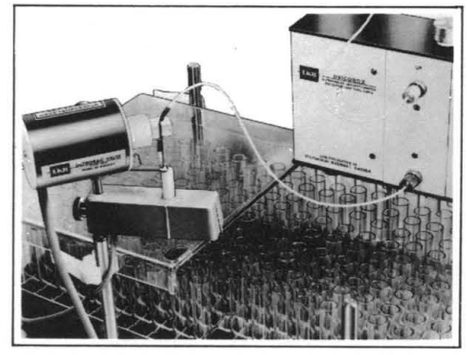
SCIENCE

8 August 1969
Vol. 165, No. 3893

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

The LKB UV Analyzer,
the Uvicord is completely compatible with the UltroRac.
The Uvicord detector unit is here shown incorporated,
with the UltroRac, in a separation system.



LKB IN THE SERVICE OF SCIENCE

LKB INSTRUMENTS INC.● 12221 PARKLAWN DRIVE ● ROCKVILLE Md. 20852

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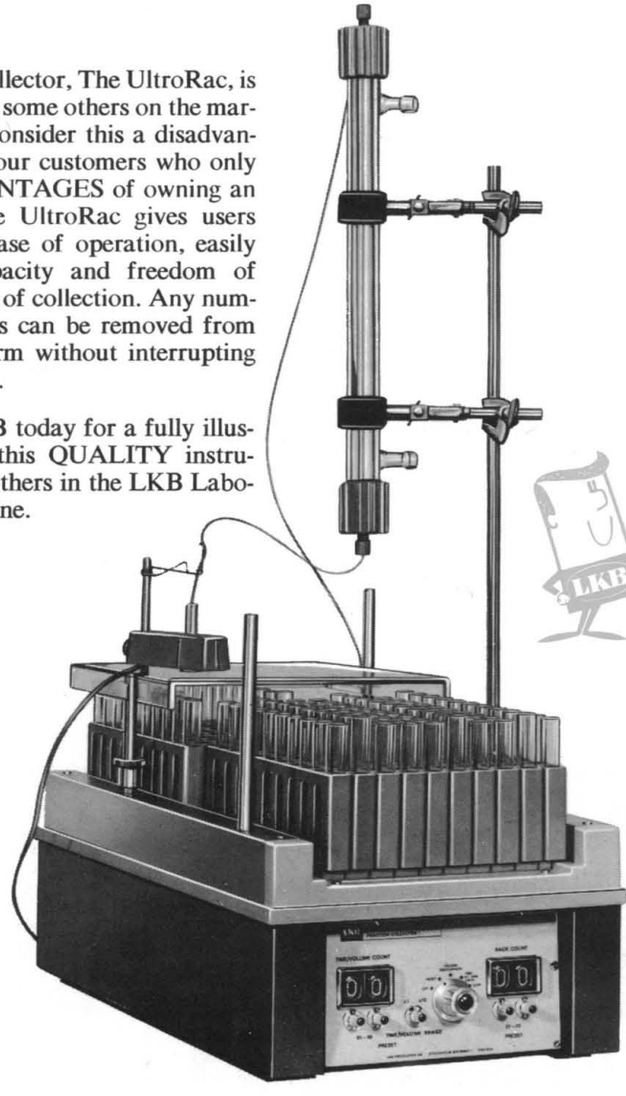
Yes, our Fraction Collector, The UltroRac, is a fraction larger than some others on the market, but we do not consider this a disadvantage and neither do our customers who only speak of the ADVANTAGES of owning an LKB UltroRac. The UltroRac gives users reliable collection, ease of operation, easily varied test-tube capacity and freedom of choice in the method of collection. Any number of test-tube racks can be removed from the collecting platform without interrupting the collecting process.

Write or phone LKB today for a fully illustrated brochure on this QUALITY instrument and the many others in the LKB Laboratory Instruments Line.



NO DROPS EVER MISS THE TUBES, EITHER

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- Polypropylene racks
- Provision for event marking
- Power outlet for flow pump
- Electronic counting system
- Positive flow control

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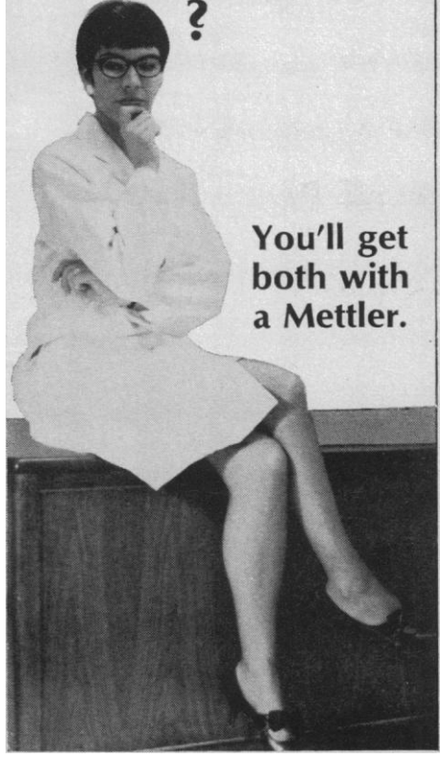
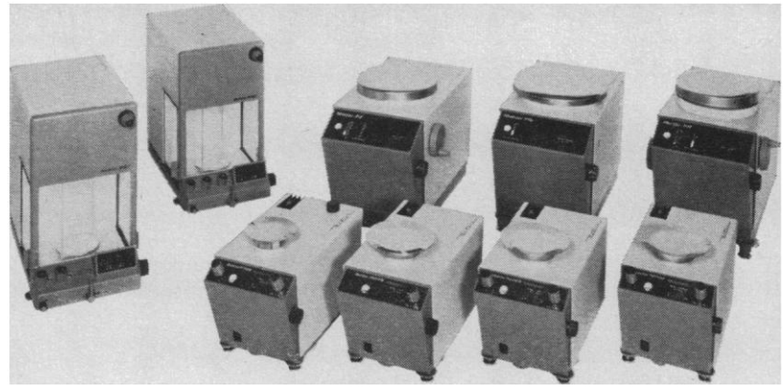
Why choose between economy and performance when you buy a balance ?





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

SPEED + PRECISION = PERFORMANCE

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

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

MANY TO CHOOSE FROM

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

THE ECONOMICAL ANALYTICALS

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

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

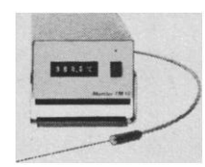
WEIGHT WATCHING MADE EASY

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

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

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

When is a Mettler NOT a balance?



When it's our TM 15 digital platinum resistance thermometer. Portable and precise, it provides absolute accuracies up to ±0.15°C over the −20 to +300°C range. The sensors may be changed without recalibration and provide a linear output to other instruments.

For information or a demonstration of a Mettler balance or the new TM 15, write Mettler Instrument Corporation, 20 Nassau St., Princeton, N.J. 08540.

Mettler®

8 August 1969
Vol. 165, No. 3893

SCIENCE

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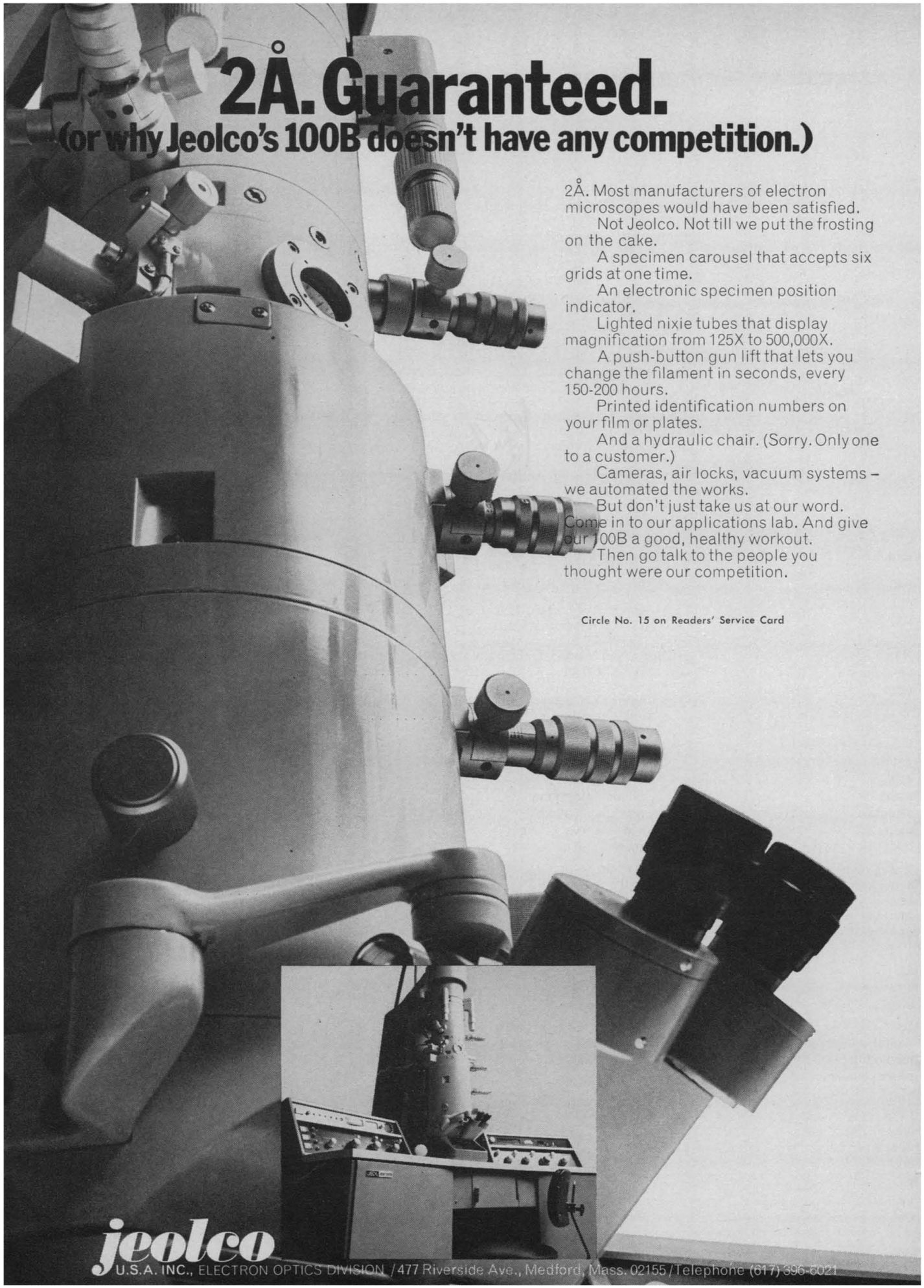
AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

The American Association for the Advancement of Science was founded in 1848 and incorporated in 1874. Its objects are to further the work of scientists, to facilitate cooperation among them, to improve the effectiveness of science in the promotion of human welfare, and to increase public understanding and appreciation of the importance and promise of the methods of science in human progress.

