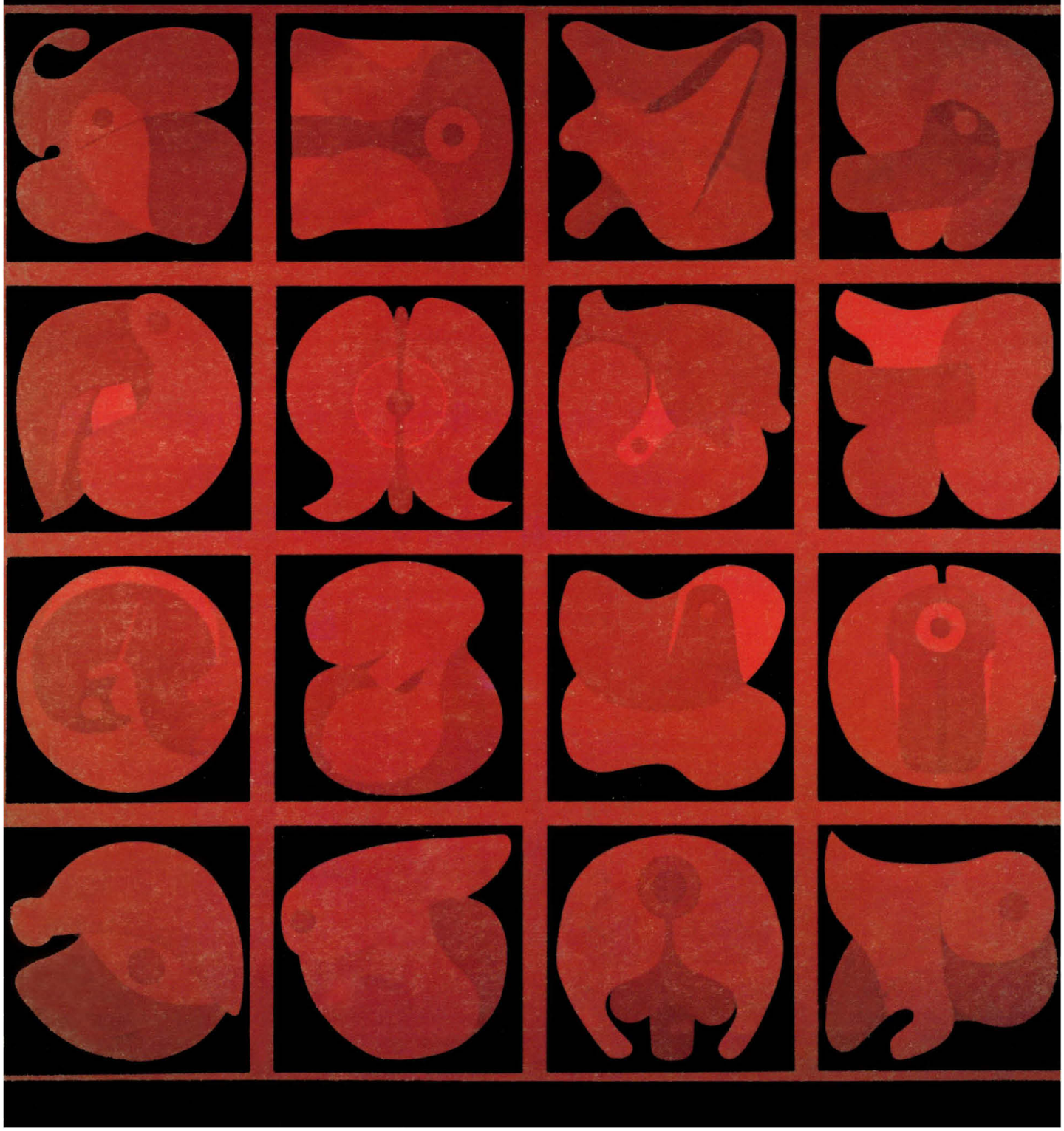
SCIENCE

12 July 1968

Vol. 161, No. 3837

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE



The all-new, hp 1200 Oscilloscope System is designed and manufactured for easy-to-set-up, foolproof operation. You make almost any measurement in your discipline because the high sensitivity and bandwidth are more than adequate for physiological, mechanical and chemical purposes.

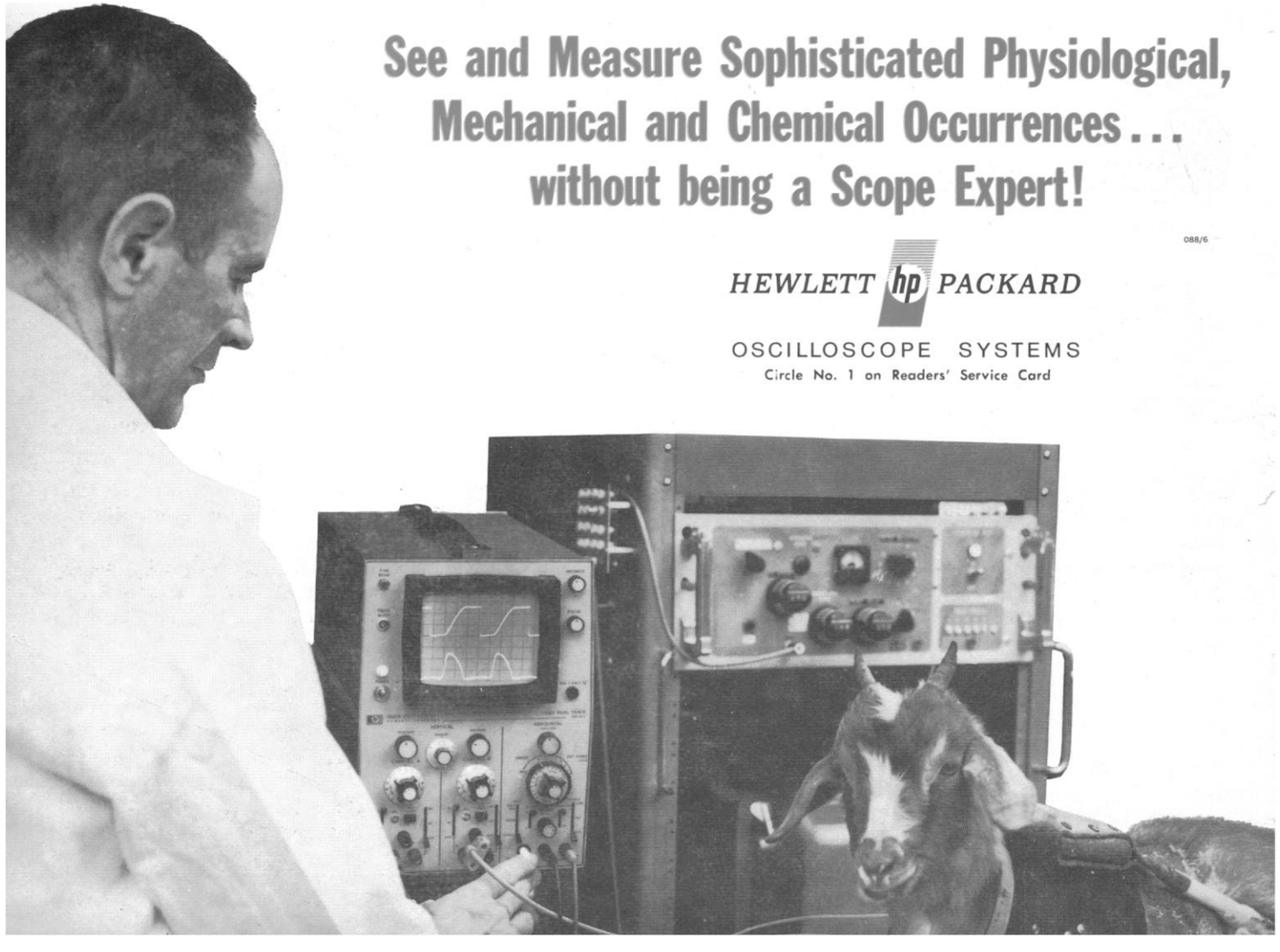
The low cost, solid state 1200 Oscilloscope System is the first state-of-the-art design to be made available to the scientific community in the last 10 years. It provides features normally associated only with the most expensive oscilloscopes. Solid state design lets you see low level signals without error-producing drift — even at the most sensitive setting; offers a lightweight rugged instrument for everyday laboratory use; and gives outstanding day-to-day performance with less maintenance and fewer adjustments—even noisy cooling fans are eliminated.

The hp 1200 Oscilloscopes are easy to set-up — the controls are grouped according to function and the dials are direct reading and interlocking to stop you from making "impossible" measurements. You see your measurement more accurately, too! The big 8 x 10 cm, parallax-free CRT displays sharp, easy-to-read traces—even in brightly lighted rooms.

The hp 1200A Oscilloscope ($990) has identical dual channel vertical amplifiers with 100 μV sensitivity. Compare and measure very low level signals without intervening preamplifiers, such as nerve potentials or sensitive transducer outputs. The CHOP mode feature displays two non-repetitive waveforms — seen before only on more expensive dual beam oscilloscopes—and you see them easier because high, 100 dB common mode rejection and a bandwidth limit switch eliminates inaccuracies caused by noise.

hp offers the 1200 Oscilloscope System in four different models so you can choose one to meet your measurement requirements. Select 5 mV or 100 μV sensitivity, single or dual channel vertical amplifiers, convenient cabinet style or the 5¼" high rack mount, 50 dB or 100 dB common mode rejection—price of $715.00 to $990.00. All models weigh less than 25 pounds and consume only 33 watts of power.

