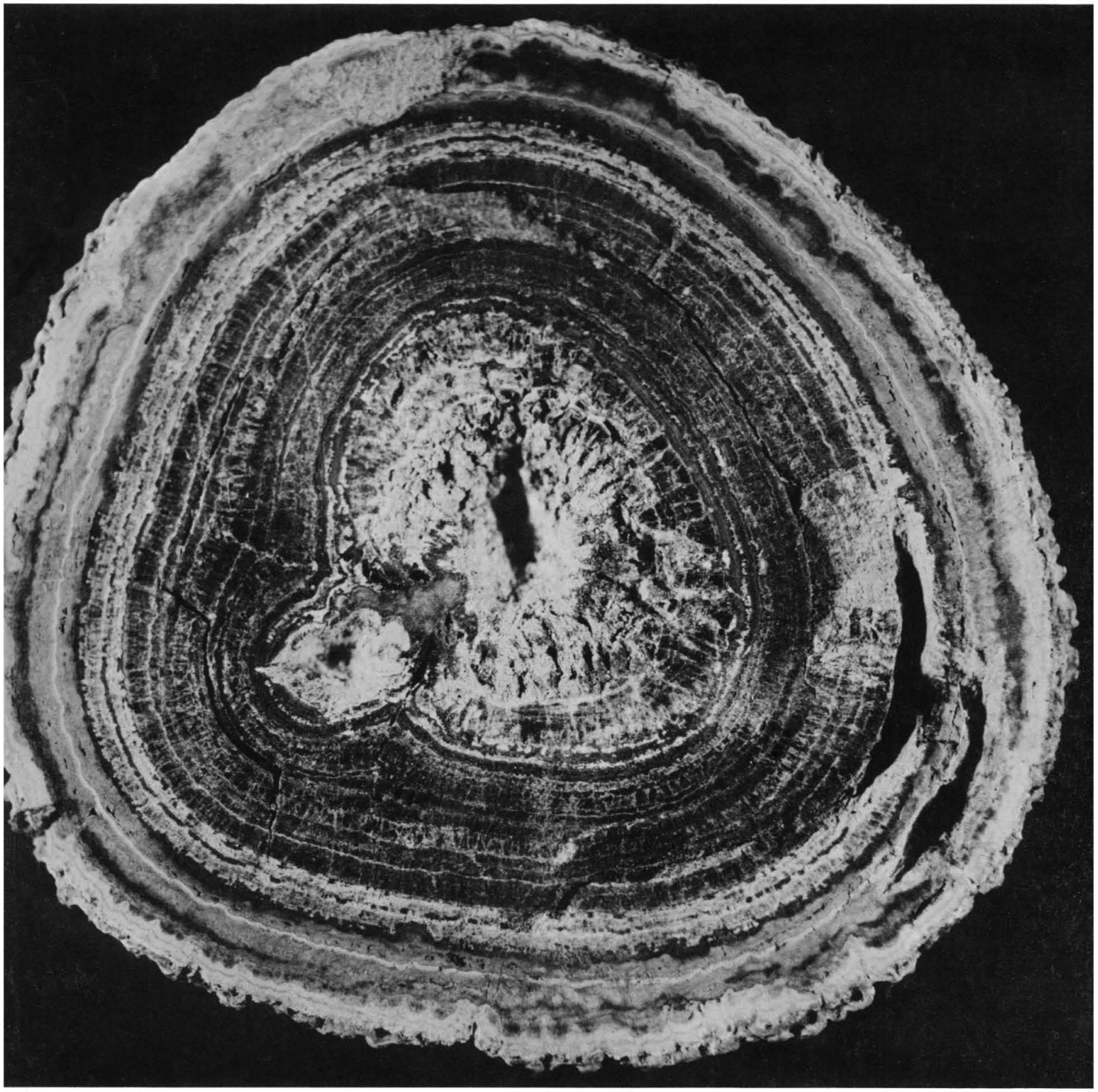
SCIENCE

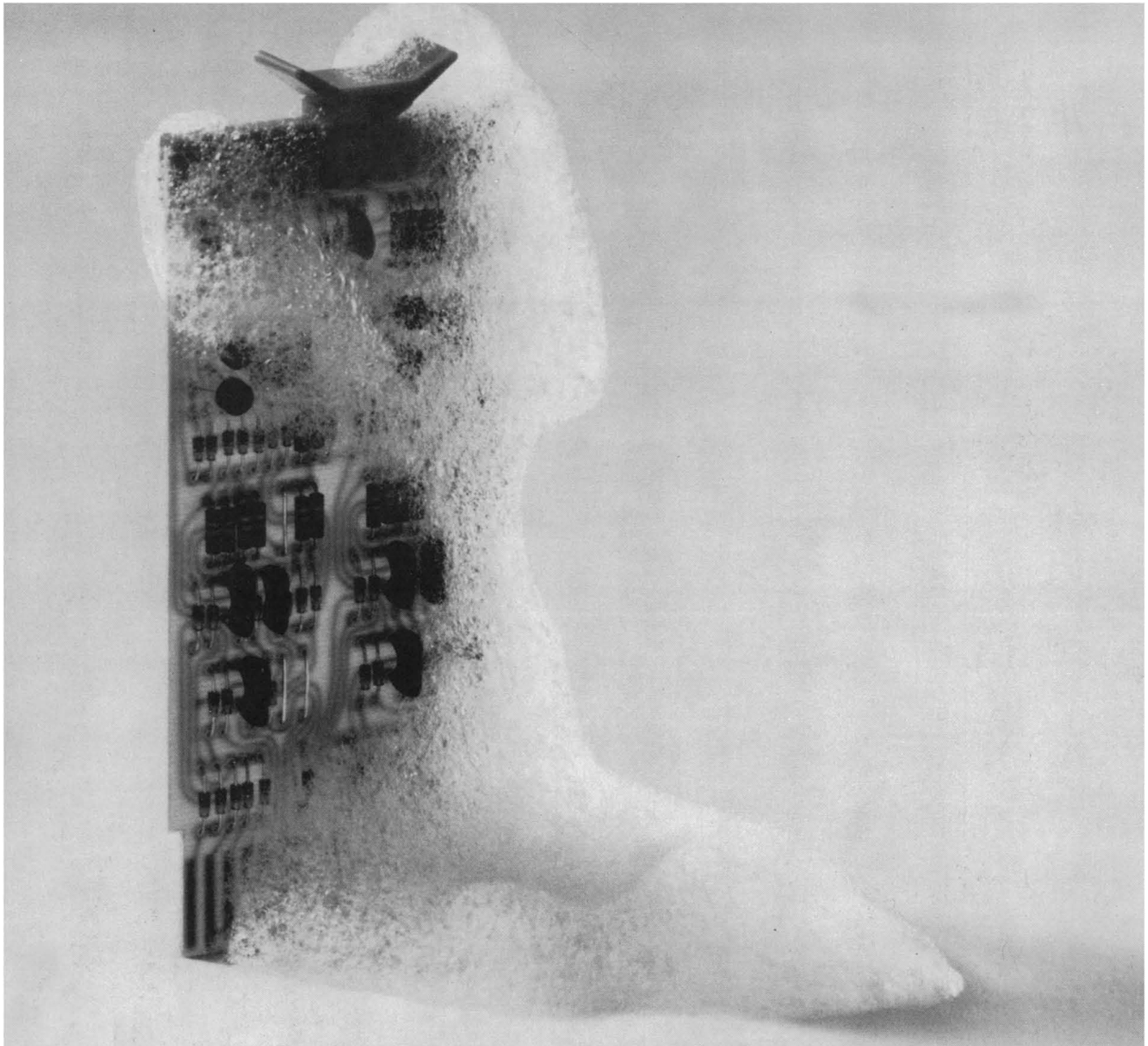
10 June 1966

Vol. 152, No. 3728

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE



BLADDER STONE



Rub-a-dub-dub

If you're going to guarantee every digital Flip Chip™ module for ten years, you worry about reliability.

This particular module was routinely run through 120 standard tests, component by component, spec by spec. (The tests took 25 seconds on one of our PDP general purpose computers, a machine mostly made of modules just like this.)

Then, we duplicated the laboratory environment. We dropped the module from a table, blew smoke at it, spilled coffee over the components. We left the module on a radiator overnight.

All components still okay.

Somehow the module got left in a shirt pocket and subjected to a further unplanned test — wash, rinse, wash, rinse, spin dry.

Know what happened? The coffee stains washed off.

Write for a catalog.

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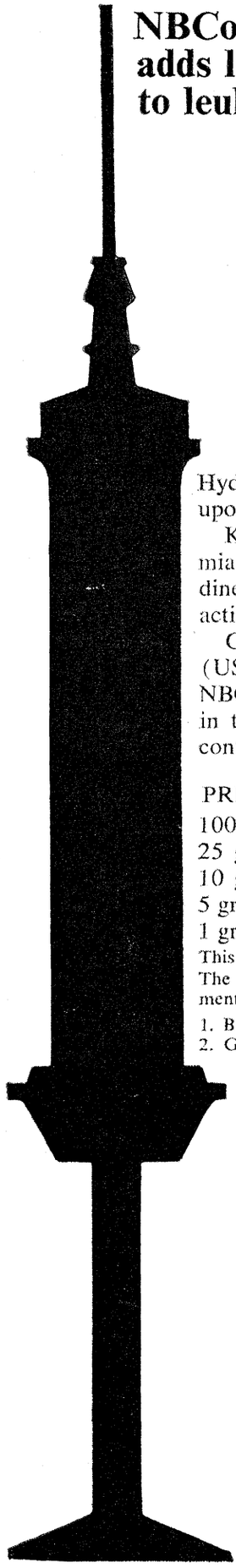

NBCo adds life blood to leukemia research

Hydroxy urea has been reported effective against the standard L1210 leukemia in mice upon intraperitoneal or oral administration. (1)

Krakoff, et.al., have shown responses from hydroxy urea in chronic granulocytic leukemia. And the substance has also been shown to reduce the rate of incorporation of thymidine H^3 into Ehrlich ascites tumor cells in vitro. It appears that part of the carcinostatic action of hydroxy urea is mediated through interference with D.N.A. metabolism. (2)

Give new life to leukemia research in your laboratory. Phone collect, 216-662-0212 (USA) only). NBCo will process your order carefully, efficiently and immediately. NBCo guarantees shipment within 60 minutes of your call; one-day delivery anywhere in the continental USA, 80 hours anywhere in the world. Send for our free catalog containing more than 3000 items.

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100 gram bottle	gm. $1.90
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This product is offered for chemical and investigational use only.
The literature references should not be interpreted as either an endorsement or disapproval of the biochemical by the cited investigation.

1. B. Stearns, K. A. Losee and J. Bernstein. *Med. Chem.* 6, 201 (1963)
2. G. R. Gale, *Biochem. Pharmacol.* 13, 1377 (1964)

NUTRITIONAL BIOCHEMICALS CORPORATION
21010 Miles Avenue
Cleveland, Ohio 44128 U.S.A.

10 June 1966
Vol. 152, No. 3728

SCIENCE

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COVER

Bladder stone, now at the Norfolk and Norwich (England) Hospital Museum, from a boy aged 12 years in 1877. The nucleus is uric acid; intermediate layers are uric acid dihydrate; surface is calcium oxalate monohydrate and ammonium acid urate. Widest dimension, 25 millimeters. See page 1511. [Stone obtained by courtesy of Ridley Thomas]

CIVIL WAR MEDICINE

By **Stewart Brooks,** *Auburndale, Mass.* In the flood of literature which has followed the Civil War, this book is the first to present the overall medical picture of the period. **It is the true story** of four agonizing years and how the North and South responded to the occasion. In addition to developing the basic concepts of diseases, drugs, and surgery in vogue over one hundred years ago, the author has deftly spiced his narrative with a variety of sidelights and arresting vignettes. *Two opening chapters underscore the general situation at the outbreak of hostilities.* Each of the remaining chapters deals with a specific area of interest.

Jan. '66, 160 pp., 22 il., 16 tables, $6.00

CANINE PEDIATRICS:

Development, Neonatal and Congenital Diseases
By **M. W. Fox,** *Galesburg State Research Hosp., Ill.* This volume provides complete and extensive discussion of perinatal and infectious pathological conditions which may occur in the young dog—*including many which are congenital or due to genetic defects.* Sections on hand rearing and the comparative development of the dog in relation to other species will be of special interest to those engaged in research. Chapters on rearing and socialization are important for research workers who are studying behavior under experimental conditions.

July '66, about 196 pp., about 52 il.

HUMAN RACES (2nd Ed.)

By **Stanley M. Garn,** *Antioch College, Yellow Springs, Ohio.* Since its original publication in 1960, **HUMAN RACES** has been enthusiastically accepted as the standard, authoritative American work on race in contemporary man. **The Second Edition incorporates many new and important findings.** " . . . Garn's book is the first completely useful, authoritative, comprehensive, and intelligible book that has been written about race."—American Anthropologist.

'65, 172 pp., 26 il., $5.50

THE TRAVELER'S MEDICAL GUIDE FOR PHYSICIANS

By **B. H. Kean,** *Cornell Univ., New York City, and* **Harold A. Tucker,** *Pago Pago, American Samoa.* Provides in practical and immediately available form the latest data bearing on problems likely or certain to arise in connection with the overseas travel of patients. **Technically written, authoritative, and well documented.** Places at the physicians fingertips essential data for the management of patients before departure, while they are abroad, and after they return. All important medical and most of the non-medical aspects of international travel are included in this one convenient source. *Feb. '66, 444 pp., 12 il., 65 tables, $12.50*

7 IMPORTANT NEW BOOKS IN SCIENCE AND TECHNOLOGY

THE PATHOLOGY OF LABORATORY ANIMALS

A Conference Sponsored by the Section on Microbiology of The New York Academy of Medicine and The New York Pathological Society. Compiled and edited by **William E. Ribelin,** *American Cyanamid Company, Princeton, N. J., and* **John R. McCoy,** *Rutgers Univ., New Brunswick. (22 Contributors)* Deals exclusively with naturally occurring lesions of the rabbit, guinea pig, rat, mouse, hamster, and monkey. Includes tumor types and occurrences, malformations, lesions of infectious and nutritional diseases, comparisons of mortality, etc.

'65, 448 pp., 292 il., 36 tables, $14.75

EMOTIONS AND THE JOB

By **S. G. Rogg** *and* **C. A. D'Alonzo,** *both of E. I. du Pont de Nemours and Company, Wilmington, Del.* The authors have dealt with the records of over 100,000 employees of a large industrial concern . . . **an unparalleled opportunity to study man at his work.** In their present work they not only record their experience with the functioning of the human mind but show both the employee and the manager how to use this information to help themselves. The approach to the problem is an integrated one—focused primarily on functional illness.

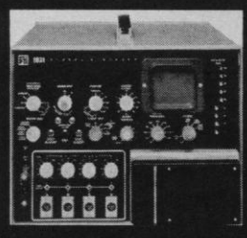
'65, 208 pp., 18 il., 7 charts, 12 tables, $6.75

SELECTED HISTOCHEMICAL AND HISTOPATHOLOGICAL METHODS

By **Samuel Wesley Thompson.** *With two chapters contributed by* **Ronald D. Hunt.** *Both of Fitzsimons General Hosp., Denver.* Several methods are presented for most tissue components, of man and animals, demonstrable histochemically. With each method is detailed information as to applications of the method, fixatives of special preparations to be used, special equipment required, type of tissue sections, applicable control measures, etc.

Jan. '66, 1,680 pp. (7x10), 401 il., $65.00

CHARLES C THOMAS • PUBLISHER 301-327 East Lawrence Avenue **SPRINGFIELD • ILLINOIS, U.S.A.**



The FT-1051 512 word memory averager.
The FT-1052 has a 1024 word memory.

INSTANT NORMALIZING

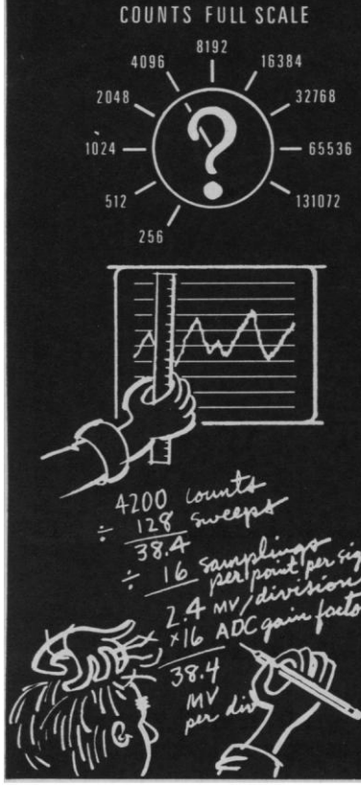
The Fabri-Tek Way: ABSOLUTE MEASUREMENTS

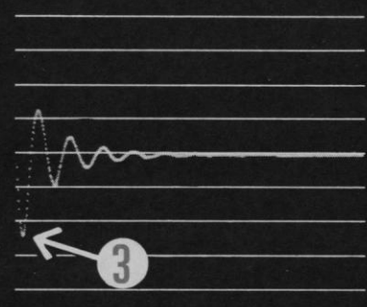
1 Turn Display Scale knob until waveform in memory, shown on screen, is of suitable size.

2 Set movable index to number of signals measured.

3 First transient oscillation is at −2.4 divisions: −2.4 divisions x 16 = −38.4 millivolts.

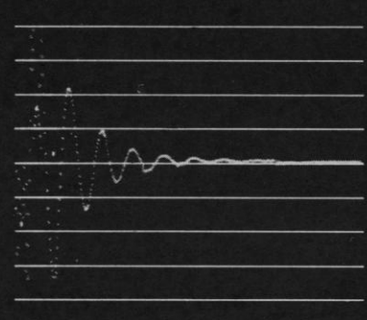
The Ordinary Way:
"RELATIVE INDICATIONS"





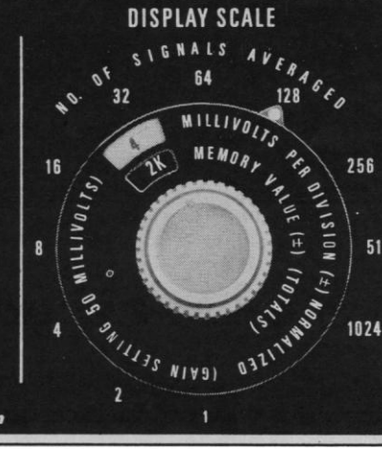
Measurement made by averaging 128 recurrent signals. Viewed with operator's choice of display scale to show peak values. (1st oscillation: −2.4 divisions x 16 millivolts = −38.4 millivolts.)

16 millivolts/division



Same measurement; operator selected display scale to show lower amplitude signal regions. (3rd oscillation: −1.3 divisions x 4 millivolts = 5.2 millivolts)

4 millivolts/division



For all areas of science, the remarkable . . . . .

FABRI-TEK SIGNAL AVERAGERS

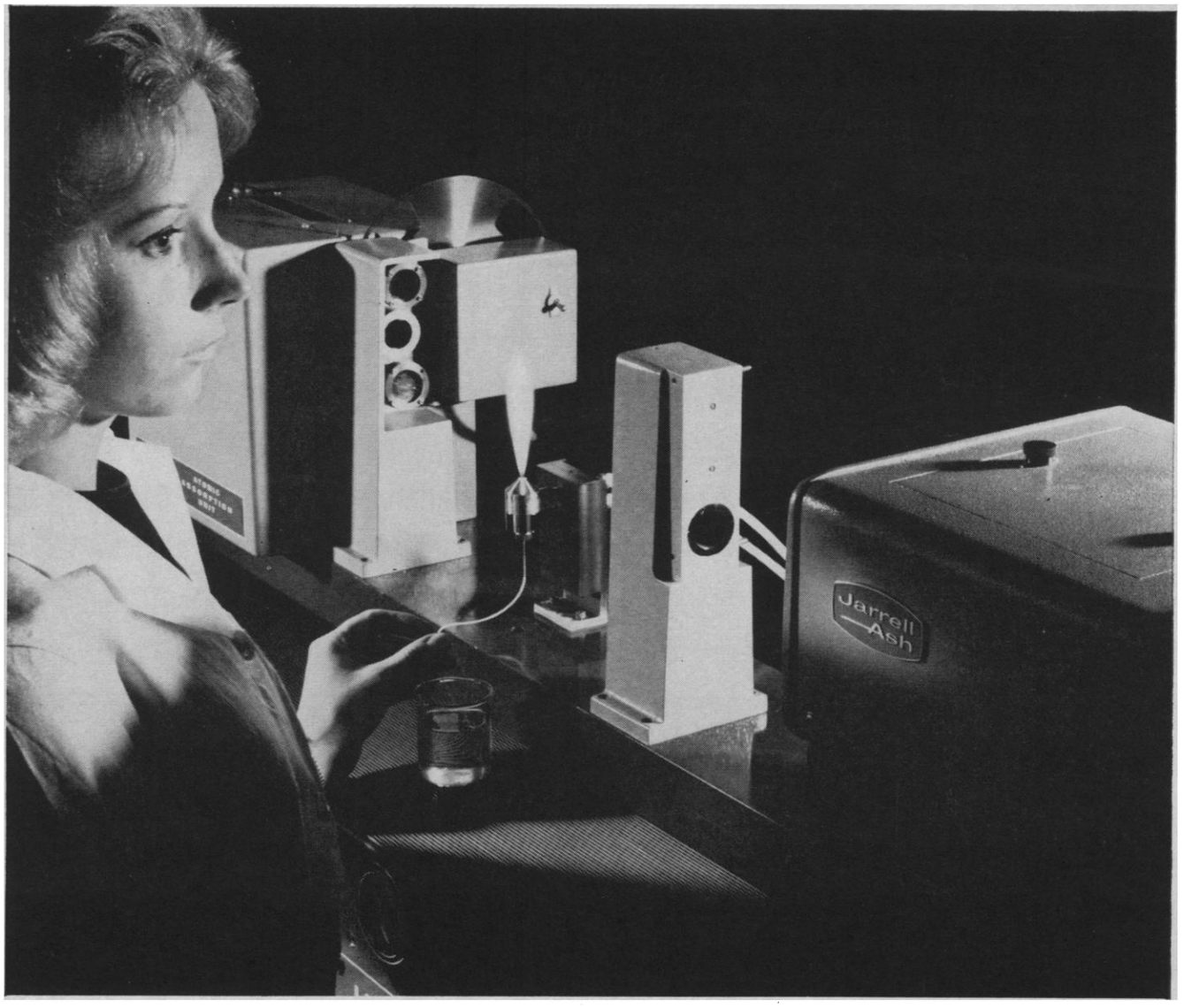
Fabri-Tek manufactures the *only* totaling type signal averagers which have a direct reading Display Scale switch. The use of the movable normalizing index on the display control, illustrated, is practical because the only normalizing factor involved is the number of sweeps (and a decimal amplifier gain factor). Other averagers' normalizing factors involve averager sweep speed, dead time, converter gain factor, as well as number of sweeps.