COVER

A forest fire sweeps through a valley in Boise National Forest, Idaho. Foresters are using small controlled fires to burn off accumulated underbrush and avoid major conflagrations such as this. See page 568. [U.S. Forest Service]



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A specimen carousel that accepts six grids at one time.

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Then go talk to the people you thought were our competition.

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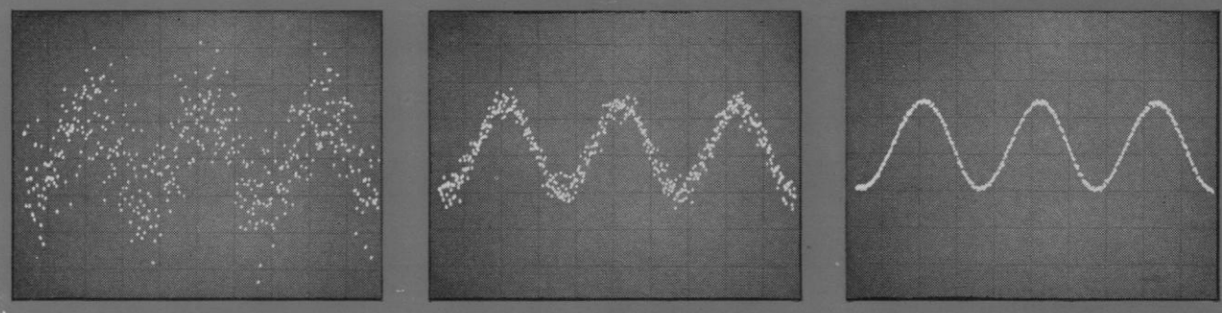

...and they're always on the scope of an HP Signal Analyzer

When you average and display physiological or other noisy signals on the HP 5480A Signal Analyzer, they stay right where you want them. Conventional signal averaging techniques for retrieving signals buried in noise let the waveforms grow and waver until eventually they wander off the scope, and often you don't get the picture till the averaging is completed.

With the new HP 5480A Signal Analyzer, you can always see what is going on. You have a flicker-free picture, no matter how slow your sweep speed. The display is always calibrated. The only change observable is the reduction of noise in your signal.

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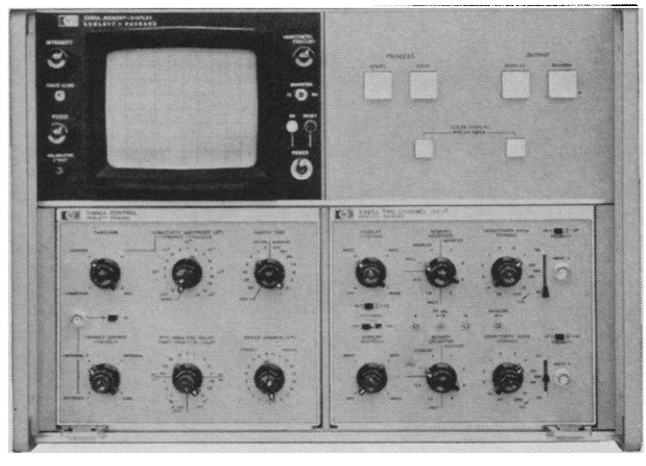
If you prefer to use the conventional summation techniques of averaging where your signal "grows" during the averaging process, it can be done with the flick of a front panel switch. Another flick of the switch and the display is automatically calibrated at the end of a preset number of sweeps.

Use it to monitor noise or obtain a signal for variance analysis. Or use it for histogram generation and multichannel scaling. There are two input channels for averaging or summing of two events. Plug-in construction guards against obsolescence.

Specially designed to interface easily with many analog and digital devices, an input/output coupler will give flexibility in feeding data to digital processing equipment, including general purpose computers such as HP's 2116A or 2115A.

The accuracy of true averaging plus the convenience of steady, flicker-free traces brings a new dimension to a variety of analytical fields such as electroencephalography, cardiography, neurology, spectroscopy and other medical, biological, chemical and physical research. Price: **$9,950.**

For complete details and comprehensive data sheets, call your local HP field engineer or write Hewlett-Packard, Palo Alto, California 94304; Europe: 54 Route des Acacias, Geneva.



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DIGITAL ANALYZERS

02804C

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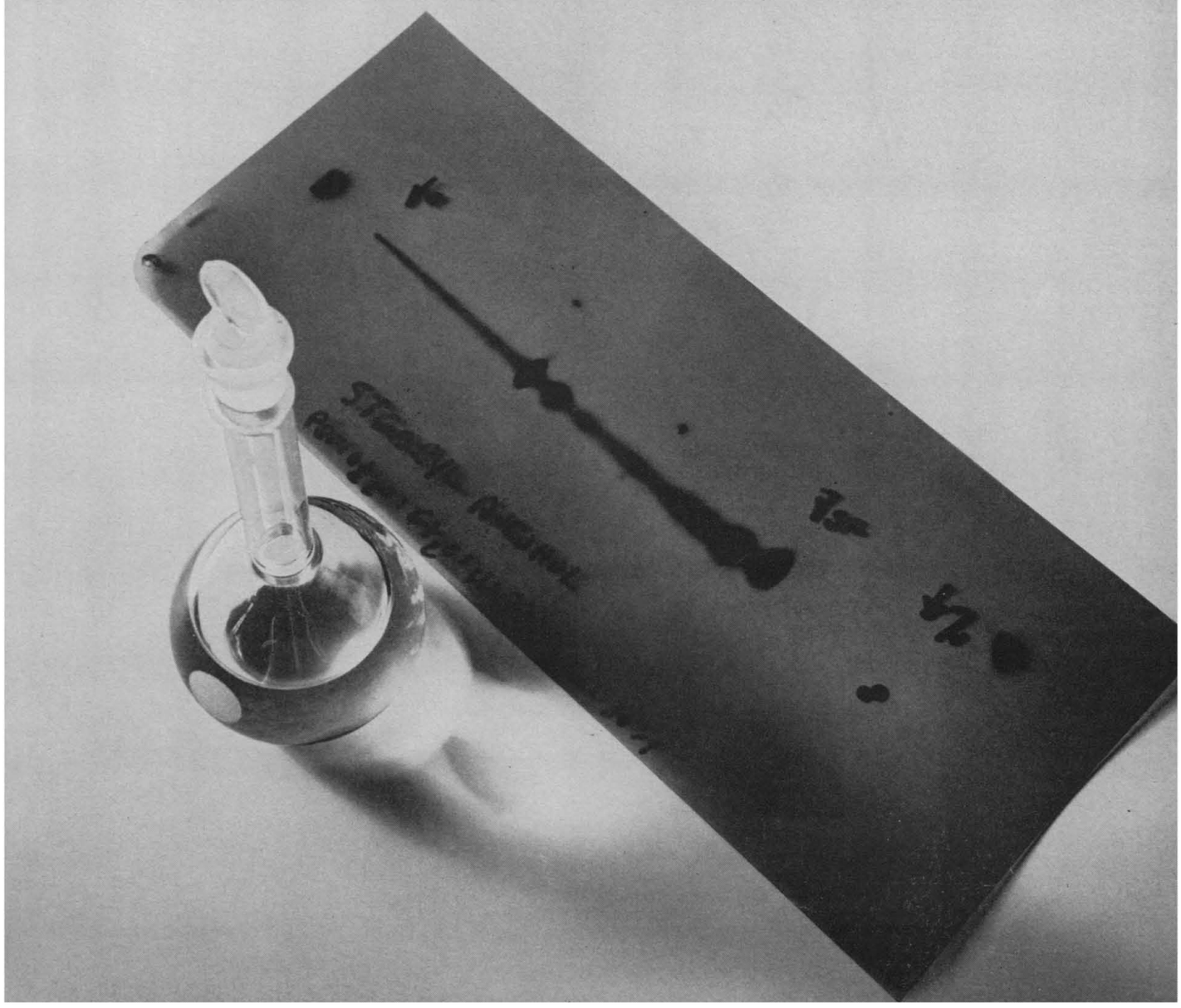

Nearly anything* vs. time.

***Voltage, current, temperature, pH, photometric absorption, weight, position, volume of titrant, applied voltage, wavelength, etc., etc.**

Our Model MR Recorder. A recording potentiometer with all of the versatility, precision, speed, and sensitivity you could ask for.

It'll measure and record voltage or current. Or virtually anything that can be translated into those terms. Or any variable that can be related to time by synchronous drive.

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At $2650 (basic price), the MR can take the place of several less versatile recorders. Anything they can chart, the MR can chart better.

