and VarioPerpex pumps, which form the new LKB pump range, have been specially designed for chromatographic, electrophoretic and all other analytical operations requiring a steady flow over long periods.
Compact and lightweight, well capable of meeting the vigorous requirements of research and industrial laboratories.
Accurate flow rate and minimal tube wear due to the patented, machined, plastic roller system.



The Perpex Pump provides continuous, precise delivery of a great variety of liquids and gases without pulsation even at the lowest speeds.
Takes up little space on the bench, can be conveniently stacked to provide multiple channels, and the absence of bearings in the pumping area eliminates vibration, and contamination from grease.
Six standard gears are available and a choice of drive ensures accurate, repeatable pumping speeds.

PLUS ONE P MORE—PRECISION!

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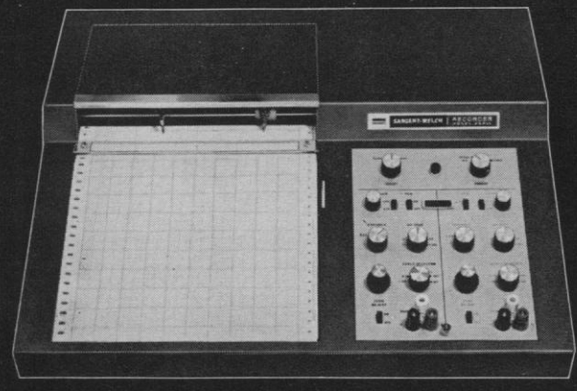
How many linear-log recorders in this picture?



Wrong.

Not one, but *two.* In our new Model DSRLG recorder, there are *two* independent linear-logarithmic channels, each with its own recording pen. So for all practical purposes, the Model DSRLG is (are?) two recorders in one.

The benefits of this double life: When connected to spectrophotometers, photometers, densitometers, and the like, the Model DSRLG will record simultaneously both transmittance *and* absorbance. And when properly factory-equipped and then connected to a spectrophotometer with a transmittance output, the DSRLG will simultaneously record both absorbance *and* log absorbance (extinction coefficient).

There are other ways to put the DSRLG to work, of course. Such as recording absorbance as a function of a nonlinear variable (temperature, pressure, etc.) which is also recorded. Or recording, linearly or logarithmically, *any* two time-synchronized variables.

So much for what and why. Now for *how.* The DSRLG uses precision, nonlinear *gears* to achieve logarithmic response. And that's a more accurate, truer method than electrical circuit approximations. (The log gears are quickly interchangeable with the linear gears.) You simply set the switches for *automatic* gain adjustment at all points in the log scale and for *automatic* divider zero-point.

Add in some of the DSRLG's other good points—all solid-state circuitry; circuit guarding to prevent interchannel communication and to reject A.C. and D.C. interference; seven switch-selected chart spans with continuously variable expansion of each from 100% to 40%; three-speed synchronous chart drive; 240-mm wide chart; a pen response of less than 1 second; zener-diode-regulated reference circuits—add all of those points in, and you've got quite a dual-pen, linear-log recorder for $2075.

Call your Sargent-Welch representative for a DSRLG demonstration. Or write to us for additional information.

9-228

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Scientific instruments, apparatus, chemicals.
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Turn on with the reliable ones

Either of these SORVALL Table-Top Superspeed Centrifuges can give you years of research-quality centrifugation combined with rotor, tube, and adapter versatility. The SS-3 is automatic; the SS-4 is manually controlled. Both incorporate Gyro-Action Direct Drive (patented), control accuracy, full-access rotor chambers, and a rugged motor that gives you power in reserve even at maximum speeds. Safety is a major factor. The SS-3 is a "set it and forget it" instrument; the control panel of the SS-4 snaps out for remote operation. For fully descriptive literature and price list, write Ivan Sorvall, Inc. Norwalk, Connecticut 06856.

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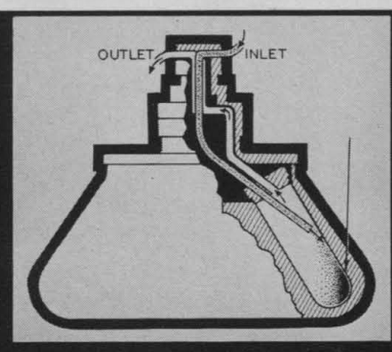
SS-4 Manual Superspeed Centrifuge RCF's to 34,800 x g — Speeds to 17,000 rpm

SS-3 Automatic Superspeed Centrifuge RCF's to 34,800 x g — Speeds to 17,000 rpm

Write for Bulletin SC-9SS-3/4

SS-1 SUPERSPEED ANGLE CENTRIFUGE
RCF's to 31,000 x G — Speeds to 16,000 RPM. The original "workhorse" of the modern laboratory and still going strong. Adaptable to Continuous Flow Collection.



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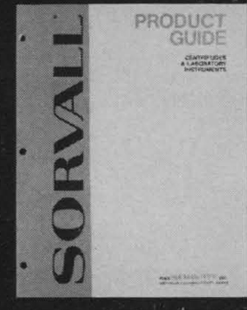
Collection in 8, 4, or 2 tubes — up to 48,200 x G may be applied. For use with SORVALL SS-1, SS-3, SS-4, and RC2-B Centrifuges.



PRODUCT GUIDE
A guide to all SORVALL centrifuges and laboratory instruments. Sent with comprehensive 28-page Price List.

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Available from

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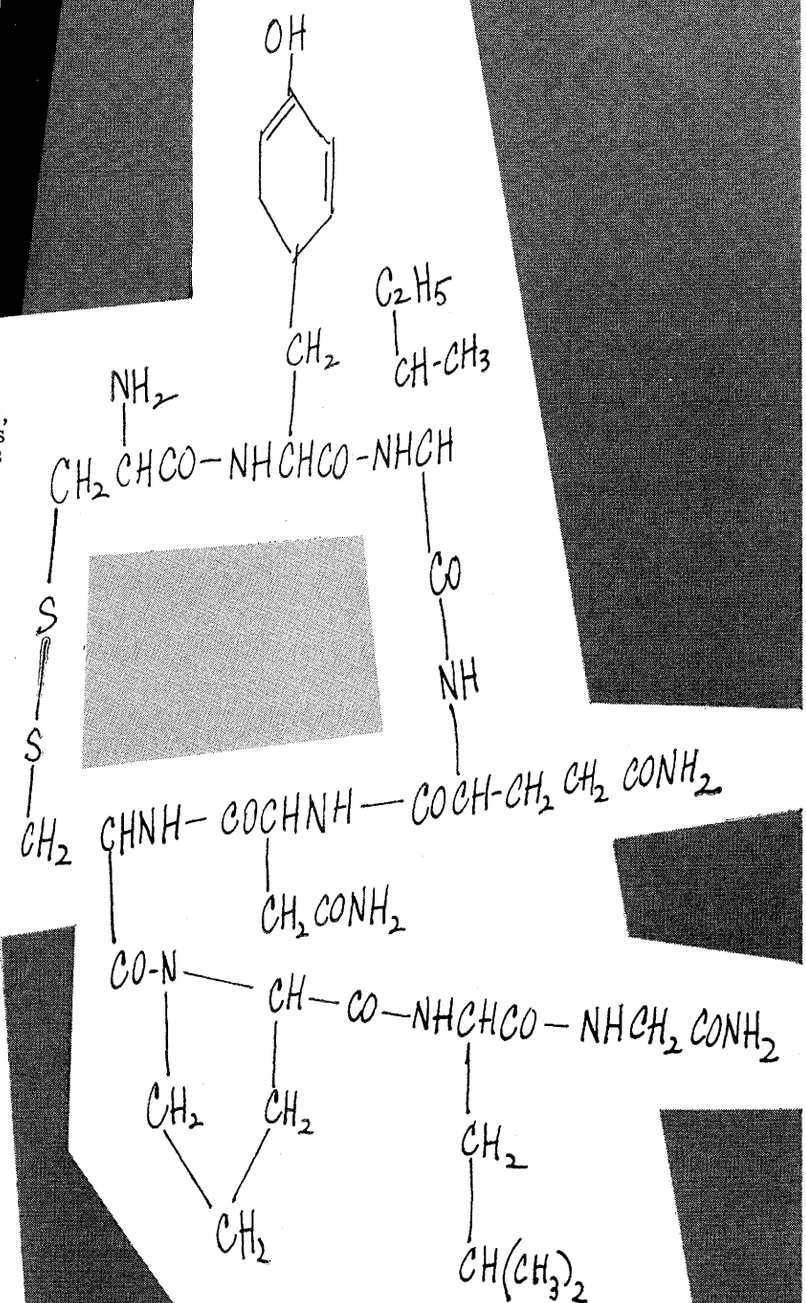

To many scientists throughout the world, Miles Laboratories in Elkhart, Indiana has since 1961 come to mean advanced products for research in Molecular Biology.

Through its Research Products Division, Miles serves the scientific community by generating critical materials required by researchers in health and nutrition—molecular biologicals, immunochemicals, isotopically labeled compounds, enzymes and substrates and reagents for protein chemistry.

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For a program with abstracts of the 1969 Symposium entitled "POLYPEPTIDES: Their Enzymatic and Chemical Synthesis; Their Role in Immunological Processes," write Miles Laboratories, Inc., Research Products Division, Elkhart, Indiana, U.S.A., 46514.

(By the way, we also make professional pharmaceuticals, chemical and biological information systems, electronic medical instruments, chemicals, household products and proprietary pharmaceuticals such as ALKA-SELTZER and ONE-A-DAY (Brand) vitamins.)