You can see and measure sophisticated occurrences without being a scope expert—so, call your nearest hp field engineer. He can help you choose the proper hp 1200 Oscilloscope for your measurements. Or, write to Hewlett-Packard, Palo Alto, California 94304. In Europe: 54 Route des Acacias, Geneva.

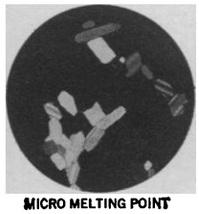


For automated thermal microscopy, just add the new Mettler FP-2 to your microscope

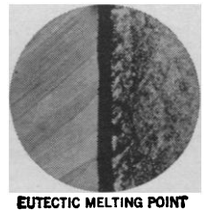
The Mettler FP-2 is an automatically controlled microfurnace and digital indicator for use with standard laboratory microscopes in thermal microscopy. By greatly increasing precision, convenience and temperature control, the system makes the time-honored technique a highly reproducible research and analytical method.

The system makes it easy to carry out studies which were considered difficult, and makes possible many studies which formerly were impossible. It enables the investigator to maintain precise control of sample temperature and to automatically record experimental data without ever looking away from the sample itself.

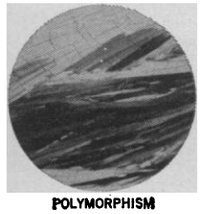
The instrument operates over the range of −20° to +300°C, temperatures suitable for study of fusion phenomena of virtually all organic



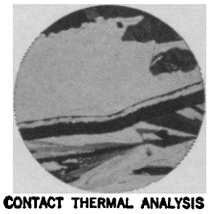
MICRO MELTING POINT



EUTECTIC MELTING POINT



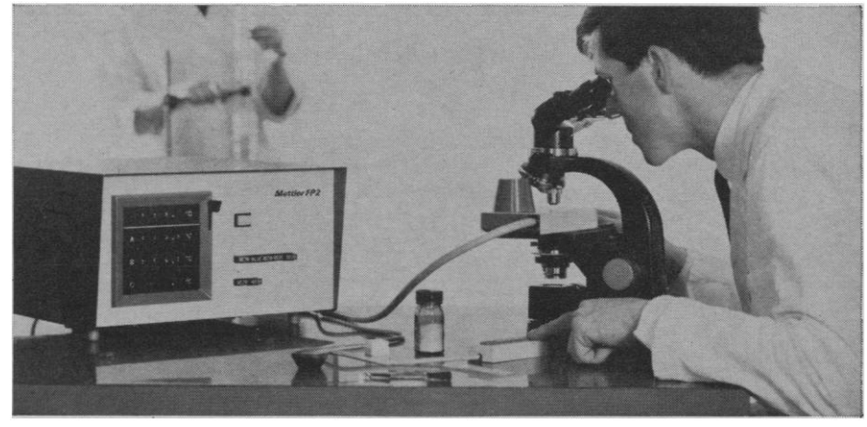
POLYMORPHISM



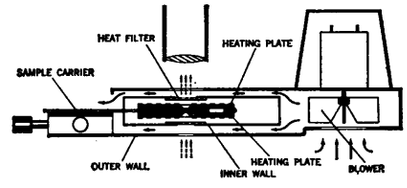
CONTACT THERMAL ANALYSIS

compounds and most inorganics. The system gives the researcher complete control over his sample temperature – increasing at a linear rate, decreasing, or holding at any single temperature. Three heating rates are provided: 10°C/minute for orientation tests, 1°C/minute for routine tests, and 0.2°C/minute for precision measurements to ±0.1°C.

The temperature control system of the Mettler FP-2 combines an electronically regulated temperature program, a platinum resistance thermometer, a low-mass sample chamber for mounting on the microscope



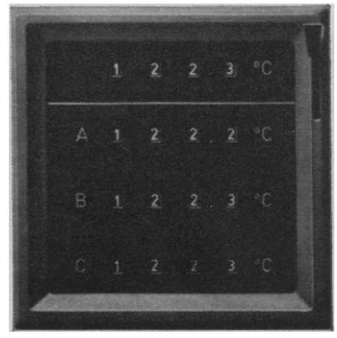
Mettler FP-2 is usable with any standard laboratory microscope



Schematic of sample chamber

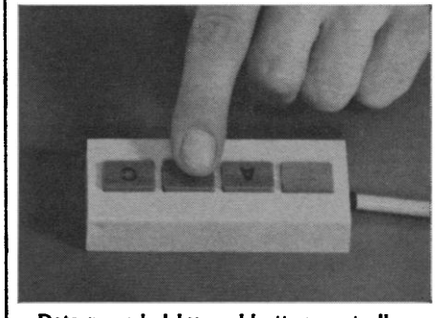
and a remote pushbutton controller for increasing, decreasing, or maintaining the sample temperature at a specific value.

The remote pushbutton controller enables the operator to record the exact temperatures at which any three thermal events occur – beginning of melt, end of melt, phase change, or any of several conditions in the crystallization process. Results are displayed automatically on the digital indicator panel.



Digital readout of analytical data

At no time during critical phase changes is the system operator required to divert his attention from the sample. He can hold the sample in isothermal condition, raise or lower the sample temperature without ever taking his eyes from the microscope. In addition, the digital indicator continuously displays the sample temperature, making it unnecessary for the tedious and continuous observation of the sample during preliminary sample heating.



Data recorded by pushbutton controller

The Mettler FP-2 maintains control of sample temperature with precision to ±0.1°C. Its temperature program is both lag-free and surge-free, providing the strictly linear temperature advance that is essential for reproducible results.

Request your copy of the new Mettler FP-2 product bulletin and an applications booklet on thermal microscopy. Write Mettler Instrument Corporation, 20 Nassau Street, Princeton, New Jersey 08540.

Mettler®

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12 July 1968
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SCIENCE

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AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

COVER

"New Symbolism," by Takeshi Kawashima, is one of 75 works of art in the Smithsonian Institution exhibit *The Art of Organic Forms* which is being shown in the Museum of Natural History in Washington, D.C., through 31 July. Kawashima, a Japanese artist born in 1930, has lived and worked in New York City since 1963. The painting is 68 by 68 inches and is done in Liquitex on canvas. See page 148. [Aldrich Museum of Contemporary Art, Ridgefield, Connecticut]

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The Nikon L-Ke offers two additional facilities of special interest to the advanced researcher. First, a precision dovetail slide mount which permits ready nosepiece interchangeability. Second, a rack-and-pinion condenser mount with focusing and centering controls. Also, the L-Ke stage can be lowered as much as 71mm to provide clearance for culture dishes, chambers and large specimens.

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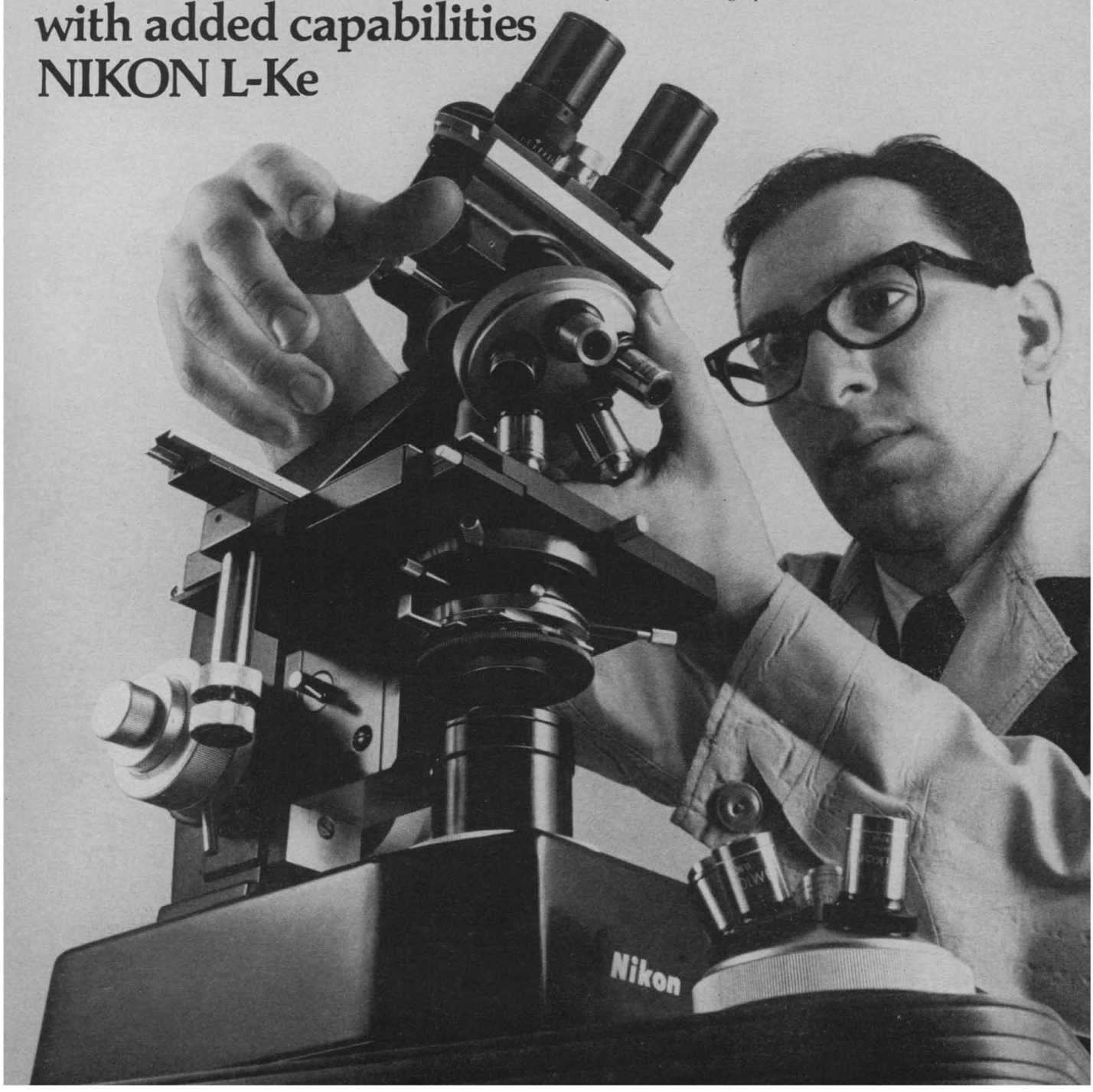