The preceding disclosures should prompt you to find out more. From your Sargent-Welch representative or by writing to us. 9-222

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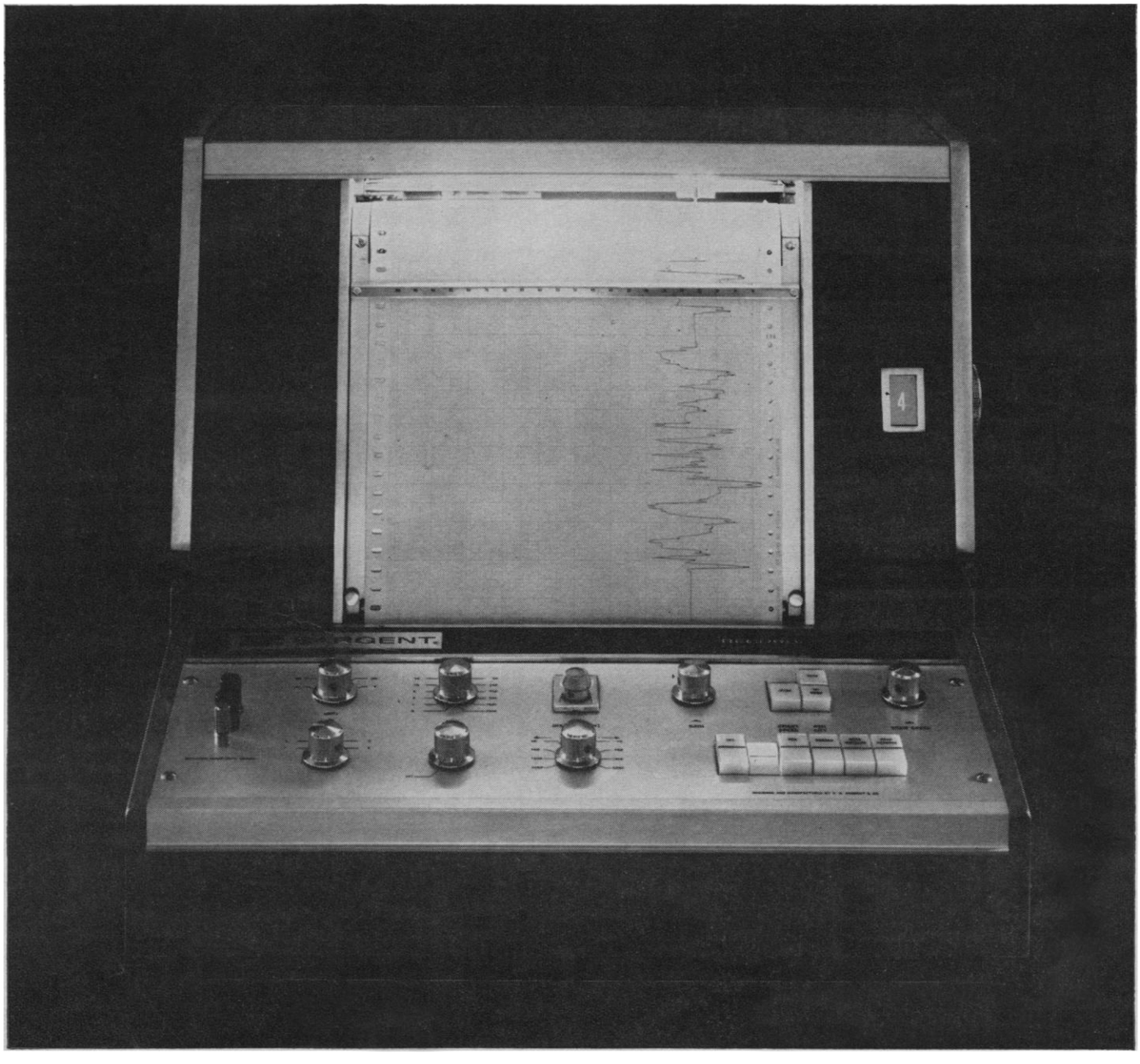

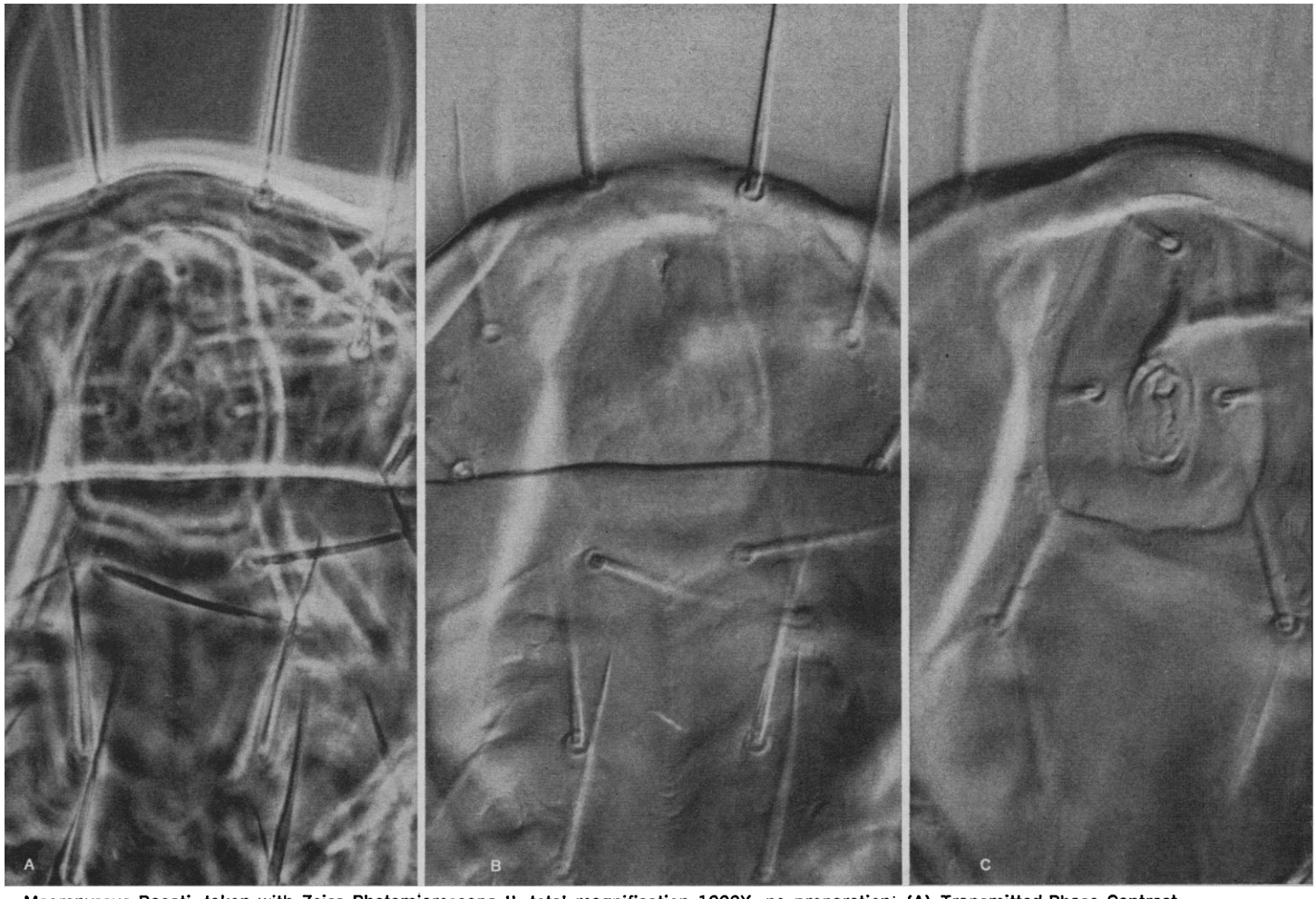

Macronyssus Bacati, taken with Zeiss Photomicroscope II, total magnification 1000X, no preparation. (A) Transmitted Phase Contrast; (B&C) Nomarski Interference Contrast in two different focal planes. Notice the 3-dimensional effect.

How to make an optical slice of life.

You do it with Nomarski differential interference microscopy, a versatile phase- and amplitude-contrast system which vastly improves images both of unstained living cells and fixed and stained preparations of cells or tissues.

Like the phase-contrast and image-duplication interference microscopes, the Nomarski system generates contrast optically by interference of light waves traversing slightly different optical paths. What sets the Nomarski system apart is that differential interference produces an "optically shadow-cast" image relatively free from disturbance from out-of-focus details. Because contrast is developed only in a very thin depth of field (as little as 0.2 μm), it is possible to make "optical sections" for detailed non-destructive analysis of living material.

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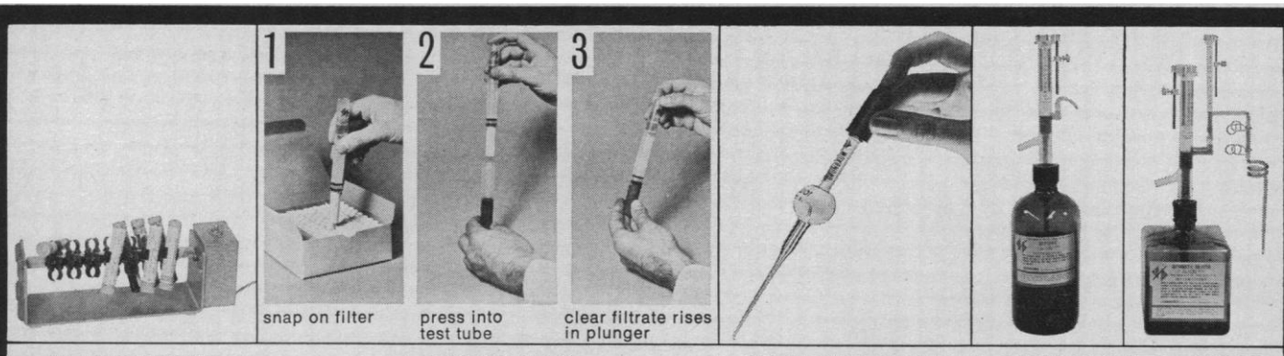

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3. GRUNBAUM PIPETS (The Perfect Pipet). The versatile GRUNBAUM micro-pipet aliquots, dilutes, transfers, and stores reagents. It's the only pipet that can handle ether, alcohol, acetone, etc. It's self-adjusting, self-filling, non-dripping and self-cleaning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

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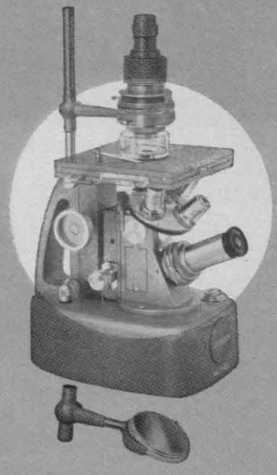
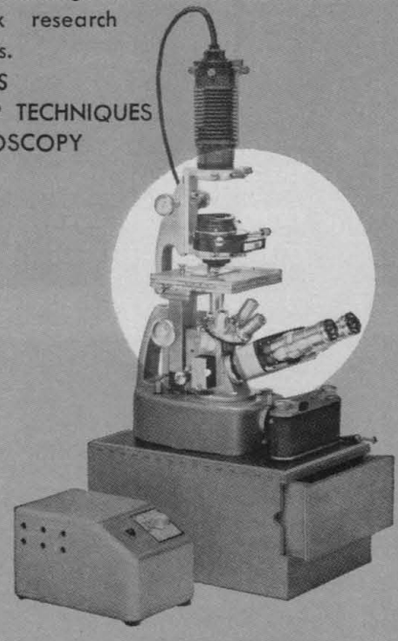
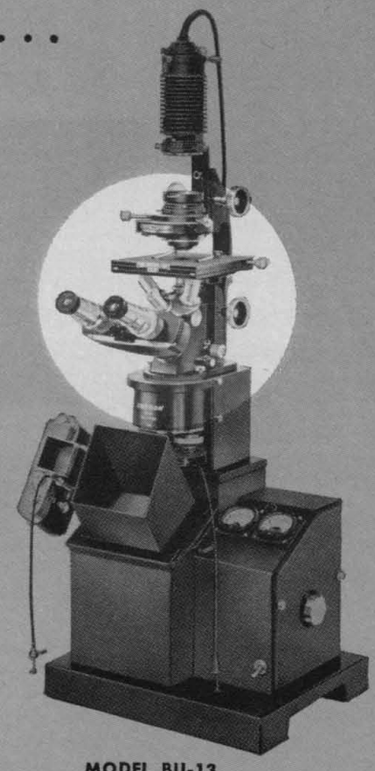


MODEL MIC



MODEL PH-BMIC



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BINOCULAR MODEL PH-BMIC. Binocular version of Model PH-MIC plus built-in camera mechanism. **$1012.**

Prices include optics, cabinets, filters, special slides, petri dishes, and basic accessories. The built-in camera mechanism is standard with binocular models and available as an accessory for monoculars. Accommodates 35mm. camera back or Polaroid Land Camera Attachment. Both available at extra cost.