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Coleman's Model 124 brings you rapid scanning speeds and the *only* linear absorbance readout ever offered in a low-cost, double-beam, grating instrument.

With the new Model 124 Hitachi Spectrophotometer you can now do fully automatic ratio recording in the 190 to 800 mμ range, *without logarithmic scales.* Model 124 presentation is linear in both absorbance and transmittance. Now, for the first time, you get maximum readability with *both* high and low absorbance values. You can obtain readings in 0 to 2.0 absorbance, or expand your readings with the 0 to 1.0 absorbance range.

You'll get three times as much work done, too. Model 124 operates at four scanning speeds up to 240 mμ per minute. Scans the entire visible range in less than two minutes, with performance comparable to that of slower scanning instruments.

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Learn more about the outstanding performance characteristics of this new spectrophotometer, available in two ranges—190 to 700 mμ and 190 to 800 mμ. Send today for Coleman Bulletin S-312.

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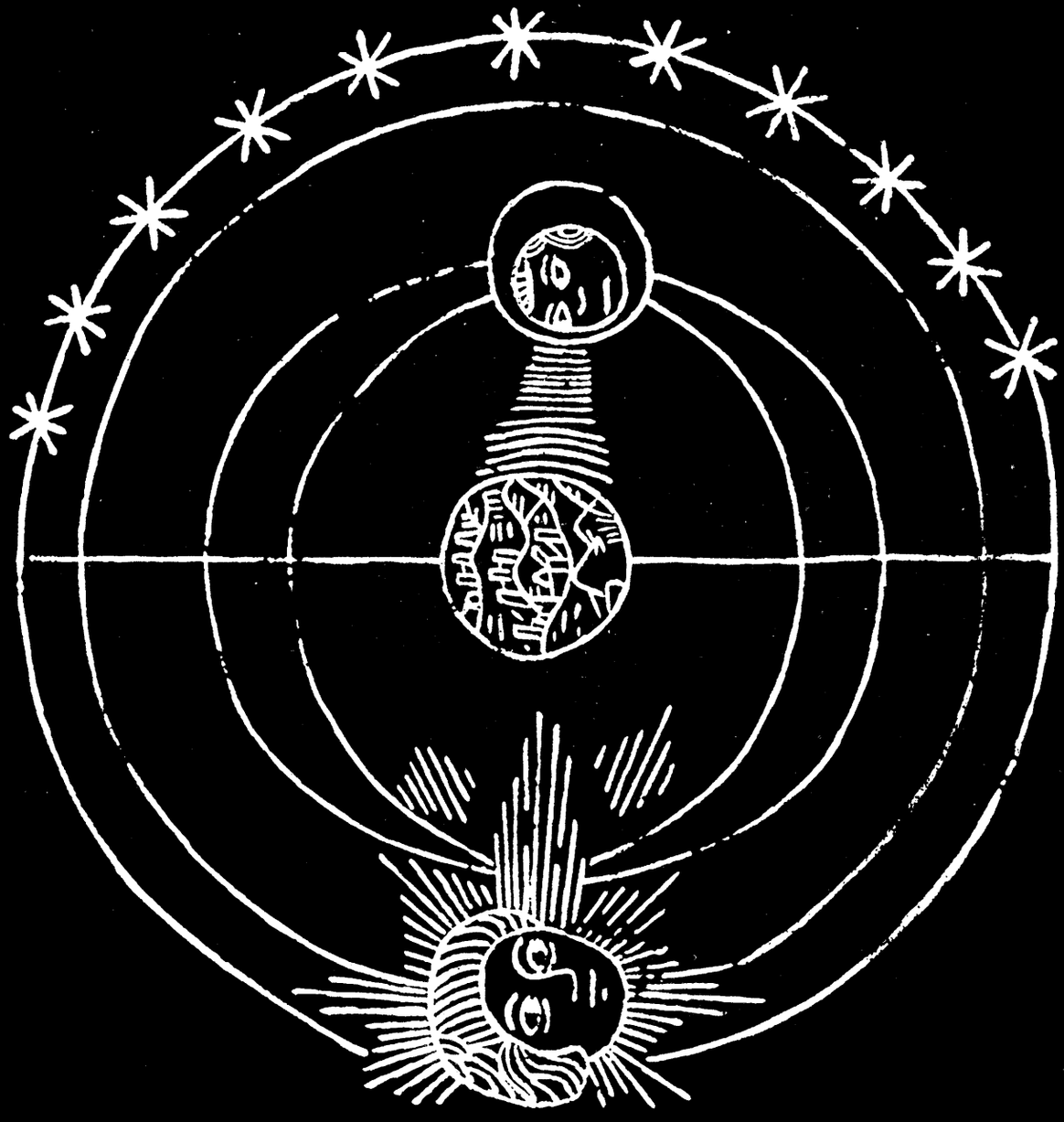

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To encourage and recognize outstanding writing on the natural sciences and their engineering and technological applications (excluding medicine) in newspapers and general circulation magazines.

Three awards of $1000 each for science writing: in newspapers with daily circulation of over 100,000; in newspapers with daily circulation of less than 100,000; in general circulation magazines.

Contest year. Material must have been published within the United States, October 1, 1968, through September 30, 1969. Deadline date for submitting entries is October 10, 1969.

For entry blanks and detailed rules, contact Grayce A. Finger, Dept. W, American Association for the Advancement of Science, 1515 Massachusetts Avenue, N.W., Washington, D.C. 20005.

Now you don't have to wait until you can afford an expensive multiple sample automatic counter before you start liquid scintillation counting. The new β-Mate I and β-Mate II are high performance, single sample, soft-beta counting spectrophotometers that do the job for a price you can afford.

β-Mate I is ideal for teaching nuclear counting and tracer techniques, using the same procedures as if the student were using a 200-sample, automatic liquid scintillation counting system.

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New β-Mate™. Shortcut to liquid scintillation.

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Our scanning microscope has a lot less to it than our competition's.

Two lenses instead of three.
So there's less difficulty lining things up. And less loss of intensity, once they're lined up.

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Because they pass through our air lock in under 30 seconds. Leaving contamination outside the instrument, where it belongs.

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ess guessing about pecimen composition with our x-ray etector.

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Our goniometer stage lets you tilt and rotate the sample, without touching the focus.

It has fewer knobs.
So it takes less time to learn how easy it is to operate.

Needs less floor space.
As it's mostly solid state.

Now wait till you see how much more you can do with so much less.

Like using our transmitted electron detector. To observe intricate internal structures.

Or viewing the continuous image on our unique TV scan. For more rapid specimen examination.

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Facts.

The Mark 260 delivers more of them...with less fuss, bother and cost...than any other oscillograph you can buy.

Facts start with accuracy.

And the Mark 260 is about as accurate as you can get. We *guarantee* 99½%. So when you're looking at the chart of a Mark 260, what you see, is fact. We owe it all to a fool-proof position feedback system that enforces pen position all the way across the chart. There are no springs, no strings. Or any of the other tricky mechanisms that you'll suffer with in other recorders.

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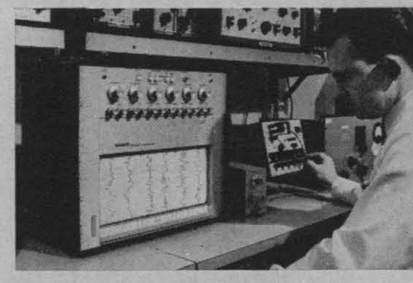
You can forget about recalibration problems, too. We took care of that little nuisance at the factory. So change those settings to your heart's delight. The Mark 260 will keep right up with you. And save you piles of time and piles of chart paper in the bargain.

That's what you get with a Mark 260. It's the go-anywhere, do-anything 6-channel recorder by Brush. At a price per channel that will surprise you.

More facts. Less fuss, bother and cost.

Ask your Brush representative for a demonstration. Or write for Mark 260 Bulletin 942-2: Clevite Corporation, Brush Instruments Division, 37th and Perkins, Cleveland, Ohio 44114. We'll include one of the most comprehensive handbooks on signal conditioning you'll ever find.