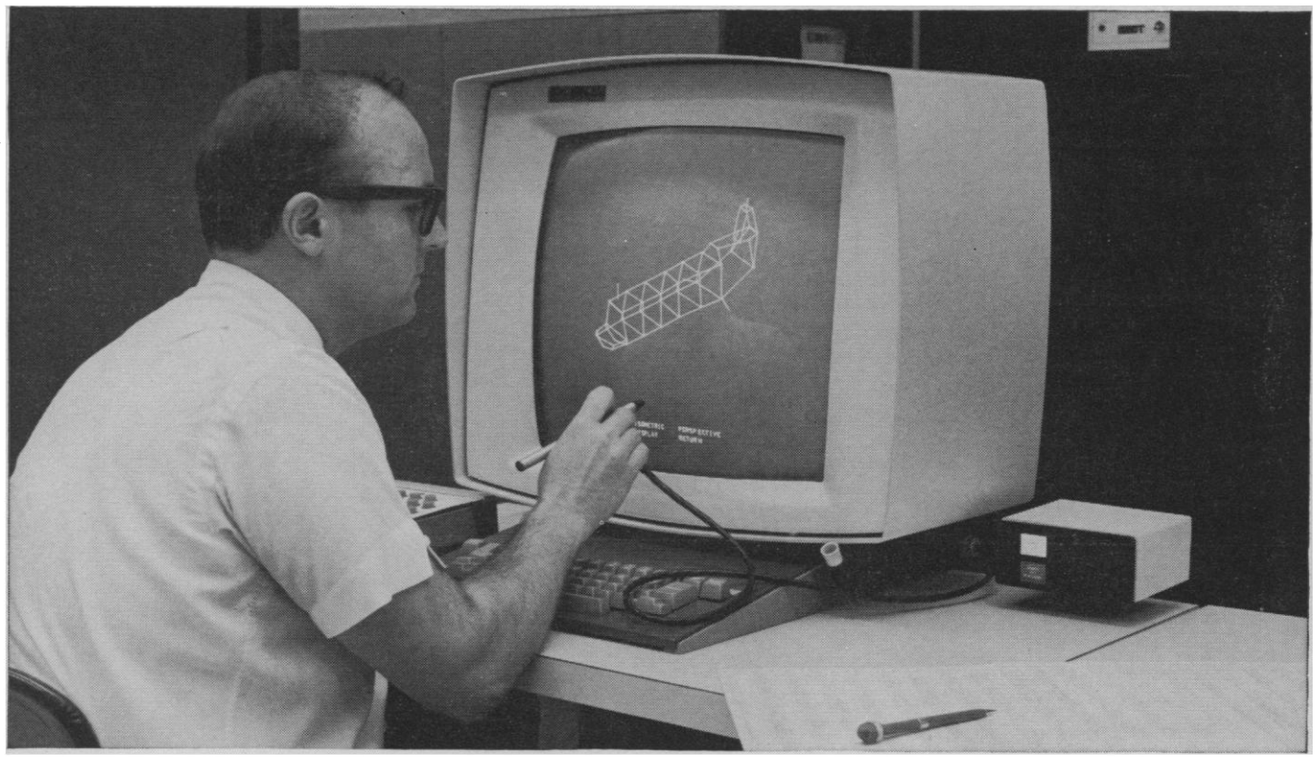

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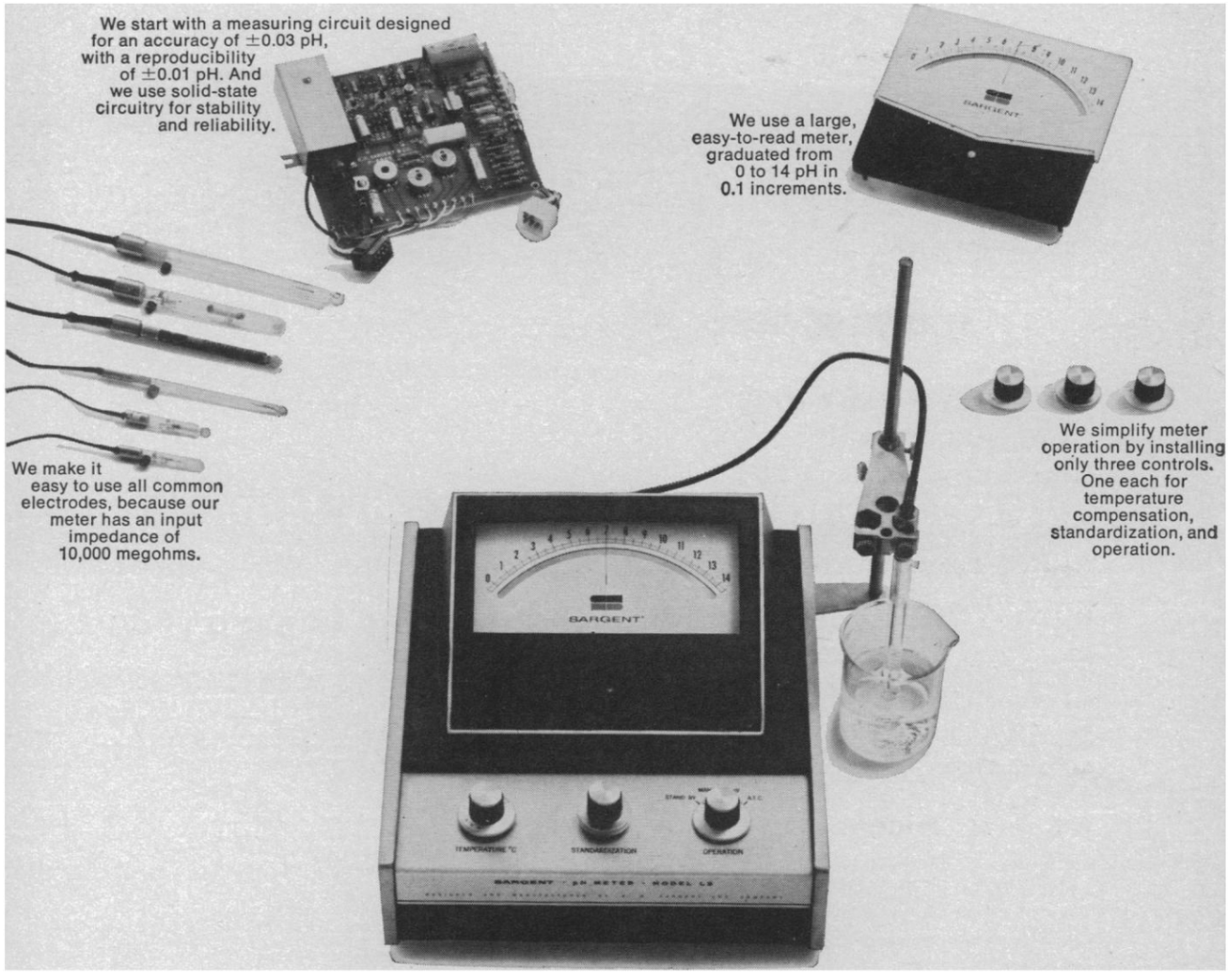

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- Voltage to Frequency Output available at Rear Panel when operating in any mode

Events Counter Features:
- Either Manual or Electronic Gating for Start & Stop
- Events may be scaled in Decade Steps to 10^7 ... 6 digit display permits count to 10^{13} without over ranging
- Input Pulse Resolution better than 50 Nanoseconds.

Frequency Meter Features:
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- Resolution ±1 Count

Period Meter Features:
- Either Manual or Electronic Gating for Start & Stop
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EU-805A/D UDI Spec. Sheet contains complete details, photos, prices and explanations of all functions and controls.