The difference in ease of operation is remarkable. This difference can be visualized by imagining measurements using a conventional oscilloscope with calibration marks but no pointer on the control knob! Actually worse, because a conventional oscilloscope can be quickly calibrated by touching the probe to a calibration voltage. That cannot be done with an averager without clearing the memory first.

Calibration ease is only one of the exceptional features of this averager. Optimum noise reducing efficiency, greater than for any other averager, for example. Digitally measured post-trigger delays during external triggering; a wide choice of digitally produced sweep recurrence rates for automatic trigger; digital as well as analog cathode ray tube display; high speed built-in printer; built-in automatic pre-set stop control; and more, make this truly the finest signal averager you can buy.

For further information, please write or phone Fabri-Tek Incorporated Instrument Division, P. O. Box 4218, Madison, Wisconsin, Phone (608) 238-8476.

FABRI-TEK
Instrument Division



For atomic absorption *(everyday or esoteric)* see Jarrell-Ash

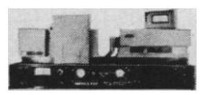
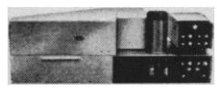
Jarrell-Ash offers three distinct systems, each combining both atomic absorption and flame emission spectrometry. One of them will prove ideal for your needs.

For routine analysis, there's the budget-priced 82-700. It is capable of performing up to 120 analyses per hour and designed for use where dependability, simplicity, space and price are prime considerations.

For maximum versatility, no other atomic absorption spectrometer can compare with the 82-500. Based on the famous Model 82-000 Ebert Spectrometer, it contains a unique multi-pass optical system, plus facilities for altering system components and adding new developments. The 82-500 provides the lowest known limits of detection.

For multi-element analysis, the Model 82-600 gives you the first direct-reading polychromator in the atomic absorption field. Precise and speedy, it analyzes very low concentrations of metallic elements in agricultural, biomedical or industrial samples . . . can determine up to 12 elements simultaneously, perform up to 600 analyses an hour.

We'd like to send you complete technical information on the instrument or instruments that interest you. Also available are copies of a new 16mm color sound movie "Atomic Absorption Spectrometry". Write: Jarrell-Ash, Film Library, 530 Lincoln Street, Waltham, Mass. 02154. Tel. (617) 899-4300. Jarrell-Ash (Europe) S.A., rue de la Jaluse 6, Le Locle, Switzerland.

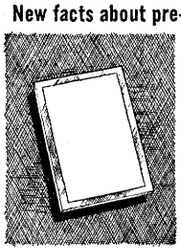
Jarrell Ash

ANALYTICAL INSTRUMENTATION
SPECTROSCOPY • X-RAY DIFFRACTION

The facts have changed!

Three new pre-coated systems for Thin Layer Chromatography have lowered cost, raised quality, widened its application.

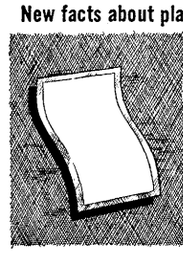
New facts about pre-coated glass



The new E. Merck, A. G. (Darmstadt) Pre-Coated Glass Plate is the finest, most versatile pre-coated TLC system ever developed. Yet a 20 x 20 cm. plate costs as little as 68¢ (in quantity) — about half as much as previously available glass systems. And it offers 5 notable advantages:

- glass only 1 mm. thick —easier to store, easier to cut into strips
- a sorbent layer (Silica Gel F 254) 250 microns in thickness—the same as you get with your own coating apparatus—offering higher capacity than thinner pre-coated systems currently available
- the hardest coating yet developed—meaning plates that are abrasion-proof under normal conditions—guaranteed to arrive in good condition—may be stacked one on top of another
- the best separating characteristics of any pre-coated system now available—equivalent to the plate you make yourself
- unique organic binder—may be used with corrosive sprays (including sulphuric and perchloric acids) and charring techniques —cannot be eluted by organic solvents— does not interfere with stains

New facts about plastic foils



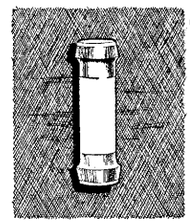
Although it is the most elegant TLC system in existence, use of the pre-coated plastic foil has been extremely limited due to its relatively high cost and narrow range of applications. Now Brinkmann introduces the MN Polygram pre-coated foil, far more versatile but costing about 30% less.

The MN Polygram foil features a dry layer with significantly higher capacity than that of previously available coated foils.

Four different types of coating are available: silica gel with starch binder, silica gel with starch binder and fluorescent indicator, cellulose powder without binder, and cellulose powder without binder but with fluorescent indicator. Each type comes in both 20 x 20 and 5 x 20 cm sizes.

Where a binder is used, starch has been selected because previously used binders (such as polyvinyl alcohol) have a substantial negative effect on the adsorption characteristics, especially when non-polar solvents are employed. Starch, however, is normally satisfactory except with highly aqueous systems, in which case the foils must be handled with care.

The Chromatotube—a new fact in itself



Chromatotubes are round glass tubes (12.5 x 2.5 cm) coated with sorbent on the inside. Since one end is closed, they are also self-contained developing tanks. After spotting, the open end is immersed in an auxiliary solvent tube sealed to the side by a plastic ring.

Special binders are not required and all conventional solvents and staining reagents may be employed. After separation, the tube can be eluted overnight and reused after activation.

Providing the most reliable, reproducible Rf values, Chromatotubes are probably the best TLC system for maintenance of uniform standards. The developing distance of 10 cm is marked so that the Rf is read at a glance. Thus the Chromatotube is ideal for mass analyses as in production control, clinical testing, and teaching procedures involving numerous students. At a relatively low cost each student has a complete chromatographic assembly.

Two types are available: Series AT tubes have been activated for 30 minutes at 110°C and subsequently sealed against external moisture; Series IT tubes are air dried and can be activated according to individual requirements.

Become up to date.

Please send me the following literature:

1. Pre-Coated Systems for TLC. 2. Catalog on apparatus, sorbents and ion exchangers for TLC. 3. I have the following problem:

_____

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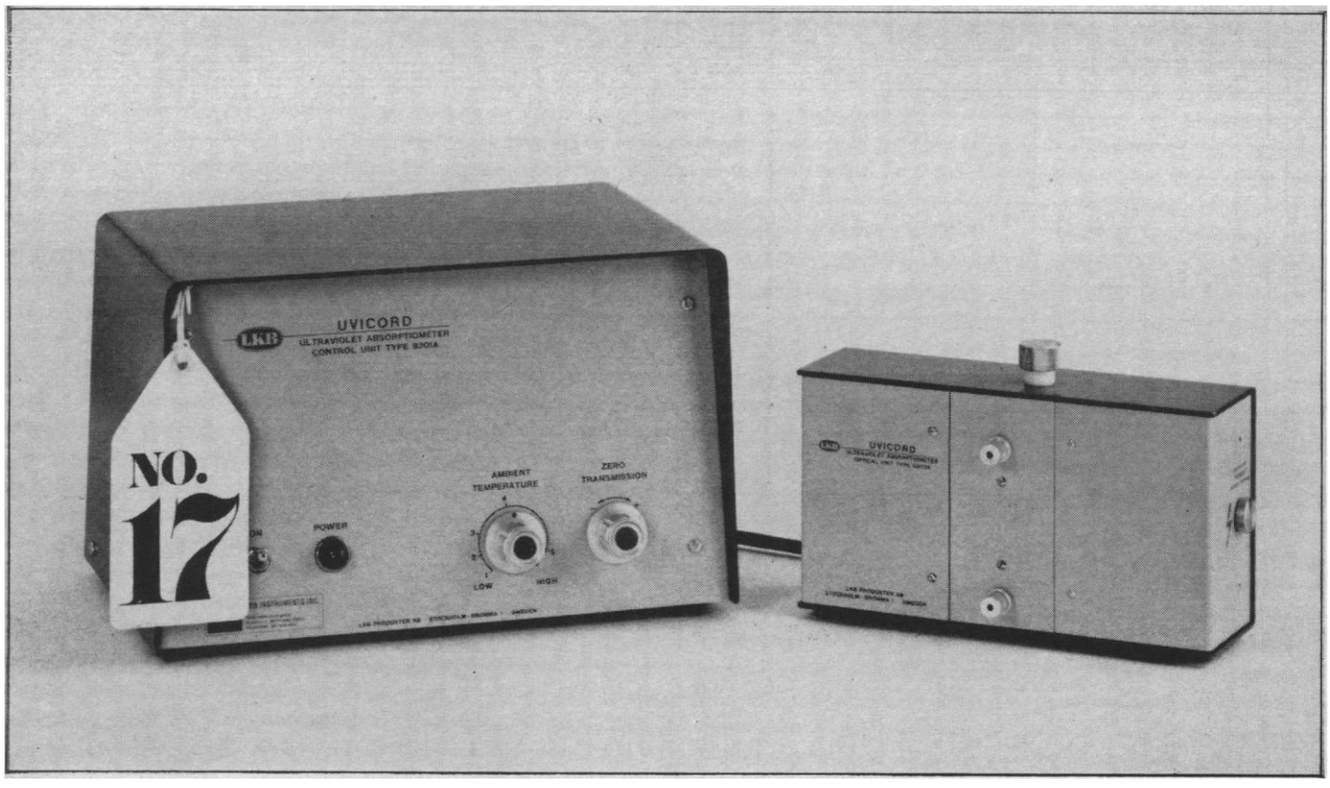


There are at least 16 UV monitors already available (and one of them is even ours). Whatever possessed us to develop number 17?

Unbounded optimism. That, and the rather firm conviction that it was now time for a first-rate, fully quantitative flow analyzer for monitoring UV absorption at either 254 or 280 mμ.

This new analyzer, the Uvicord II, is now available as a particularly useful tool for continuous measurement of the UV absorption of electrophoretic or chromatographic effluents containing fractions which absorb at 254 or 280 mμ. And it is especially suited for cold room use because: (1) the light source compartment is insulated and has its own built-in heating coil, and (2) the control unit *and/or* recorder can be physically separated from the detector unit, thanks to a very long cable. (One of several advantages of a *separate* recorder.)

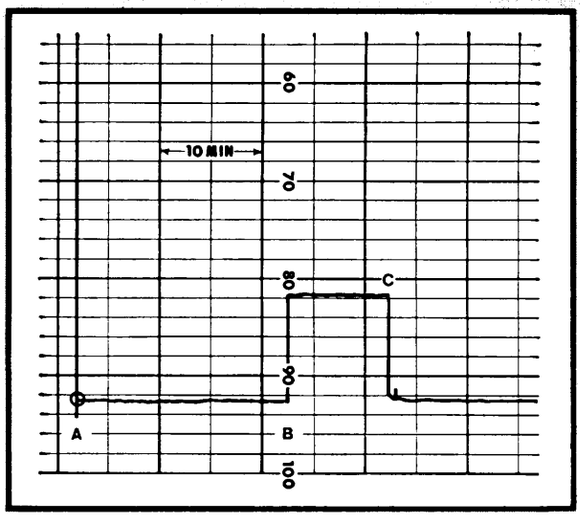
The primary source of the 254 mμ in the Uvicord II is a stable, long-lived, low-pressure mercury lamp. But then getting the desired 280 mμ was quite another matter and proved to be somewhat of a strain on the aforementioned unbounded optimism. The eventual elegant exclusive solution: the 254 mμ from the mercury lamp is used to excite a transparent rod which has been specially activated to fluoresce strongly. This rod then emits UV in a relatively narrow peak with a maximum at 280 mμ. Unwanted radiation is eliminated by using black glass and selective interference filters. This latter interference filter was also developed by us and provides unique assurance of getting the essentially monochromatic light needed for quantitative measurements.

What is the possibility of harming UV-sensitive materials with the Uvicord II? It's unlikely. The *maximum* UV dose to which a sample can be exposed is a negligible 10^{-11} Einstein/min, equivalent to 0.09 μW.

Then we should probably also tell you that this instrument has a well-designed detector unit, that the very small measuring cells have good flow properties and are easy to get to, and that the circuitry is simple, straightforward and dependable. All true. Or, that the Uvicord II is compatible with our entire line of chromatographic devices, fraction collectors, and recorders. The Uvicord II takes its place comfortably in our complete systems (whose individual units are all LKB-designed and built), or, alternatively, can perform as a versatile UV analyzer when coupled to other equipment. Incidentally, the Uvicord II follows the Uvicord I but doesn't necessarily displace it. You might keep the Uvicord I in mind if your need is solely for 254 mμ; it's still very viable.

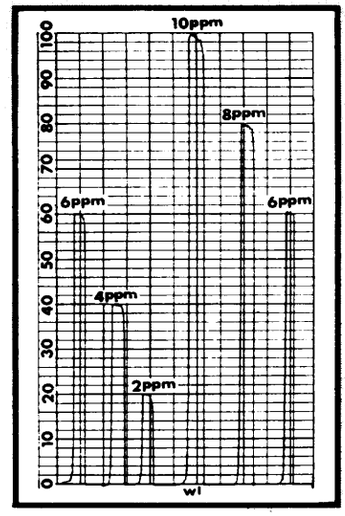
(So now there are at least 17 UV monitors, and *two* of them are ours.) For complete specifications on the Uvicord II, ask for bulletin **8300S6.**

LKB INSTRUMENTS, INC., 12221 Parklawn Drive, Rockville, Maryland 20852
LKB-PRODUKTER AB, P.O. Box 76, Stockholm-Bromma 1, Sweden



Model 303 double-beam system eliminates the effects of drift in lamp, detector, and electronics. Here, Ca is run from a cold start. Burner is lighted at A, 1 ppm Ca inserted at B, withdrawn at C. Quiet, stable baseline commonly produces 5X improvement in detection limit and precision.

Model 290 readout in concentration requires no tedious calculations. Here, direct readings on an accessory linear recorder are obtained for 2, 4, 6, 8, and 10 ppm Calcium.



performance-proved instruments for ATOMIC ABSORPTION ANALYSIS

WHY YOU SHOULD USE PERKIN-ELMER ATOMIC ABSORPTION

Atomic absorption for the determination of metallic elements is today's fastest-growing analytical technique. Perkin-Elmer, a leader from the beginning, has the kind of competence that produced its Analytical Methods Book, which gives detailed guidance for 64 elements and over 300 analyses. Perkin-Elmer also publishes the Atomic Absorption Newsletter, the only technical journal devoted to the new technique.

Clearly, such deep analytical experience can result in first-class atomic absorption equipment. Indeed, Perkin-Elmer's two instruments are designed expressly for the special needs of atomic absorption: they are not compromises, accessories, or adaptations of equipment originally developed for other needs.

The Model 303 double-beam system offers speed, precision and sensitivity: With built-in 10X scale expansion, it is possible to detect very small deviations from the stable baseline shown above, left. The ability to measure tiny signals produces the best possible detection limits.

With the DCR-1 accessory, the Model 303 reads out directly in concentration in any desired units on a four-digit illuminated display. A determination can be completed in four seconds. The DCR-1 will also automatically take and present the average of 4, 8, or 16 readings of the same sample.

The Model 290 Reads Directly in Concentration: The most time-consuming portion of conventional atomic absorption analysis is the conversion of linear transmittance readings to their logarithms, followed by curve plotting. With the 290, all this is eliminated. The 5-inch readout scale is linear in concentration.

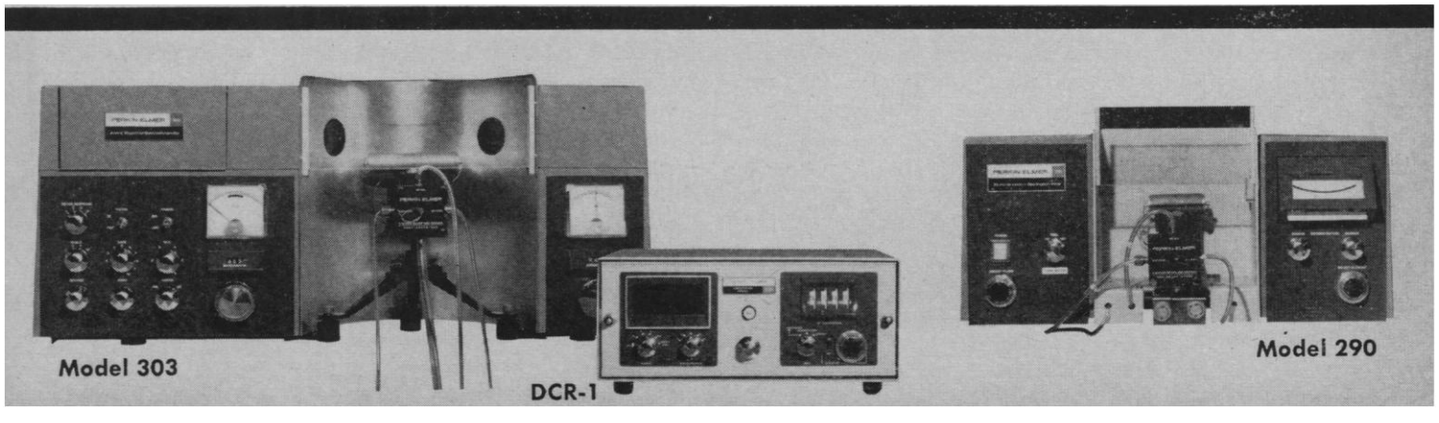
The Model 290 is a big instrument in a small container. A 50-inch optical path has been folded into a neat 25-inch package; detection limits are therefore equal to or better than those of much larger single-beam instruments.