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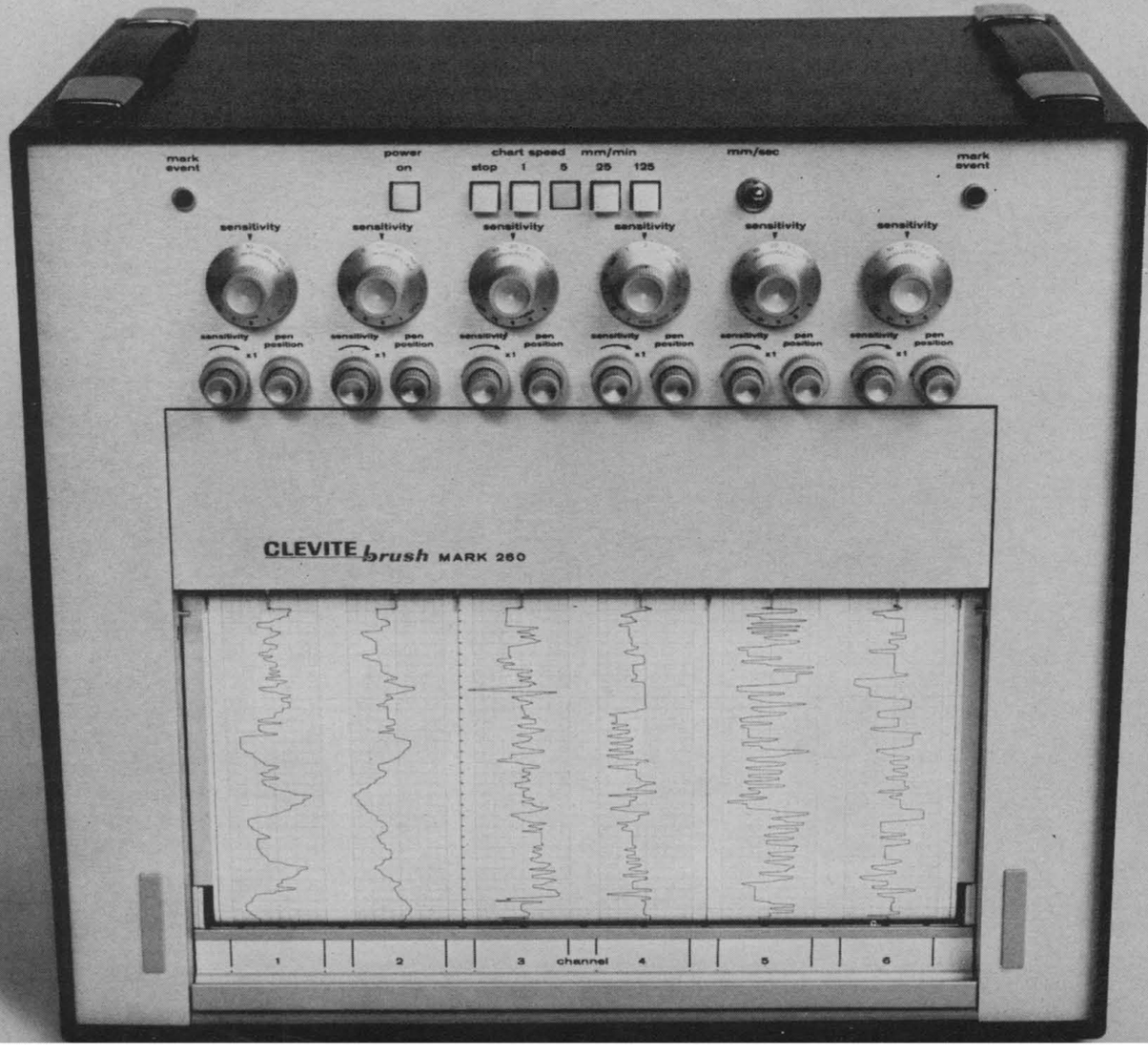

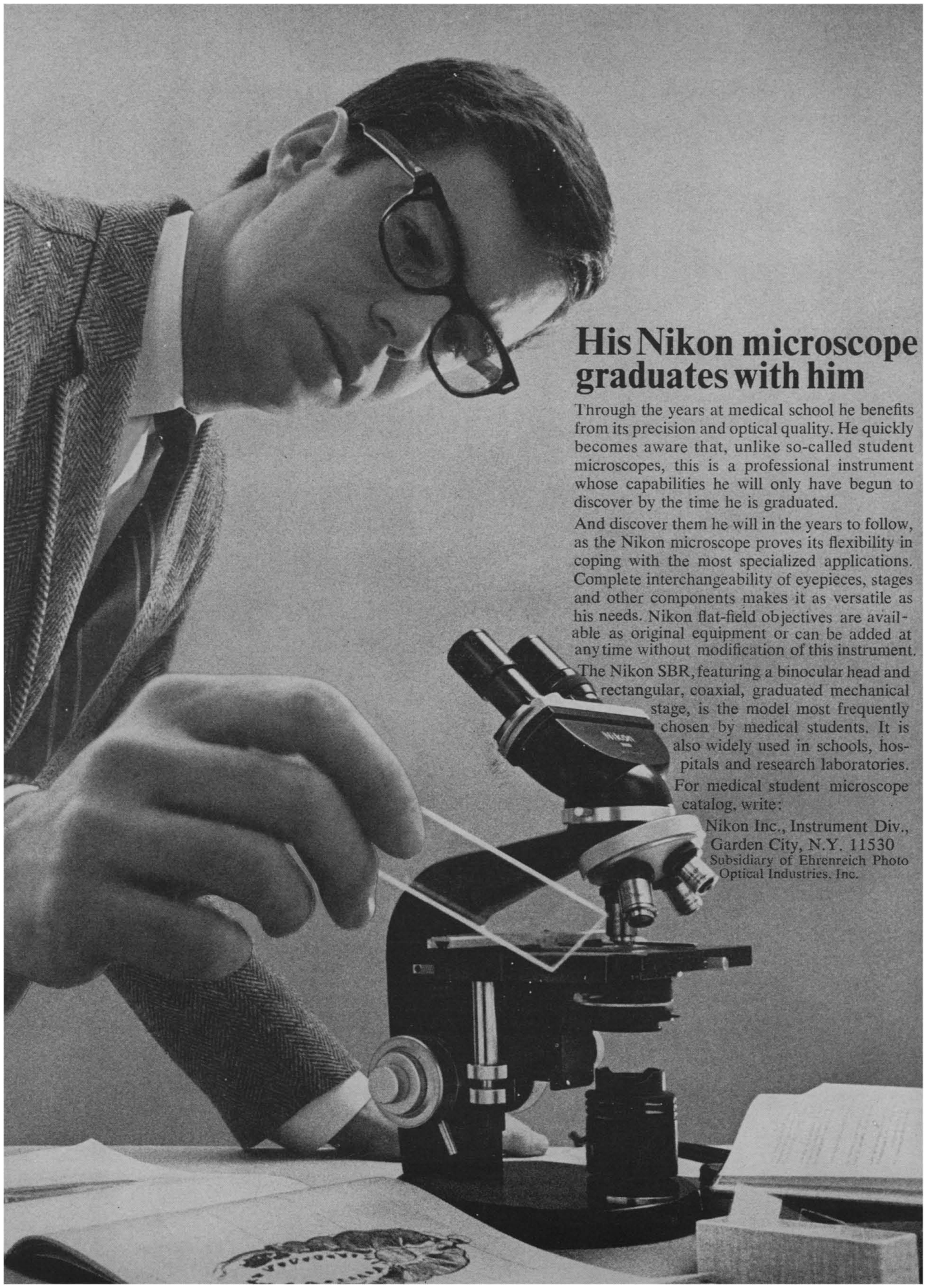

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For medical student microscope catalog, write:

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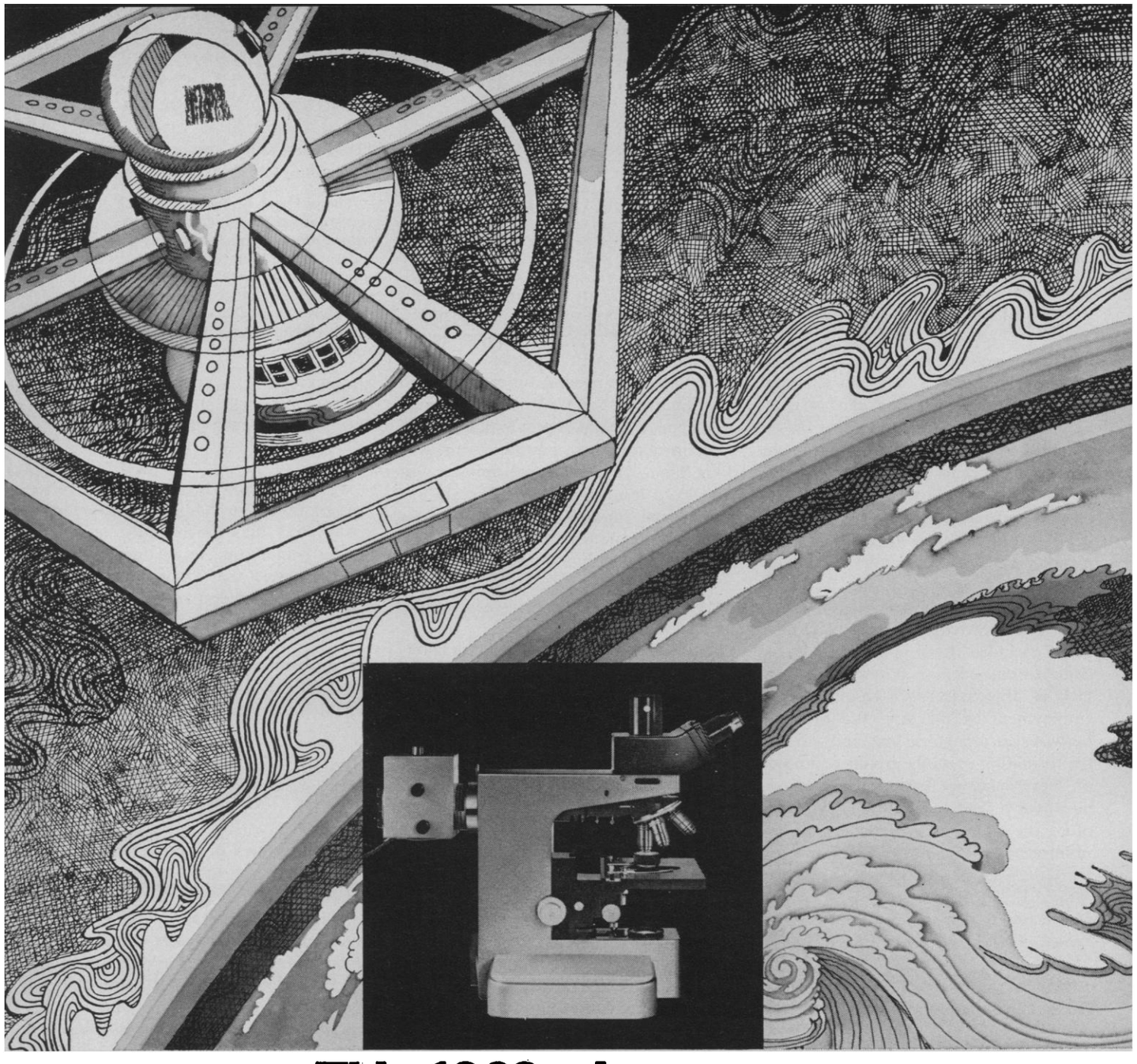