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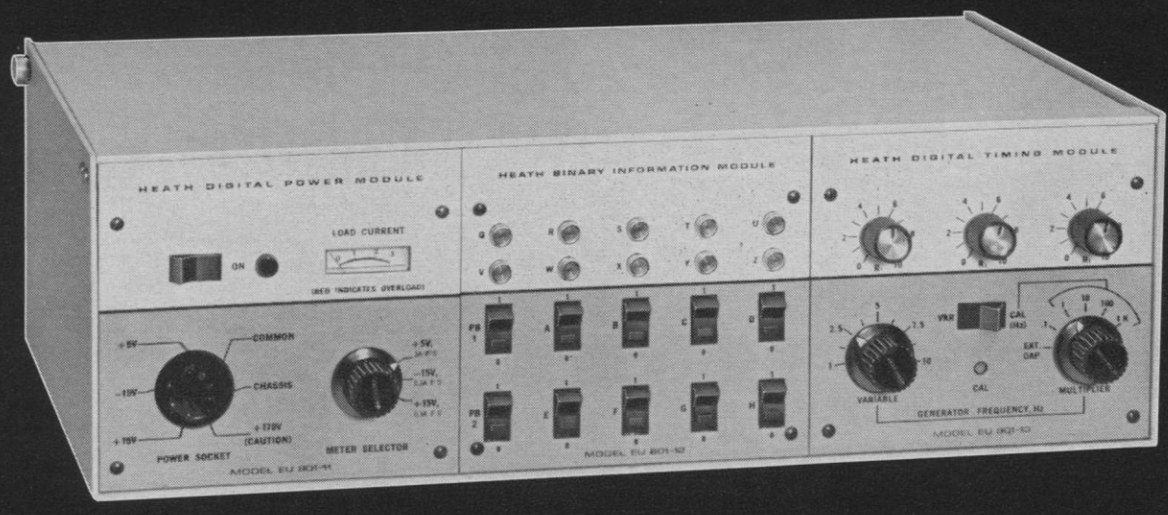
Circuit Card Spec. Sheet contains complete details and specs. on each circuit plus card prices.

another Heath/Malstadt-Enke design

DIGITAL & ANALOG SYSTEMS



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Recommended System (EU-801A as illustrated) Includes:

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EU-801-12 Binary Information Module
10 neon lamps and driver circuits; lamps light with application of logic 1. 8 SPDT switches and 2 SPDT spring return switches for binary information inputs. Connections for switches and lamps available at top of circuit cards. $50.

EU-801-13 Digital Timing Module
Contains function generator and three controls for use with monostable and comparator circuits. Generator range, 0.1 Hz to 10 kHz, variable in 5 decade steps. External capacitor position for other frequencies to 100 kHz. Outputs: complementary square wave, complementary pulse, and ramp. $60.

EU-801A Circuit Cards
Included are four Nand gate cards, two dual J-K flip flops, one dual monostable multivibrator, one relay card (contains 7 relays), one comparator/voltage to frequency converter card, one dual inline IC patch card, two multiple connector/blank PC cards, one operational amplifier card with 1200 megohm input. Individual cards available, prices range from $10 to $40. (Note: many cards from the EU-805A U.D.I. can be used.

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Holds any three modules; has elevating support to allow unit to be tilted back for access to front panel controls or forward when "patching" circuit cards. $20.

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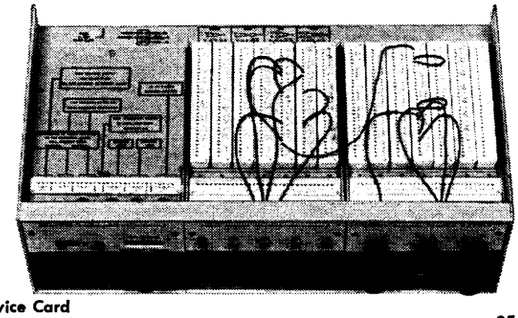

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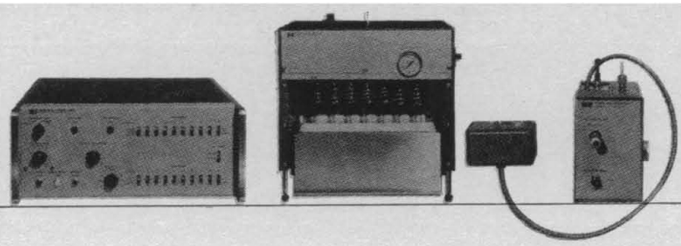

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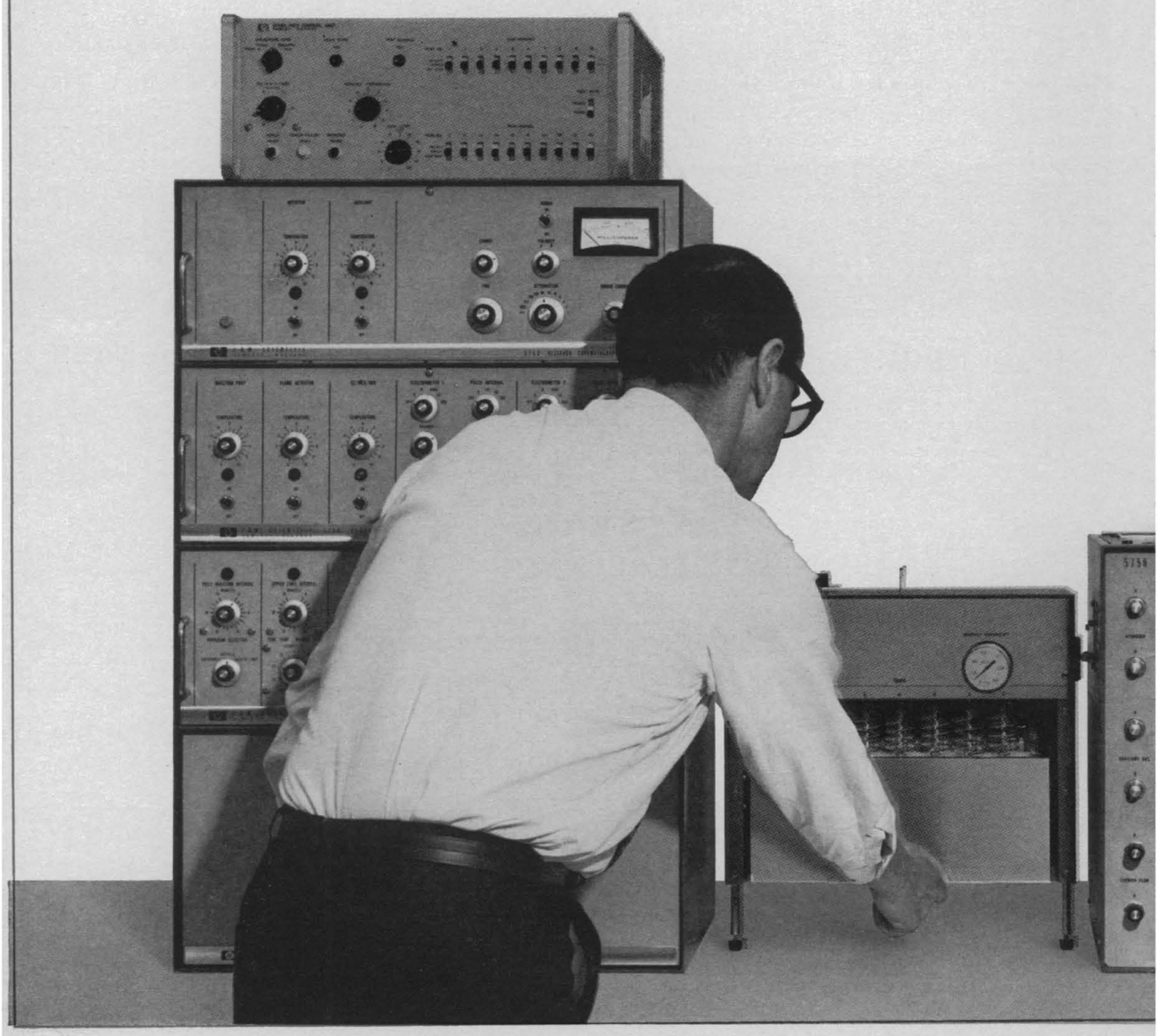

If you already own a good analytical gas chromatograph, here's a sensible way to add automatic preparative gc, reliably and economically. Install the new H-P Model 5795A Preparative Attachment on your analytical gc. It'll take less than one hour to do the job, and you'll benefit in many ways.

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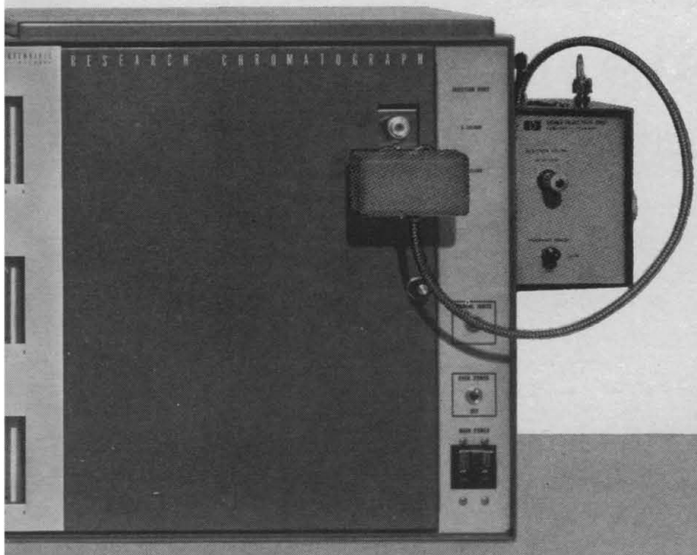
ANALYTICAL INSTRUMENTS



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For a catalog and price list on the CARY 16K and the CARY 16 (which is ideal for general spectrophotometric tasks), write Cary Instruments, 2724 South Peck Road, Monrovia, California 91016. Ask for Data File E803-78.