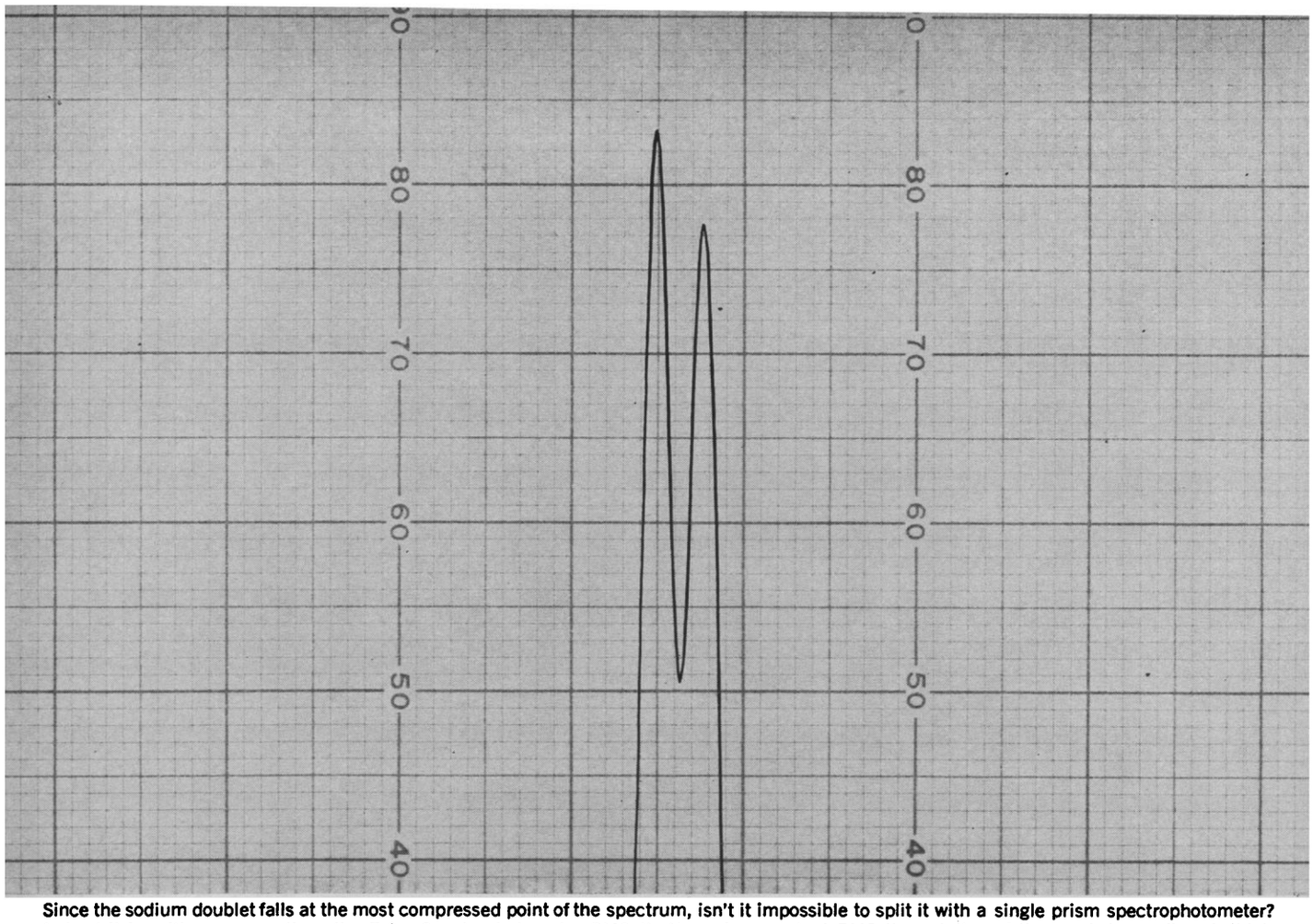
Both instruments can determine over 60 elements with Perkin-Elmer-built single and multi-element hollow-cathode lamps and the versatile premix burner. The nitrous oxide burner head enables analysis for Al, Ti, V, Si, the rare earths and other refractory elements. The new three-slot Boling head, for air-acetylene, does not clog with solutions containing 40% sugar, 20% lead, or undiluted serum. Yet another head provides a short optical path to reduce sensitivity and avoid dilutions.

Free training and literature: Subscriptions to the Atomic Absorption Newsletter, a bi-monthly technical journal, are available free on request. A summary of applications reprints can be obtained by writing for AA322. Instrument users receive free training courses in Chicago, Houston, Los Angeles, San Francisco, or Norwalk, Connecticut.

For details, including information on specific applications, write to the Instrument Division, Perkin-Elmer Corporation, 723 Main Avenue, Norwalk, Connecticut.

PERKIN-ELMER





Since the sodium doublet falls at the most compressed point of the spectrum, isn't it impossible to split it with a single prism spectrophotometer? Indeed it is, with one exception—the Zeiss Spectrophotometer PMQ II. Above is an actual PMQ II resolution of the most demanding doublet. Distance between peaks is approximately 6 Å.

You're looking at an impossibility

It goes without saying that the Zeiss Spectrophotometer PMQ II (185 mμ-2500 mμ range) has greater resolving power than any other single prism instrument. The "impossible" proof is at the top of this page.

Here are three other impossibilities made possible by the PMQ II: (1) it reproduces any slit setting within .2 microns, (2) its true wavelength setting remains constant at all times, (3) it changes over from one to any other type of measurement (flame, fluorescence, chromatogram, absorption) in approximately 30 seconds — much faster than other spectrophotometers.

For complete information, write Carl Zeiss Inc., 444 Fifth Ave., New York, N.Y. 10018. Complete service facilities available.

ZEISS

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To produce quality tissue cultures year, after year, after year... requires the best in media and sera

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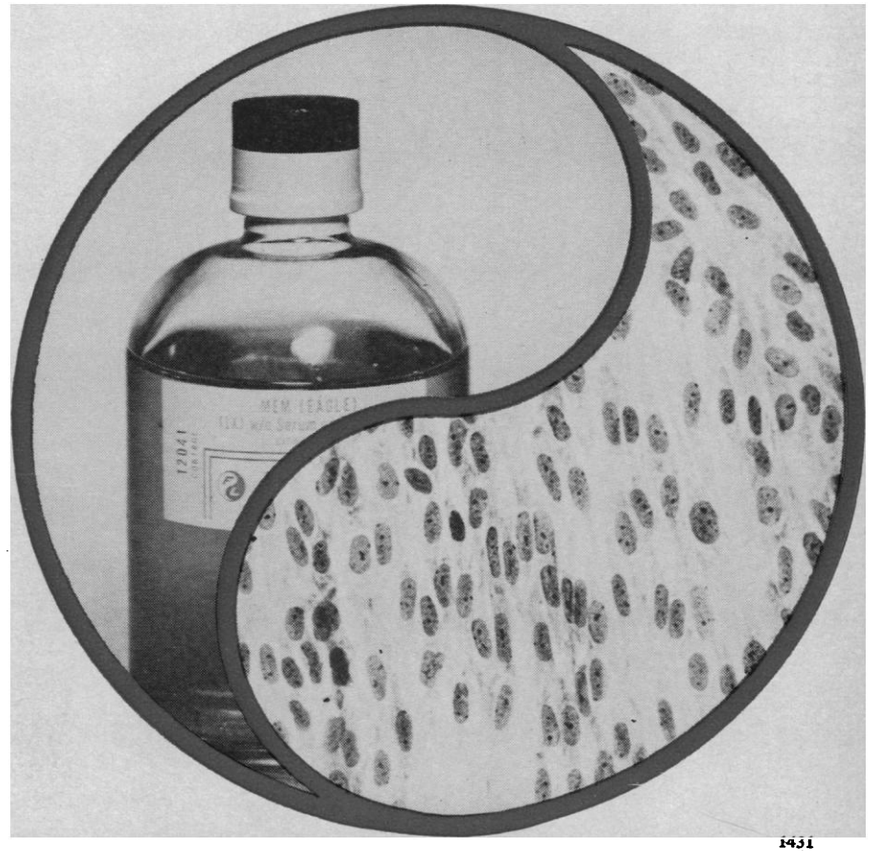
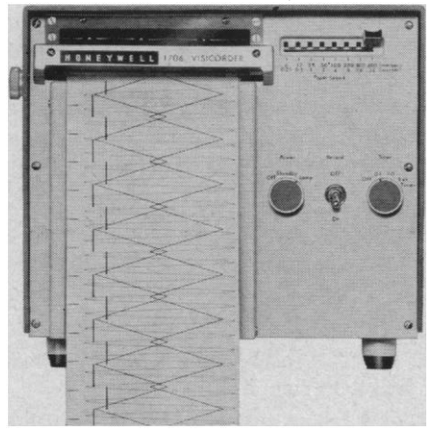


Mightier than the pen



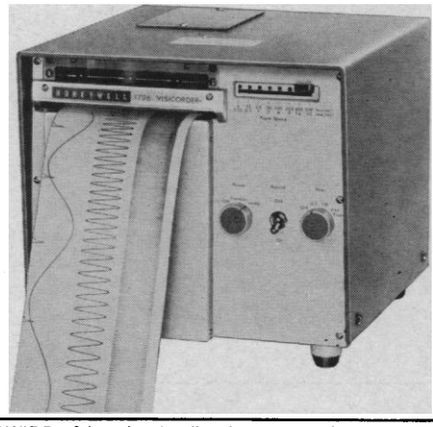
Honeywell's new 1706 Visicorder Oscillograph records up to 6 channels of data from DC to 13,000 cps, yet costs half as much as most pen-writing oscillographs!

If you're recording dynamic data, why settle for the limitations of a pen-writing oscillograph? The new 1706 not only does everything any penwriter will do, but it also gives you three times the trace excursion and 130 times the frequency response.

Compared to a typical pen-writing oscillograph, the 1706's frequency response is from DC to 13,000 cps, vs. DC to 100 cps for the penwriter. Trace excursion is 120mm – full paper width – as opposed to the penwriter's 40mm. The 1706 provides trace overlap; the penwriter doesn't. And, the 1706 does all this at about *half the cost* of the pen-writing machine!

Other features of the versatile 1706 include: built-in, two-speed timing system; eight paper speeds; galvanometer trace calibration scale at the recording point; simplified galvanometer alignment, and easy, drop-in paper loading. In addition, the 1706 uses Honeywell subminiature galvanometers, interchangeable with all other Visicorder Oscillographs.

For more detailed information on the Honeywell 1706, contact your Honeywell representative, or mail the coupon below directly to Honeywell.



Gene Haugen
Honeywell Test Instruments Division
Mail Station 407
Denver, Colorado 80217

Please send literature on the Honeywell Model 1706 Visicorder Oscillograph to:

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AN EDITORIAL—

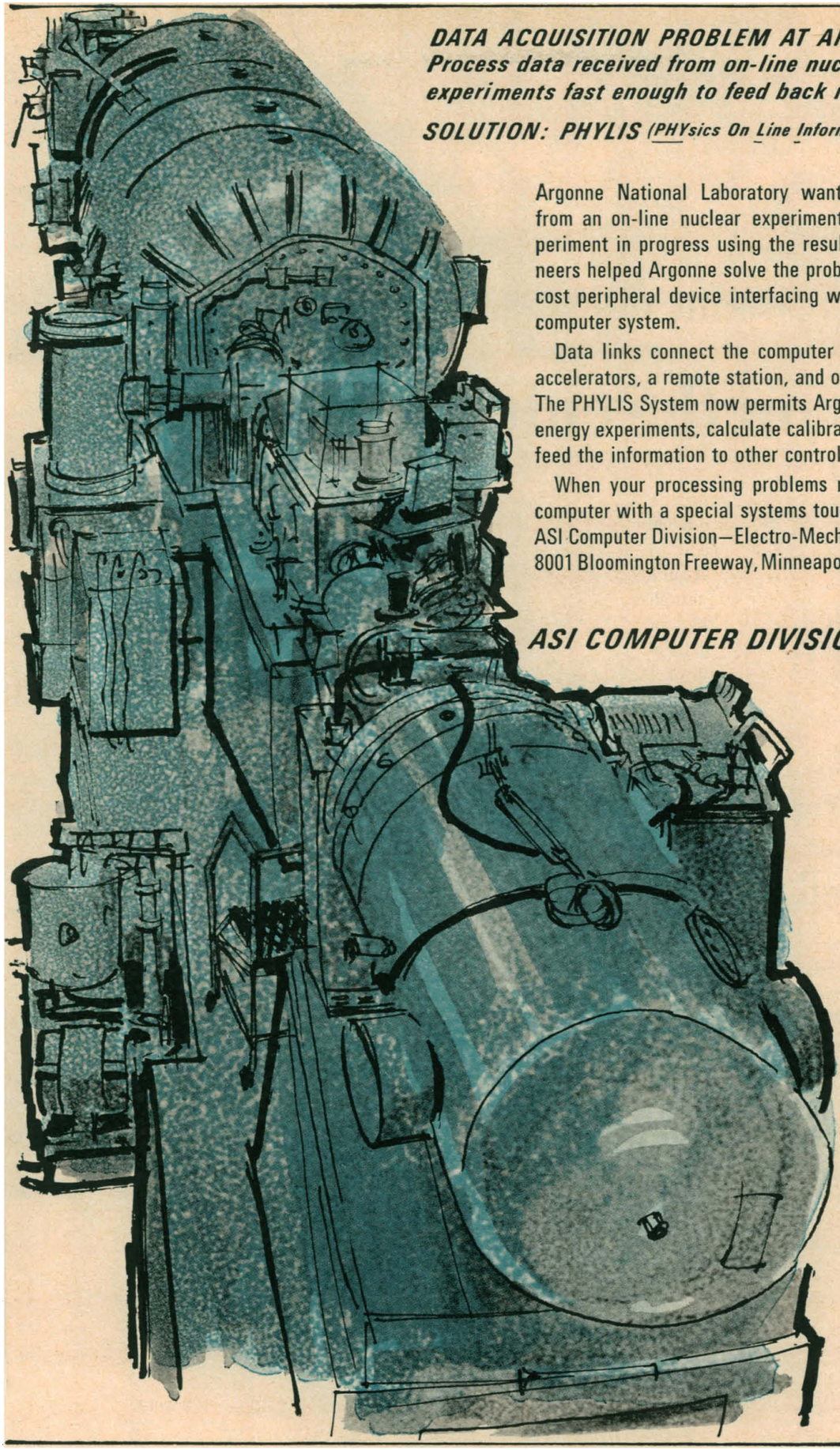
reprinted from the April, 1966 issue of Analytical Chemistry—

Automatic Chemical Analysis

A HIGHLIGHT of the Phoenix ACS meeting was the presentation of the award address by Dr. L. T. Skeggs, recipient of the ACS Award in Chemical Instrumentation, sponsored by E. H. Sargent and Co. The address was a historical description of the development of an ingenious system of continuous-flow analysis employing conventional, classical methods for the determination of various constituents in blood. Now available commercially as the Technicon AutoAnalyzer, the apparatus is capable of performing at least 30 different techniques in clinical analysis. A multiple channel version determines 12 substances in a single, 2-ml. sample of blood serum and records the results on a chart displaying the analytical findings in relation to the normal range of each constituent in blood serum.

The development of this system of automatic analysis has several significant connotations for the analytical profession. First, by relieving the tedium of routine determinations, it is possible to decrease considerably the amount of technician time per analysis. If clinical experience is a guide, the result will not be a decrease in the required number of technicians, but rather a dramatic increase in the output of analytical data. Second, by decreasing the time interval between sampling and result, the utility of the analytical data is greatly increased. In the clinical laboratory, the physician can be handed the analytical results *before* he examines the patient, and thus he is guided to a more accurate diagnosis, and often is informed of completely unsuspected ailments. Third, an incentive is given for the development of new tests, which might be so cumbersome as not to warrant routine application if handled manually. Fourth, the system is flexible enough to provide for modifications as simplifications or improvements are achieved. Finally, the successful automation of conventional analytical methods serves as a challenge to the proponents of the automation of more sophisticated analytical techniques to provide methods that will be superior.

Naturally, the problems involved in automation will vary greatly from one type of laboratory or industry to another, and the utility of this or any other system of automation will be directly related to the ingenuity of the analytical chemist.



DATA ACQUISITION PROBLEM AT ARGONNE:
Process data received from on-line nuclear physics experiments fast enough to feed back results in real-time.

SOLUTION: PHYLIS *(PHYsics On Line Information Station).*

Argonne National Laboratory wanted to process data from an on-line nuclear experiment and modify the experiment in progress using the results. ASI system engineers helped Argonne solve the problem with special low cost peripheral device interfacing with a high-speed ASI computer system.

Data links connect the computer system, two particle accelerators, a remote station, and other instrumentation. The PHYLIS System now permits Argonne to analyze low-energy experiments, calculate calibration distribution, and feed the information to other controls.

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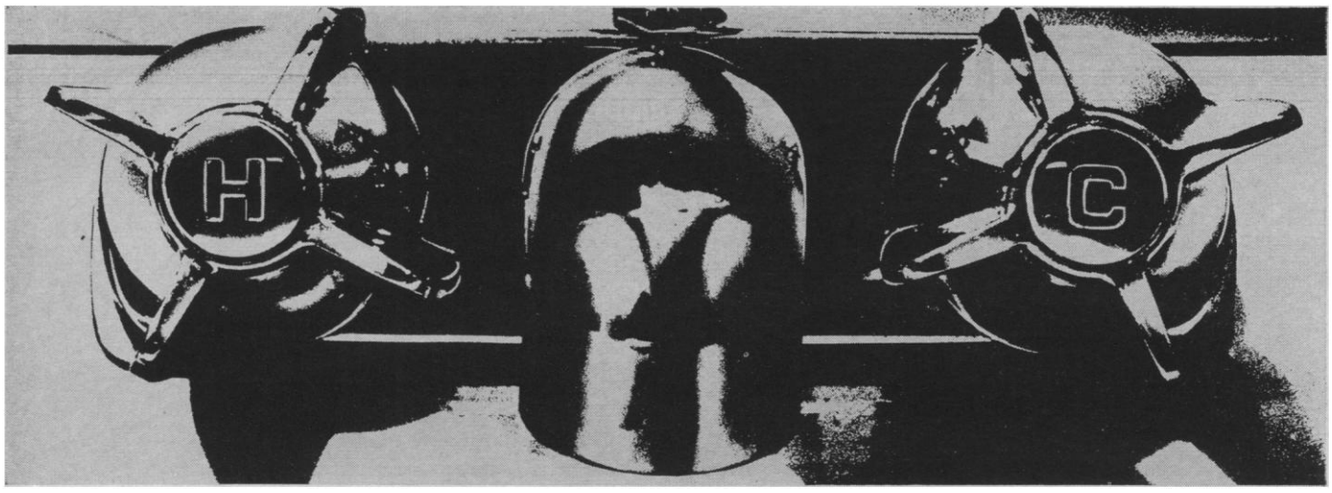
ASI COMPUTER DIVISION EMR



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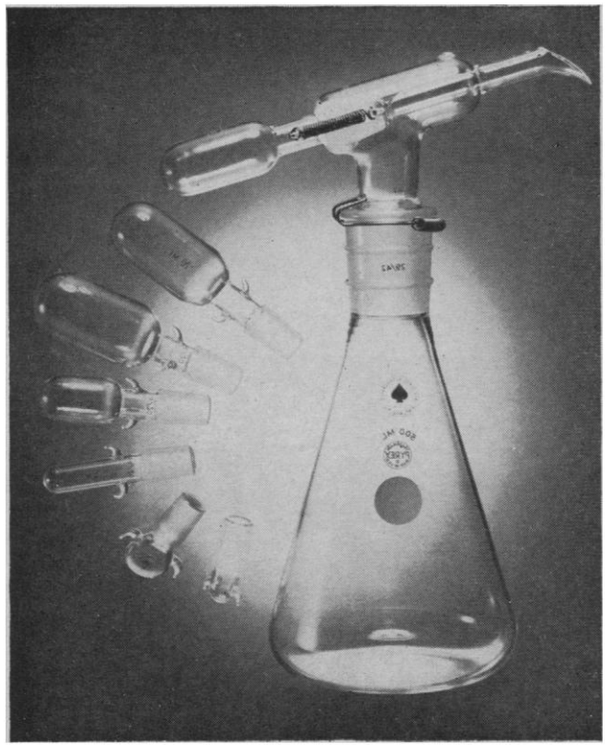

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⧫ 14/20 Interchangeable Volumetric Heads, Cap.: 1 ml.: $3.75, 3 ml.: $3.75, 5 ml.: $3.75, 10 ml.: $3.85, 15 ml.: $3.85, 20 ml.: $3.95, 25 ml.: $3.95. Specials to order.