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72969

5 September 1969, Volume 165, Number 3897 **SCIENCE**

Potomac Valley Test Facility

If we had had the foresight a few years ago to establish the Potomac Valley Test Facility, several recent national problems could have been handled more satisfactorily. An example was the problem of what to do with a large supply of unwanted poison gas in Colorado. The Army proposed to ship it by train to the East Coast and then to dump it at sea off the coast of New Jersey. Had the Potomac Valley Test Facility been in existence, several containers of the gas could have been dropped into the Potomac River, between the White House and the Pentagon, from an altitude calculated to give the impact velocity expected at sea bottom. Dropping a few containers into the Potomac River would have given congressmen, Army officials, and other interested persons an opportunity to observe at first hand whether the containers survived unharmed, and if they did not, the rate of leakage of the gas and its effects on the neighboring flora and fauna. Nothing quite takes the place of direct, personal experience in evaluating an event and its consequences. The nation's central decision makers should not be denied this experience.

More recently, the Edgewood Arsenal and Fort McClellan have suspended open-air testing of nerve gas until a team of scientists can determine whether such tests are as free from danger as they are reputed to be. The National Academy of Sciences, which is frequently asked to advise the government on difficult technical matters, has its headquarters in Washington. Also nearby are the National Bureau of Standards, the Food and Drug Administration, and other agencies that can provide much technical information and relevant expertise. If open-air tests of nerve gas were conducted in or near Washington, representatives of appropriate agencies and of interested congressional committees could easily obtain the firsthand information which they will no doubt wish to have in evaluating the possible hazards of testing such gases in or near inhabited areas.

Another use of the Potomac Valley Test Facility would be in conducting studies of the sonic boom. Sonic boom tests have already been carried out in several parts of the country, but the test sites have been remote from Washington, and there is still considerable disagreement over the extent of the disturbance and the willingness of the public to accept repeated sonic booms. Again, firsthand information would be useful to the decision makers. If repeated tests were conducted over Washington, members of Congress and officials of responsible Executive agencies could observe the effects on babies, pets, the sick and the elderly, on classrooms and conferences, and also on window panes and other fragile objects. They could learn for themselves just how much or little disturbance repeated sonic booms produce at various times of day and night.

There would be still other advantages of having a general-purpose test facility located in Washington. Studies of the time-zone effect indicate that physiological disturbances, loss of sleep, reduced effectiveness, and impaired judgment follow sudden transportation from a time zone to which a person is adapted to another, several time zones removed. However, there are individual differences in these effects, and the whole matter needs further study. Washington is full of people who make frequent trips to Europe, Africa, the West Coast, or Asia. Clearly they would be good subjects for studies of time-zone effects, and their number could readily be increased, for it would be easy to get nominations of politicians, bureaucrats, editorial writers, and others whose frequent or prolonged absence from Washington would be considered by many to be in the national interest.—DAEL WOLFLE

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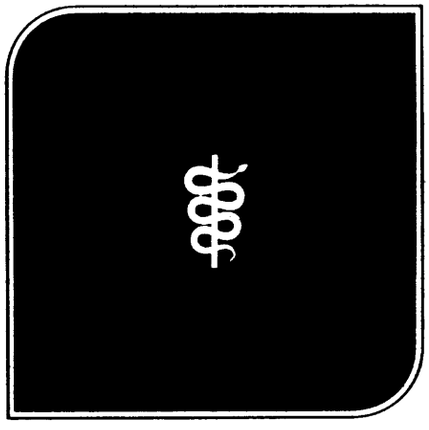

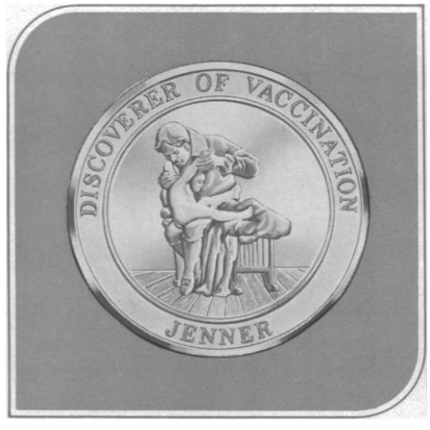

The History of Medicine is the History of Man

From antiquity, the physician—the healer—has played a central role in the history of man. Indeed, in earlier societies, the physician was venerated for his "magical" powers, and considered godlike.

Recognizing the creative aspects of medical progress, the Medical Heritage Society has undertaken a uniquely elegant creative tribute to this progress in a classic form of art . . . . the bas relief Art Medal.

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The history of medicine is so rich in momentous events that it required months of scholarly research by our advisory board to select the sixty most significant events. Included are such high points as the discovery of blood circulation, the development of anesthesia, and the invention of the microscope . . . the highlights of medical history from Hippocrates and Galen to Pasteur and Freud. These achievements have been artistically interpreted in bas relief, engraved in meticulous detail—and will be minted in Proof Sets of Solid Platinum, Sterling Silver, and Solid Bronze. Each medal is 39 millimeters in diameter—larger and thicker than a silver dollar.

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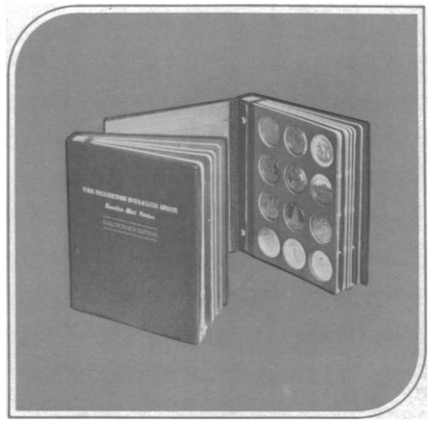
Bonus medal



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The participants at the conference considered the vastly larger scale of electrostatic phenomena of the earth's atmosphere, from fair weather electricity, involving such effects as electrification from bursting bubbles, snow and dust storms, to the violent electrical activity and intense electric fields associated with thunderstorms and volcano activity.

There was strong agreement that it would be desirable to set up a university-located electrostatics research center, specializing in electrostatics research and development of applied electrostatic techniques. Such a center could establish an electrostatics library and maintain a directory of people working in the diverse areas of electrostatics.

A. D. MOORE
Department of Electrical Engineering, University of Michigan, Ann Arbor 48104

BERNARD VONNEGUT
Atmospheric Sciences Research Center, State University of New York, Albany 12203

Forthcoming Events

October

1–3. American **Nuclear** Soc., San Juan, P.R. (H. Gomberg, Puerto Rico Nuclear Center, Univ. of Puerto Rico, Mayagües 00709)

1–5. American Soc. for **Information Science**, San Francisco, Calif. (J. E. Bryan, ASIS, 2011 Eye St., NW, Washington, D.C. 20006)

2–5. American Soc. of **Human Genetics**, San Francisco, Calif. (C. J. Witkop, Jr., 429 Owre Hall, Univ. of Minnesota, Minneapolis 55455)

2–9. **Use of Computers in Clinical Medicine**, 2nd symp., Buffalo, N.Y. (H. J. Alvis, Associate Dean, Continuing Medical Education, 211 Main St., Buffalo 14214)

5–9. **Electrochemical** Soc., Detroit, Mich. (E. G. Enck, The Society, 30 E. 42 St., New York 10017)

5–9. **Prestressed Concrete** Inst., Boston, Mass. (W. B. Bennett, Jr., PCI, 205 W. Wacker Dr., Chicago, Ill. 60606)

5–10. **Water Pollution Control** Federation, 42nd annual, Dallas, Tex. (R. E. Fuhrman, WPCF, 3900 Wisconsin Ave., NW, Washington, D.C. 20016)

6–8. International Congr. on **Antiparasites**, 3rd, Milan, Italy. (CONGITA, Via Barberini 86, 00185 Rome, Italy)

6–10. International Seminar on **Neoplastic Diseases**, Heidelberg, Germany. (R. H. Jackson, 10607 Miles Ave., Cleveland, Ohio 44105)

6–10. **Research Equipment** Exhibit and Instrument Symp., 19th annual, Bethesda, Md. (J. B. Davis, Chief, Supply Management Bureau, National Institutes of Health,

Bldg. 12A, Room 4003, Bethesda 20014)

7–8. Conference on **Automation in Injection Molding**, Cincinnati, Ohio. (R. P. Fox, Soc. of Plastics Engineers, 656 W. Putnam Ave., Greenwich, Conn. 06830)

7–8. Symposium on Recent Progress in **Diabetes and Insulin Research**, Omaha, Neb. (M. A. Mehlman, Dept. of Biochemistry, Univ. of Nebraska, College of Medicine, Omaha 68105)

7–9. Conference on **Environmental Effects on Aircraft and Propulsion Systems**, Bordentown, N.J. (R. A. Bard, Naval Air Propulsion Test Center, P.O. Box 176, 1440 Parkway Ave., Trenton, N.J. 08628)

8–9. Society for **Management Information Systems**, Minneapolis, Minn. (G. W. Dickson, Management Information Systems Research Center, School of Business Administration, Univ. of Minnesota, Minneapolis 55455)