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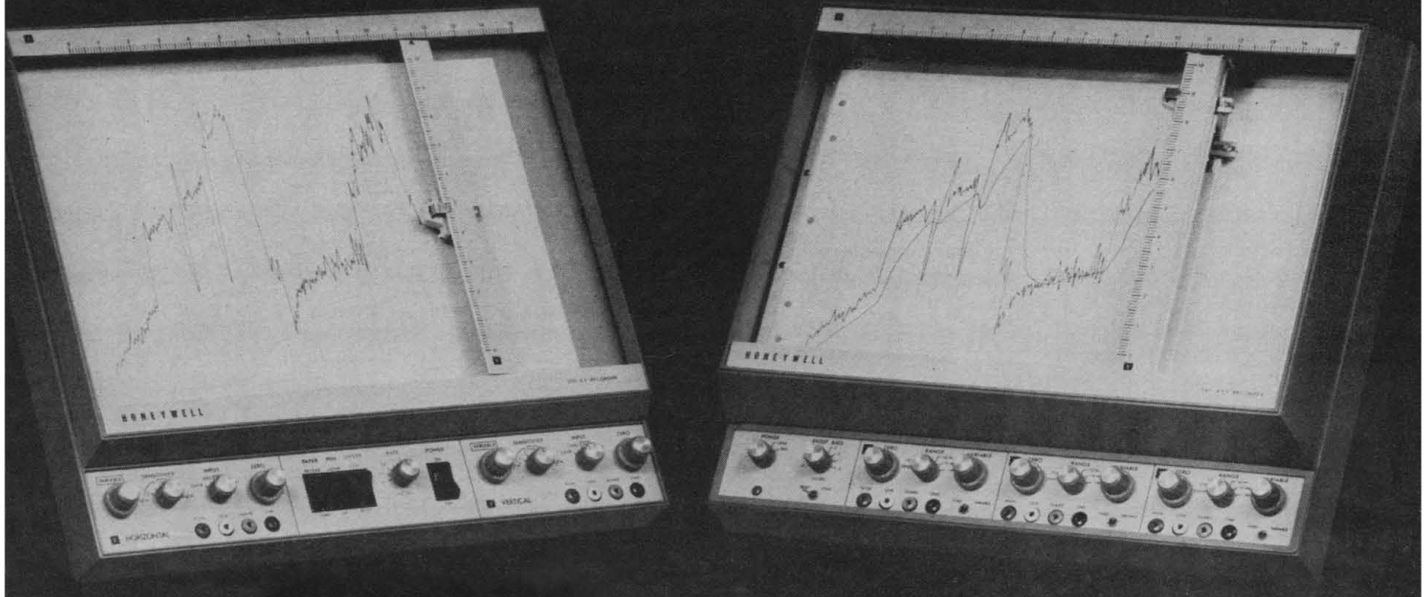

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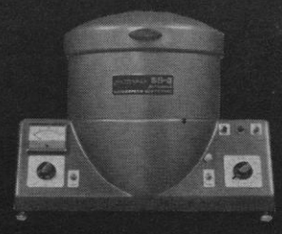

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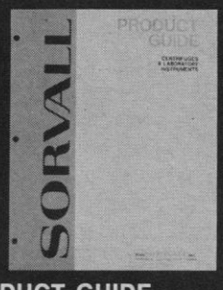

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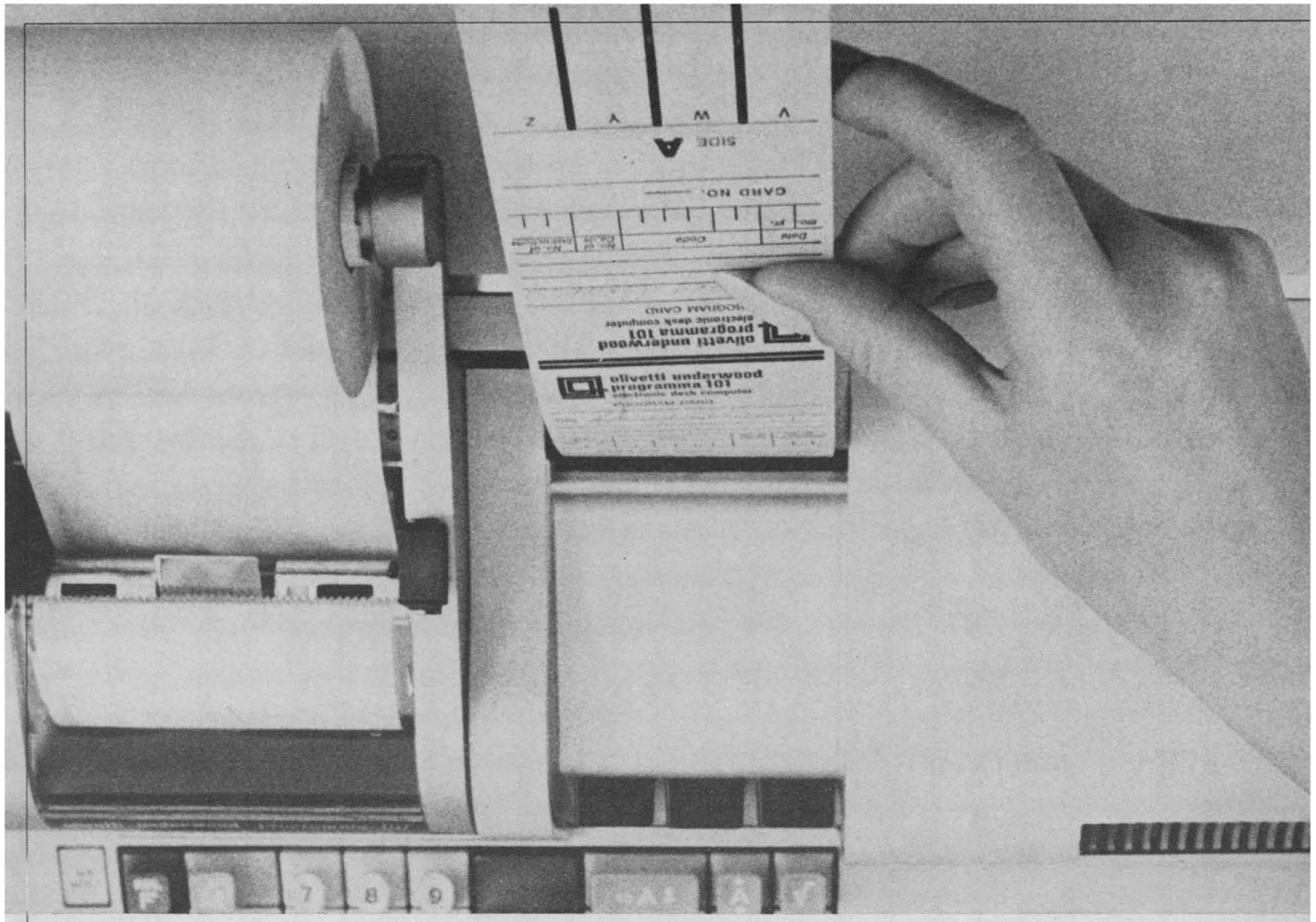

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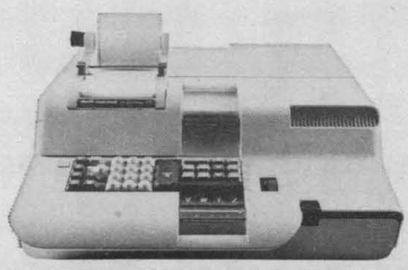

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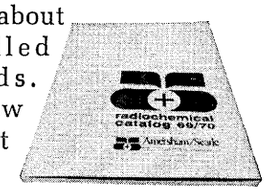

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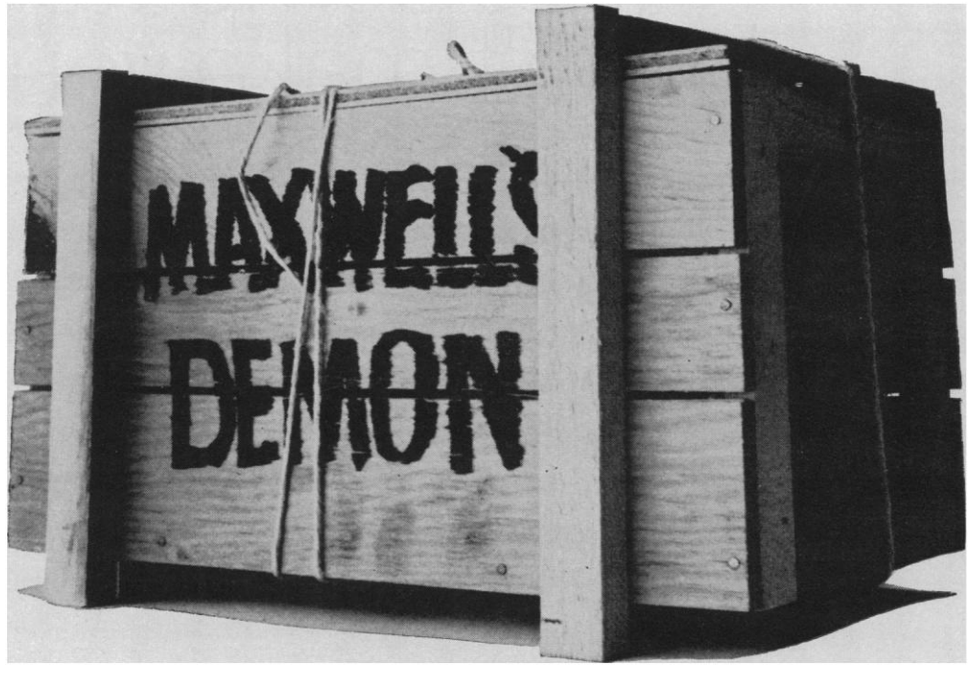