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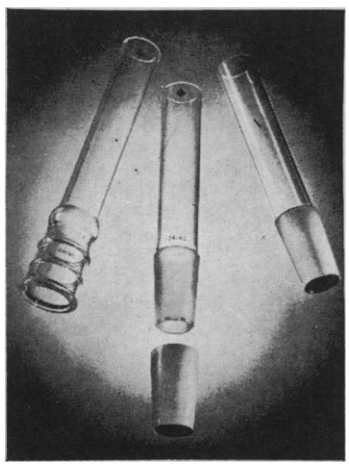

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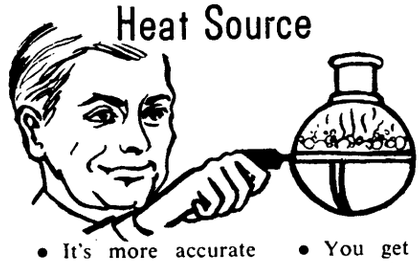

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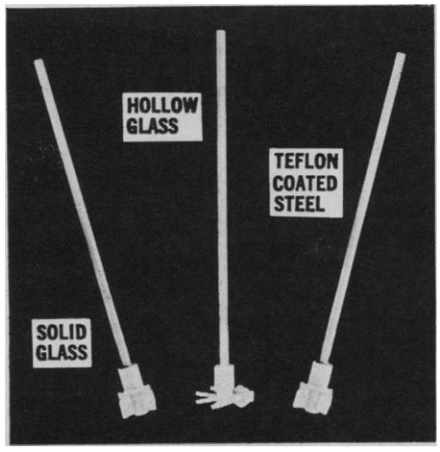

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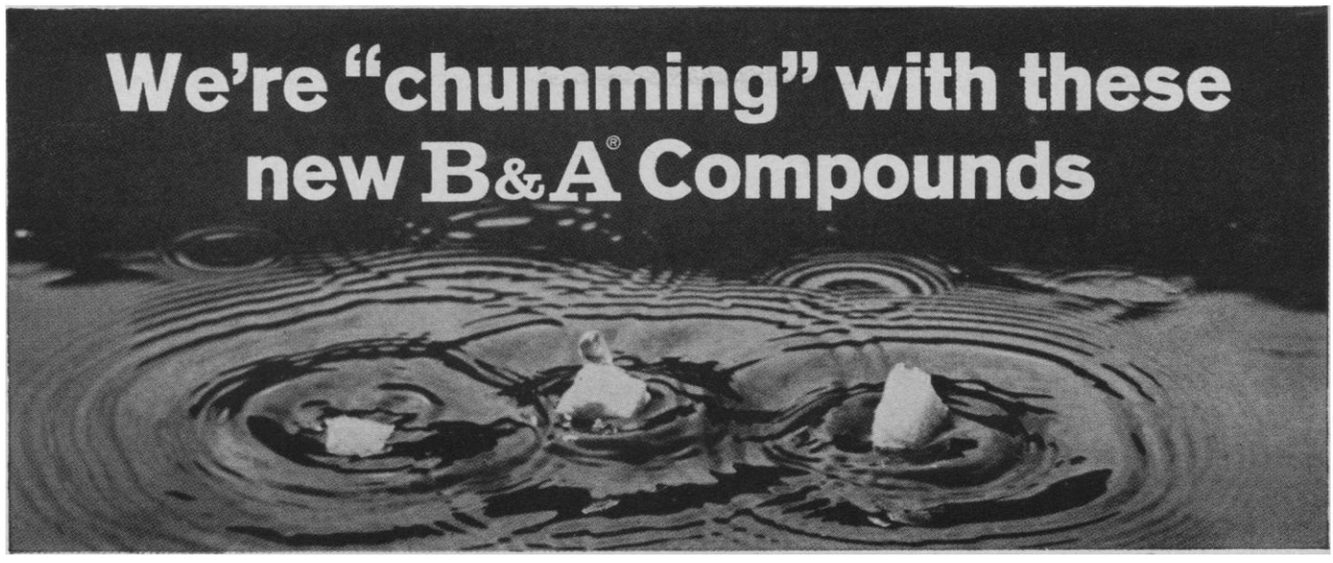


chum (chŭm), *n.* (Origin obscure) Chopped fish, or bait, thrown overboard to draw fish.

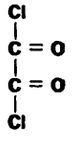
chum, *v. i.* To fish with the aid of chum.

We're using these new compounds as "chum" to see if we can arouse any interest from you. Some of the products that we advertised in earlier "fishing trip" ads proved so useful to readers that we're now supplying them in pilot and production quantities.

Monochloroacetyl Chloride: $CH_2ClCOCl$
Dichloroacetyl Chloride: $CHCl_2COCl$
Trichloroacetyl Chloride: CCl_3COCl

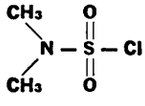
Convenient intermediates for introducing the corresponding chloroacetyl group in a variety of organic syntheses.

Oxalyl Chloride



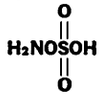
Synthesis of acid chlorides. Condensation reagent with $AlCl_3$ for ethers of aromatic hydrocarbons to form open diketones.

N,N-Dimethyl Sulfamyl Chloride



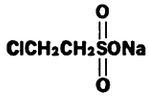
Reacts with amines, sodium alcoholates, sodium phenates, etc. to give the corresponding amides and esters.

Hydroxylamine-O-Sulfonic Acid



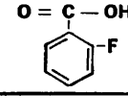
Reacts with organic amines to form hydrazines.

Sodium 2-Chloroethane Sulfonate



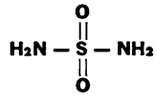
For introducing the sulfoethyl group in organic synthesis.

O-Fluorobenzoic Acid



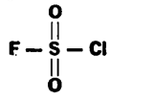
Pharmaceutical intermediate.

Sulfamide



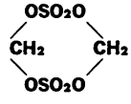
Similar to urea in many of its reactions, except it is more acidic and can act as a dibasic acid.

Sulfuryl Chlorofluoride



Gives selective reactivity between SO_2F_2 & SO_2Cl_2. Reacts with phenol or substituted phenols forming the corresponding aryl fluorosulfonates.

Methylene Sulfate

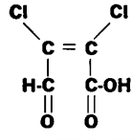


Reacts with alcohols & glycols to give formals; with tertiary amines such as pyridine, quinoline & dimethylaniline compounds of a type analogous to betaine results.

Sulfur Trioxide Pyridine Complex
Sulfur Trioxide Trimethylamine Complex
Sulfur Trioxide Triethylamine Complex

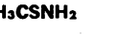
Specialty sulfating and sulfamating agents.

Mucochloric Acid



This compound and its derivatives exhibit bactericidal, fungicidal and insecticidal properties.

Thioacetamide, Tech.



Highly reactive with organic halides, aldehydes, nitriles, acid chlorides, etc.

If any of these makes your mouth water, don't hesitate to write for more information. B&A Fine Chemicals, Allied Chemical Corporation, P.O. Box 353, Morristown, N. J.

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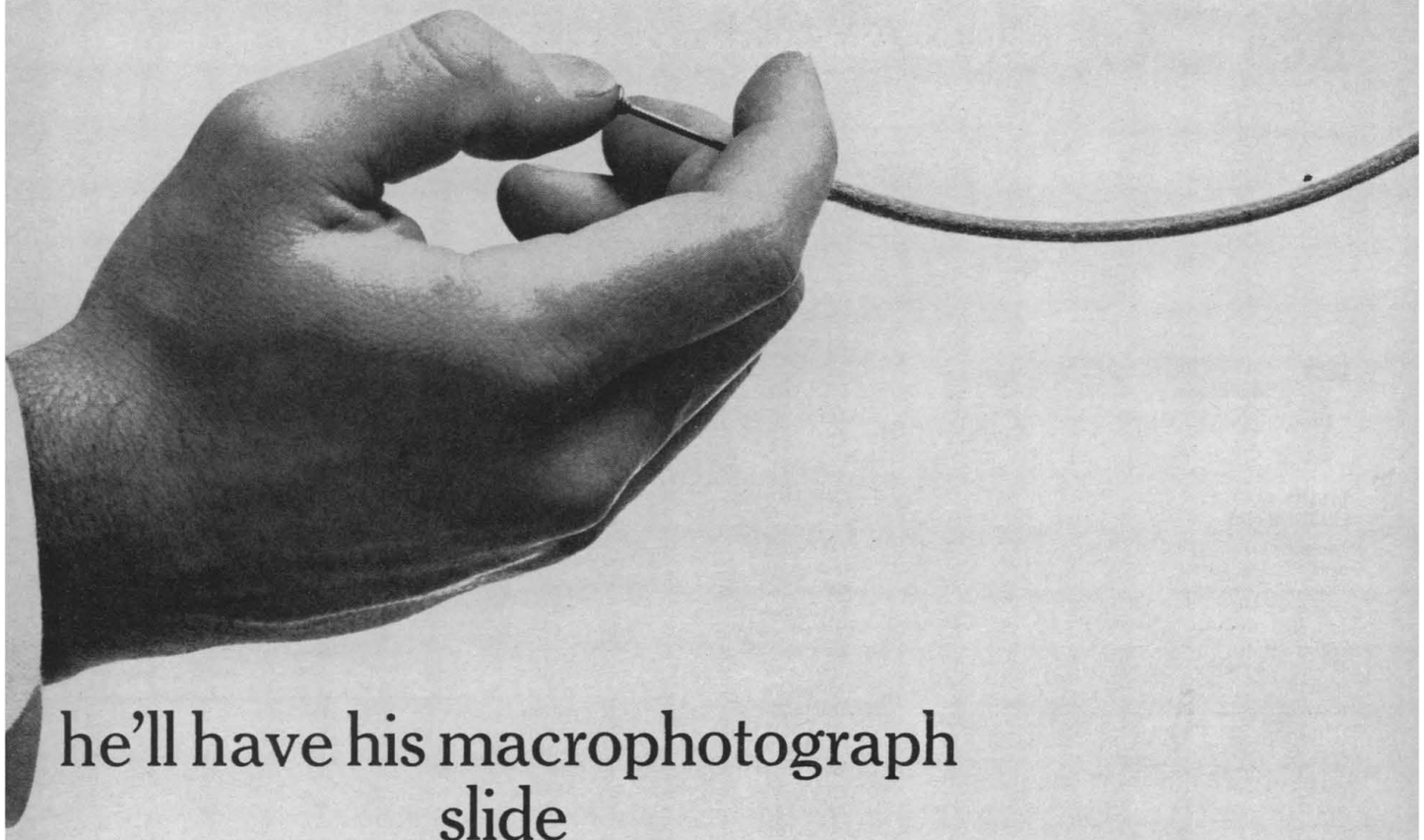

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All from one camera. The Polaroid MP-3 Land camera.

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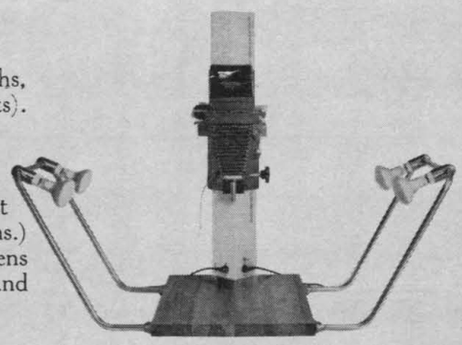
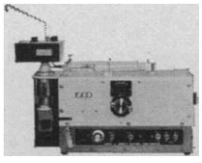
Can the MP-3 take care of your photographic requirements? Certainly.

Polaroid Corporation, Cambridge, Mass. 02139



Polaroid MP-3 Industrial View Camera

Here are some ISCO instruments. . .



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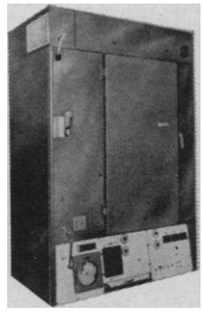

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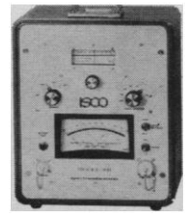

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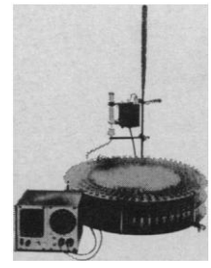
measures the spectral distribution and intensity of light sources. The spectrum from 380 to 1050 mμ can be scanned with a continuous dial control without the need for filter interchange. Features: 8 full scale ranges of intensity; direct reading in spectral intensity units; true cosine response; extreme portability; and a remote extension probe. **$1990**



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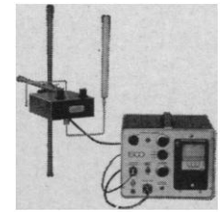

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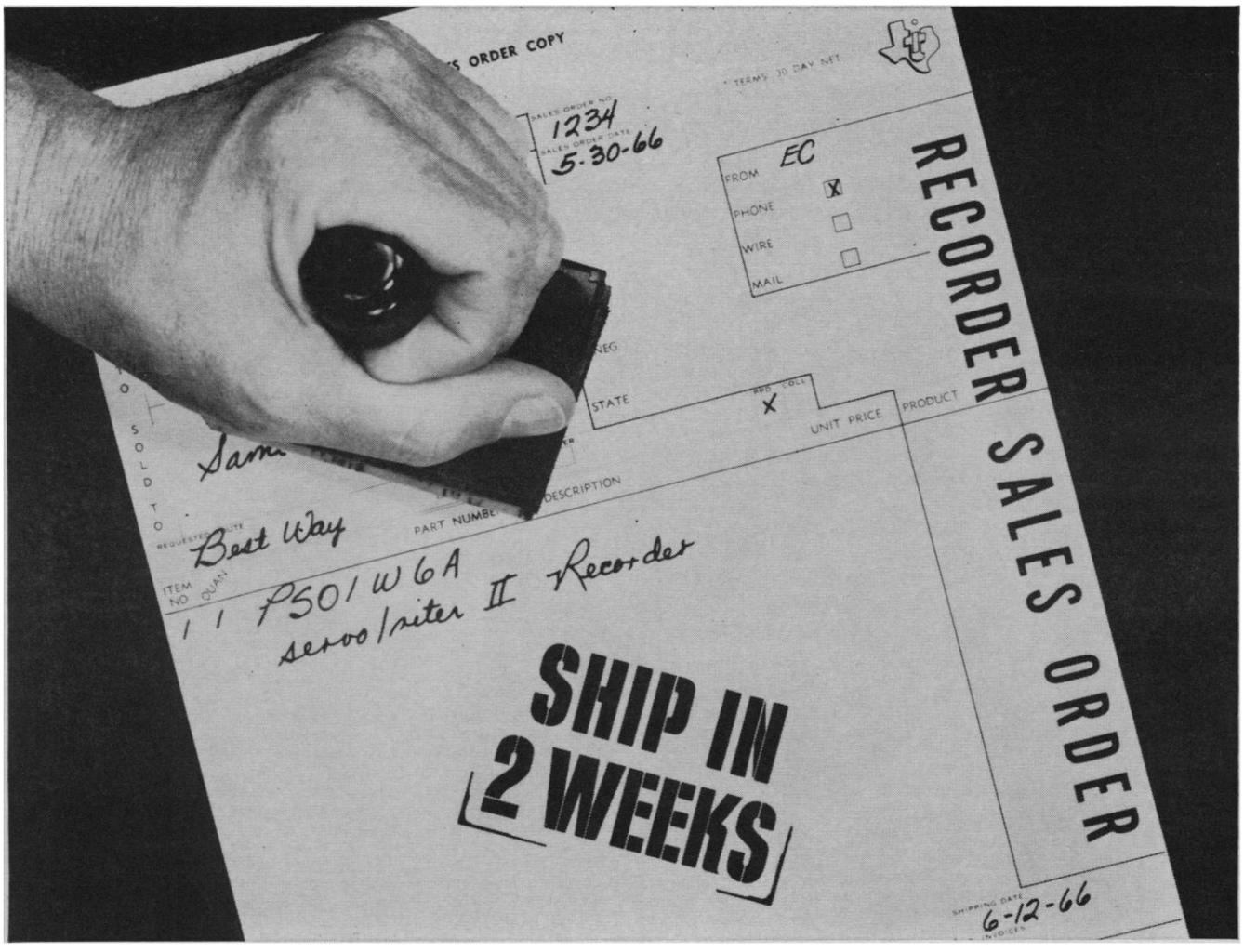

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FLUSH-MOUNTING with electrical speed changer	1	1	1	YES	32 from .5 in./hr. to 40 in./min.
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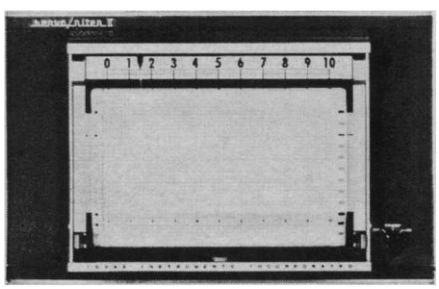

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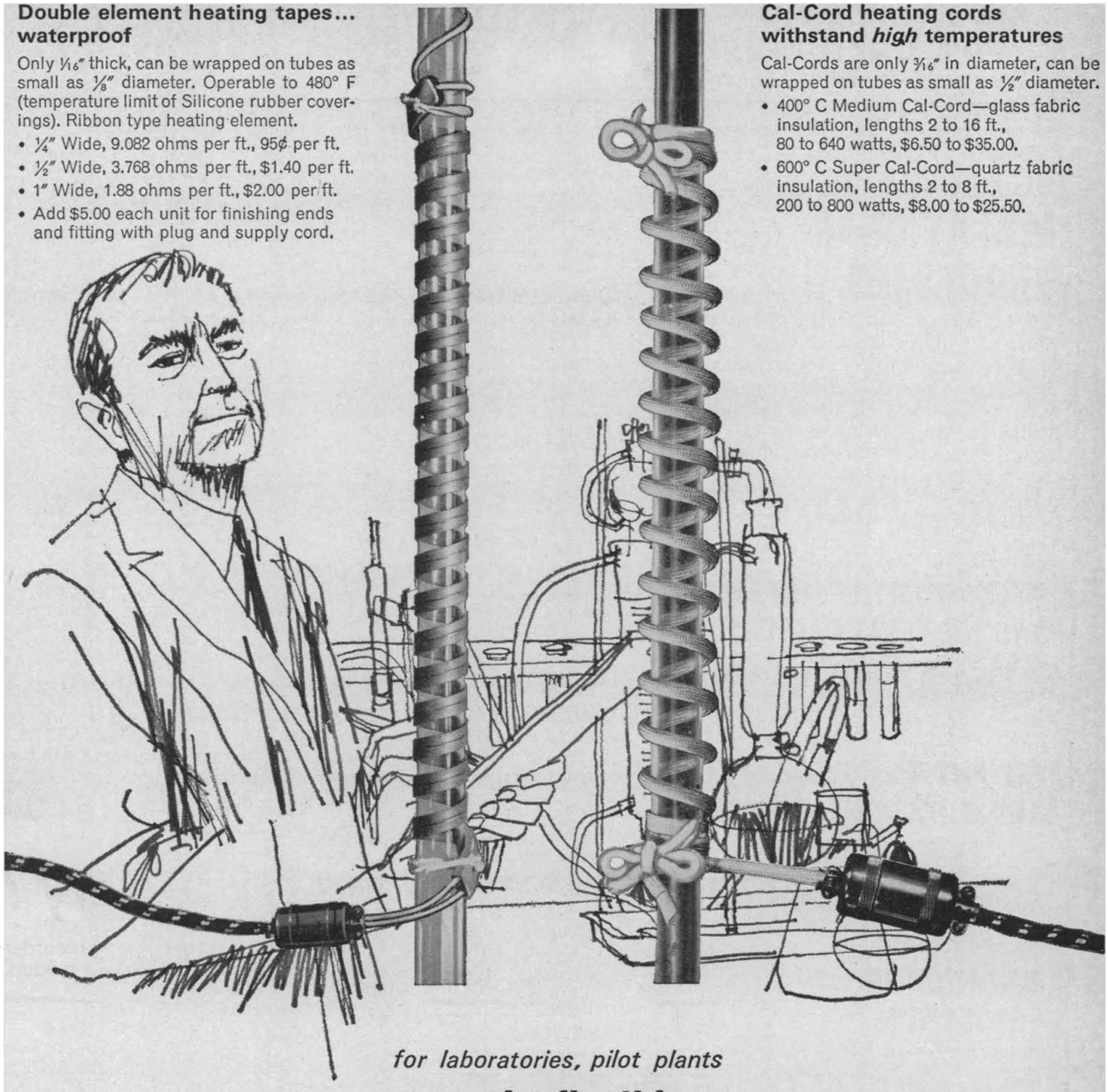