8–10. American Council on **Education**, 52nd annual, Washington, D.C. (F. Skinner, ACE, 1785 Massachusetts Ave., NW, Washington, D.C. 20036)

8–11. National Assoc. of **Biology Teachers**, Philadelphia, Pa. (J. R. Lightner, NABT, 1420 N St., NW, Washington, D.C. 20005)

12–16. American Soc. of **Plastic and Reconstructive Surgeons**, St. Louis, Mo. (P. Randall, The Society, 18 Laughlin Lane, Philadelphia, Pa. 19118)

24–26. **Orton** Soc., 20th annual, New York, N.Y. (V. A. Graff, The Society, 15 Claremont Ave., New York 10027)

25–29. American Soc. of **Anesthesiologists**, San Francisco, Calif. (W. S. Marinko, 515 Busse Highway, Park Ridge, Ill. 60608)

25–31. American Assoc. of **Medical Record Librarians**, New York, N.Y. (M. Waterstraat, The Association, 211 E. Chicago Ave., Chicago, Ill. 60611)

26–30. Society for **Industrial and Applied Mathematics**, Anaheim, Calif. (R. K. Windsor, 33 S. 17 St., Philadelphia, Pa. 19103)

27–29. Interscience Conf. on **Antimicrobial Agents and Chemotherapy**, 9th, Washington, D.C. (R. W. Sarber, American Soc. for Microbiology, 1913 Eye St., NW, Washington, D.C. 20006)

25–26. International Soc. for **Homotoxicology** and **Antihomotoxicological Therapy** Symp., Baden-Baden, Germany. (F. Doerper, Bertholdstr. 7, 757 Baden-Baden)

27–30. National **Powerplant** Mtg., Cleveland, Ohio. (W. I. Marble, 2 Pennsylvania Plaza, New York 10001)

27–30. National **Safety** Congr. and Exposition, Chicago, Ill. (H. W. Champlin, The Congress, 425 N. Michigan Ave., Chicago 60611)

29–31. Symposium on **Pharmacology of Selected Drugs Used in Dermatology: Principles of Action and Uses**, New York, N.Y. (P. Merwin, New York Univ. Medical Center, 550 First Ave., New York 10016)

30–3. Association of American **Medical Colleges**, Cincinnati, Ohio. (D. E. Mattson, Div. of Educational Measurement and Research, AAMC, 2530 Ridge Ave., Evanston, Ill. 60201)

31–2. American Soc. of **Criminology**, Columbus, Ohio. (R. M. Susman, ASC, 800 Fourth St., SW, S-610, Washington, D.C. 20024)

November

2–5. **Atherosclerosis,** 2nd intern. symp., Chicago, Ill. (L. N. Katz, Chicago Heart Assoc., 22 W. Madison St., Chicago 60602)

2–7. Society of **Cosmetic Chemists,** Harriman, N.Y. (A. R. Korte, 521 W. 57 St., New York 10019)

3–4. Institute of **Navigation,** San Diego, Calif. (R. E. Freeman, Inst. of Navigation, Suite 912, 711 14th St., NW, Washington, D.C. 20005)

3–4. **Veterinarians,** 45th annual conf., Columbia, Mo. (F. McCulloch, School of Veterinary Medicine, Univ. of Missouri, Columbia 65201)

3–5. **Engineering Science in Biomedicine,** 7th annual, St. Louis, Mo. (E. Y. Rodin, Dept. of Applied Mathematics and Computer Science, Box 1176, Washington Univ., St. Louis 63130)

3–6. National Bureau of Standards, 3rd **Materials Research** Symp., Gaithersburg, Md. (R. R. Stromberg, A-307, Polymers Bldg., NBS, Washington, D.C. 20234)

3–7. American Soc. of **Parasitologists,** Washington, D.C. (D. V. Moore, Dept. of Microbiology, Univ. of Texas, Southwestern Medical School, Dallas 75235)

4–5. **Chemical Marketing Research** Assoc., Toronto, Canada. (P. E. Levesque, FMC Corp., 633 Third Ave., New York 10017)

4–6. Society of **Plastics Engineers,** Dallas, Tex. (C. C. Campbell, SPE, 656 W. Putnam Ave., Greenwich, Conn. 06830)

4–7. **Acoustical** Soc. of America, San Diego, Calif. (B. H. Goodfriend, 335 E. 45 St., New York 10017)

5–7. Pittsburgh **Diffraction** Conf., 27th, Pittsburgh, Pa. (J. H. Scott, U.S. Steel Research Center, Monroeville, Pa. 15146)

5–8. American **Chemical** Soc., southeastern regional mtg., Richmond, Va. (H. R. R. Wakeham, Philip Morris Inc., Box 3D, Richmond 23206)

5–8. Federation of Socs. for **Paint Technology,** Chicago, Ill. (R. W. Matlack, 121 S. Broad St., Philadelphia, Pa. 19107)

6–7. National Symp. on **Industrial Robots,** Chicago, Ill. (D. W. Hanify, IIT Research Inst., 10 W. 35 St., Chicago 60616)

6–8. American Soc. of **Cytology,** 17th annual scientific mtg., Chicago, Ill. (W. R. Lang, 7112 Lincoln Dr., Philadelphia, Pa. 19119)

6–8. American **Physical** Soc., Gainesville, Fla. (W. Seagondollar, Dept. of Physics, North Carolina State Univ., Raleigh 27607)

10–12. **Geological** Soc. of America, Atlantic City, N.J. (R. C. Becker, P.O. Box 1719, Boulder, Colo. 80302)

10–12. **Operations Research** Soc. of America, 36th natl., Miami, Fla. (M. E. Thomas, Dept. of Industrial and Systems Engineering, Univ. of Florida, Gainesville 32601)

10–12. **Paleontological** Soc., Atlantic City, N.J. (R. L. Langenheim, Jr., Dept. of Geology, Univ. of Illinois, Urbana 61801)

10–14. American College of **Preventive Medicine,** Philadelphia, Pa. (E. A. Piszczek, 6410 N. Leona Ave., Chicago, Ill. 60646)

10–14. American **Public Health** Assoc.,

97th annual, Philadelphia, Pa. (B. F. Mattison, APHA, 1740 Broadway, New York 10019)

10–14. Technical Conf. on **Tin**, 2nd, Bangkok, Thailand. (W. Fox, Intern. Tin Council, Haymarket House, 28 Haymarket, London, S.W.1., England)

11–13. **Neurosurgical** Soc., 28th annual, Kyoto, Japan. (H. Handa, Dept. of Neurosurgery, Kyoto Univ., Kyoto)

11–14. **Neutrons in Radiobiology** Symp., Oak Ridge, Tenn. (J. A. Auxier, Oak Ridge National Lab., P.O. Box X, Oak Ridge 37830)

12–15. American **Speech and Hearing** Assoc., Chicago, Ill. (K. O. Johnson, APHA, 9030 Old Georgetown Rd., Washington, D.C. 20014)

13–14. **Biochemical** Soc., Warwick, England. (A. I. P. Henton, 7 Warwick Court, Holborn, London, W.C.1., England)

16–18. Academy of **Psychosomatic Medicine**, Scottsdale, Ariz. (E. Dunlop, The Academy, 150 Emory St., Attleboro, Mass. 02703)

16–19. Association of **Military Surgeons** of the U.S., Washington, D.C. (Brig. Gen. F. E. Wilson, USAR, Executive Director, 1500 Massachusetts Ave., NW, Washington, D.C. 20005)

16–20. American Assoc. of **Blood Banks**, Houston, Tex. (L. J. James, AABB, 30 N. Michigan Ave., Chicago, Ill. 60602)

16–20. **Gulf and Caribbean Fisheries** Inst., 22nd annual, Miami Beach, Fla. (Executive Secretary, Gulf and Caribbean Fisheries Inst., 10 Rickenbacker Causeway, Miami 33149)

16–20. American Soc. of **Mechanical Engineers**, Los Angeles, Calif. (O. B. Schier, II, United Engineering Center, 345 E. 47 St., New York 10017)

17–19. National **Fire Protection** Assoc., Denver, Colo. (D. Richardson, The Association, 60 Batterymarch St., Boston, Mass. 02110)

17–21. **Electronic Industries** Assoc., Laser Subdivision, Paris, France. (J. Davis, EIA Subdivision, 2001 Eye St., NW, Washington, D.C. 20006)

17–21. World **Mental Health** Assembly, Washington, D.C. (P. V. Lemkau, Assembly Chairman, 615 N. Wolfe St., Baltimore, Md. 21205)

18–19. International Federation of **Surgical Colleges**, Buenos Aires, Argentina. (R. S. Johnson-Gilbert, Secretary, c/o Royal College of Surgeons of England, Lincolns Inn Fields, London, W.C.2, England)

18–21. **Magnetism and Magnetic Materials**, 15th conf., Philadelphia, Pa. (J. Blades, Franklin Inst., Research Labs., Philadelphia 19103)

19–21. Eastern **Analytical** Symp., New York, N.Y. (R. J. Knauer, Advanced Materials Div., Armco Steel Corp., P.O. Box 1697, Baltimore, Md. 21203)

20–21. Association for the Study of **Animal Behaviour**, London, England. (J. Cullen, Psychology Dept., The University, Stirling, England)

20–23. American **Anthropological** Assoc., New Orleans, La. (C. C. Reining, Suite 112, 3700 Massachusetts Ave., NW, Washington, D.C. 20016)

20–24. **Audio Engineering** Soc., 37th

conv., New York, N.Y. (J. D. Colvin, Room 428, 60 E. 42 St., New York 10017)