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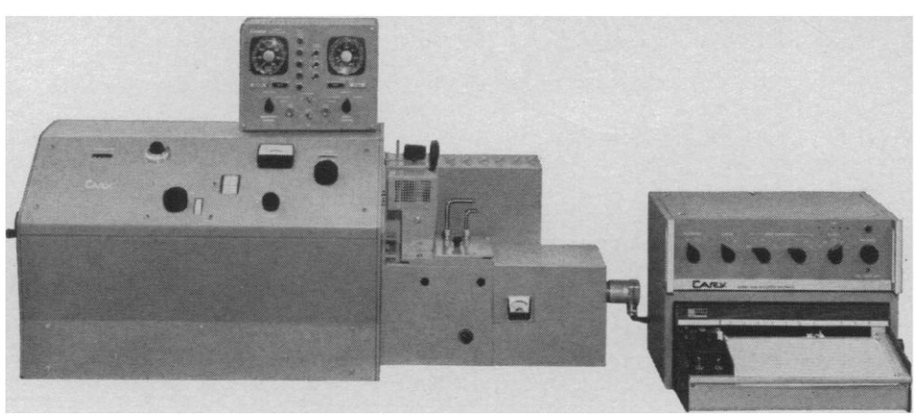

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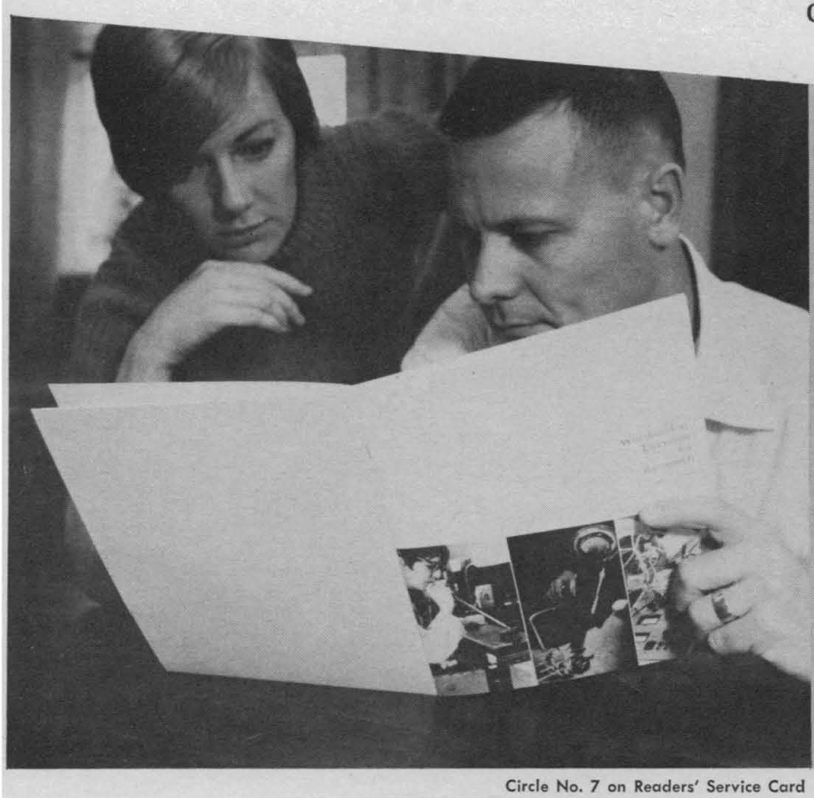

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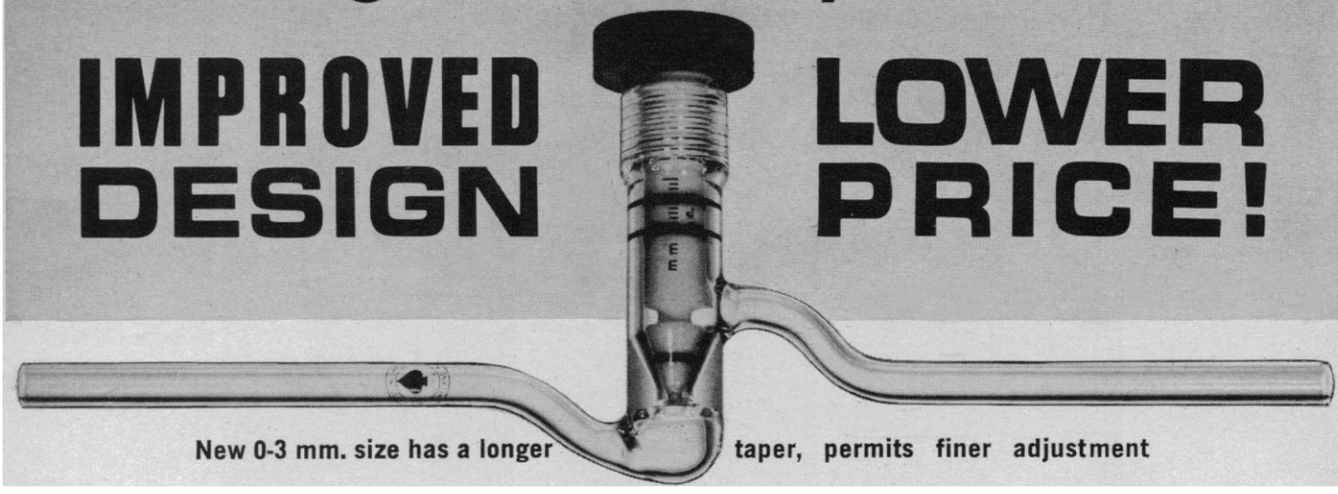

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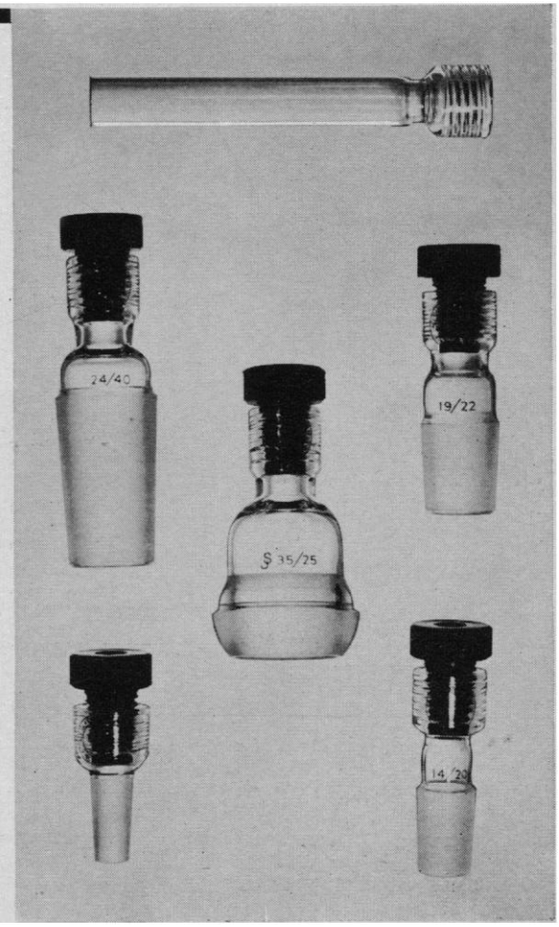

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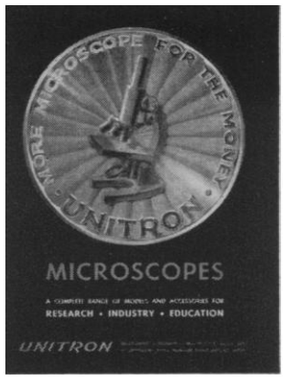

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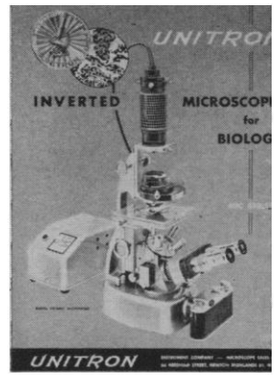

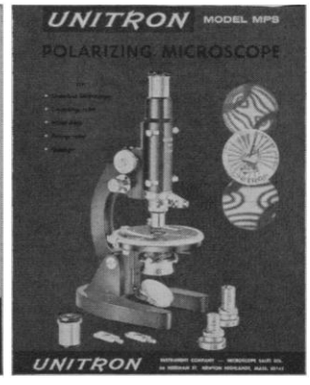

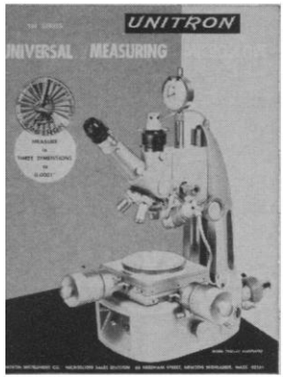

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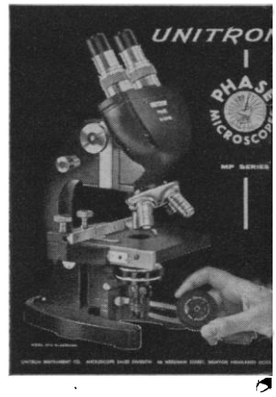