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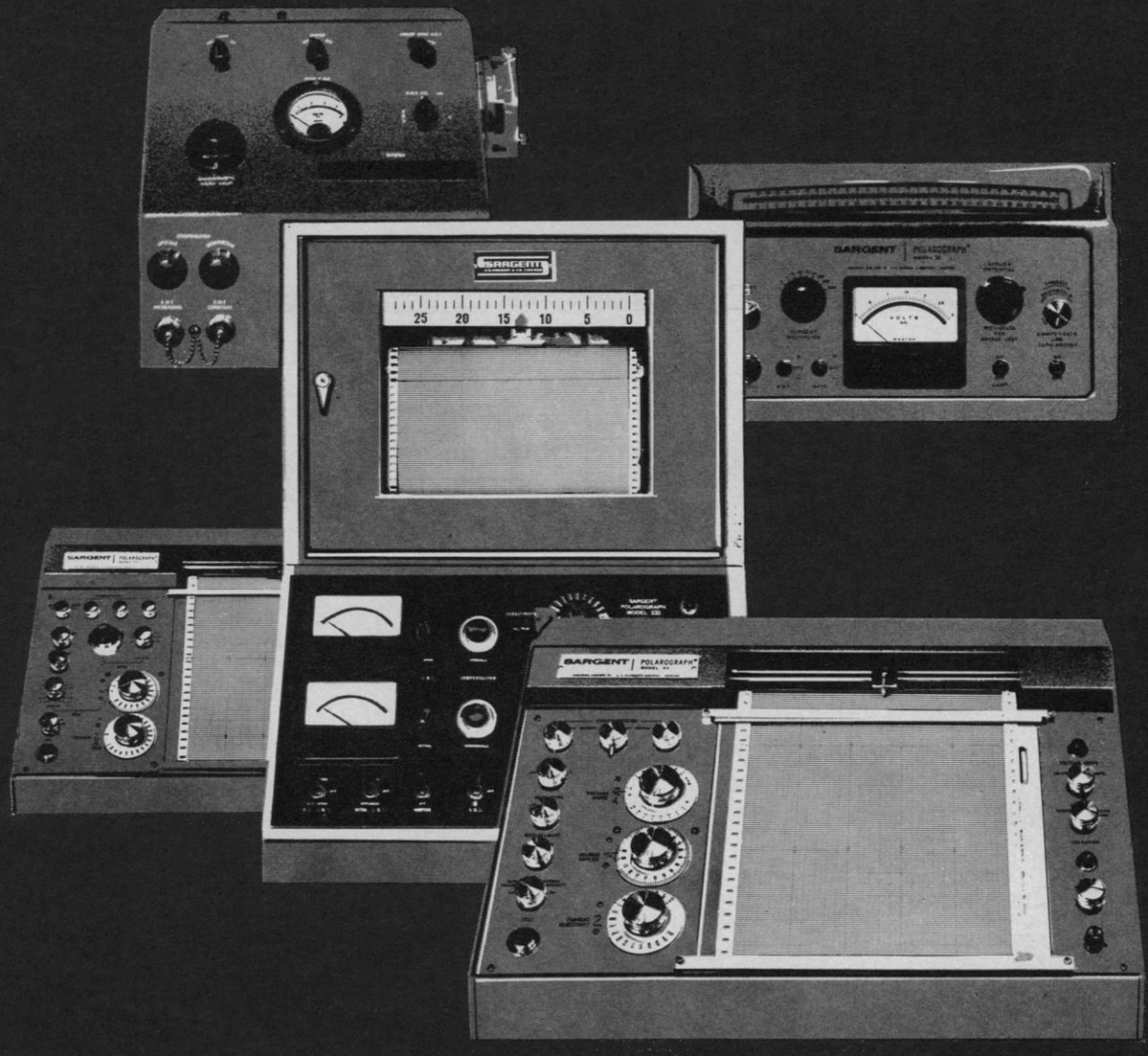

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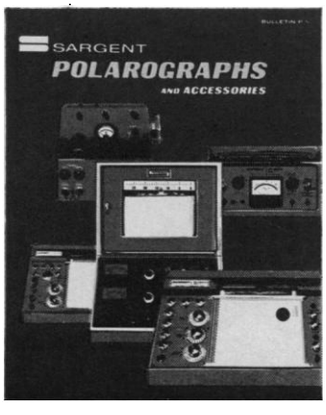

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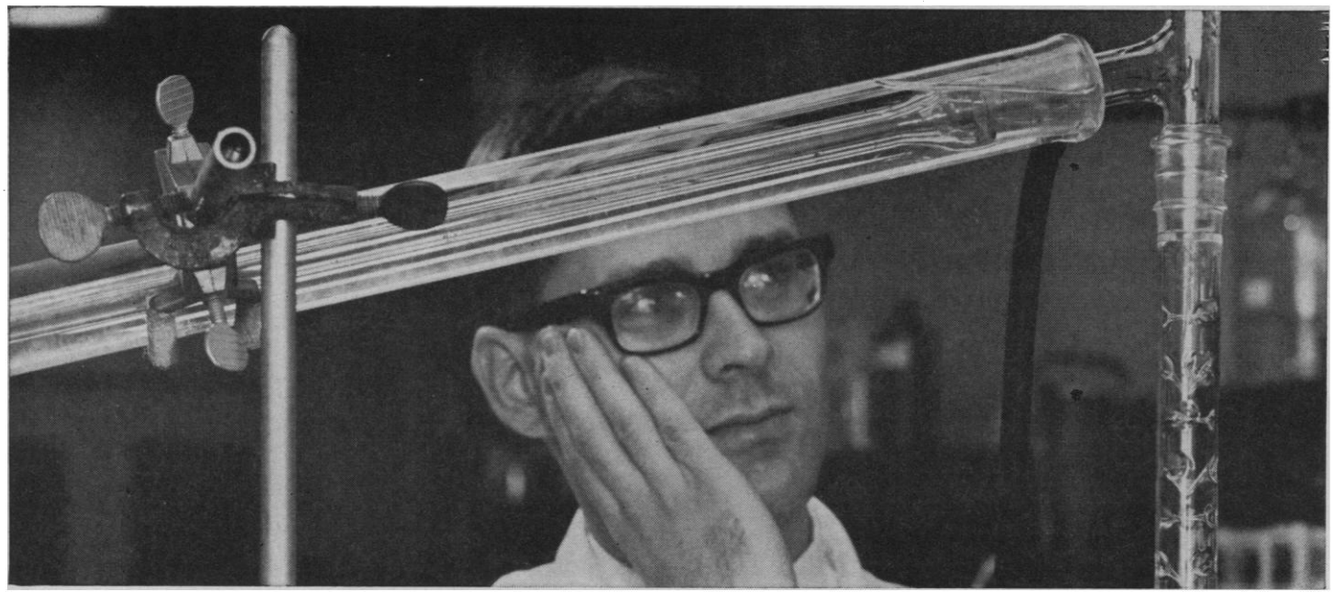

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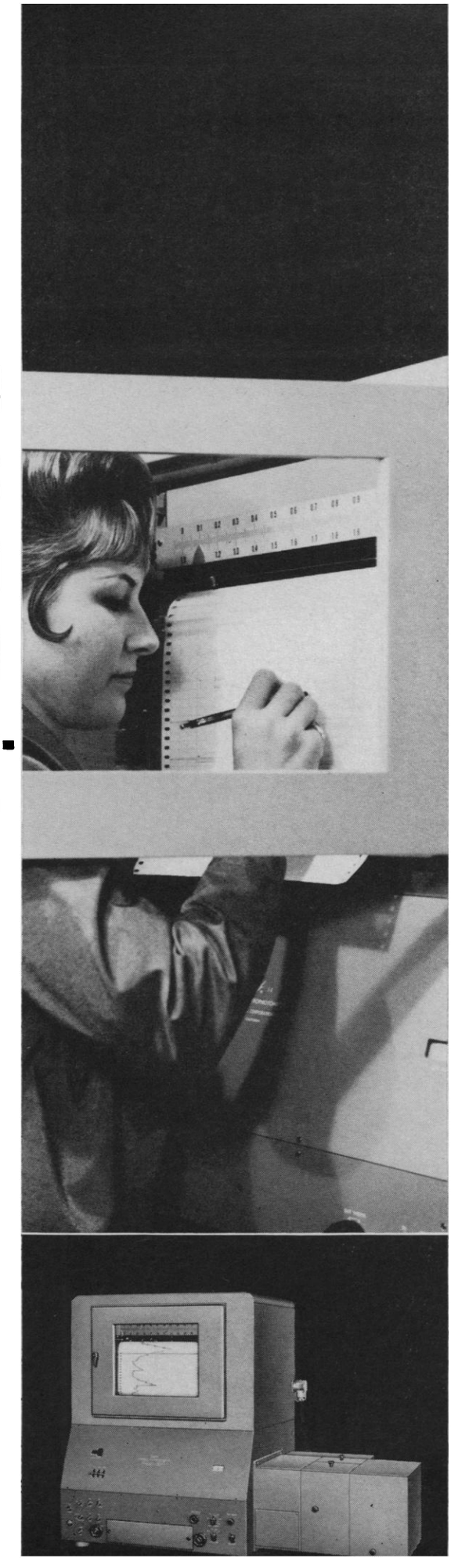

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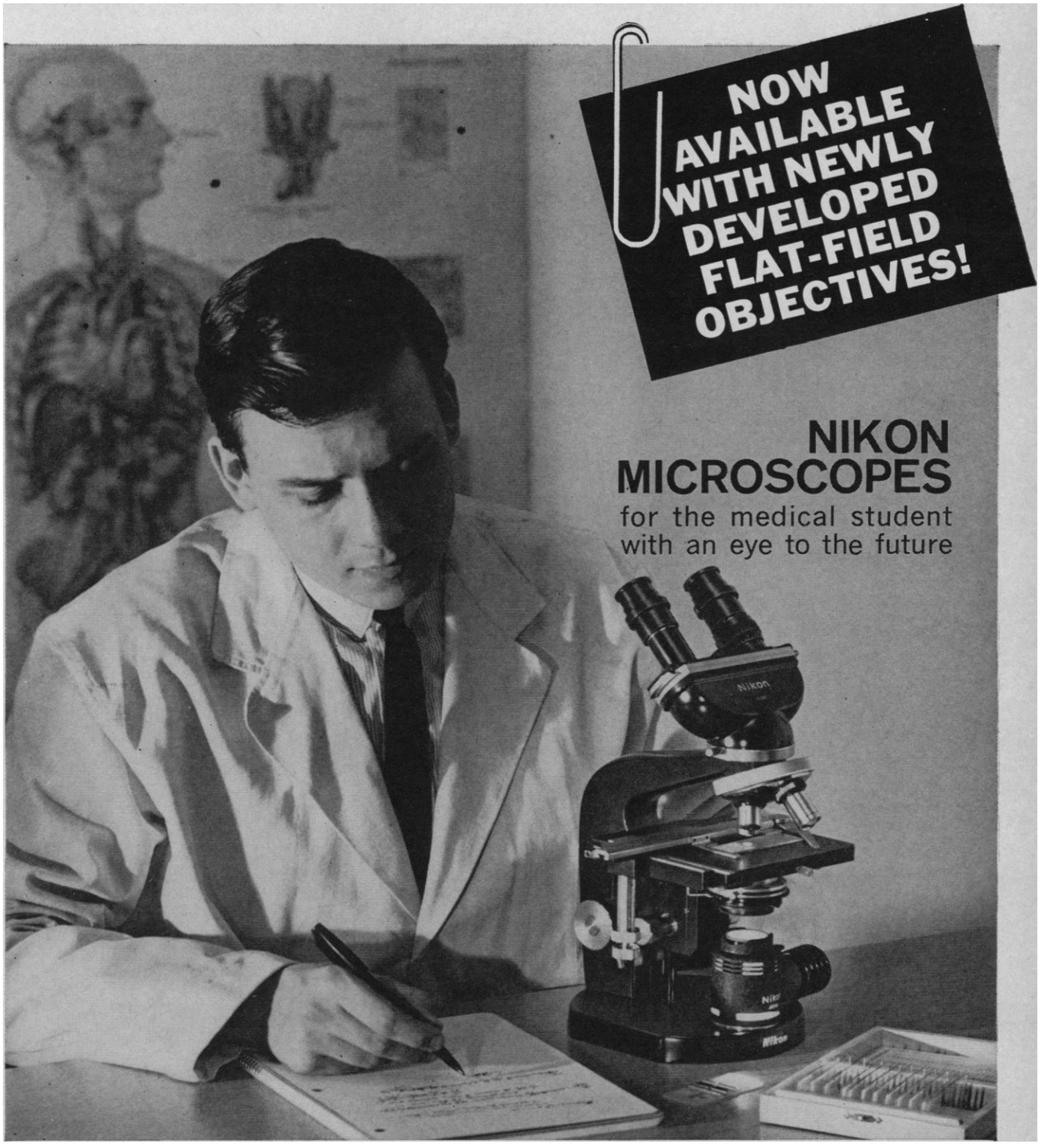

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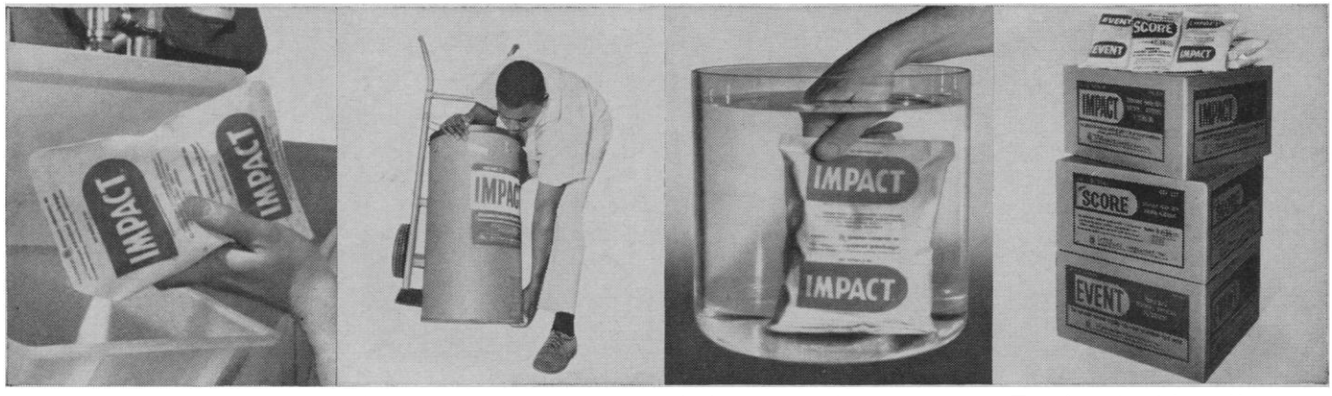

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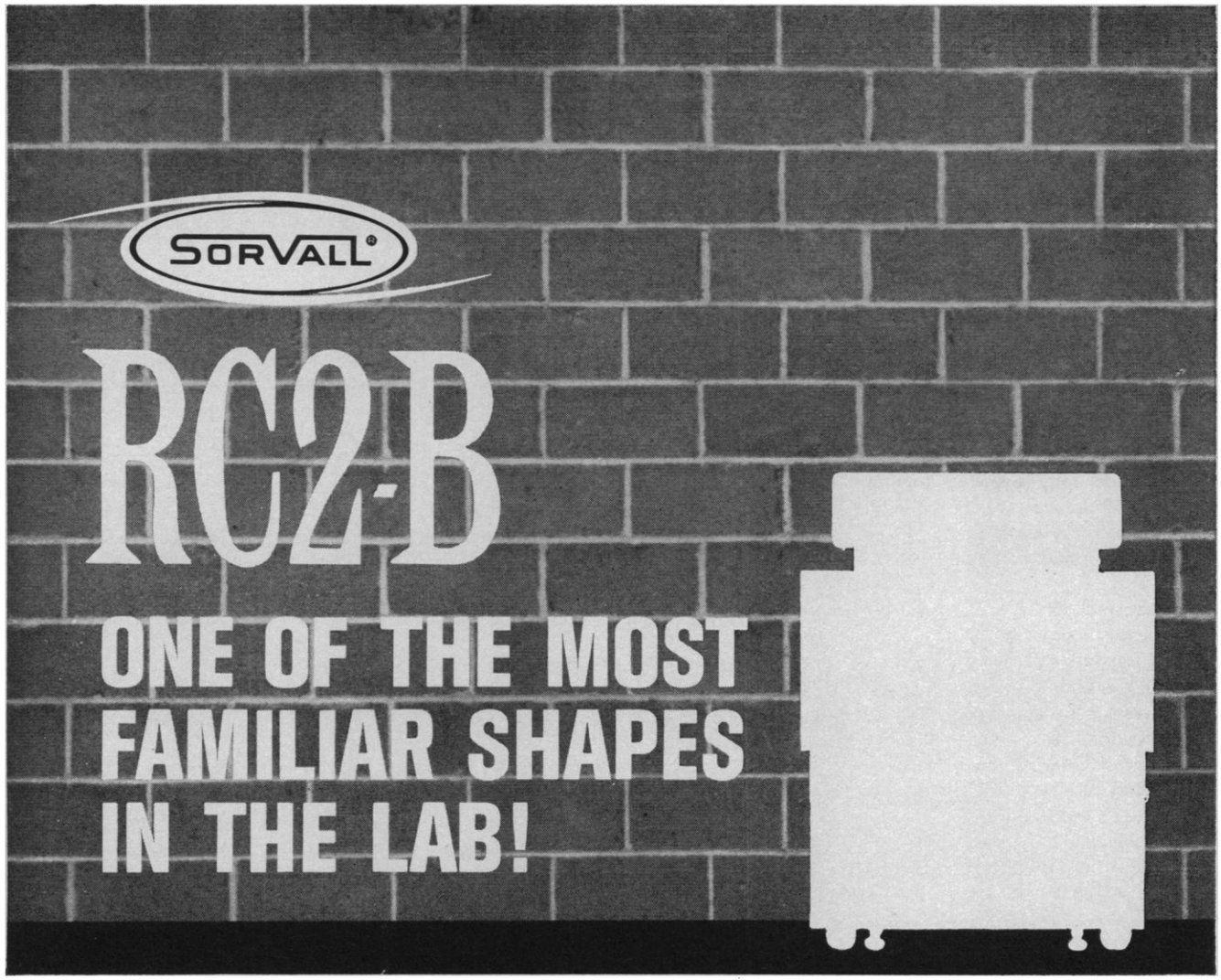

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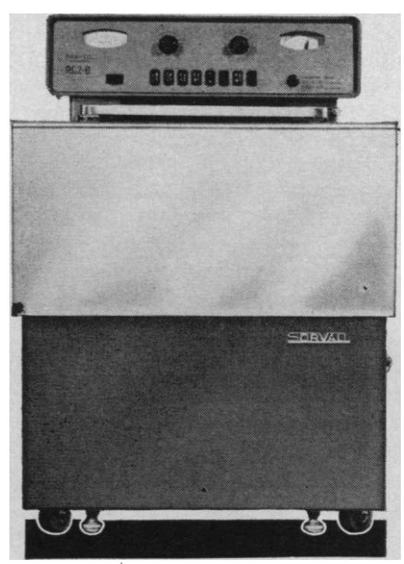

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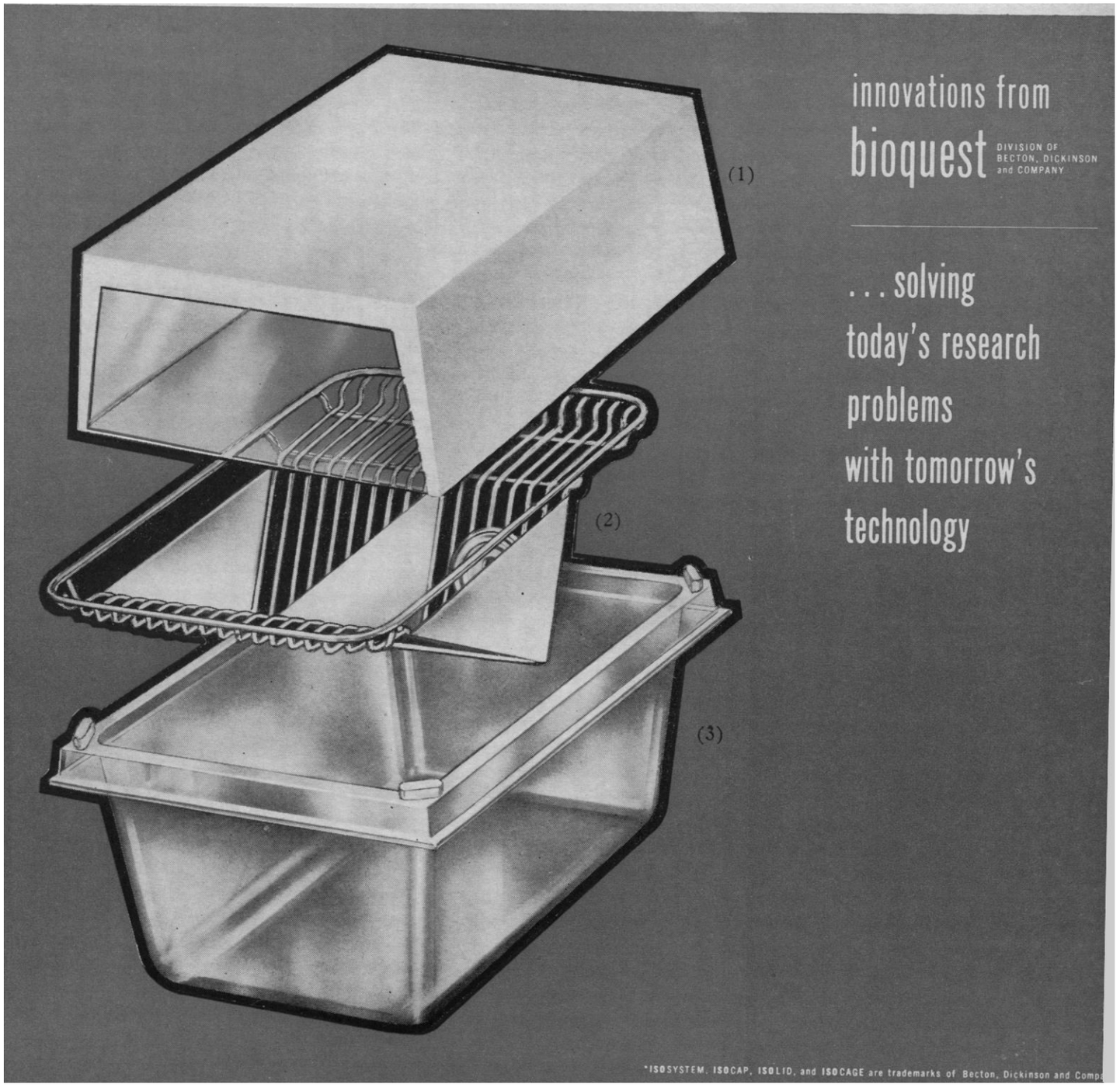

Why Scientists Speak Out

Lykken's and Deans' letters (11 March) on "Scientists and social and political problems" miss the point of scientists' concern. Whether scientists are more capable than others in resolving social problems is not the issue. Weapons are the technological result of the work of a large segment of the scientific community. No member of the profession can escape the onus this places on science as a whole. Should there be any question of the right, even responsibility, of scientists, either individually or as a group, to speak out on public issues which vitally affect, and are influenced by, their work?