21–22. **Clinical** Conf., 13th annual, Houston, Tex. (J. Brandenberger, M. D. Anderson Hospital & Tumor Inst., Univ. of Texas, Houston 77025)

30–3. American Acad. for **Cerebral Palsy**, Las Vegas, Nev. (G. Solomons, University Hospitals, Iowa City, Iowa 52240)

30–4. American **Nuclear** Soc., San Francisco, Calif. (O. J. Du Temple, ANS, 244 E. Ogden Ave., Hinsdale, Ill. 60521)

December

1–4. **Entomological** Soc. of America, Chicago, Ill. (R. H. Nelson, 4603 Calvert Rd., College Park, Md. 20740)

2–5. **Reticuloendothelial** Soc., 6th natl., San Francisco, Calif. (E. Dobson, Donner Lab., Univ. of California, Berkeley 94720)

3–5. International **Wire and Cable** Symp., Atlantic City, N.J. (J. Spergel, U.S. Army Electronics Command, Amsel-K1-EE, Fort Monmouth, N.J. 07703)

3–6. American Assoc. of **Physicists in Medicine**, Chicago, Ill. (J. G. Kereiakes, Radioisotope Lab., Cincinnati General Hospital, Cincinnati, Ohio 45229)

5–6. **Oklahoma Acad. of Sc'ence**, Edmond. (J. T. Self, 730 South Oval, Univ. of Oklahoma, Norman 73069)

5–6. **Interferon** Symp., New York, N.Y. (I. Saulpaugh, New York Heart Assoc., 2 E. 64 St., New York 10021)

5–6. American **Rheumatism** Assoc., Tucson, Ariz. (M. M. Walsh, ARA, 1212 Avenue of the Americas, New York 10036)

5–7. American Acad. of **Oral Medicine**, New York, N.Y. (B. Tuchman, 200 Central Park South, New York 10019)

5–7. American Acad. of **Psychoanalysis**, New York, N.Y. (M. Carroll, AAP, 125 E. 65 St., New York 10021)

6–11. Galaxy Conf. on **Adult Education**, Washington, D.C. (E. Sydnor, 900 Silver Spring Ave., Silver Spring, Md. 20910)

7–9. American Soc. of **Hematology**, Cleveland, Ohio. (F. H. Gardner, Presbyterian–Univ. of Pennsylvania Medical Center, Philadelphia 19104)

7–12. American Soc. for **Testing and Materials**, Cincinnati, Ohio. (T. A. Marshall, Jr., ASTM, 1916 Race St., Philadelphia, Pa. 19103)

8–10. **Applications of Simulation**, 3rd conf., Los Angeles, Calif. (P. J. Kiviat, RAND Corp., 1700 Main St., Santa Monica, Calif. 90406)

8–10. **Circuit Theory**, intern. symp., San Francisco, Calif. (B. J. Leon, School of Electrical Engineering, Cornell Univ., Ithaca, N.Y. 14850)

8–10. National **Electronics** Conf. and Exhibition, 25th, Chicago, Ill. (R. J. Napolitan, NEC, Oakbrook Executive Plaza #2, 1211 W. 22 St., Oak Brook, Ill. 60521)

8–10. Southern **Surgical** Assoc., Hot Springs, Va. (D. C. Sabiston, Jr., Duke Univ. Medical Center, Durham, N.C. 27706)

8–11. Oak Ridge Associated Universi-

ties Symp. in **Medicine**, 12th, Oak Ridge, Tenn. (R. M. Kniseley, Medical Div., Oak Ridge Associated Universities, Oak Ridge 37830)

11–12. Conference on **Holography and the Computer**, Houston, Tex. (J. A. Jordan, Jr., IBM, Houston Scientific Center, 6900 Fannin St., Houston 77025)

12–14. American **Psychoanalytic** Assoc., New York, N.Y. (H. Fischer, 1 E. 57 St., New York 10022)

14–18. American Assoc. of **Hospital Pharmacists**, Washington, D.C. (J. A. Oddis, AAHP, 4630 Montgomery Ave., Bethesda, Md. 20014)

15–18. American **Geophysical** Union, San Francisco, Calif. (W. E. Smith, AGU, 2100 Pennsylvania Ave., NW, Washington, D.C. 20037)

17–19. Symposium on **Infections and Immunosuppression in Sub-Human Primates**, Rijswijk, Netherlands. (H. Balner, Radiobiological Institute TNO, Lange Kleiweg 151, Rijswijk Z.H., Netherlands)

18–20. International Symp. on **Computer and Information Science** (COINS-69), Miami Beach, Fla. (J. T. Lou, Univ. of Florida, Gainesville 32601)

26–30. **Sigma Delta Epsilon**, Boston, Mass. (M. Myers, 6234 Mary Lane Dr., San Diego, Calif. 92115)

26–31. American Assoc. for the **Advancement of Science**, 136th mtg., Boston, Mass. (Meetings Manager, 1515 Massachusetts Ave., NW, Washington, D.C. 20005)

26–31. **Animal Behavior** Soc., Boston, Mass. (B. Dane, Tufts Univ., Medford, Mass.)

26–31. American Soc. of **Naturalists**, Boston, Mass. (B. H. Judd, Dept. of Zoology, Univ. of Texas, Austin 78712)

26–31. Society of **Protozoologists**, Boston, Mass. (M. Hammond, Dept. of Zoology, Utah State Univ., Logan 84321)

26–31. National Assoc. of **Science Writers**, Boston, Mass. (R. Arctander, The Association, Box H, Sea Cliff, N.Y. 11579)

26–31. **Scientific Research** Soc. of America, Boston, Mass. (C. A. Walker, SRSA, 155 Whitney Ave., New Haven, Conn. 06510)

26–31. **Sigma Pi Sigma**, Boston, Mass. (C. G. Shugart, Society of Physics Students, State Univ. of New York, Stony Brook 11790)

26–31. Society for the **Study of Evolution**, Boston, Mass. (D. L. Jameson, Dept. of Biology, Univ. of Houston, Houston, Tex. 77004)

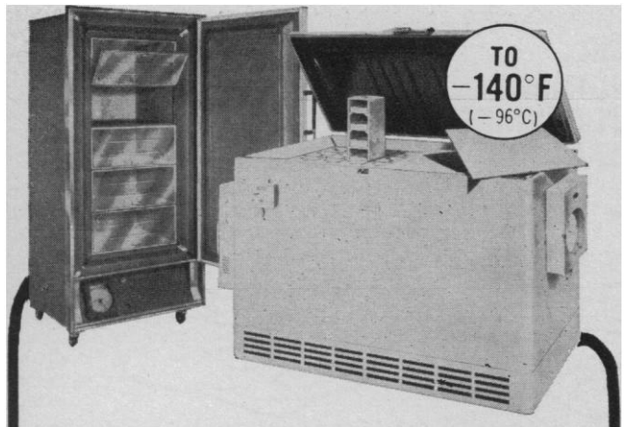
26–31. American Soc. of **Zoologists**, Boston, Mass. (J. R. Shaver, Dept. of Zoology, Michigan State Univ., East Lansing 48823)

27–30. **Archaeological** Inst. of America, San Francisco, Calif. (J. S. Ord, AIA, 260 West Broadway, New York 10013)

27–30. Western Soc. of **Naturalists**, Los Angeles, Calif. (D. H. Montgomery, Dept. of Biological Sciences, California State College, San Luis Obispo 94301)

28–30. American **Historical** Assoc., Washington, D.C. (W. D. Harris, AHA, 400 A Street, SE, Washington, D.C. 20003)

29–31. American **Physical** Soc., Los Angeles, Calif. (W. W. Havens, Jr., APS, 335 E. 45 St., New York 10017)



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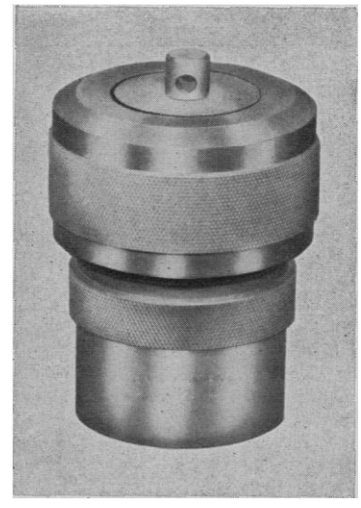

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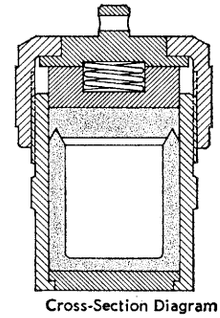

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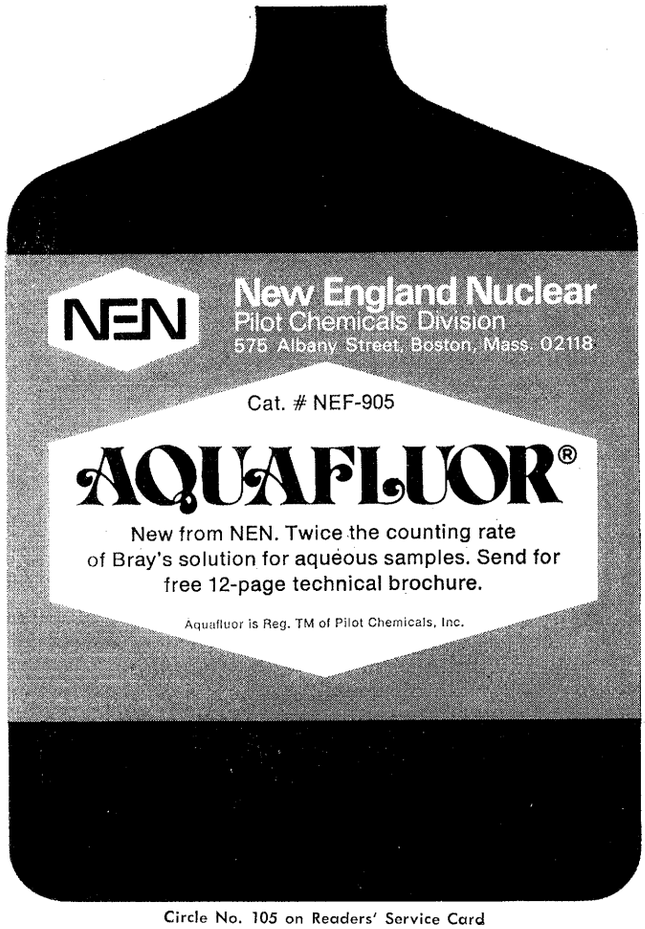

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BOOKS RECEIVED

(*Continued from page 1003*)

Animal Bones in Archaeology. A Book of Notes and Drawings for Beginners. Michael L. Ryder. Published for the Mammal Society by Blackwell Scientific Publications, Oxford, ed. 2, 1969 (U.S. distributor, Davis, Philadelphia). xxiv + 68 pp. Paper, $3.