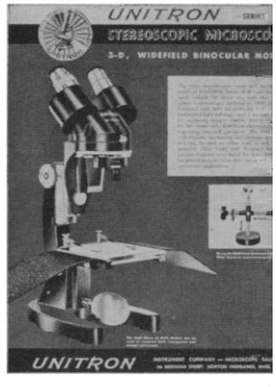

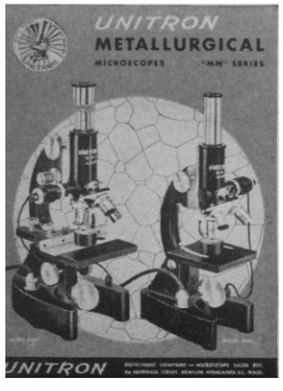

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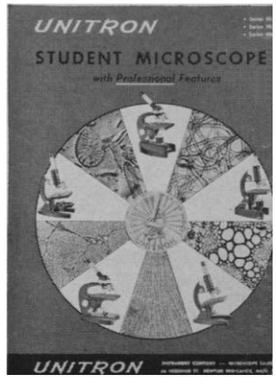

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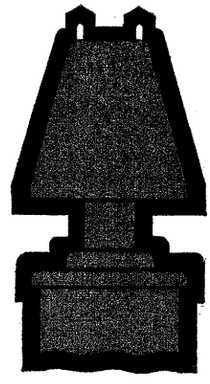

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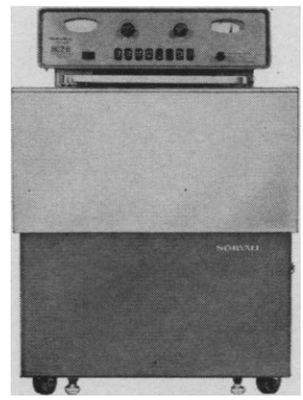

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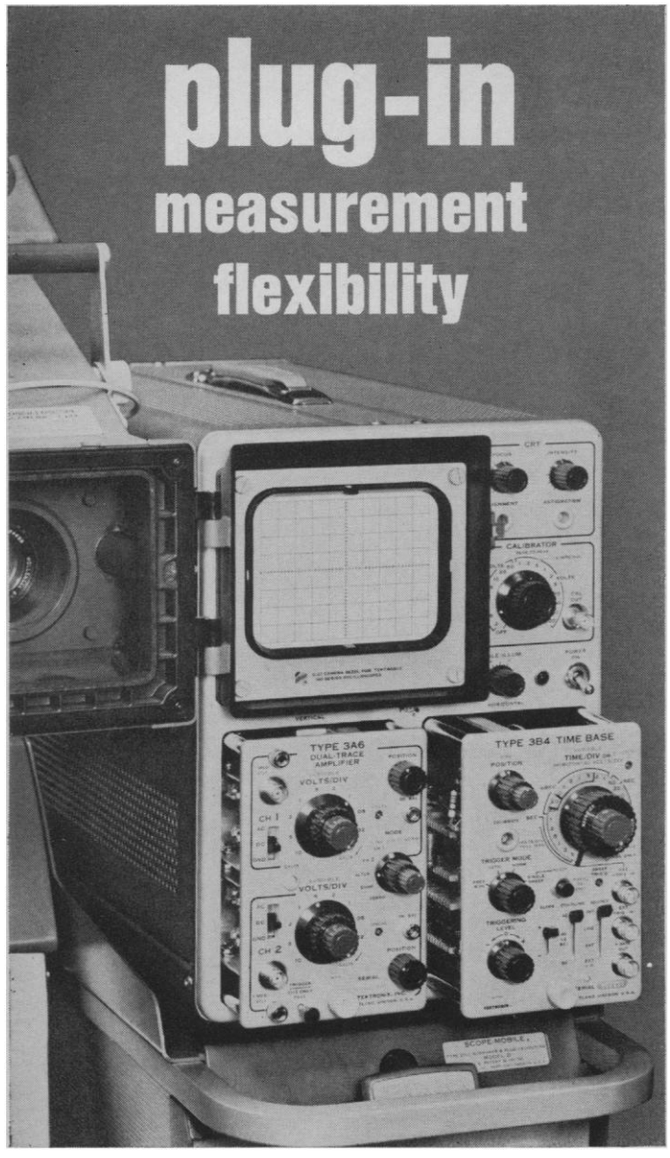

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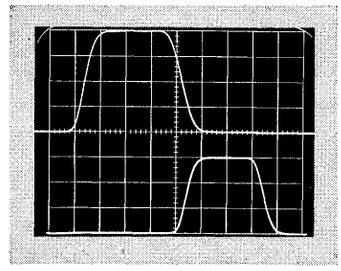

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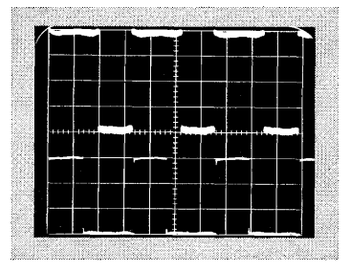

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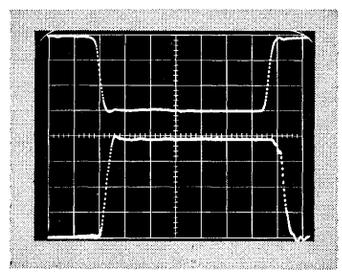

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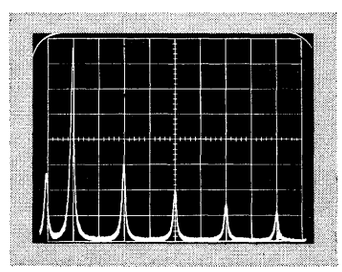

The Tektronix Type 561A oscilloscope has a complete selection of plug-ins, permitting you to change your measurement capabilities to meet your changing measurement needs. Amplifier plug-ins offer a wide range of measurement capabilities with 10 MHz dual-trace plug-ins, 10 μV/div differential plug-ins, 350-ps sampling plug-ins and spectrum analyzer plug-ins covering the spectrum from 50 Hz to 36 MHz. Time-base plug-ins include delayed sweep, X50 magnifier, single time-bases or sampling time-bases. Amplifier plug-ins may be placed in the horizontal position for X-Y or multiple X-Y displays, and automatic seeking plug-ins are available.

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For a demonstration of the Type 561A Oscilloscope or Type 564 Split-Screen Storage Oscilloscope, contact your nearby Tektronix Field Engineer or write: Tektronix, Inc., P. O. Box 500, Beaverton, Oregon 97005.

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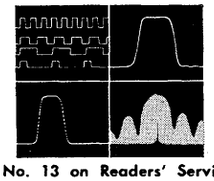

...with multi-trace, differential, sampling and spectrum analyzer plug-ins

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Education in the Shadow of Contempt

In his article "The social sciences and public policy" (3 May, p. 508), David B. Truman wrote:

> A more deliberate effort will require from active academics a serious, explicit, and continuing concern for education. One gets the impression that departmental and professional gatherings, except as they discuss a particular discipline, are the last places, not excepting general faculty meetings, in which to encounter serious thought about education. Presidents and deans are expected to pontificate on such matters, and the talk of professional educationists is tolerated if they keep to themselves, but an impression is conveyed that such concerns are not quite respectable for serious scholars. The impression is not accurate, of course, but circumstances give it some appearance of validity.

These, as well as many other points in the article, soak up added significance with every confrontation of students and college administrations, including Provost Truman's own ordeal at Columbia University. The article deserves serious attention. . . . We shall comment on a few of the issues touched on in the quoted passage.

1) If Truman is right, then we have the odd spectacle on our university campuses of many scholars, including many social scientists, taking little professional interest in what, by all odds, is one of the most fundamental of all social processes—education.

2) No less strange is the cavalier, almost contemptuous, attitude, sensed by Truman, toward those "educationists" who *do* make it their professional concern to study the educational enterprise. This attitude is not only strange—in the light of the commitment of the academic world to scholarly study of all phenomena—but it may have had consequences far more serious than a low position for educationists on the academic totem pole. In many instances this attitude has prevented academicians from hearing warnings that educationists were issuing decades ago and to which the current campus upheavals are now giving a tragic point.

3) The policy of relying on academicians in the diverse intellectual disciplines (history, economics, sociology, philosophy, psychology) to save education from the educationists, a policy in which millions upon millions of dollars have been invested by both the private foundations and government, we believe, is both theoretically and practically bankrupt. Truman's analysis indirectly explains why this belief is

justified, because the same factors that produce an inverse relationship between the development of a discipline as a science and its involvement with social problems also operate against the professional involvement of academic specialists in problems of education. Beginning with the fact that many disciplines have relevance for problems of education, it does not follow that their disciples will be willing or even able to work on these problems.

4) However, if the academic specialists are willing and able, the problem of finding an academic structure in which they can do so is perhaps not so obdurate as Truman seems to indicate. To be sure, the departmental structure—based on the academic disciplines—is eminently unsuited to interdisciplinary attacks of societal problems. Nevertheless, modern American universities do have on their campuses institutions that are interdisciplinary—the professional schools. The schools of law, medicine, engineering, architecture, and agriculture all use distinctive domains of practice to focus the results of many disciplines. The school of education is also such a structure; social scientists who really want to devote themselves to the study of education are more than welcome, and who knows, they may even find the intellectual climate there quite invigorating.

HARRY S. BROUDY
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Food Irradiation Study

In response to Schweigert (Letters, 3 May) and to the general question of the mutagenicity of food sterilized by exposure to ionizing radiation, we are now conducting, with an inbred strain of mice, experiments designed to detect damage to the polygenic system induced by a food component that has been subjected to megarad doses of gamma radiation. An outline of the work in progress is available from the Science Information Exchange of the Smithsonian Institution. This study is being supported by the Food and Drug Administration.