EARL GRAHAM
973 Woodmere Drive, Westfield, New Jersey

Tough Old Boys at M.I.T.

I don't think I am an unduly sentimental alumnus of M.I.T. (class of '22), but Carter's article on my Alma Mater's past and future ("M.I.T.: New president will pursue broadened goals," 25 March, p. 1511) gave me the feeling that he didn't know as much about his subject as he should have. It isn't so much that "Tech is hell." This is, or was in my time, only a fragment of an undergraduate college yell which began "*We are happy*; Tech is hell—" and then went on to complete itself in an ingenious 19th-century fashion. Carter could have been much more to the point if, in speaking of the Institute's third president, Francis Amasa Walker, he had cited Walker's famous remark which, as much as anything, set the Institute's tone, and did it in the 1890's. "The Institute," said Walker, "is a place for men to work, not for boys to play." This thunderous statement was made a full half-century and more before most other university officials began mumbling about The Necessity for, uh, Excellence.

In the days when Abbott Lawrence Lowell (a political scientist) was president of Harvard, Richard Cockburn Maclaurin (earned doctorates in mathematical physics and in law) was president of M.I.T. Judging from the languid pace at the Yard end of Massachusetts Avenue in the 1920's, Maclaurin was able to keep up his end of things along Memorial Drive better than Lowell did amid the mystical spiderwebs of Harvard Square. Lowell, it will be remembered, took over from Charles William Eliot, who had prepped for the educational game, if I may put things that way, by being M.I.T.'s first professor of analytical chemistry.

ERIC HODGINS
University Club, 1 West 54 Street, New York 10019

NIH Traineeships

A recent directive of the National Institutes of Health concerning the use of traineeships provides an illustration for Wolfle's statement (Editorial, 1 April) that "the decision as to how each student will spend his years of working for the doctorate is . . . often determined by the source of his financial support rather than by what would be educationally most beneficial."

This particular directive recommends that once a graduate student is put on a fellowship supported by a training program he remain on that program throughout his graduate study. This will preclude the practice we have been following of using training funds for an initial 1 or 2 years of traineeship and then transferring the students to NIH predoctoral fellowships or research grants as may seem appropriate.

It is almost impossible to start a student out on an NIH predoctoral fellowship because of the long delay between application and award. No trainee would wish to wait so long to obtain confirmation of support. Also, it is very difficult to start a student out on a research grant at a time when he is spending a major portion of his time in course work, because of the "percent of effort" statement required of our grant personnel. The present directive will unquestionably reduce the number of graduate students in our department by a third, possibly by half, at a time when training more pharmacologists has become an important aspect of medical education. I am afraid that the people responsible for establishing such regulations are not in close touch with the problems of administering graduate programs in the medical sciences.

ALLAN D. BASS
Department of Pharmacology, Vanderbilt University, Nashville, Tennessee 37203

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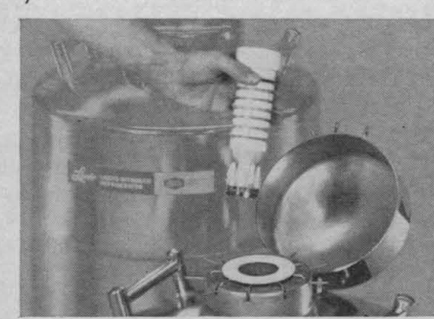

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10 June 1966, Volume 152, Number 3728

SCIENCE

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Student Exchange

For a fortunate few, the Grand Tour of Europe used to be an important part of education. More recently, other arrangements, such as the Junior Year Abroad, have allowed selected students to live or study for a few months in another country. One program that is extensively used in Europe and deserves to be more widely known in the U.S. is IAESTE—the International Association for the Exchange of Students for Technical Experience.

Under the IAESTE program, each member country offers temporary employment to engineering and science students from other countries and in turn is permitted to select an approximately equal number of its own students for temporary employment in other countries. Most of the exchange students work in industry, but some are placed in government laboratories or universities. Employment is usually for a summer period of 8 to 12 weeks but may run for as long as a year. The employer is expected to pay the student a wage sufficient to cover his living expenses during the working period and pays IAESTE a standard fee to help meet administrative expenses. Placement of foreign students in American industry and selection of American students for foreign assignments are handled by IAESTE–U.S., 866 United Nations Plaza, New York, New York 10017.

From the student's standpoint, the program provides an eagerly sought opportunity to work for several months in another country, to earn most of the expenses necessary for the trip, and to have a happy blend of vocational, professional, and international experience. In Europe, the number of students exchanged has increased steadily from 920 in 1948, the first year of the program, to approximately 10,000 this year.

United States participation has remained fairly small, partly because transatlantic travel is more expensive than travel across a European border, partly because many American students lack fluency in a second language, and chiefly because American employers do not offer enough positions for foreign students to earn as many places abroad as American students would like to fill.

This year 150 U.S. students are leaving American campuses for work in Europe, and a few for other parts of the globe. Twice this number wanted to go, but half could not be accepted because the U.S. did not offer enough positions to students from other countries.

The employer considering this program must balance the cost of a temporary employee against the stimulating effect of temporary association with a bright, inquiring young mind from a different scientific or engineering background. The U.S. companies which have participated in the past appear to be well satisfied, for most continue to take part year after year. And the number of positions they offer is growing; there are about 50 more this year than in 1965. The students who come to the U.S. under this program are advanced undergraduate or graduate students who are highly motivated to get first-hand acquaintance with American industry and who are individually selected to fit the requirements of the positions they fill. It is not surprising that they make good temporary additions to a company or laboratory staff.

Expansion of the program would seem desirable. The students benefit; the employer has a competent temporary addition to his staff; and the nation benefits from the better understanding of another country that the American students bring back to the U.S. and the visitors take to their home countries.—DAEL WOLFLE

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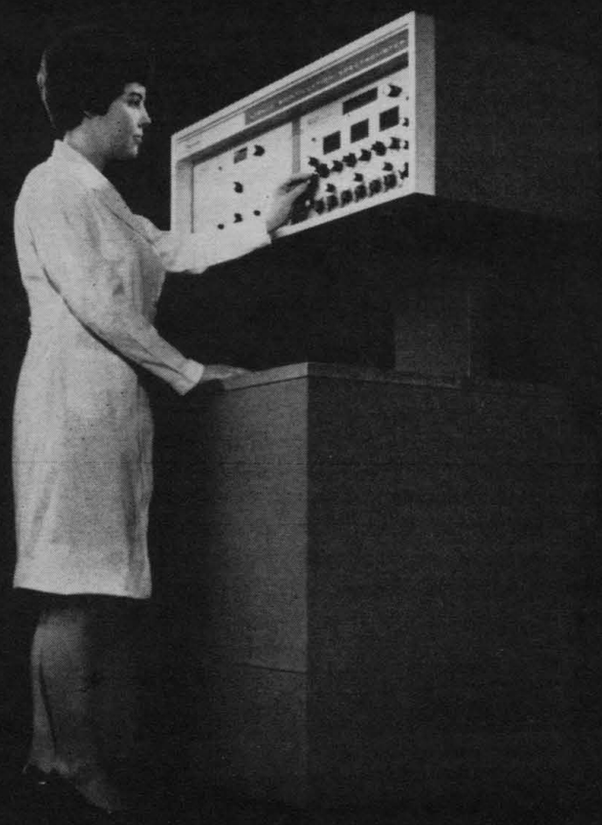

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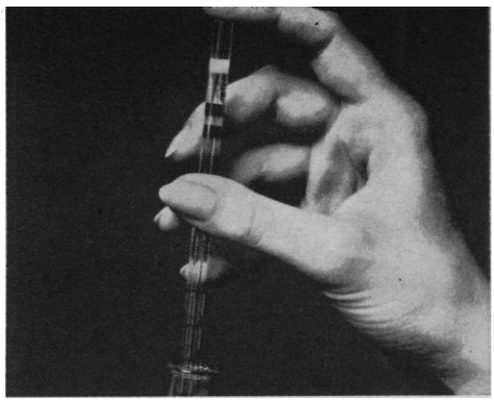

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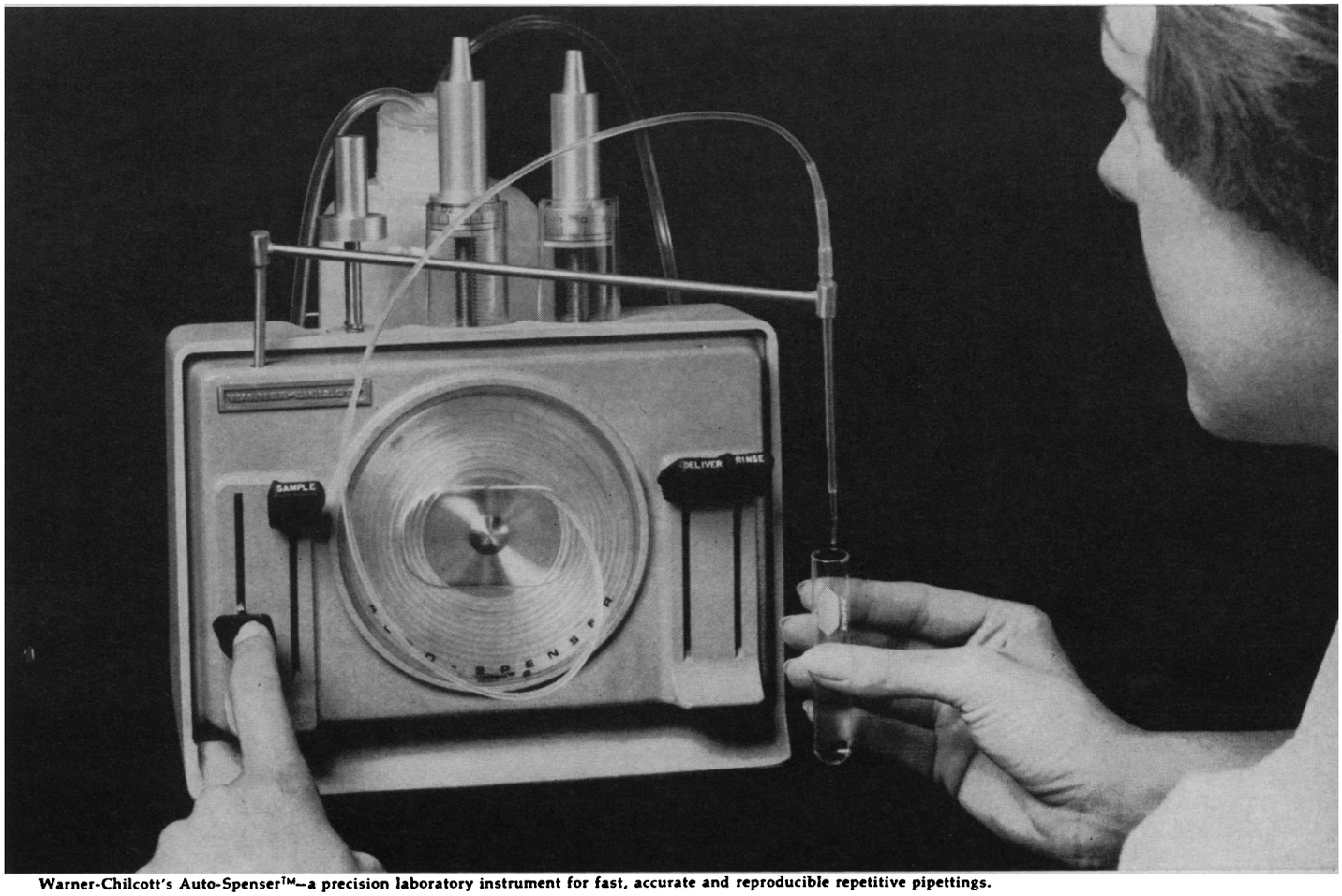

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England recalled that in 1949 the Hormel Institute of the University of Minnesota initiated a project to develop a breed of miniature swine specifically for use in biomedical research. Medical personnel of the Mayo Foundation gave added impetus, recognizing the need for a convenient experimental animal that would better meet certain anatomical and physiological demands. The objectives of the University of Minnesota program were to develop normal swine small enough at maturity to be easily handled and maintained. The objectives of the other miniature-swine developmental programs are similar and it appears that steady progress is being made in achieving these objectives.

As the programs have developed it has become clear that two classes of miniature swine need to be established. Not only is there a real demand for swine that have an adult weight less than 30 kilograms, but also for one that has an adult weight about 70 kilograms, similar to the so-called standard man and to the weight of most of the miniature swine now being used. With the development of a standard 30-kilogram pig, which may well be available during the next decade, swine will assume a major role in research laboratories. In fact, an appreciable increase in usage is predicted before this lower weight is realized.

The proceedings of the symposium will be published in book form as a publication of the U.S. Atomic Energy Commission's Division of Technical Information and will be available in early 1966 from Clearinghouse for Federal Scientific and Technical Information, U.S. Department of Commerce, Springfield, Virginia.

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University of California,
Davis 95616

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Forthcoming Events

June

25–26. **Drug Information** Assoc., annual mtg., Chicago, Ill. (E. Conrad, American Medical Assoc., Chicago)

26–28. Society for **Investigative Dermatology**, Chicago, Ill. (G. W. Hambrick, Jr., 3400 Spruce St., Philadelphia, Pa.)

26–29. American Soc. of **Agricultural Engineers**, annual mtg., Univ. of Massachusetts, Amherst. (J. L. Butt, P.O. Box 229, St. Joseph, Mich.)

26–30. American **Medical** Assoc., 99th annual mtg., Chicago, Ill. (The Association, 535 N. Dearborn St., Chicago, Ill. 60601)

26–30. American **Veterinary Medical** Assoc., 103rd annual mtg., Louisville, Ky. (The Association, 600 S. Michigan Ave., Chicago, Ill.)

26–1. American **Physical Therapy** Assoc., Los Angeles, Calif. (L. Blair, 1790 Broadway, New York 10019)

26–1. American Soc. for **Testing and Materials**, 69th annual mtg., Atlantic City, N.J. (ASTM, 1916 Race St., Philadelphia, Pa.)

26–3. National **Education** Assoc., conv., Miami Beach, Fla. (W. G. Carr, NEA, 1201 16th St., NW, Washington, D.C.)

27–28. **Astronomical** Soc. of the Pacific, annual summer mtg., Seattle, Wash. (P. W. Hodge, Dept. of Astronomy, Univ. of Washington, Seattle 98105)

27–28. **Fluorine Chemistry**, symp., Ann Arbor, Mich. (R. W. Parry, Dept. of Chemistry, Univ. of Michigan, Ann Arbor 48104)

27–29. **Aerospace Sciences**, West Coast mtg., Los Angeles, Calif. (W. J. Brunke, American Institute of Aeronautics and Astronautics, 1290 Sixth Ave., New York 10019)

27–29. **American Soc. of Heating, Refrigerating, and Air-Conditioning Engineers**, Toronto, Ont., Canada. (R. C. Cross, 345 E. 47 St., New York 10017)

27–29. **Marine Technology** Soc., 2nd annual conf., Washington, D.C. (C. W. Covey, Undersea Technology, 617 Lynn Bldg., 1111 N. 19 St., Arlington, Va. 22209)

27–29. Association for **Research in Ophthalmology**, mtg., Chicago, Ill. (H. E. Kaufman, Dept. of Ophthalmology, Univ. of Florida College of Medicine, Gainesville)

27–29. **Vacuum Metallurgy** Div., American Vacuum Soc., 9th annual mtg., New York, N.Y. (M. A. Orehoski, U.S. Steel Corp., Applied Research Laboratory, Monroeville, Pa. 15146)

27–30. **Health Physics** Soc., annual mtg., Houston, Tex. (J. G. Terrill, Jr., Div. of Radiological Health, U.S. Public Health Service, Washington, D.C.)

27–30. **Molecular Biology of Viruses**, symp., Univ. of Alberta, Edmonton, Canada. (J. S. Colter, Dept. of Biochemistry, Univ. of Alberta, Edmonton)

29–1. **Chemistry of Sulfides**, conf., Princeton Univ., Princeton, N.J. (J. Sapoch, 306 Nassau Hall, Princeton)

31–3. **Tissue Culture** Assoc., annual mtg., San Francisco, Calif. (W. A. Nelson-Rees, Naval Biological Laboratory, Naval Supply Center, Oakland, Calif., 94625)

July

1–3. **Radiology of Normal and Pathological** Mammary Structures, European symp., Strasbourg, France. (C. Gros, Service Central de Radiologie, Hôpital Civil, Strasbourg 67)

4–8. **British Medical Assoc.**, Exeter, England. (Secretary, Tavistock Sq., London W.C.1, England)

4–8. **Magnetohydrodynamic Electrical Power Generation**, intern. symp., Salzburg, Austria. (European Nuclear Energy Agency, 38 boulevard Suchet, Paris 16)

4–8. **Mathematical and Computational Methods in Social Sciences**, Rome, Italy. (P. Maranda, Dept. of Anthropology, Peabody Museum, Harvard Univ., Cambridge, Mass. 02138)

4–8. European **Orthodontic** Soc., 42nd congr., Garmisch-Partenkirchen, West Germany. (H. Derichsweiler, Sonnenstr. 27/111, Munich 15)

4–8. **Rarefied Gas Dynamics**, 5th intern. symp., Oxford, England. (C. L. Brundin, Engineering Laboratory, Parks Rd., Oxford)

4–9. **South African Assoc. for the Advancement of Science**, annual congr., Johannesburg. (I. M. Sinclair, The Association, P.O. Box 6894, Johannesburg)

4–15. **Ekistics** and the Future of Human Settlements, intern. seminar, Athens, Greece. (D. Iatridis, 24, Strat. Syndesmou St., Athens 136)

5–8. **Blood Groups of Domestic Animals**, 10th European conf., Paris, France. (J. Bouw, European Soc. for Animal Blood Group Research, 5 Duivendaal, Wageningen, Netherlands)

5–8. **Lens Design** with Large Computers, intern. conf., Rochester, N.Y. (Inst. of Optics, Univ. of Rochester, Rochester 14627)

5–9. Technical and Industrial **Communications**, 9th annual inst., Colorado State Univ., Fort Collins. (B. K. McKee, Inst. in Technical and Industrial Communications, Rm. 322 Liberal Arts, Colorado State Univ., Fort Collins 80521)

5–9. Society for the Study of **Fertility**, annual mtg., Cambridge, England. (D. Casey, 8 Jesus Lane, Cambridge)

5–9. American Soc. of **Pharmacognosy**, 7th annual mtg., Univ. of Minnesota, Minneapolis. (L. C. Schramm, College of Pharmacy, Univ. of Minnesota, Minneapolis 55455)

6–7. **Space Flight Mechanics**, specialist conf., Denver, Colo. (R. S. Novosad, Martin-Marietta Corp., Mail No. A127, Denver 80201)

6–8. Space and Ballistic **Missile Technology**, 11th symp., U.S. Air Force Academy, Colo. (C. T. Morrow, Aerospace Corp., P.O. Box 95083, Los Angeles, Calif. 90045)

6–9. National Soc. of **Professional Engineers**, annual mtg., Minneapolis, Minn. (The Society, 2029 K St., NW, Washington, D.C. 20006)

7–8. **Spectroscopy and Automation**, symp., Inst. of Physics and the Physics Soc., Univ. of Bristol, Bristol, England. (R. Jenkins, M.E.L., Equipment Co., Analytical Laboratory, 207 Kings Cross Rd., London W.C.1)

7–8. Chemically Grown **Surface Films**, conf., Univ. of Strathclyde, Strathclyde, Scotland. (Meetings Officer, Inst. of Physics and the Physics Soc., 47 Belgrave Sq., London S.W.1)

8–12. **Graph Theory**, seminar, Rome, Italy. (International Computation Centre, Viale Civilta del Lavoro 23, Rome)

9–15. **Medical Women's** Intern. Assoc., 10th congr., Rochester, N.Y., and Niagara Falls, Ont. (The Association, 1790 Broadway, New York 10019)

10–15. **Power**, mtg., Inst. of Electrical and Electronics Engineers, New Orleans, La. (E. C. Day, IEEE, 345 E. 47 St., New York 10017)

10–16. American **Library** Assoc., annual conf., New York, N.Y. (D. H. Clift, 50 E. Huron St., Chicago, Ill. 60611)

11–14. **Aerospace Systems**, conf., Seattle, Wash. (Inst. of Electrical and Electronics Engineers, 345 E. 47 St., New York 10017)

11–15. International Council for **Bird Preservation**, world conf., Cambridge, England. (The Council, c/o British Museum of Natural History, Cromwell Rd., London S.W.7)

11–15. Use of **Isotopes in Milk Technology**, seminar, Munich, West Germany. (Intern. Agency Liaison Branch, Office of the Director General, Food and Agriculture Org., Via delle Termi di Caracalla, Rome, Italy)

11–15. **Weights and Measures**, 51st natl. conf., Denver, Colo. (Executive Secy. of the Conference, National Bureau of Standards, Washington, D.C. 20234)

11–16. **Graphic Design and Visual Communications Technology**, 2nd intern. congr., Bled Yugoslavia. (Intern. Council of Graphic Design Assoc., Herengracht 567, Amsterdam-C, Netherlands)

11–16. **Hydraulics** 2nd Latin American congr., Caracas, Venezuela. (M. Gonzalez, Colegio de Ingenieros de Venezuela, Apartado de Correos 2006, Caracas)

11–16. **Reaction Mechanisms of Inorganic Solids**, intern, symp., Aberdeen, Scotland. (General Secretary, Chemical Soc., Burlington House, London W.1, England)

11–16. **Statistical Mechanics and Thermodynamics**, intern. symp., Copenhagen, Denmark. (T. A. Bak, H. C. Ørsted Inst., Univ. of Copenhagen, Copenhagen)

11–30. **Linguistics**, 2nd seminar, Grenoble, France. (Intern. Assoc. of Applied Linguistics, 9, rue Lhomond, Paris 5)

12–14. **Failure Analysis**, William H. Eisenman conf., New York, N.Y. (J. V. Richard, American Soc. for Metals, Metals Park, Ohio 44073)

12–15. Use of **Radioisotopes and Radiation in Dairy Science** and Technology, seminar, Vienna, Austria. (P. Fent, Div. of Public Information, Intern. Atomic Energy Agency, A-1010, Kärntnerring 11, Vienna)

12–19. International Union of **Crystallography**, 7th general assembly and congr., Moscow, U.S.S.R. (J. Ibers, Chemistry Dept., Northwestern Univ., Evanston, Ill.)