Animal Discrimination Learning. Based on a conference, Sussex, England, 1967. R. M. Gilbert and N. S. Sutherland, Eds. Academic Press, New York, 1969. xvi + 502 pp., illus. $19.50.

Animal Diversity. Milton Fingerman. Holt, Rinehart and Winston, New York, 1969. viii + 184 pp., illus. Paper, $2.95. Modern Biology Series.

Annual Review of Medicine. Vol. 20. Arthur C. DeGraff and William P. Creger, Eds. Annual Reviews, Palo Alto, Calif., 1969. x + 500 pp., illus. $8.50.

Annual Review of Pharmacology. Vol. 9. Henry W. Elliott, Windsor C. Cutting, and Robert H. Dreisbach, Eds. Annual Reviews, Palo Alto, Calif., 1969. viii + 594 pp., illus. $8.50.

The Apologie and Treatise of Ambroise Paré. Containing the Voyages Made into Divers Places with Many of His Writings upon Surgery. Geoffrey Keynes, Ed. Dover, New York, 1968. xxiv + 244 pp., illus. Paper, $2.50. Reprint of the 1952 edition.

Astrophysics and Stellar Astronomy. Thomas L. Swihart. Wiley, New York, 1969. x + 310 pp., illus. $9.95. Space Science Text Series.

Atherosclerosis. Pathology, Physiology, Aetiology, Diagnosis and Clinical Management. F. G. Schettler and G. S. Boyd, Eds. Elsevier, New York, 1969. xx + 1032 pp., illus. $69.50.

Atom, Man, and the Universe. The Long Chain of Complications. Hannes Alfvén. Translated from the Swedish edition (Stockholm, 1964) by John M. Hoberman. Freeman, San Francisco, 1969. viii + 112 pp. $3.50.

Attitude Change. A Critical Analysis of Theoretical Approaches. Charles A. Kiesler, Barry E. Collins, and Norman Miller. Wiley, New York, 1969. xiv + 386 pp. $8.95. Series in Psychology.

Bacterial Metabolism. H. W. Doelle. Academic Press, New York, 1969. xiv + 490 pp., illus. $14.50.

Bacterial Physiology and Metabolism. J. R. Sokatch. Academic Press, New York, 1969. xii + 444 pp., illus. $14.50.

Basic Microbiology. Margaret F. Wheeler and Wesley A. Volk. Lippincott, Philadelphia, ed. 2, 1969. xii + 412 pp., illus. $8.75.

Basic Physiology and Anatomy. Ellen E. Chaffee and Esther M. Greisheimer. Lippincott, Philadelphia, ed. 2, 1969. xii + 634 pp., illus. $9.40.

Beeinflussung des Stoffwechsels durch die Ernährung. A symposium, Bad Soden, 1967. J. C. Somogyi and H. D. Cremer, Eds. Karger, Basel, 1969 (U.S. distributor, Phiebig, White Plains, N.Y.). vi + 170 pp., illus. Paper, $14.40. Bibliotheca "Nutritio et Dieta," No. 11. Institute of Nutrition Research of the Green Meadow Foundation, vol. 11.

Bibliographic Control of the Literature of Oncology 1800–1960. Pauline M. Vaillancourt. Scarecrow Press, Metuchen, N.J., 1969. 232 pp. $5.

The Biochemistry of the Nucleic Acids. J. N. Davidson. Methuen, London, ed. 6, 1969 (U.S. distributor, Barnes and Noble, New York). xvi + 352 pp., illus. $8.

Biology of Peromyscus (Rodentia). John A. King, Ed. American Society of Mammalogists, Stillwater, Okla., 1968 (available from Bryan P. Glass, Department of Zoology, Oklahoma State University, Stillwater). xiv + 594 pp., illus. $15. Special Publication No 2.

Biology of Termites. Vol. 1. Kumar Krishna and Frances M. Weesner, Eds. Academic Press, New York, 1969. xiv + 600 pp., illus. $32.

Biophysique. I, Energétique Cinétique: Isotopes. Jacques Tonnelat. Masson, Paris, 1968. viii + 404 pp., illus. 80 F. Certificat de Biochimie Structurale et Métabolique.

Black's Medical Dictionary. William A. R. Thomson. Barnes and Noble, New York, ed. 28, 1969. xii + 1016 pp. + plates. $7.

Carbohydrate Metabolism and Its Disorders. F. Dickens, P. J. Randle, and W. J. Whelan, Eds. Academic Press, New York, 1968. Vol. 1 (xvi + 578 pp., illus. $20); vol. 2 (xiv + 394 pp., illus. $16).

The Cell Cycle. Gene-Enzyme Interactions. G. M. Padilla, G. L. Whitson, and I. L. Cameron, Eds. Academic Press, New York, 1969. xx + 404 pp., illus. $19.50. Cell Biology Series.

Cellular Immunology. Books 1 and 2. Macfarlane Burnet. Melbourne University Press, Carlton, Victoria, Australia; Cambridge University Press, New York, 1969. x + 728 pp., illus. + 8 plates. $18.50.

Chemistry. Structure and Changes of Matter. Uno Kask. Barnes and Noble, New York, 1969. xvi + 608 pp., illus. Paper, $5.95. Barnes and Noble International Textbook Series.

Coasts. E. C. F. Bird. M.I.T. Press, Cambridge, Mass., 1969. xvi + 246 pp., illus. $7.50. An Introduction to Systematic Geomorphology, vol. 4.

Communication Satellites. Ingemar Dörfer. Almqvist and Wiksell, Stockholm, 1969. 56 pp. Paper. Stockholm International Peace Research Institute: Stockholm Papers, No. 1.

Complementarity in Biology. Quantization of Molecular Motion. James P. Isaacs and John C. Lamb. Johns Hopkins Press, Baltimore, 1969. x + 184 pp., illus. $6.50.

Condensed Computer Encyclopedia. Philip B. Jordain. Michael Breslau, Ed. McGraw-Hill, New York, 1969. xvi + 608 pp., illus. $14.50.

The Corrosion and Oxidation of Metals: First Supplementary Volume. Ulick R. Evans. St. Martin's, New York, 1968. viii + 488 pp., illus. $20.

Cours de Théorie Relativiste Unitaire. Jean E. Charon. Michel, Paris, 1969. 230 pp., illus. 58.10 F. Progrès des Sciences et Techniques.

Creative Biology Teaching. Delma E. Harding, Roger P. Volker, and David L. Fagle. Iowa State University Press, Ames, 1969. viii + 344 pp., illus. $10.50.

Currents in American Medicine. A Developmental View of Medical Care and Education. Julius B. Richmond. Harvard University Press, Cambridge, Mass., 1969.

xviii + 142 pp., illus. $5.50. A Commonwealth Fund Book.

Cybernetic Serendipity. The Computer and the Arts. An exhibition, London, 1968. Jasia Reichardt, Ed. Praeger, New York, 1969. 104 pp., illus. $8.95. Studio International Special Issue.

Decision Making and Administration in Higher Education. John D. Millett. Kent State Universtiy Press, Kent, Ohio, 1968. x + 162 pp. Cloth, $5; paper, $1.95.

Deformation of Solids. I. H. Hall. Barnes and Noble, New York, 1968. x + 230 pp., illus. $7.95.

Delinquents and Nondelinquents in Perspective. Sheldon and Eleanor Glueck. Harvard University Press, Cambridge, Mass., 1968. xx + 268 pp. $8.50.

The Design of Optical Spectrometers. J. F. James and R. S. Sternberg. Chapman and Hall, London, 1969. (U.S. distributor, Barnes and Noble, New York). xii + 240 pp., illus. $10.50.

The Development and Use of Polyester Products. E. N. Doyle. McGraw-Hill, New York, 1969. xii + 372 pp., illus. $16.

Dictionary of Nutrition and Food Technology. Arnold E. Bender. Archon, Hamden, Conn.; Butterworths, London, ed. 3, 1968. viii + 228 pp. $9.50.

Differential and Integral Inequalities. Theory and Applications. Vol. 1, Ordinary Differential Equations. V. Lakshmikantham and S. Leela. Academic Press, New York, 1969. xii + 396 pp. $18.50. Mathematics in Science and Engineering, vol. 55.