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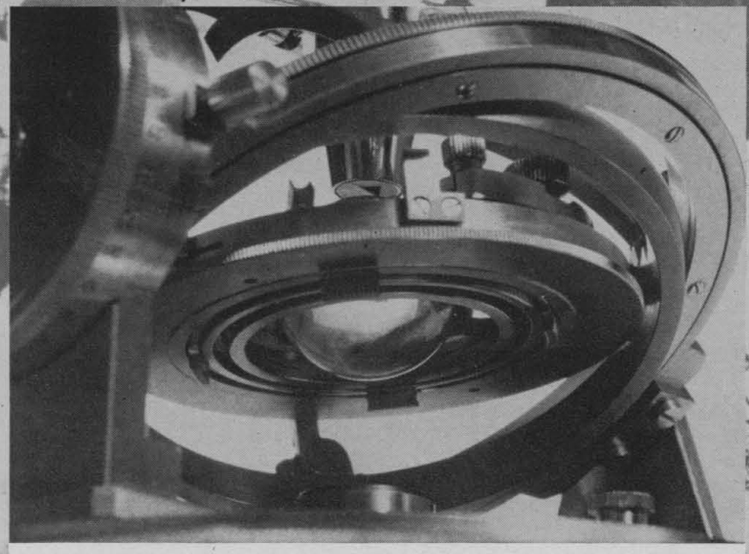

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12 July 1968, Volume 161, Number 3837 **SCIENCE**

Nuclear Power—Rosy Optimism and Harsh Reality

A dramatic confrontation between rosy optimism and harsh reality is now gripping the attention of the electrical power industry. During 1966 and 1967, in a bandwagon atmosphere, large numbers of nuclear power plants were authorized. As of 1 April 1968, about 35 percent of scheduled additions to electrical capacity were nuclear. Recent events, however, have caused some observers to fear that optimism was overdone. The utilities have gambled heavily on unproven equipment, some of which will be brought on line far behind schedule. Power shortages could result.

A conspicuous example is the installation at Oyster Creek, New Jersey, which is now about a year and a half behind schedule. During field hydrostatic testing of the reactor pressure vessel on 29 September 1967, a leak was detected. A dye-penetrant test revealed that the leak was the result of flaws in a field weld made to join a control rod housing to a stub tube in the pressure vessel. Detailed examination revealed localized intergranular cracking in 123 of 137 stainless steel stub tubes, and welding defects in each of the 137 field welds joining the stub tubes and the control rod housings.

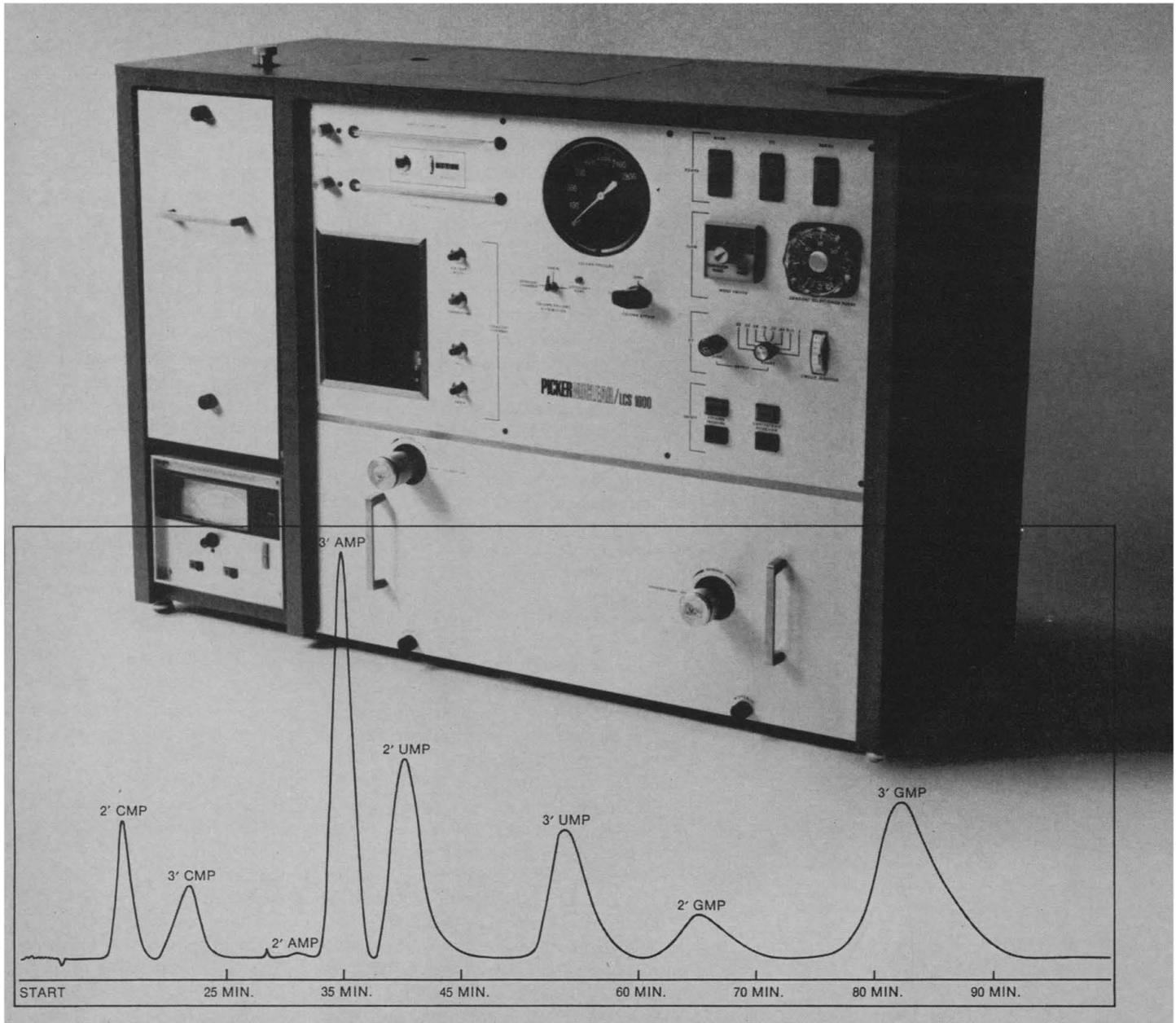
Many of the defects found were minor, and it seems unlikely that complete failure of a weld would have occurred had the weaknesses not been discovered. Even had such failure occurred, there would not have been a violent nuclear accident. However, if a leak or a weld failure had occurred after the reactor had operated for some time, the difficulty of repairing the defect would have been great, owing to intense radioactivity.

Before the Oyster Creek facility can be operated, it must be licensed. Three different groups will pass on the matter. First, there is the Division of Reactor Licensing of the Atomic Energy Commission, then the statutorily constituted Advisory Committee on Reactor Safeguards, and finally the Atomic Energy Commission itself. These bodies cannot be expected to act hastily. Defects in one aspect of the plant raise specters of other, yet undetected, flaws, and it is not certain that procedures used for repair of the defects will be acceptable. When the Oyster Creek generating plant will become operational is anybody's guess, but it could be in the distant future.

These delays will be costly in money and prestige. The Oyster Creek plant represented a courageous gamble by the General Electric Company, which, in 1963, undertook to guarantee delivery of a completed plant involving new design features at a stunningly low price. Announcement of the contract for the plant was widely regarded as signifying that nuclear power had come of age.

Following this event, other large nuclear installations were authorized at an increasing rate. Then came a great outcry against air pollution associated with coal-fired plants. The move toward nuclear power became a stampede. Delays at the bellwether Oyster Creek plant will have a sobering effect. An additional deterrent is the fact that costs of nuclear installations have increased by 40 percent during the last 2 years. Nuclear plants also have been tagged as important potential contributors to thermal pollution, since they are relatively less efficient thermally than coal-fired plants.

All of these difficulties will be surmounted, and nuclear power one day will furnish a substantial fraction of this country's electrical energy. How distant that day will be will depend mainly on how long it takes industry and labor to achieve new and higher standards of design excellence and quality control.—PHILIP H. ABELSON



This new Nucleic Acid Analyzer separated this nucleotide mixture in only 80 minutes. (And it's the only one in the world that could have.)

That chromatogram above actually took only 80 minutes with Picker's new Nucleic Acid Analyzer. It represents the separation of 1 microgram quantities of the 2′, 3′ monophosphates of ribonucleosides of cytosine, uracil, adenine, and quanine. Accordingly, if one were anxious to prove a point and the circumstances were truly ideal, you might well squeeze more than 12 separations out of this device in 24 working hours. Four separations in a typical work day: easy.

In any case, happy results have also been achieved with our Nucleic Acid Analyzer and mixtures of the mono-, di-, and triphosphates of the ribonucleosides of adenine, guanine, cytosine, and uracil. Complete analysis time: about 100 minutes. Mixtures of nucleotides and other UV-absorbing substances from natural sources yield chromatograms with an impressive multiplicity of peaks. Quickly.

So how does Picker's Nucleic Acid Analyzer effect nucleotide separations in so much less than the usual 24 to 36 hours? By introducing some interesting innovations into semi-automatic liquid chromatography: small bore columns packed with glass microspheres (which are coated with a skin of anion exchange resins), the columns run at high pressure (1000 psi or more).