14–16. **Listeriosis**, 3rd intern. symp., Bilthoven, Netherlands. (E. H. Kampelmacher, Natl. Inst. of Public Health, Sterrenbos 1, Utrecht)

14–16. Uses of **Plastics** in the Pacific Northwest, workshop, Richland, Wash. (R. A. V. Raff, College of Engineering, Washington State Univ., Pullman 99163)

15–19. **Tetanus**, intern. conf., Bern, Switzerland. (W. Mamie, Tiefenauspital der Stadt Bern, Bern)

17–21. Canadian **Veterinary Medical** Assoc., annual conv., Vancouver, B.C. (The Association, P.O. Box 416 C.P., Ottawa 2, Ont.)

17–22. **Control Procedures in Drug Production**, 2nd seminar, Hershey, Pa. (W. L. Blockstein, Extension Services in Phar-

macy, Univ. of Wisconsin, Madison 53706)

17–22. American Soc. for **Pharmacology and Experimental Therapeutics**, mtg., Mexico City, Mexico. (E. B. Cook, The Society, 9650 Wisconsin Ave., NW, Washington, D.C. 20014)

17–23. **Animal Venoms**, intern. symp., São Paulo, Brazil. (Conference Secretary, Inst. Butantan, Caixa Postal 65, São Paulo)

18–20. American Inst. of **Aeronautics and Astronautics**, Interagency Chemical **Rocket Propulsion** Group, mtg., Washington, D.C. (Chemical Propulsion Information Agency, 8621 Georgia Ave., Silver Spring, Md.)

18–20. **Aerospace Reliability and Maintainability**, 5th mtg., New York, N.Y. (American Inst. of Aeronautics and Astronomics, 1290 Sixth Ave., New York)

18–22. World Federation for **Mental Health**, 19th mtg., Prague, Czechoslovakia. (J. E. Purkyne Czechoslovak Medical Soc., Sokolska 31, Prague)

18–22. Nuclear and Space **Radiation Effects**, annual conf., Stanford Univ., Palo Alto, Calif. (V. A. J. van Lint, General Atomics, Special Nuclear Effects Laboratory, Box 608, San Diego, Calif. 92112)

18–23. Society of the **Chemical Industry**, annual mtg., Dublin, Ireland. (The Society, 41 Belgrave Sq., London S.W.1, England)

18–24. American Soc. for **Horticultural Science**, 14th Caribbean region mtg., El Salvador, San Salvador. (E. H. Casseres, Calle Londres 40, Mexico 6, D.F.)

19–21. **Alkali Metals**, intern. symp., Nottingham, England. (General Secretary, Chemical Soc., Burlington House, London W.1, England)

20–21. **Crystal Growth**, symp., Moscow, U.S.S.R. (N. V. Belov, Inst. of Crystallography, Academy of Sciences of the U.S.S.R., Lenin Prospekt 59, Moscow B-333)

21–24. **Data Processing**, intern conf., Chicago, Ill. (Data Processing Management Assoc., 524 Busse Highway, Park Ridge, Ill. 60068)

23–28. **Anatomy**, 1st Pan American congr., Mexico, D.F. (Congress Secretariat, Apt. Postal 25279, Admon. de Correos 70, Mexico 20)

24–30. **Microbiology**, 9th intern. congr., Moscow, U.S.S.R. (N. E. Gibbons, Intern. Assoc. of Microbiological Soc., Div. of Applied Biology, Natl. Research Council, Ottawa 2, Ont., Canada)

24–30. **Ornithology**, 14th intern. congr., Oxford, England. (N. Tinbergen, Dept. of Zoology, Oxford Univ., Oxford)

24–30. **Pharmacology**, intern. congr., São Paulo, Brazil. (M. Roche e Silva, Dept. of Pharmacology, Faculty of Medicine, Univ. of São Paulo, Ribeirao Preto, São Paulo)

25–27. **Data Acquisition and Processing in Biology and Medicine**, conf., Univ. of Rochester, Rochester, N.Y. (Office of Technical Activities Board, Inst. of Electrical and Electronics Engineers, 345 E. 47 St., New York 10017)

25–29. Interpretation and Therapy of **Cardiac Arrhythmias**, conf., Hahnemann Medical College and Hospital, Philadelphia, Pa. (L. S. Dreifus, Hahnemann Medical College, 230 N. Broad St., Philadelphia)

25–30. **Animal Husbandry**, intern conf., Göttingen, West Germany. (Intern. Agency

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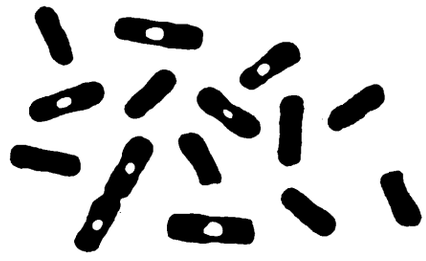

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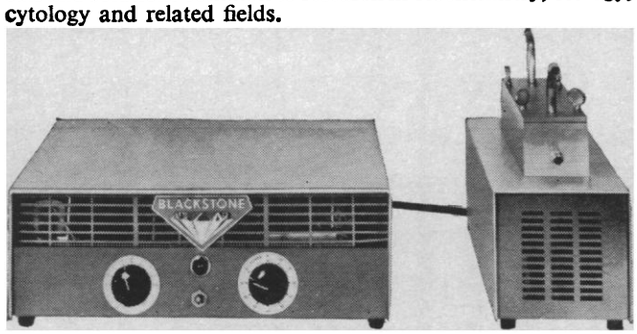

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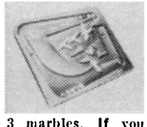

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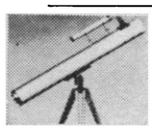

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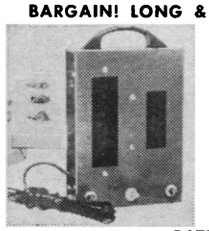

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25–31. **Genetics**, intern, symp., São Paulo, Brazil. (G. Pavan, Dept. of Biology, Univ. of São Paulo, Caixa Postal 8105, São Paulo, Brazil)

26–28. American **Astronomical** Soc., Cornell Univ., Ithaca, N.Y. (G. C. McVittie, Univ. of Illinois Observatory, Urbana)

26–30. **Clinical Chemistry**, 6th intern. congr., Munich, Germany. (O. Wieland, 11. Medizinische Universitätsklinik, Ziemssenstr. 1, 8 Munich)

27–30. **International Primatological Soc.** mtg., Frankfurt-am-Main, Germany. (D. Stark, Ludwig-Rehnstr. 14, Frankfurt)

28–31. **Psychosomatic Medicine in Obstetrics and Gynecology**, 3rd intern. congr., Vienna, Austria. (A. H. Palmrich, Vienna Acad. of Medicine, Alserstr. 4, Vienna 9)

29–30. **Linguistic** Soc. of America, Univ. of California, Los Angeles. (A. A. Hill, Box 8120 University Station, Austin, Tex.

31–4. American Soc. of **Animal Science**, annual mtg., Rutgers Univ., New Brunswick, N.J. (A. M. Pearson, Dept. of Food Science, Michigan State Univ., East Lansing)

31–5. **Dermatology**, 13th intern. congr., Munich, West Germany. (C. G. Shirren, Frauenlobstr. 9, Munich)

31–6. **Mycology**, 4th European congr., Warsaw, Poland. (Intern. Union of Biological Sciences, General Secretariat, Dept. of Zoology, Univ. of Washington, Seattle 98105)

August

1–3. **Electron Spin Resonance Spectroscopy**, symp., American Chemical Soc. Div. of Physical Chemistry, Michigan State Univ., East Lansing. (M. T. Rogers, Dept. of Chemistry, Michigan State Univ., East Lansing 48823)

1–4. **Psychoanalysis**, 2nd Pan American congr., Buenos Aires, Argentina. (M. Heiman, 1148 Fifth Ave., New York, N.Y. 10028)

1–4. **Toxicology and Occupational Medicine**, 5th inter-American conf., Miami, Fla. (W. B. Deichmann, Univ. of Miami School of Medicine, Coral Gables, Fla. 33134)

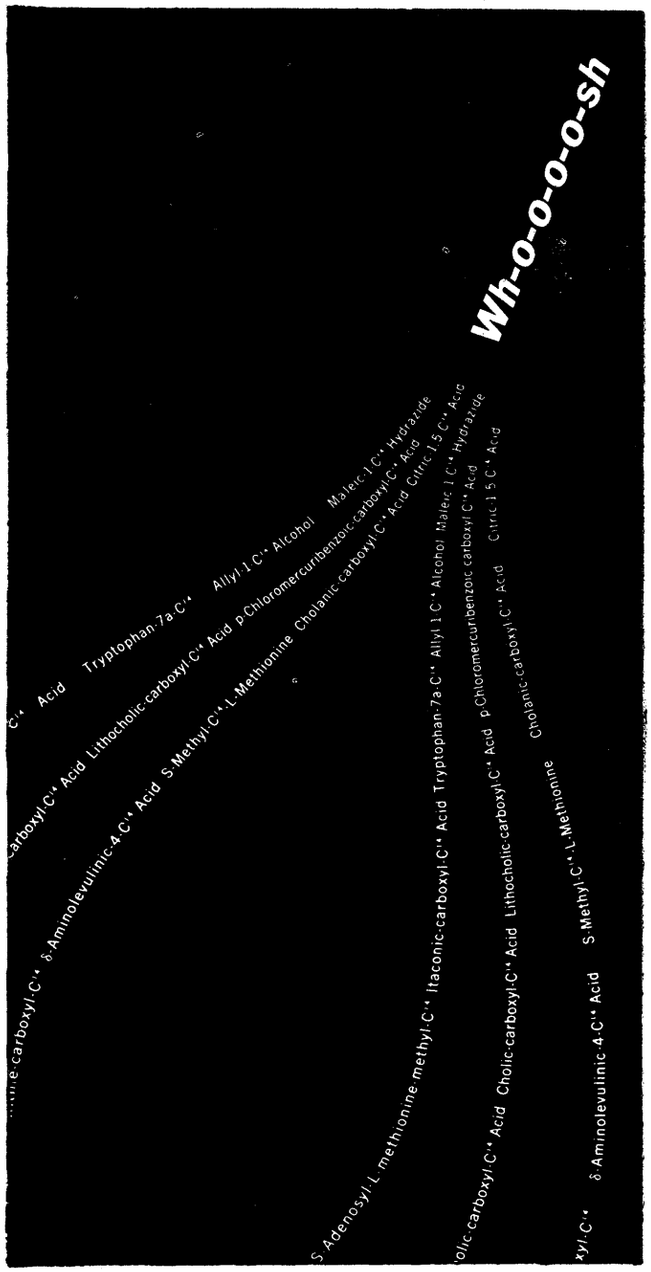
1–5. **Instrumentation Science**, 3rd research conf., Instrument Soc. of America, William Smith College, Geneva, N.Y. (K. B. Schnell, ISA, 530 William Penn Pl., Pittsburgh, Pa. 15219)

1–6. **Nuclear Physics**, intern. seminar, Joensuu, Finland. (Research Inst. for Theoretical Physics, Univ. of Helsinki, Helsinki, Finland)

1–6. European **Seismological Commission**, mtg., Copenhagen, Denmark. (E. Peterschmitt, Inst. de Physique du Globe, 38, boulevard d'Anvers, Strasbourg, France)

1–6. **Upper Mantle**, symp., Copenhagen, Denmark. (H. C. Smith, Upper Mantle Commission, Geological Survey of Canada, Ottawa, Ont.)

1–7. International Union of **Scientific Psychology**, 18th congr., Moscow, U.S.S.R. (Secretary-General, Dept. of Psychology, Univ. of Moscow, Marx Ave. 18, Moscow)



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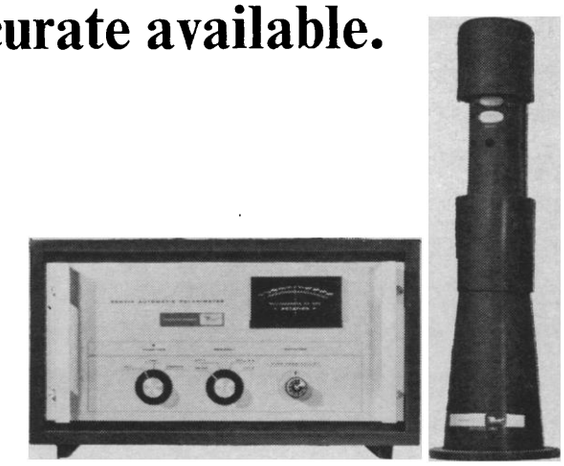

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2–4. **Vaso-Active Polypeptides**, symp., Ribeiraõ Prêto, Brazil. (M. Rocha e Silva, Dept. of Pharmacology, Faculty of Medicine, Ribeiraõ Prêto)

2–5. **Synaptic Mechanisms**, symp., Rio de Janeiro, Brazil. (C. Chagas, Inst. of Biophysics, Natl. Faculty of Medicine, Avda. Pasteur 458, Rio de Janeiro)

3–8. International **Geographical Union**, Latin American regional conf., Mexico City, Mexico. (A. Bassols Batalla, Mexican Soc. of Geography and Statistics, Justo Sierra 19, Mexico City 1)

3–10. **Nutrition**, 7th intern. congr., Hamburg, West Germny. (U. Ritter, 1st Medical Clinic of the University, Martinistr. 52, Hamburg 20)

4–11. **Psychology**, 18th intern. congr., Moscow, U.S.S.R. (A. R. Luria, Univ. of Moscow, 13 Frunze Str., Moscow G. 19)

7–12. Latin American Assoc. of **Physiological Sciences**, 7th mtg., Mar del Plata, Argentina. (V. G. Foglia, Paraguay 2155 7th flr., Buenos Aires, Argentina)

8–10. Society for **Cryobiology**, annual mtg., Boston, Mass. (I. Wodinsky, A. D. Little Co., 30 Memorial Dr., Cambridge, Mass.)

8–11. **Biometry and Statistics in Food, Population, and Health Research**, mtg., Mexico City, Mexico. (General Secretariat, Intern. Union of Biological Sciences, Dept. of Zoology, Univ. of Washington, Seattle 98105)

8–12. **Heat Transfer**, 3rd intern. conf., Chicago, Ill. (T. F. Irvine, College of Engineering, State Univ. of New York, Long Island Center, Stoney Brook)

8–12. National **Medical Assoc.**, 71st annual session, Chicago, Ill. (J. T. Givens, 2400 Corprew Ave., Norfolk, Va.)

8–13. **Anesthesiology**, 2nd European congr., Copenhagen, Denmark. (H. Poulson, Dept. of Anesthesia, University Hospital, Aarhus, Denmark)

10–11. European Assoc. for **Animal Production**, study commissions, mtgs., Edinburgh, Scotland. (K. Kállay, Corso Trieste 67, Rome, Italy)

10–12. Applications of **X-ray Analysis**, 15th annual conf., Denver, Colo. (J. B. Newkirk, Metallurgy Div., Denver Research Inst., Univ. of Denver, Denver 80201)

11–18. **Animal Production**, 9th intern. congr., Edinburgh, Scotland (Congress Secretary, 5 Hope Park Sq., Edinburgh 8)

14–17. **Cryobiology**, intern. conf., Sapporo, Japan. (Z. Yosida, Inst. of Low Temperature Science, Hokkaido Univ., Sapporo)

14–17. **Soil Conservation** Soc. of America, Albuquerque, N.M. (H. W. Pritchard, 7515 NE Ankeny Rd., Ankeny, Iowa)

14–18. Canadian **Pharmaceutical** Assoc., 59th conv., St. John, New Brunswick. (P. W. Bell, 175 College St., Toronto 2B, Ont.)

14–19. American Inst. of **Biological Sciences**, 17th annual, Univ. of Maryland, College Park. (AIBS, 3900 Wisconsin Ave., Washington, D.C.)

14–19. **Ophthalmology**, 20th intern. congr., Munich, West Germany. (The Congress, Beethovenstr. 8, Munich 15)

14–20. **Combustion**, 11th intern. symp., Univ. of California, Berkeley. (Combustion Inst., 986 Union Trust Bldg., Pittsburgh, Pa. 15219)

14–21. American Assoc. of **Clinical Chemists**, natl. conv., Miami Beach, Fla. (G. T. Lewis, Univ. of Miami Medical School, Coral Gables, Fla.)

15–17. **Guidance and Control** Specialists, conf. Seattle, Wash. (D. B. DeBra, Dept. of Aeronautics and Astronautics, Stanford Univ., Stanford, Calif.)

15–17. Institute of **Mathematical Statistics**, Los Angeles, Calif. (G. E. Nicholson, Jr., Univ. of North Carolina, Chapel Hill)

15–17. German Speaking **Mycological** Soc., 6th scientific mtg., Vienna, Austria. (H. Rieth, The Society, Univ. Hautklinik, Martinistr. 52, 2 Hamburg 20, West Germany)

15–18. **Forensic Immunology, Medicine, Pathology, and Toxicology**, 4th intern. mtg., Copenhagen, Denmark (J. Voight, Dis Congr. Service, Skindergade 36, Copenhagen K)

15–18. **Physics of Snow and Ice**, conf., Sapporo, Japan. (Z. Yosida, Inst. of Low Temperature Science, Hokkaido Univ., Sapporo)

15–19. New England Assoc. of **Chemistry Teachers**, 28th summer conf., Dartmouth College, Hanover, N.H. (E. B. Moore, Science Dept., Hanover High School, Hanover, N.H.)