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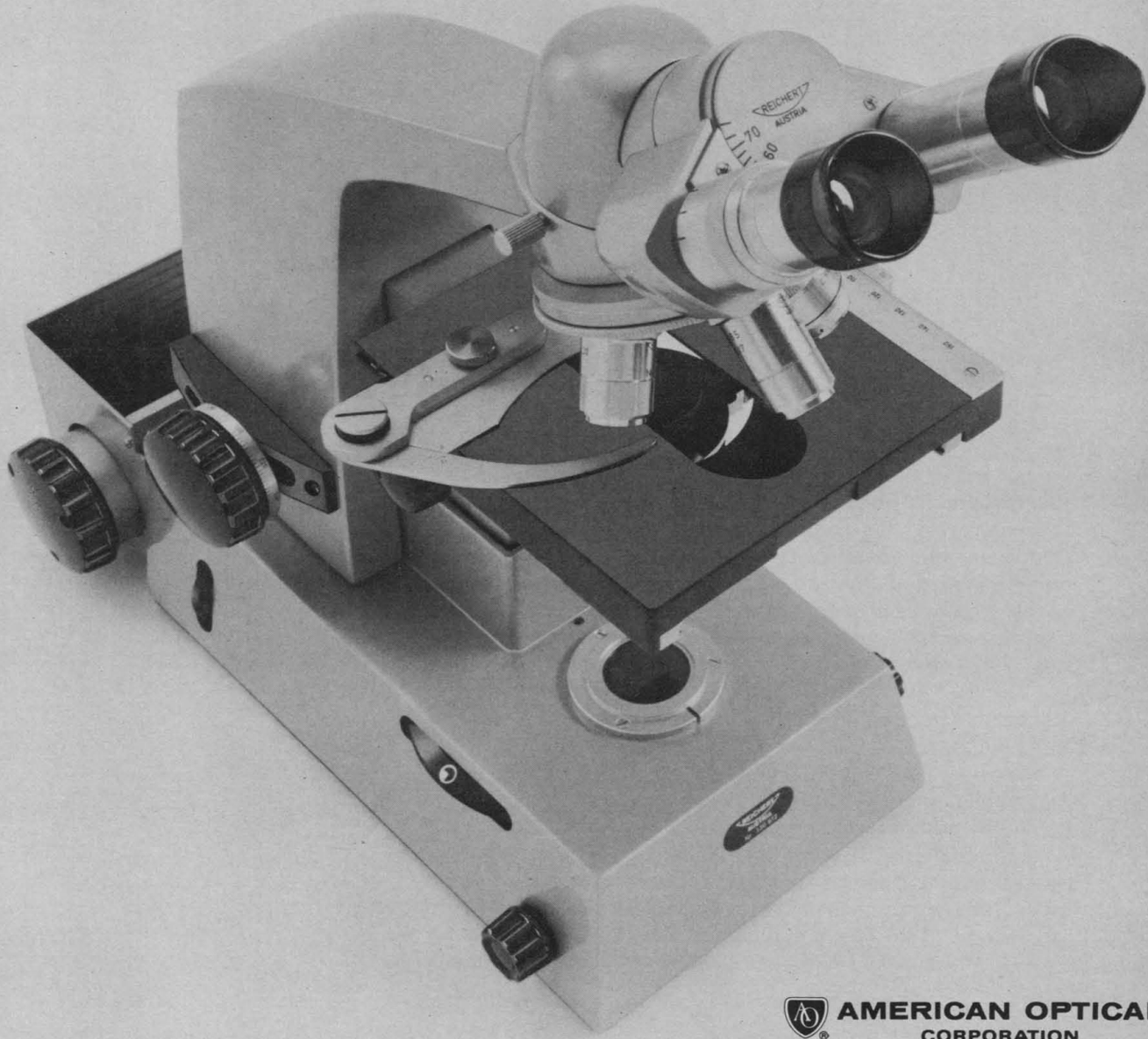

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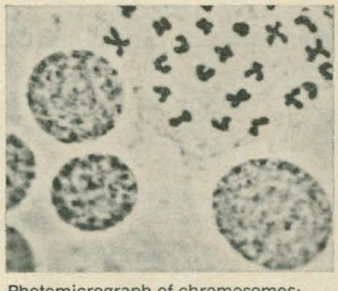

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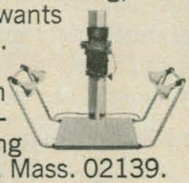

Macrophotograph of wing attachment.

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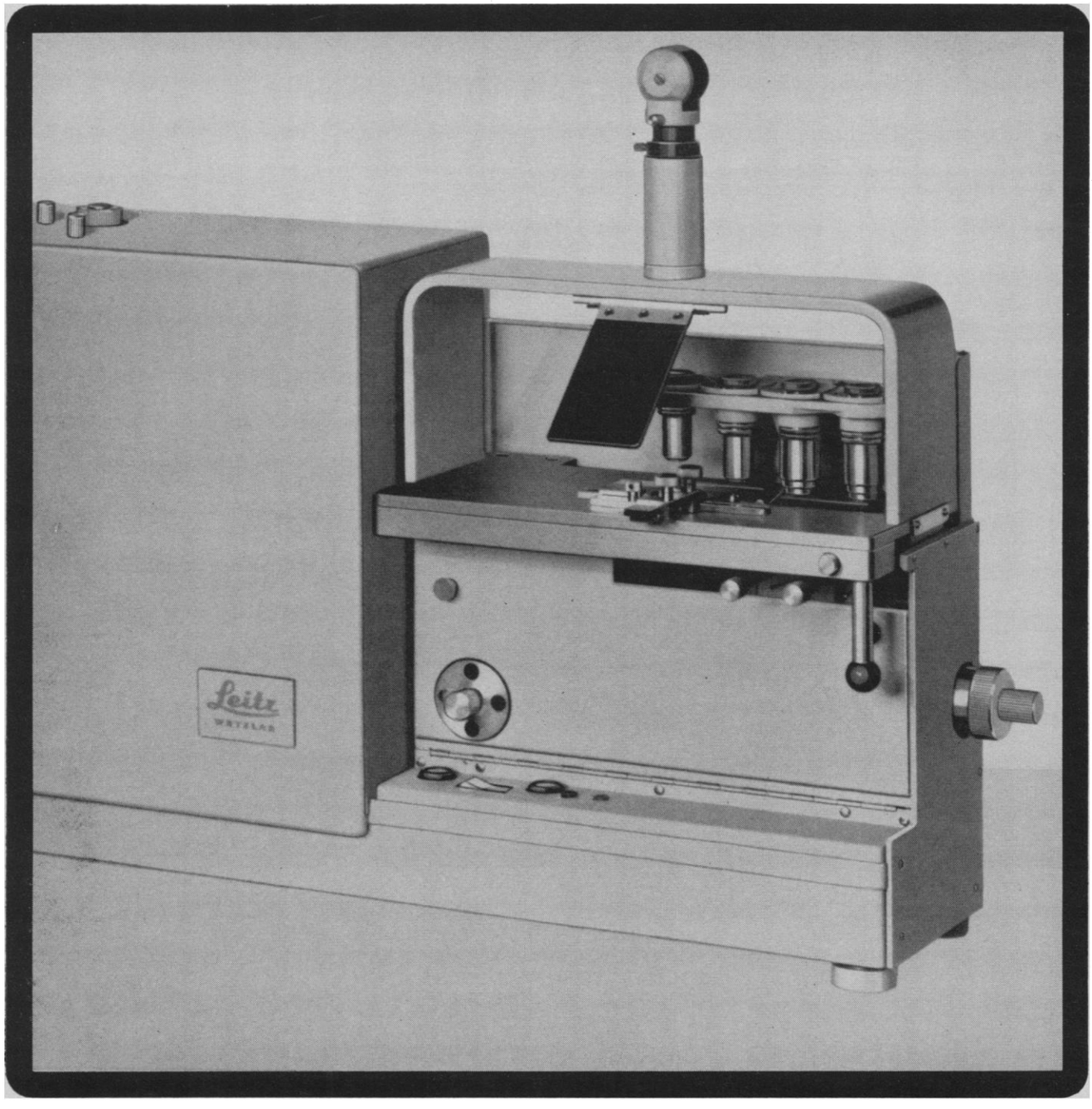
The Polaroid MP-3 Multipurpose View Land Camera.



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8 August 1969, Volume 165, Number 3893

SCIENCE

Science Policy Studies

The National Science Foundation has announced a program of grants for science policy and planning activities at state and local levels. The purposes are to help state and local governments become better partners in the growing number of federal-state or federal-local collaborative activities for technological development, resource utilization, pollution abatement, and other problems that have a scientific or technical component; to improve federal-state-local communication on science and technology policy issues; and to analyze data on scientific resources at state and local levels.

Since 1959 half the states and several large cities have created formal mechanisms for securing scientific and technological advice. The economic and other motivations are so strong that already 47 of the state governors have designated liaison officers to work with NSF in developing better knowledge of the uses of science and technology on the part of state and local governments. Proposals for studies under the new program may be submitted to NSF by state or local government units, universities, or nonprofit organizations, but preference will be given to proposals that call for collaboration between a unit of government and a university.