A Discrete-Time Approach for System Analysis. Michel Cuénod and Allen Durling. Academic Press, New York, 1969. xii + 226 pp., illus. $13.50. Electrical Science Series.

Earth Materials. W. G. Ernst. Prentice-Hall, Englewood Cliffs, N.J., 1969. x + 150 pp., illus. Cloth, $5.95; paper, $2.50. Foundations of Earth Science Series.

Eastern Europe. Norman J. G. Pounds. Aldine, Chicago, 1969. xx + 912 pp., illus. + 20 plates. $12.75. Geographies for Advanced Study.

Eclosion and Synthesis. Perspectives on the History of Knowledge. Salomon Bochner. Benjamin, New York, 1969. xiv + 274 pp. Cloth, $10; paper, $3.95.

Electrophoresis. Duncan J. Shaw. Academic Press, New York, 1969. viii + 144 pp., illus. $4.95.

Elementary Differential Equations and Boundary Value Problems. William E. Boyce and Richard C. DiPrima. Wiley, New York, ed. 2, 1969. xvi + 592 pp., illus. $10.95.

Eléments de Génétique Rationnelle. J. de Laguarigue. Dunod, Paris, 1969. x + 134 pp., illus. Paper, 28,00 F. Les bases scientifiques de l'agriculture et leurs conséquences immédiates.

Elements of Stereochemistry. Ernest L. Eliel, with a section by F. Basolo. Wiley, New York, 1969. vi + 98 pp., illus. Paper, $2.95.

Elsevier's Dictionary of Chemical Engineering. In English, American, French, Spanish, Italian, Dutch, and German. Compiled and arranged on an English alphabetical basis by W. E. Clason. Elsevier, New York, 1968. Vol. 1, Chemical Engineering and Laboratory Equipment (x + 620 pp. $25); vol. 2, Chemical En-

gineering; Processes and Products (x + 572 pp. $25).

Entomological Parasitology. The Relations between Entomology and the Medical Sciences. Marcel Leclercq. Translated by G. Lapage. Pergamon, New York, 1969. xviii + 160 pp., illus. $8. International Series of Monographs in Pure and Applied Biology: Modern Trends in Physiological Sciences, vol. 29.

Environment and Cultural Behavior. Ecological Studies in Cultural Anthropology. Andrew P. Vayda, Ed. Published for the American Museum of Natural History by Natural History Press, Garden City, N.Y., 1969. xviii + 486 pp., illus. Cloth, $7.95; paper, $2.95. American Museum Sourcebooks in Anthropology.

The Excavations at Helwan. Art and Civilization in the First and Second Egyptian Dynasties. Zaki Y. Saad. J. Frank Autry, Ed. University of Oklahoma Press, Norman, 1969. xvi + 208 pp., illus. $6.95.

Expanding Dimensions in Rehabilitation. A Reference for the Health Professional. Based upon presentations made at the Institute in Advanced Techniques for Occupational Therapists, Cleveland, 1966. Lelia Jaffe Zamir, Ed. Thomas, Springfield, Ill., 1969. xiv + 202 pp., illus. $12.

Experimental Cell Biology. An Elementary Laboratory Guide. William R. Bowen. Macmillan, New York; Collier-Macmillan, London, 1969. viii + 264 pp., illus. Paper, $4.95.

Experiments in Microbial Genetics. A practical course, Hammersmith Hospital, London, 1960–64. R. C. Clowes and W. Hayes, Eds. Wiley, New York, 1968. xii + 244 pp., illus. Spiral bound, $5.95.

Explanation and Human Action. A. R. Louch. University of California Press, Berkeley, 1969. x + 244 pp. Paper, $2.65. Reprint of the 1967 edition.

Exploitable Molecular Mechanisms and Neoplasia. Twenty-second Annual Symposium on Fundamental Cancer Research, Houston, Texas, 1968. Published for the University of Texas M. D. Anderson Hospital and Tumor Institute by Williams and Wilkins, Baltimore, 1969. xiv + 626 pp., illus. $17.

Exploring Light. Alexander Efron. Hayden, New York, 1969. viii + 140 pp., illus. Paper, $3.95. Hayden Modern Physics Series.

Exploring Mechanics. Alexander Efron. Hayden, New York, 1969. x + 182 pp., illus. Paper, $4.95. Hayden Modern Physics Series.

Faces. Roy U. Jordan. Illustrated by Brenda Jordan. Published by the author, Box 136, Emporia, Kansas, 1969. viii + 150 pp. Paper, $1.95.

Farbfernseh-Servicetechnik. F. Möhring. Winter'sche Verlagshandlung, Braunschweig, 1969. viii + 248 pp., illus. DM 36.

Fertility and Family Planning. A World View. A conference, Ann Arbor, Mich., 1967. S. J. Behrman, Leslie Corsa, Jr., and Ronald Freedman, Eds. University of Michigan Press, Ann Arbor, 1969. viii + 504 pp., illus. $12.50. A Sesquicentennial Publication.

Fluorescent Antibody Techniques and Their Applications. Akiyoshi Kawamura, Jr., Ed. University of Tokyo Press, Tokyo; University Park Press, Baltimore, 1969. xiv + 204 pp., illus. $16.50.

Free Vibrations of Circular Cylindrical Shells. Anthony E. Armenàkas, Denos C. Gazis, and George Herrmann. Pergamon, New York, 1969. xii + 212 pp., illus. $14.

FROST A Two-Dimensional Few Group Neutron Diffusion Code. K. Andrzejewski. Institutt for Atomenergi, Kjeller Research Establishment, Kjeller, Norway, 1969. iv + 28 pp., illus. Paper. Kjeller Report No. 133.

Functions and Graphs. I. M. Gelfand, E. G. Glagoleva, and E. E. Shnol. Translated and adapted from the second Russian edition by Thomas Walsh and Randell Magee. M.I.T. Press, Cambridge, 1969. vi + 106 pp., illus. Cloth, $6; paper, $1.95. Library of School Mathematics, vol. 2.

Future Goals of Engineering in Biology and Medicine. Proceedings of an International Conference, Washington, D.C., 1967. James F. Dickson, III, and J. H. U. Brown, Eds. Academic Press, New York, 1969. xvi + 360 pp., illus. $16.

Game Theory in the Behavioral Sciences. A conference, Montreal, 1966. Ira R. Buchler and Hugo G. Nutini, Eds. University of Pittsburgh Press, Pittsburgh, 1969. xvi + 268 pp., illus. $8.95.

A General Theory of the Kinematics and Geometry of Gears in Three Dimensions. A. Dyson. Oxford University Press, New York, 1969. x + 142 pp., illus. $8.80.

Hal-Farrug. A Village in Malta. Jeremy Boissevain. Holt, Rinehart and Winston, New York, 1969. xviii + 108 pp., illus. Paper, $1.95. Case Studies in Cultural Anthropology.

Handbook of Applied Hydraulics. Calvin Victor Davis and Kenneth E. Sorensen, Eds. McGraw-Hill, New York, ed. 3, 1969. xii + 1584 pp., illus. $37.50.

Handbook of Middle American Indians. Vol. 7, Ethnology, Part 1 (viii + 576 pp., illus. + 4 charts. $15). Vol. 8, Ethnology, Part 2 (viii + pp. 577–968, illus. + 3 maps. $15). Evon Z. Vogt, Ed. University of Texas Press, Austin, 1969.

A Handbook of MMPI Group Profiles. Richard I. Lanyon. University of Minnesota Press, Minneapolis, 1968. xiv + 82 pp., illus. $7.50.

Herschel at the Cape. Diaries and Correspondence of Sir John Herschel, 1834–1838. Edited with an introduction by David S. Evans, Terence J. Deeming, Betty Hall Evans, and Stephen Goldfarb. University of Texas Press, Austin, 1969. xxxviii + 398 pp., illus. + 12 plates. $10. History of Science Series, No. 1.

High-Speed Photography. Proceedings of the Eighth International Congress, Stockholm, 1968. N. Robert Nilsson and Lars Hogberg, Eds. Almqvist and Wiksell, Stockholm; Wiley, New York, 1969. xii + 504 pp., illus. $31.

The Higher Learning, the Universities, and the Public. Carl Kaysen. Princeton University Press, Princeton, N.J., 1969. viii + 88 pp. Cloth, $4.75; paper, $1.95. Stafford Little Lectures at Princeton University, 1968.

The History of the Abacus. J. M. Pullan. Praeger, New York, 1969. xiv + 130 pp., illus. $4.95.

History Under the Sea. A Handbook for Underwater Exploration. Mendel Peterson. Smithsonian Institution Press,

Washington, D.C., 1969 (distributor, Random House, New York). xvi + 208 pp., illus. $5.95. Smithsonian Publication 4538. Reprint of the 1965 edition.

Hormones, Cells and Organisms. The Role of Hormones in Mammals. P. Catherine Clegg and Arthur G. Clegg. Stanford University Press, Stanford, Calif., 1969. viii + 216 pp., illus. + 4 plates. Cloth, $5.50; paper, $1.95.

How to Solve General Chemistry Problems. C. H. Sorum. Prentice-Hall, Englewood Cliffs, N.J., ed. 4, 1969. x + 326 pp. Paper, $3.95.

Human Action. Conceptual and Empirical Issues. A conference, Chicago, 1967. Theodore Mischel, Ed. Academic Press, New York, 1969. xiv + 298 pp., illus. $6.95.

Human Growth. The Story of How Life Begins and Goes On. Lester F. Beck. Harcourt, Brace and World, New York, 1969. viii + 120 pp., illus. $4.95. Revised version of the 1949 edition.

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