15–19. **Microscopy**, 13th intern. symp., Chicago, Ill. (W. C. McCrone, Research Inst., 451 E. 31 St., Chicago 60616)

15–19. American **Statistical** Assoc., Los Angeles, Calif. (D. C. Riley, The Association, 810 18th St. NW, Washington, D.C. 20006)

16. International Assoc. for the **Prevention of Blindness**, general assembly, Munich, West Germany. (J. P. Baillart, 47, rue de Bellechasse, Paris 7, France)

16–17. Central Nervous System Effects of **Analgesic Drugs**, symp., Santiago, Chile. (J. Mardones, Inst. of Pharmacology, Univ. of Chile, Casilla 12967, Santiago)

16–19. International Assoc. of **Milk, Food, and Environmental Sanitarians**, Minneapolis, Minn. (H. L. Thomasson, P.O. Box 437, Shelbyville, Ind. 46176)

16–26. **Mathematicians**, intern. congr., Moscow, U.S.S.R. (V. G. Karamanov, Acad. of Sciences of the U.S.S.R., Lenin Prospekt, Moscow)

17–19. Joint **Automatic Control** Conf., 7th annual, Univ. of Washington, Seattle. (G. Kovatch, NASA, Electronics Research Center, 575 Technology Sq., Cambridge, Mass. 02139)

19–26. Applied **Geography**, symp., Intern. Geographical Union Commission on Applied Geography, West Greenwich, R.I. (P. H. Nash, Graduate School, Univ. of Rhode Island, Kingston 02881)

19–28. **Geology**, 23rd intern. congr., Prague, Czechoslovakia. (Organizing Committee, Ústředni ústav geologický, Malostranské náměstí 19, Prague 1)

20–24. American **Phytopathological** Soc., Denver, Colo. (C. J. R. Shay, Dept. of Botany and Plant Pathology, Purdue Univ., Lafayette, Ind. 47907)

20–25. **Diseases of the Chest**, 9th intern. congr., Copenhagen, Denmark. (M. Kornfeld, American College of Chest Physicians, 112 E. Chestnut St., Chicago, Ill. 60611)

21–24. **Free Radicals in Solution**, in-

tern. symp. Ann Arbor, Mich. (R. C. Elderfield, Dept. of Chemistry, Univ. of Michigan, Ann Arbor 48104)

21–25. American Soc. of **Agronomy**, Oklahoma State Univ., Stillwater. (M. Stelly, The Society, 677 S. Segoe Rd., Madison, Wis. 53711)

21–25. **Electron Microscopy** Soc. of America, San Francisco, Calif. (G. Thomas, Dept. of Mineral Technology, Univ. of California, Berkeley)

21–26. **Hematology**, 11th Intern. congr., Sydney, Australia. (F. P. Walsh, 1 York St., Sydney)

21–26. **Illuminating Engineering** Soc., natl. technical conf., Minneapolis, Minn. (A. D. Hinckley, The Society, 345 E. 47 St., New York 10017)

21–7. British Assoc. for the **Advancement of Science**, 128th annual mtg., Nottingham, England. (Secretary, 20 Great Smith St., 3 Sanctuary Bldg., London S.W.1)

22–24. **Physiology**, 12th Scandinavian congr., Turku, Finland. (K. Hartiala, Dept. of Physiology, Turku Univ., Turku)

22–26. Society of **Photo-Optical Instrumentation** Engineers, 11th annual technical symp., St. Louis, Mo. (R. T. Hedden, 16 Harneywold Dr., St. Louis 63136)

22–26. **Poultry Science** Assoc., Utah State Univ., Logan. (C. B. Ryan, Dept. of Poultry Science, Texas A&M Univ., College Station 77843)

22–27. **Food Science and Technology**, 2nd intern. congr., Warsaw, Poland. (A. Borys, Inst. Przemyslu Miesnego, Rakowiecka 36, Warsaw 12)

22–27. **History of Medicine**, 20th intern. congr., Berlin, Germany. (Secretariat, Augustastr. 37, 1 Berlin 45)

22–27. Pan American Federation of Associations of **Medical Schools**, 1st general assembly, Bogota, Colombia. (E. Braga, Caixa Postal 26-ZC-39, Rio de Janeiro, GB, Brazil)

22–10. **Science**, 11th Pacific congr., Tokyo, Japan. (Pacific Science Assoc., Bishop Museum, Honolulu, Hawaii 96819)

23–25. **Biological Photographic** Assoc., 36th annual mtg., Lexington, Ky. (P. Brook, The Association, Cornell Univ. Medical College, 1300 York Ave., New York, N.Y.)

23–26. **Electronics**, western show and conv., Los Angeles, Calif. (S. Sensiper, WESCON, 3600 Wilshire Blvd., Suite 1920A, Los Angeles 99005)

23–30. **Luminescence**, intern. congr., Budapest, Hungary. (G. Szigeti, Research Inst. for Technical Physics, Hungarian Acad. of Sciences, P.O. Box Ujpest 1, No. 76, Budapest)

23–1. **Radio Astronomy** and the Galactic System, symp., Noordwijk, Netherlands. (J. H. Oort, University Observatory, Leiden, Netherlands)

24–29. International Soc. of **Blood Transfusion**, 11th biennial congr., Sydney, Australia. (G. T. Archer, 1 York St., Sydney)

24–29. **Prehistoric and Protohistoric Sciences**, 7th intern. congr., Prague, Czechoslovakia. (S. J. De Laet, Seminaire d'Archéologie de l'Université, 2 Blandijnberg, Ghent, Belgium)

25. Scandinavian **Pharmacologists**, mtg., Turku, Finland. (K. Hartiala, Dept. of Physiology, Turku Univ., Turku)

NEW BOOKS

(Continued from page 1498)

ical geohydrology" by William Back and Bruce B. Hanshaw; "Hydrodynamics of the dolphin," by Max O. Kramer; "Hydromechanics of inland navigation" by Shu-T'ien Li; and "Technical development in ground water recharge" by Paul Baumann.

Advances in Magnetic Resonance. vol. 1. John S. Waugh, Ed. Academic Press, New York, 1965. 425 pp. Illus. $15. Six papers: "The theory of relaxation processes" by A. G. Redfield; "Chemical rate processes and magnetic resonance" by Charles S. Johnson, Jr.; "Nuclear magnetic resonance of paramagnetic molecules" by D. R. Eaton and W. D. Phillips; "Theory of nuclear spin-spin coupling" by Michael Barfield and David M. Grant; "Geminal and vicinal proton-proton coupling constants in organic compounds" by Aksel A. Bothner-By; and "Electron spin resonance of radical ions" Kerry W. Bowers.

Advances in Quantum Chemistry. vol. 2. Per-Olov Löwdin. Academic Press, New York, 1965. 384 pp. Illus. $14.50. Seven papers: "Quantum calculations, which are accumulative in accuracy, unrestricted in expansion functions, and economical in computation" by S. F. Boys and P. Rajagopal; "Zero differential overlap in π-electron theories" by Inga Fischer-Hjalmars; "Theory of atomic hyperfine structure" by S. M. Blinder; "The theory of pair-correlated wave functions" by R. McWeeny and E. Steiner; "Quantum chemistry and crystal physics, stability of crystals of rare gas atoms and alkali halides in terms of three-atom and three-ion exchange interactions" by Laurens Jansen; "Charge fluctuation interactions in molecular biophysics" by Herbert Jehle; and "Quantum genetics and the aperiodic solid. Some aspects on the biological problems of heredity, mutations, aging, and tumors in view of the quantum theory of the DNA molecule" by Per-Olov Löwdin.

Algebra der Logik (Exakte Logik). vols. 1 and 3. Ernst Schröder. Chelsea, New York, ed. 2, 1966. vol. 1, 731 pp.; vol. 2, 633 pp.; vol. 3, 825 pp. Illus. $35 set.

Algebraic Structure Theory of Sequential Machines. J. Hartmanis and R. E. Stearns. Prentice-Hall, Englewood Cliffs, N.J., 1966. 221 pp. Illus. $12. Prentice-Hall International Series in Applied Mathematics.

Atlas of Electrochemical Equilibria in Aqueous Solutions. Marcel Pourbaix. Translated from the French by James A. Franklin. Centre Belge d'Etude de la Corrosion CEBELCOR, Brussels; Pergamon Press, New York, 1966. 644 pp. Illus. $36.

Automatic Control and Computer Engineering. vol. 3. V. V. Solodovnikov, Ed. Translated from the Russian edition (Moscow, 1960) by O. M. Blunn. Tribhuan Prasad, Translation Ed. Pergamon, New York, 1966. 455 pp. Illus. $15.50. Ten papers: "Control algorithms and control computers in complex automation" by V. V. Solodovnikov; "Stability 'in the large' and self-oscillation of one- and two-stage non-linear servomechanisms" by V. V. Petrov; "Pulse control systems" by G. S. Pospelov; "Dynamic features of linear

operations on digital computers" by A. G. Getmanov; "Concerning the non-stationary properties of pulse systems" by M. D. Potapov; "Practical methods in the linear theory of control systems with variable parameters" by A. S. Shatalov; "Aspects of the theory of variable linear systems in the presence of random inputs" by A. M. Batkov; "Methods of improving the quality of control systems by non-linear devices and a computer" by G. M. Ostrovskii; "Analysis and synthesis of simple optimum second order relay systems" by A. A. Pavlov and V. P. Putsillo; and "The stability and self-oscillation of acoustic systems containing compressors and the suppression of self-oscillation by feedback" by V. A. Bodner and V. V. Kazakevich.

Basic Chemical Thermodynamics. Jürg Waser. Benjamin, New York, 1966. 296 pp. Illus. Paper, $3.95; cloth, $8.

Basic Concepts in Quantum Mechanics. Alexander S. Kompaneyets. Translated from the Russian edition by Scripta Technica. Leon F. Landovitz, Translation Ed. Reinhold, New York, 1966. 160 pp. Illus. Paper, $3.95.

Basic Electronics for Scientists. James J. Brophy. McGraw-Hill, New York, 1966. 487 pp. Illus. $12.75.

Basic Organic Chemistry: A Mechanistic Approach. J. M. Tedder and A. Nechvatal. Wiley, New York, 1966. 252 pp. Illus. Paper, $3.75.

Die Bewegungsgruppen der Kristallographie. J. J. Burckhardt. Birkhäuser, Basel, Switzerland, 1966. 209 pp.

Bond Energies, Ionization Potentials, and Electron Affinities. V. I. Vedeneyev, L. V. Gurvich, V. N. Kondrat'yev, V. A. Medvedev, and Ye. L. Frankevich. Translated from the Russian edition (Moscow, 1962) by Scripta Technica. St. Martin's Press, New York, 1966. 216 pp. Illus. $8.50.

Chemistry: A Structural View. D. R. Stranks, M. L. Heffernan, K. C. Lee Dow, P. T. McTigue, and G. R. A. Withers. Cambridge Univ. Press, New York, 1965. 485 pp. Illus. $9.50.

Chemistry and Physics of Carbon: A Series of Advances. vol. 1. Philip A. Walker, Jr., Ed. Dekker, New York, 1965. 398 pp. Illus. $13.75. Six papers: "Dislocations and stacking faults in graphite" by S. Amelinckx, P. Delavignette, and M. Heerschap; "Gaseous mass transport within graphite" by G. F. Hewitt; "Microscopic studies of graphite oxidation" by J. M. Thomas; "Reactions of carbon with carbon dioxide and steam" by Sabri Ergun and Morris Mentser; "The formation of carbon from gases" by Howard B. Palmer and Charles F. Cullis; and "Oxygen chemisorption effects on graphite thermoelectric power" by P. L. Walker, Jr., L. G. Austin, and J. J. Tietjen.

Computational Techniques for Chemical Engineers. H. H. Rosenbrock and C. Storey. Pergamon, New York, 1966. 346 pp. Illus. $13.50.

A Course in Thermodynamics. Joseph Kestin. Blaisdell (Ginn), Waltham, Mass., 1966. 637 pp. Illus. $14.50.

A Course of Mathematics for Engineers and Scientists. vol. 6, *Advanced Theoretical Mechanics*. Brian H. Chirgwin and Charles Plumpton. Pergamon, New York, 1966. 517 pp. Illus. $8.

CRC Handbook of Tables for Probability and Statistics. William H. Beyer, Ed. Chemical Rubber Co., Cleveland, Ohio, 1966. 378 pp. Illus. $15.

Crystal Physics. G. S. Zhdanov. Translated from the Russian by A. F. Brown. Academic Press, New York, 1965. 510 pp. Illus. $15.50.

Dipole Methods for Measuring Earth Conductivity. L. M. Al'pin, M. N. Berdichevskii, G. A. Vedrintsev, and A. M. Zagarmistr. Consultants Bureau, New York, 1966. 316 pp. Illus. Paper, $27.50. The papers in this collection were selected and translated from the Russian by George V. Keller and were published between 1950 and 1963.

Direct Generation of Electricity. K. H. Spring, Ed. Academic Press, New York, 1965. 420 pp. Illus. $16. Six papers: "The thermodynamic and economic basis" by K. H. Spring; "Fuel cells" by I. Dugdale; "MHD generation" by D. T. Swift-Hook; "The thermionic converter" by R. V. Harrowell; "Thermoelectric generation" by D. A. Wright; and "Miscellaneous conversion methods" by K. H. Spring.

Electrical Instruments in Hazardous Locations. Ernest C. Magison. Plenum Press, New York, 1966. 235 pp. Illus. $22.50.

Electrodeposition of Metals in Ultrasonic Fields. Sergei Mikhailovich Kochergin and Galina Yakovlevna Vyaseleva. Translated from the Russian edition (Moscow, 1964). Consultants Bureau, New York, 1966. 77 pp. Illus. Paper, $12.50.

Electronic Drafting and Design. Nicholas M. Raskhodoff. Prentice-Hall, Englewood Cliffs, N.J., 1966. 608 pp. Illus. $15.95.

Elementary Number Theory. Edmund Landau. Translated from the German edition (1947) by Jacob E. Goodman. Chelsea, New York, ed. 2, 1966. 256 pp. Illus. $4.95.

Elementary Physics. F. W. Van Name, Jr. Prentice-Hall, Englewood Cliffs, N.J., 1966. 303 pp. Illus. $7.95.

Elementary Statistics. Paul G. Hoel. Wiley, New York, ed. 2, 1966. 361 pp. Illus. $7.25.

Elements of Abstract Algebra. Richard A. Dean. Wiley, New York, 1966. 340 pp. Illus. $7.95.

Essentials of Physics. A text for students of science and engineering. Sidney Borowitz and Arthur Beiser. Addison-Wesley, Reading, Mass., 1966. 720 pp. Illus. $11.75. Addison-Wesley Series in Physics.

Evaluation of Concrete Properties from Sonic Tests. E. A. Whitehurst. American Concrete Inst., Detroit, Mich.; Iowa State Univ. Press, Ames, 1966. 106 pp. Illus. $4.50. American Concrete Inst. Monograph No. 2.

Experimental Physics at Low Temperatures. An introductory survey. Lachlan Mackinnon. Wayne State Univ. Press, Detroit, Mich., 1966. 281 pp. Illus. $9.95.

Field-Effect Transistors: Physics, Technology, and Application. J. Torkel Wallmark and Harwick Johnson, Eds. Prentice-Hall, Englewood Cliffs, N.J., 1966. 400 pp. Illus. $12.75. Prentice-Hall Electrical Engineering Series, edited by William L. Everitt. Contributors are Schuyler M. Christian, David M. Griswold, Fred P. Heiman, Steven R. Hofstein, Harwick

Johnson, Paul E. Kolk, Dietrich Meyerhofer, A. Karl Rapp, Akos G. Revesz, Albert Rose, J. Torkel Wallmark, Paul K. Weimer, and Karl H. Zaininger.

Fundamental Analogue Techniques. R. J. A. Paul. Macmillan, New York, 1966. 226 pp. Illus. $6.50.

Fundamentals of Automation and Remote Control. S. A. Ginzburg, I. Ya. Lekhtman, and V. S. Malov. Translated from the second Russian edition (Moscow) by R. Farkas and J. J. Schorr-Kon. J. M. Howl, Translation Ed. Pergamon, New York, 1966. 512 pp. Illus. $15.

Fundamentals of Transistors: A Programmed Text. Prepared by Technical Training Staff, Radio Corporation of America. Prentice-Hall, Englewood Cliffs, N.J., 1966. 239 pp. Illus. $10.

Geometric Transformations. vols. 1 and 2. vol. 1, *Euclidean and Affine Transformation* (170 pp.); vol. 2, *Projective Transformations* (148 pp.). P. S. Modenov and A. S. Parkhomenko. Translated from the Russian edition (Moscow, 1961) by Michael B. P. Slater. Academic Press, New York, 1966. Illus. Paper, $2.45 each; cloth, $5.50 each.

The Glow Discharge: And an Introduction to Plasma Physics. F. Llewellyn-Jones. Methuen, London; Wiley, New York, 1966. 221 pp. Illus. $5. Methuen's Monographs on Physical Subjects Series.

Handbook of Metal Powders. Arnold R. Poster, Ed. Reinhold, New York; Chapman and Hall, London, 1966. 284 pp. Illus. $15.

Homotopy Theory and Duality. Peter Hilton. Gordon and Breach, New York, 1966. 234 pp. Illus. Paper, $5.95; cloth, $11. Notes on Mathematics and Its Applications Series.

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The Identification of Organic Compounds. A manual of qualitative and quantitative methods. Stig Veibel. Gad, Copenhagen, ed. 6, 1966. 468 pp. Illus.

Inorganic Chemistry. Vol. 2, *Metals*. C. S. G. Phillips and R. J. P. Williams. Oxford Univ. Press, New York, 1966. 693 pp. Illus. $8.

Insoluble Monolayers at Liquid-Gas Interfaces. George L. Gaines, Jr. Interscience (Wiley), New York, 1966. 400 pp. Illus. $14.

Introduction to Chemical Thermodynamics. M. H. Everdell. Norton, New York, 1966. 464 pp. Illus. $8.75.

Introduction to Electron Microscopy. Cecil E. Hall. McGraw-Hill, New York, ed. 2, 1966. 409 pp. Illus. $17.50. International Series in Pure and Applied Physics.

Kinetic Methods of Analysis. K. B. Yatsimirskii. Translated by P. J. J. Harvey. Pergamon, New York, 1966. 171 pp. Illus. $7.50. International Series of Monographs in Analytical Chemistry, vol. 25.

Laboratory Course in Physical Chemistry. Hugh W. Salzberg, Jack I. Morrow, and Stephen R. Cohen. Academic Press, New York, 1966. 335 pp. Illus. $7.75.

Mathematical Introduction to Celestial Mechanics. Harry Pollard. Prentice-Hall, Englewood Cliffs, N.J., 1966. 123 pp. Illus. $6. Prentice-Hall Mathematics Series.

Measurement and Analysis of Random Data. Julius S. Bendat and Allan G. Piersol. Wiley, New York, 1966. 406 pp. Illus. $17.75.

Modern Technical Physics. Arthur Beiser. Addison-Wesley, Reading, Mass., 1966. 720 pp. Illus. $9.75.

A New Physics of Matter and Energy. J. A. Nissim. Lewis, London, 1966. 351 pp. Illus. £2.2s.

Nonlinear Electron-Wave Interaction Phenomena. Joseph E. Rowe. Academic Press, New York, 1965. 605 pp. Illus. $18. Electrical Science Series of Monographs and Texts, edited by Henry G. Booker and Nicholas DeClaris.

The Organic Chemistry of Titanium. Raoul Feld and Peter L. Cowe. Butterworth, Washington, 1965. 221 pp. Illus. $9.95.

Physical Chemistry. Frank T. Gucker and Ralph L. Seifert. Norton, New York, 1966. 846 pp. Illus. $10.

Polymorphism and Polytypism in Crystals. Ajit Ram Verma and P. Krishna. Wiley, New York, 1966. 361 pp. Illus. $12.75.

Quantum Mechanics. D. I. Blokhintsev. Translated from the third and fourth Russian editions by J. B. Sykes and M. J. Kearsley. Reidel, Dordrecht, Holland; Gordon and Breach, New York, 1966. 551 pp. Illus. $17.50.

Quantum Mechanics. A. A. Sokolov, Y. M. Loskutov, and I. M. Ternov. Translated from the Russian edition (Moscow, 1962) by Scripta Technica. Holt, Rinehart, and Winston, New York, 1966. 557 pp. Illus. $11.

Senior Science for High School Students. pts. 1 and 2. pt. 1, *Physics* (480 pp.); pt. 2, *Chemistry* (488 pp.). Nuclear Research Foundation, Senior Science Textbook Group of Authors and Editors. H. Messel, Chairman. Nuclear Research Foundation, Univ. of Sydney, Australia, 1966. Illus.

Some Topics in Complex Analysis. E. G. Phillips. Pergamon, New York, 1966. 149 pp. Illus. $5.50. International Series of Monographs in Pure and Applied Mathematics, vol. 86, edited by I. N. Sneddon, M. Stark, and S. Ulam.

Statics of Deformable Bodies. Nils O. Myklestad. Macmillan, New York, 1966. 350 pp. Illus. $11.95. Macmillan Series in Applied Mechanics, edited by Fred Landis.

Techniques of Oscillographic Polarography. Robert Kalvoda. SNTL-Publishers of Technical Literature, Prague, 1965; Elsevier, New York, ed. 2, 1966. 214 pp. Illus. $12.50.

Tensor Calculus through Differential Geometry. J. Abram. Butterworth, London, 1965. 176 pp. Illus. $7.50.

Thermoanalytical Methods of Investigation. Paul D. Garn. Academic Press, New York, 1965. 622 pp. Illus. $19.50.

Thin Layer Chromatography: A Practical Laboratory Handbook. A. A. Akhrem and A. I. Kuznetsova. Translated from the Russian edition (Moscow, 1964) by J. Schmorak. Israel Program for Scientific Translations, Jerusalem, 1965; Davey, New York, 1966. 136 pp. Illus. $8.75.

Weather Studies. L. P. Smith. Pergamon, New York, 1966. 139 pp. Illus. Paper, $2.45. The Commonwealth and International Library.