Announcement of this new program preceded by one day a three-day seminar in Washington, D.C., of the Science and Public Policy Studies Group. This informal organization was born at the 1966 AAAS meeting when several university representatives were invited to consider how AAAS might help the score or so of universities that could then be identified as having teaching and research programs on science and government or science and public policy. Eugene Skolnikoff offered to arrange a program and workshop at the 1967 meeting for such university representatives as were interested. Out of this beginning grew the Science and Public Policy Studies Group, which meets annually at AAAS meetings and which will probably hold other seminars similar to the Washington one of last month. The mailing list (which in such an informal organization is equivalent to the membership roster) now includes persons from 89 universities and from a number of government agencies.

The composition of that list makes it clear that the makers of science policy are being surrounded by a growing group of analysts, who, to a large extent, come from backgrounds different from those of the majority of the makers of science policy. Most of the "engineers" of science policy—the people who have helped government agencies to establish their own policies—have been physical or biological scientists or engineers. Most of the "scholars" of science policy—the academicians who conduct the university programs—come from the social sciences, political science, law, history or public affairs.

The distinction is not sharp. Several universities were represented at the Washington seminar by physicists. Don Price, Harvey Brooks, Alvin Weinberg, and a few others have been not only leading "engineers" but also thoughtful analysts of science policy. Yet the distinction is valid and follows the history of other relationships between the men who plan and direct business, governmental, or other practical affairs and the men who give most thought to analyzing the problems and processes involved.

The rapid growth of the Science and Public Policy Studies Group forecasts an expanding historical, descriptive, and analytical literature of science policy. The development of the new NSF program suggests that these studies will give increased attention to state and local science policies.—DAEL WOLFLE

Choosing a Signal Processor

by DR. E.U. COHLER, *President*
Computer Signal Processors, Inc.

Signal processing systems fall into three general categories. It is important to appreciate the differences in order to make a sensible selection.

Function-Specific

Function-specific processors are usually designed to perform a single version of a complete processing function. These systems, when developed and debugged, very often maximize performance per dollar. Unfortunately, they often result from the observation: "It's simple; we just throw together a few integrated circuits and . . .". Sadly, the result is usually functionally rigid, obsolescent, and has cost a great deal to engineer.

Algorithm-Specific

Algorithm-specific processors are designed to perform individual algorithms of general usefulness, such as Fast Fourier Transforms. This category really consists of partial systems, since these processors must be combined with either a function-specific processor or a computer. Thus it is clear that the algorithm-specific processor, like the function-specific processor, is an inherently rigid approach.

General-Purpose

General-purpose processors are systems whose functions are programmed rather than wired. The most flexible of the three, they combine the advantage of standard hardware with a multiple function capability. Such a system may be used for any algorithm: Fourier transforms, digital filtering, correlations, convolutions, cepstra, amplitude histograms, signal averaging, spectral densities, or statistical analyses. It can also accomplish the many odd jobs peculiar to a non-specific environment: comparison, peripherals handling, display, threshold sets, adaptation, and decision-making.

Each category has its place and its most useful applications. Since you know your own requirements better than anyone else, it is practical to do your own evaluating. After each category has been considered against the application, selection will be nearly automatic.

Courses

Atomic Absorption Spectroscopy, Washington, D.C., 25–26 October. This course is primarily for chemists and technicians interested in the application of atomic absorption spectroscopy to analysis and covers the fundamentals of atomic absorption theory as well as instrument designs. Comparison is made to flame emission and atomic fluorescence spectrometry. Topics include typical instrument component arrangements, methods of calibration and calculation, and sources of error in terms of spectral, flame, and chemical interferences. Specific applications will be drawn from typical industrial and clinical problems. *Fee*: $80. (Education Office, American Chemical Society, 1155 16th St., NW, Washington, D.C. 20036)

Combustion-Generated Air Pollution, Berkeley, Calif., 22–26 September. Topics to be covered include combustion thermodynamics, vehicular and industrial emissions and control, detection and analysis of pollutants, atmospheric photochemistry, meteorology, analysis of pollution sources, effects on human beings and vegetation, waste disposal, and legal aspects of pollution. *Fee*: $280. (Continuing Education in Engineering, University of California Extension, 2223 Fulton St., Berkeley, Calif. 94720)

Offshore Petroleum Exploration and Development, Los Angeles, Calif., 15–19 September. For individuals and members of companies with offshore petroleum exploration and exploitation interests, members of governmental agencies concerned with offshore leasing, and educators interested in petroleum resources of the sea and equipment needed in their development. To acquaint interested groups and individuals with the geological and geochemical setting of oil and gas accumulations beneath the sea floor and with techniques presently available and under consideration for exploring and producing them. General principles of petroleum geology; geologic, tectonic, and ecologic setting of offshore petroleum reservoirs; geochemistry of the origin, migration, and accumulation of petroleum; survey of major offshore exploration areas; engineering systems in geophysical exploration, drilling, and producing oil and gas from the sea floor; and offshore economics. Prerequisite is a bachelor's degree in engineering, science, or equivalent. *Fee*: $275. (Engineering and Physical Sciences Extension, University of California, 10851 Le Conte Ave., Los Angeles 90024)

Column Selection in Gas Chromatography, Philadelphia, Pa., 27 September. This new course explores the critical step in gas chromatography, the selection of the proper column, from both the theoretical and practical point of view. Column materials, length, diameter, solid support, and percent liquid phase are discussed. The results obtained with different columns and different operating parameters are shown in chromatograms. Rules are developed to aid in choosing proper conditions. It is assumed that the participant is working with gas chromatography. No background in higher mathematics is required. *Fee*: $45. (Education Office, American Chemical Society, 1155 16th St., NW, Washington, D.C. 20036)

National Meetings

September

8–10. **Agriculture Meteorology** Conf., 9th, Seattle, Wash. (R. J. Hanks, Dept. of Soils and Meteorology, Utah State Univ., Logan 84321)

8–10. **Metallurgy and Materials Science**, intern. conf., Philadelphia, Pa. (G. R. Belton, School of Metallurgy and Materials Sciences, Univ. of Pennsylvania, Philadelphia 19104)

8–10. **Standards Engineers** Soc., 18th annual, Washington, D.C. (J. M. Ward, 11208 Long Pine Trail, Potomac, Md. 20857)

8–12. **Dietetics**, 5th intern. congr. (American Dietetic Assoc., 52nd annual), Washington, D.C. (Public Relations, The Association, 620 N. Michigan Ave., Chicago, Ill. 60611)

8–12. American Soc. of **Limnology and Oceanography**, La Jolla, Calif. (G. H. Lauff, W. K. Kellogg Biological Station, Michigan State Univ., Hickory Corners 49060)

8–13. **High Energy Physics and Nuclear Structure**, intern. conf., New York, N.Y. (S. Devons, Dept. of Physics, Columbia Univ., New York 10027)

9–10. Society of **Logistics Engineers**, 4th annual, Cape Canaveral, Fla. (G. Dill, Aerospace Services Div., Pan American World Airways, Inc., Patrick AFB, Fla. 32925)

11–12. Symposium on **Sulphur in Nutrition**, Corvallis, Ore. (J. E. Oldfield, Dept. of Animal Science, Oregon State Univ., Corvallis 77331)

14–17. Association of **Medical Illustrators**, Washington, D.C. (B. J. Melloni, AMI, Georgetown Univ., Washington, D.C. 20007)

14–20. College of American **Pathologists** and American Soc. of **Clinical Pathologists**, joint annual mtg., Chicago, Ill. (O. Neibel, CAP, 230 N. Michigan Ave., Chicago 60601)

17–19. American **Science Film** Assoc., Washington, D.C. (B. J. Melloni, ASFA, Georgetown Univ., Washington, D.C. 20007)

17–19. **Blood and Tissue Antigens**, intern. symp., Ann Arbor, Mich. (D. Aminoff, Simpson Memorial Inst., Univ. of Michigan, Ann Arbor 48104)

17–19. **Industrial Research**, 5th natl. conf., Chicago, Ill. (V. J. Danilov, Industrial Research Bldg., Beverly Shores, Ind. 46301)

18–20. **Chemical Marketing Research Assoc.**, Lake Placid, N.Y. (P. E. Levesque, FMC Corp., 633 Third Ave., New York 10017)

21–24. American Assoc. of **Medical Clinics**, New York, N.Y. (E. M. Wurzel, Executive Director, The Association, 421 King St., Alexandria, Va. 22314)

21–24. **Petroleum Mechanical Engineering Conf.**, Tulsa, Okla. (H. E. Broadbent, Atlantic Richfield Co., P.O. Box 8138, Philadelphia, Pa. 19101)

21–25. **Comparative Leukemia Research**, 4th intern. symp., Cherry Hill, N.J. (R. M. Dutcher, School of Veterinary Medicine, Univ. of Pennsylvania, New Bolton Center, Kennett Square 19348)

22–24. National Conf. on **Packaging**

Wastes, San Francisco, Calif. (M. Li, Food Protection and Toxicology Center, Univ. of California, Davis 95616)

22–26. **Combustion-Generated Air Pollution**, Berkeley, Calif. (Continuing Education in Engineering, University Extension, Univ. of California, Berkeley 94720)

22–26. International **Simulation and Training** Conf., Montreal, Canada. (W. I. Marble, SAE Hq., Meetings Manager, 2 Pennsylvania Plaza, New York 10001)

23–25. **Physics and Nondestructive Testing**, 9th annual, Chicago, Ill. (W. J. McGonnagle, Symp. Coordinator, P.O. Box 554, Elmhurst, Ill. 60126)

24–26. IEEE **Ultrasonics** Symp., St. Louis, Mo. (D. I. Bolef, Inst. of Electrical and Electronics Engineers, Ultrasonics Symp., Dept. of Physics, Washington Univ., St. Louis 63130)

26–3. American Acad. of **General Practice**, Philadelphia, Pa. (M. F. Cahal, The Academy, Volker Blvd. at Brookside, Kansas City, Mo. 64112)

28–1. Society of **Petroleum Engineers of AIME**, 44th annual, Denver, Colo. (J. R. Dempsey, Northern Natural Gas Co., P.O. Box 308, Omaha, Neb. 68102)

29–1. International Conf. on **Bioelectrical Impedance**, New York, N.Y. (S. E. Marovich, The Conference, 1150 NW 14th St., Miami, Fla. 33136)

29–3. American Soc. of **Photogrammetry**, Portland, Ore. (L. P. Jacobs, 105 N. Virginia Ave., Falls Church, Va. 22046)

30–2. **Analytical Chemistry in Nuclear Technology**, 13th Conf., Gatlinburg, Tenn. (L. J. Brady, Oak Ridge National Lab., P.O. Box X, Oak Ridge, Tenn. 37830)

October

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

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

2–9. **Use of Computers in Clinical Medicine**, 2nd symp., Buffalo, N.Y. (H. J. Alvis, Associate Dean, Continuing Medical Education, 2211 Main St., Buffalo, 14214)

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

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

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

6–10. **Research Equipment** Exhibit and Instrument Symp., 19th annual, Bethesda, Md. (J. B. Davis, Chief, Supply Management Bureau, National Institutes of Health, Bldg. 12A, Room 4003, Bethesda 20014)

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

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

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

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

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

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

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

13–14. **Psychological Aspects of Perception**, New York, N.Y. (E. Harms, 158 E. 95 St., New York 10028)

13–16. Association of Official **Analytical Chemists**, Washington, D.C. (L.G. Ensminger, Box 540, Benjamin Franklin Station, Washington, D.C. 20044)

13–17. American Assoc. for **Laboratory Animal Science**, 20th annual, Dallas, Tex. (J. J. Garvey, The Association, Box 10, Joliet, Ill. 60434)

14–16. **Remote Sensing of Environment** Symp., Ann Arbor, Mich. (Univ. of Michigan, Extension Service, Conf. Dept., 412 Maynard St., Ann Arbor 48103)

14–17. Society for **Experimental Stress Analysis**, Houston, Tex. (B. E. Rossi, SESA, 21 Bridge Sq., Westport, Conn. 06880)

14–22. Pan-Pacific **Surgical** Assoc., 11th congr., Honolulu, Hawaii. (H. DeVault, Room 236, Alexander Young Bldg., Honolulu 96813)

16–17. Association of **Earth Science Editors**, 3rd annual conf., Houston, Tex. (W. D. Rose, Kentucky Geological Survey, Univ. of Kentucky, Lexington 40506)

16–17. National Conf. on **Fluid Power**, Chicago, Ill. (W. R. Smith, NCFP, 3300 S. Federal St., Chicago 60616)

16–17. **Rapid Excavation,** 2nd symp., Sacramento, Calif. (H. L. Hartman, Dean of Engineering, Sacramento State College, Sacramento 95819)

17–19. Society for **Social Responsibility in Science**, New Haven, Conn. (H. Bloom, SSRS, 221 Rock Hill Rd., Bala-Cynwyd, Pa. 19004)

18–23. American Acad. of **Pediatrics**, Chicago, Ill. (G. E. Hughes, Secretary for Education Affairs, 1801 Hinman Ave., Evanston, Ill. 60204)

19–22. American **Mining** Congr., San Francisco, Calif. (R. W. Van Evera, Ring Bldg., Washington, D.C. 20036)

19–25. American College of **Gastroenterology**, 34th annual, Houston, Tex. (D. Weiss, Executive Director, ACG, 33 W. 60 St., New York 10023)

20–21. **Polymer-Modified Hydraulic Cements** Symp., Philadelphia, Pa. (H. B. Wagner, Dept. of Chemistry, Drexel Inst. of Technology, Philadelphia 19104)

20–22. **George H. Hudson Symp.**, 5th annual, Plattsburgh, N.Y. (G. F. Kokoszka, Dept. of Chemistry, State Univ. College, Plattsburgh 12901)

20–22. American Assoc. of **Stratigraphic Palynologists**, University Park, Pa. (A. Traverse, Dept. of Geology and Geophysics, Pennsylvania State Univ., University Park 16802)

21–24. **Optical** Soc. of America, 54th annual, Chicago, Ill. (M. E. Warga, The Society, 2100 Pennsylvania Ave., NW, Washington, D.C. 20037)

21–25. Association of **Engineering Geologists**, 12th annual, San Francisco, Calif. (P. Vardy, AEG, P.O. Box 985, San Francisco 94101)

23–25. American **Astronautical** Soc., Las Cruces, N.M. (J. Penwarden, News Service, New Mexico State Univ., Las Cruces)

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

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

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

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

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

BOOKS RECEIVED

(Continued from page 582)

1969. viii + 96 pp., illus. Paper, $2.95. Hayden Modern Physics Series.

Exploring Sound. Alexander Efron. Hayden, New York, 1969. viii + 72 pp., illus. Paper, $2.45. Hayden Modern Physics Series.

Farming the Sea. Alexander McKee. Crowell, New York, 1969. x + 198 pp. + 16 plates. $6.95.

A Field Guide to the Stars and Planets. Including the Moon, Satellites, Comets, and Other Features of the Universe. Donald H. Menzel. Illustrated by Ching Sung Yü. Mifflin, Boston, 1969. xvi + 400 pp. $4.95. Peterson Field Guide Series, vol. 15. Reprint of the 1964 edition.

Food Pharmacology. N. Sapeika. Thomas, Springfield, Ill., 1969. xiv + 186 pp., illus. $9.50. American Lecture Series, No. 732.

Garden in the West. A Dramatic Account of Science in Agriculture. George S. Wells. Dodd, Mead, New York, 1969. xiv + 274 pp. $5.

Genesis and Evolutionary Development of Life. A. I. Oparin. Translated from the Russian edition (Moscow, 1966) by Eleanor Maass. Academic Press, New York, 1968. x + 206 pp., illus. $9.50.

Genetics and Man. C. D. Darlington. Schocken, New York, 1969. 384 pp., illus. + 8 plates. Paper, $2.95. Revised and expanded edition, with a new introduction by the author, of *The Facts of Life.*

The Geography of State Policies. J. R. V. Prescott. Aldine, Chicago, 1969. 208 pp. $5. University Library of Geography.

Gravity a Dynamic State—Not a Field. Charles A. Cummings. Hagan, Gahanna, Ohio, 1967. xiv + 114 pp., illus. $4.90.

The Halfway House Movement. A Search for Sanity. Harold L. Raush with Charlotte L. Raush. Appleton-Century-Crofts, New York, 1968. xiv + 250 pp. $5.50. Century Psychology Series.

Hawaii: A Pictorial History. Compiled and designed by Joseph Feher. Accompanying text by Edward Joesting, part 1; by O. A. Bushnell, part 2. Bishop Museum Press, Honolulu, 1969. 518 pp., illus. $25. Bernice P. Bishop Museum Special Publication No. 58.

Heterogeneous Catalysis. S. J. Thomson and G. Webb. Wiley, New York, 1968. x + 198 pp., illus. Paper, $4.50. University Chemical Texts, vol. 4.

Human Anatomy Made Simple. I. MacKay Murray. Illustrated by Eva Cellini. Doubleday, Garden City, N.Y., 1969. 192 pp. Paper, $1.95. Made Simple Series.

Immunological Tolerance. A Reassessment of Mechanisms of the Immune Response. Proceedings of an international conference, Augusta, Mich., 1968. Maurice Landy and Werner Braun, Eds. Academic Press, New York, 1969. xvi + 352 pp., illus. $7.50. Perspectives in Immunology.

Influence of Structural Movement on Sedimentation During the Pennsylvanian Period in Western Missouri. Richard J. Gentile. University of Missouri Press, Columbia, 1968. x + 86 pp., illus. + 8 separate plates. $4.50. University of Missouri Studies, vol. 45.

Insomnia. The Guide for Troubled Sleepers. Gay Gaer Luce and Julius Segal. Doubleday, Garden City, N.Y., 1969. xii + 372 pp. $6.95.

Intelligence and Cultural Environment. Philip E. Vernon. Methuen, London, 1969 (U.S. distributor, Barnes and Noble, New York). viii + 264 pp., illus. $7.25. Methuen's Manuals of Modern Psychology.

International Conference on Statistical Mechanics. Kyoto, Japan, 1968. S. Ono, R. Abe, T. Izuyama, and M. Suzuki, Eds. Physical Society of Japan, 1969. viii + 330 pp., illus. Paper, $16. Supplement to *Journal of the Physical Society of Japan*. Vol. 26, 1969.

International Review of Cytology. Vol. 25. G. H. Bourne, J. F. Danielli, and K. W. Jeon, Eds. Academic Press, New York, 1969. xviii + 446 pp., illus. $19.50.

Introduced Trees of Central California. Woodbridge Metcalf. Illustrated by Mary B. and Fred Pomeroy and Mary Foley Benson. University of California Press, Berkeley, 1968. 160 pp., illus. + 8 plates. Paper, $2.25. California Natural History Guides, No. 27.

Introduction to Celestial Mechanics. Jean Kovalevsky. Translated from the French edition (Paris, 1963) by Express Translation Service. Springer-Verlag, New York; Reidel, Dordrecht, Holland, 1967. viii + 128 pp., illus. $6.40. Astrophysics and Space Science Library, vol. 7.

Introduction to Plant Physiology. Jacob Levitt. Mosby, St. Louis, 1969. viii + 304 pp., illus. $9.85.

Introduction to PL/1 Programming. R. Clay Sprowls. Harper and Row, New York, 1969. x + 182 pp., illus. Paper, $4.95.

Introduction to Terrain-Vehicle Systems. Part 1, The Terrain. Part 2, The Vehicle. M. G. Bekker. University of Michigan Press, Ann Arbor, 1969. xviii + 846 pp., illus. $27.50.

Isolation and Identification of Drugs in Pharmaceuticals, Body Fluids and Post-Mortem Material. E. G. C. Clarke, Ed., assisted by Judith Berle. Pharmaceutical Press, London, 1969 (available in U.S. from Rittenhouse Book Store, Philadelphia). xxiv + 872 pp., illus. $39. Extra Pharmacopoeia Companion Volume.

The Journal of Charles Mason and Jeremiah Dixon. Transcribed from the original in the U.S. National Archives. Introduction by A. Hughlett Mason. American Philosophical Society, Philadelphia, 1969. xii + 232 pp., illus. $5. Memoirs of the American Philosophical Society, vol. 76.

Laboratory Anatomy of the White Rat. Robert B. Chiasson. Brown, Dubuque, Iowa, ed. 2, 1969. viii + 88 pp., illus. Spiral bound, $1.95.

Laboratory Exercises in Cell Physiology. Roger H. Trumbore. Mosby, St. Louis, 1969. x + 158 pp. Spiral bound, $4.25.

Laboratory Manual for Chemistry: A Quantitative Approach by R. Nelson Smith, John E. Quinlan, and Alvin L. Beilby. Ronald Press, New York, 1969. viii + 184 pp., illus. Paper, $4.25.

A Laboratory Manual of Mammalian Anatomy and Physiology. Sigmund Grollman. Macmillan, New York; Collier-Macmillan, London, ed. 2, 1969. xiv + 226 pp., illus. Paper, $4.95.

Left and Right in Science and Life. Vilma Fritsch. Barrie and Rockliff, London, 1968 (U.S. distributor, Humanities Press, New York). 20 pp., illus. $5.50.

Length of Stay in PAS Hospitals. United States, Pre- and Post-Medicare. Commission on Professional and Hospital Activities, Ann Arbor, Mich., 1969. xliv + 556 pp. Paper, $4.

Les Lasers. Principes, Réalisations, Applications. A. Orszag. Masson, Paris, 1968. xii + 180 pp., illus. Paper, 50 F.

Machine, Assembly, and Systems Programming for the IBM 360. William H. Payne. Harper and Row, New York, 1969. xiv + 322 pp., illus. Paper, $4.95.

Magnetochemie. Werner Haberditzl. Akademie-Verlag, Berlin; Pergamon, Oxford; Vieweg, Braunschweig, 1968. 196 pp., illus. Paper, DM 6.80. Wissenschaftliche Taschenbücher, vol. 50.

Maligne Tumoren im Kindesalter. F. Rehbein, Ed. Hippokrates-Verlag, Stuttgart, 1969. 408 pp., illus. Gln. DM 38. Zeitschrift für Kinderchirurgie, Supplement zu Ban 6.

Mammals from the State of Oaxaca, Mexico, in the American Museum of Natural History. George G. Goodwin. American Museum of Natural History, New York, 1969. 272 pp. + plates. Paper, $15. Bulletin of the American Museum of Natural History, vol. 141, art. 1.

Mankind 2000. First International Future Research Conference, Voksenkollen, Norway, 1967. Robert Jungk and Johan Galtung, Eds. Universitetsforlaget, Oslo; Allen and Unwin, London, 1969 (U.S. distributor, P.O. Box 142, Boston). 368 pp., illus. $14.90. Research Monographs from the International Peace Research Institute, Oslo, No. 1.

Mathematics for Science and Engineering. Philip L. Alger. McGraw-Hill, New York, ed. 2, 1969. x + 374 pp., illus. $9.75. Based on *Engineering Mathematics* by Charles Proteus Steinmetz.

Mechanics. Wallace Arthur and Saul K. Fenster. Holt, Rinehart and Winston, New York, 1969. xviii + 670 pp., illus. $14.95.

Mechanisms of Reactions of Sulfur Compounds. Vol. 2. N. Kharasch, B. S. Thyagarajan, and A. I. Khodair, Eds. Intra-Science Research Foundation, Santa Monica, Calif., 1968. iv + 284 pp., illus. Paper, $10.

Memoria su "L'Atomo Statico." Idee Nuove nella Fisica. Camillo Piombini. Tipografia Pavoniana, Brescia, Italy, 1968. 114 pp., illus. Paper, 1500 lire.

Metabolism and Membrane Permeability of Erythrocytes and Thrombocytes. First International Symposium, Vienna, 1968. Erwin Deutsch, Eckehart Gerlach, and Kurt Moser, Eds. Thieme Verlag, Stuttgart, 1968 (U.S. distributor, Intercontinental Medical Book, New York). xvi + 480 pp., illus. DM 110.

Microbial Growth. Nineteenth Symposium of the Society for General Microbiology, London, 1969. Pauline M. Meadow and S. J. Pirt, Eds. Published for the Society for General Microbiology by Cambridge University Press, New York, 1969. xii + 452 pp., illus. + 7 plates. $16.50.

Modern Astronomy: An Introduction. Hans Kienle. Translated from the German edition (Munich, 1963) by Alex Helm.

Crowell, New York, 1969. 144 pp. + 12 plates. $6.95.

Modernization Among Peasants. The Impact of Communication. Everett M. Rogers, in association with Lynne Svenning. Holt, Rinehart and Winston, New York, 1969. xviii + 430 pp., illus. $6.95.

Monte Carlo Principles and Neutron Transport Problems. Jerome Spanier and Ely M. Gelbard. Addison-Wesley, Reading, Mass., 1969. xiv + 234 pp., illus. $14.95. Addison-Wesley Series in Computer Science and Information Processing.

Mössbauer Effect Methodology. Vol. 4. Proceedings of a symposium, Chicago, 1968. Irwin J. Gruverman, Ed. Plenum, New York, 1968. viii + 272 pp., illus. $15.

Nation-Building and Community in Israel. Dorothy Willner. Princeton University Press, Princeton, N.J., 1969. xiv + 482 pp. $10.

The Olmec World. Ignacio Bernal. Translated from the Spanish edition (Mexico City, 1968) by Doris Heyden and Fernando Horcasitas. University of California Press, Berkeley, 1969. xviii + 274 pp., illus. $12.50.

Origins of Mendelism. Robert C. Olby. Schocken, New York, 1969. iv + 204 pp. + 8 plates. Paper, $2.45. Reprint of the 1966 edition.

The Palace of Nestor at Pylos in Western Messenia. Vol. 2, The Frescoes. Mabel L Lang. Published for the University of Cincinnati by Princeton University Press, Princeton, N.J., 1969. xiv + 258 pp. + 162 plates. $40.

The Penguin Dictionary of British Natural History. Richard Fitter, assisted by Maisie Fitter. Barnes and Noble, New York, 1968. 352 pp. $5. Reprint, with minor corrections, of the 1967 edition.

Perceptrons. An Introduction to Computational Geometry. Marvin Minsky and Seymour Papert. MIT Press, Cambridge, 1969. vi + 258 pp., illus. Paper, $4.95.

The Periodic Table. D. G. Cooper. Plenum, New York; Butterworths, London, ed. 4, 1968. x + 118 pp., illus. Paper, $2.50.

Persepolis. The Archaeology of Parsa, Seat of the Persian Kings. Donald N. Wilber. Crowell, New York, 1969. xx + 124 pp., illus. $7.95.

Perspectives in Endocrinology. Hormones in the Lives of Lower Vertebrates. E. J. W. Barrington and C. Barker Jorgensen, Eds. Academic Press, New York, 1968. xvi + 584 pp., illus. + 3 plates. $22.50.

Photoelasticity. The Selected Scientific Papers of M. M. Frocht. M. M. Leven, Ed. Pergamon, New York, 1969. xxii + 470 pp., illus. $18.50.

Physiological Systems in Semiarid Environments. A seminar, Albuquerque, N.M., 1967. C. Clayton Hoff and Marvin L. Riedesel, Eds. University of New Mexico Press, Albuquerque, 1969. x + 294 pp., illus. $9.

The Plague Killers. Greer Williams. Scribner, New York, 1969. xiv + 354 pp. $6.95.

Plant Chimeras. W. Neilson-Jones. Methuen, London, ed. 2, 1969 (U.S. distributor, Barnes and Noble, New York). viii + 124 pp., illus. $4. Methuen's Monographs on Biological Subjects.

Population Genetics. W. J. Ewens. Methuen, London, 1969 (U.S. distributor, Barnes and Noble, New York). xii + 148 pp. $5. Methuen's Monographs on Applied Probability and Statistics.

Prehistoric Europe. From Stone Age Man to the Early Greeks. Philip Van Doren Stern. Norton, New York, 1969. 384 pp., illus. $10.

Probability Theory. Henry E. Kyburg, Jr. Prentice-Hall, Englewood Cliffs, N.J., 1969. x + 294 pp., illus. $10.95.

Progress in Nucleic Acid Research and Molecular Biology. Vol. 9. J. N. Davidson and Waldo E. Cohn, Eds. Academic Press, New York, 1969. xxiv + 472 pp., illus. $19.50.

Rebels Against War. The American Peace Movement, 1941–1960. Lawrence S. Wittner. Columbia University Press, New York, 1969. xvi + 340 pp. $10. Contemporary American History Series.

Semiconductor Detectors. G. Bertolini and A. Coche, Eds. Interscience (Wiley), New York; North-Holland, Amsterdam, 1968. x + 518 pp., illus. $22.50.

A Short History of Psychiatry. Erwin H. Ackerknecht. Translated from the German edition (1959) by Sula Wolff. Hafner, New York, ed. 2, 1968. xvi + 112 pp. + 8 plates. Paper, $4.25.

Smoking, Health, and Behavior. Edgar F. Borgatta and Robert R. Evans, Eds. Aldine, Chicago, 1968. xii + 292 pp., illus. $10.75.

Social Work with Groups. Helen Northen. Columbia University Press, New York, 1969. x + 270 pp. $7.50.

Solid State Physics. Advances in Research and Applications. Vol. 22. Frederick Seitz, David Turnbull, and Henry Ehrenreich, Eds. Academic Press, New York, 1968. xvi + 536 pp., illus. $25.

Teaching Black Children to Read. Joan C. Baratz and Roger W. Shuy, Eds. Center for Applied Linguistics, Washington, D.C., 1969. xvi + 224 pp. Paper, $5. Urban Language Series, vol. 4.

Television in Politics. Its Uses and Influence. Jay G. Blumler and Denis McQuail. University of Chicago Press, Chicago, 1969. xxviii + 380 pp., illus. $13.25.

Text-Atlas of Cat Anatomy. James E. Crouch. Illustrated by Martha B. Lackey. Lea and Febiger, Philadelphia, 1969. xvi + 400 pp. $25.

The Unbound Prometheus. Technological Change and Industrial Development in Western Europe from 1750 to the Present. David S. Landes. Cambridge University Press, New York, 1969. x + 566 pp. Cloth, $8.50; paper, $2.95.

University in Turmoil. The Politics of Change. Immanuel Wallerstein. Atheneum, New York, 1969. xii + 148 pp. $4.95.

Upper Palaeozoic Rocks, Bonaparte Gulf Basin of Northwestern Australia. J. J. Veevers and J. Roberts. Bureau of Mineral Resources, Geology and Geophysics, Canberra, Australia, 1968. x + 156 pp., illus. + 38 plates + maps. B.M.R. Bulletin No. 97.

The Urban Guerrilla. Martin Oppenheimer. Quadrangle, Chicago, 1969. 192 pp. $5.50.

The World of the Red Fox. Leonard Lee Rue III. Lippincott, Philadelphia, 1969. 208 pp., illus. $5.95. Living World Books.