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render the human environment safe, and governmental efforts in this direction.

This symposium demonstrated the noticeable progress in understanding mechanisms of chemical carcinogenesis through application of modern methods of molecular biology and pathology, genetics, and pharmacology. Advances of practical significance for carcinogen testing and prevention of disease through elimination of hazards will undoubtedly result from the progress of research in this field. The proceedings of the symposium will be published as volume 11 of *Progress in Experimental Tumor Research* (S. Karger AG, Basel, Switzerland).

F. HOMBURGER

Bio-Research Institute,
Cambridge, Massachusetts 02141

Note

1. The following authors participated in the symposium: I. Berenblum, Rehovoth, Israel; F. Bischoff, Santa Barbara, Calif.; E. Boyland, London; G. Bryson, Santa Barbara; W. J. Burdette, Houston; A. Cantarow, Bethesda; M. M. Coombs and C. J. Croft, London; T. L. Dao, Buffalo; C. Deckers, Louvain, Belguim; G. Della Porta, Milan; L. Diamond, Philadelphia; R. E. Eckardt, Linden, N.J.; A. Furst, San Francisco; C. Heidelberger, Madison, Wis.; D. Hoffmann, New York; F. Homburger, Cambridge, Mass.; N. Mantel, Bethesda; E. C. Miller and J. A. Miller, Madison, Wis.; E. L. Richardson, Boston; U. Saffiotti, Chicago; M. Shimkin, Philadelphia; C. M. Southam, New York; B. L. Van Duuren, New York; J. H. Weisburger, Bethesda; G. Wogan, Cambridge, Mass.; E. Wynder, New York.

Calendar of Events

National Meetings

August

1–3. Conference on **Dermatology**, Aspen, Colo. (W. C. Eisele, Univ. of Colorado Medical Center, 4200 E. 9th Ave., Denver 80220)

3–9. National **Poultry** Science Assoc., Fort Collins, Colo. (R. E. Moreng, Animal Science Bldg., Colorado State University, Fort Collins 80521)

11–15. National **Medical** Assoc., Houston, Tex. (S. C. Smith, 520 W St. NW, Washington, D.C. 20001)

12–14. American Inst. of **Aeronautics and Astronautics**, Pasadena, Calif. (W. J. Brunke, Meetings Manager, 1290 Sixth Ave., New York 10019)

12–16. American **Crystallographic** Assoc., Buffalo, N.Y. (W. L. Kehl, Gulf Research & Development Co., P.O. Box 2038, Pittsburgh, Pa. 15230)

15–16. American Inst. of **Aeronautics and Astronautics**, Pasadena, Calif. (W. J. Brunke, Meetings Manager, 1290 Sixth Ave., New York 10019)

18–21. **Botanical** Soc. of America, Davis, Calif. (Botany Dept., Indiana Univ., Bloomington)

18–21. **Genetics** Soc. of America, Davis, Calif. (Genetics Soc. of America, Missouri State College, Springfield)

18–21. **Mycological** Soc. of America, Davis, Calif. (Pioneering Research Div., Natick Labs., Natick, Mass.)

18–21. American **Bryological** Soc., Davis, Calif. (The Society, Box 36, Missouri State College, Springfield)

18–21. **Ecological** Soc. of America, Davis, Calif. (Ecology Section, Health Physics Div., Oak Ridge Natl. Lab., Oak Ridge, Tenn.)

18–21. American Soc. for **Horticultural Science**, Davis, Calif. (C. Blackwell, P.O. Box 109, St. Joseph, Mich. 49085)

18–21. American Soc. of **Plant Physiologists**, Davis, Calif. (Dept. of Biology, Yale Univ., New Haven, Conn. 06520)

18–21. American Soc. of **Plant Taxonomists**, Davis, Calif. (Botany Dept., Univ. of California, Berkeley)

18–22. IUTAM Symp. on **High-Speed Computing in Fluid Dynamics**, Monterey, Calif. (F. N. Frenkiel, U.S. Natl. Committee on Theoretical and Applied Mechanics, c/o David Taylor Model Basin, Washington, D.C.)

18–22. American Soc. for **Pharmacology and Experimental Therapeutics**, Minneapolis, Minn. (Mrs. A. Ulman, 9650 Rockville Pike, Bethesda, Md. 20014)

19–23. American **Crystallographic** Assoc., Buffalo, N.Y. (W. L. Kehl, Gulf Research and Development Co., P.O. Box 2038, Pittsburgh, Pa. 15230)

19–29. Symposium on **Physics of the Magnetosphere**, Washington, D.C. (J. Gazin, % Committee on Space Research, 55 Boulevard Malesherbes, Paris 8, France)

20–23. Association of American **Geographers**, 64th annual, Washington, D.C. (J. W. Nystrom, 1146 16th St., NW, Washington, D.C.)

20–23. American **Statistical** Assoc., 128th annual, Pittsburgh, Pa. (Executive Director, 810 18th St., NW, Washington, D.C. 20006)

21–23. **Applications of X-ray Analysis**, 17th conf., Denver, Colo. (J. B. Newkirk, Metallurgy Div., Univ. of Denver, Denver)

21–23. American Soc. of **Civil Engineers**, Cambridge, Mass. (W. H. Wisley, United Nations Plaza, 345 E. 47 St., New York 10017)

22–24. American **Nuclear** Soc., Schenectady, N.Y. (J. E. Burke, General Electric Research and Development Center, Schenectady)

28–30. Society for the Study of **Reproduction**, Nashville, Tenn. (R. P. Amann, 105 Borland Lab., Pennsylvania State Univ., University Park, 16802)

30–1. American **Psychological** Assoc., San Francisco, Calif. (E. Walker, 1200 17th St., NW, Washington, D.C.)

International and Foreign Meetings

August

1–2. Commonwealth **Medical** Assoc. Canberra, Australia. (BMA House, Tavistock Sq., London, W.C.1, England)

5–8. **Aviation and Space Medicine**, 17th intern., Oslo, Norway. (C.-W. Sem-Jacobsen, EEG Lab, Sykehus Gaustad, Vinderen 3, Oslo)

5–9. **Rorschach and Other Projective Techniques**, 7th intern. congr., London,

England. (C. Williams, 32 Willes Rd., London, N.W.5)

5–10. Asia-Pacific Acad. of **Ophthalmology**, 3rd Conf., Singapore. (E. Kwee, % Ophthalmic Dept., General Hospital, Singapore 3)

5–10. General Assembly of the World **Medical** Assoc., Sydney, Australia. (World Medical Assoc., 10 Columbus Circle, New York 10019)

6–16. **Soil Science**, 9th intern. congr., Sydney, Australia. (Australian Organizing Committee, % CSIRO Waite Agricultural Research Inst., Adelaide)

12–15. International Conf. on **Radiation Chemistry**, Argonne, Ill. (E. J. Hart, Argonne National Lab., 9700 S. Cass Ave., Argonne 48090)

12–17. **Mental Health**, 7th intern. congr., London, England. (World Federation for Mental Health, Regional U.S. Office, Suite 716, 124 E. 21 St., New York 10016)

12–30. **Limnology**, 17th intern. congr., Israel. (International Assoc. of Theoretical and Applied Limnology, % Freshwater Biological Assoc., Ferry House, Far Sawrey, Ambleside, Westmorland, England)

13–16. Disorders of the **Skull Base Region**, 1st intern. congr., Stockholm, Sweden. (C. A. Hamberger, Ear, Nose, and Throat Clinic, Karolinska Sukhuset, Stockholm 60)

14–27. United Nations Conf. on the **Exploration and Peaceful Uses of Outer Space**, Vienna, Austria. (Bundesministerium fur Auswartige Angelegenheiten, Ballhausplatz 2, A-1010 Vienna)

18–22. International Congr. of **Histochemistry and Cytochemistry**, New York, N.Y. (R. M. Rosenbaum, Dept. of Pathology, % Albert Einstein College of Medicine, New York 10461)

18–22. Canadian **Pharmaceutical** Assoc., Regina, Sask. (P. W. Bell, 175 College St., Toronto 2B, Ont., Canada)

18–23. **Thermal Analysis**, 2nd intern. conf., Worcester, Mass. (P. D. Gain, Univ. of Akron, Arkon, Ohio 44304)

18–24. International Union of **Theoretical and Applied Mechanics**, Monterey, Calif. (F. N. Frenkiel, U.S. National Committee on Theoretical and Applied Mechanics, % David Taylor Model Basin, Washington, D.C.)

19–21. **Water Pollution Research**, 4th intern. conf., Prague, Czechoslovakia. (P. A. Krenkel, American Commission, Box 1670, Station B, Vanderbilt Univ., Nashville, Tenn. 37203)

19–23. American **Meteorological** Soc., Montreal, P.Q., Canada. (D. W. Hitschfeld, Dept. of Meteorology, McGill Univ., Montreal)

19–23. International **Peat** Congr., 3rd, Quebec City, P.Q., Canada. (Div. of Building Research, Natl. Research Council, Ottawa 7, Ont., Canada)

19–28. International Assoc. of **Geochemistry and Cosmochemistry**, Prague, Czechoslovakia. (E. Ingerson, Univ. of Texas, Austin 78712)

19–28. International **Geological** Congr., 23rd, Prague, Czechoslovakia. (M. A. Dudek, Ustredni Ustav geologicky, Malostranske nam. 19, Prague 1)

19–28. International Congr. of **Genetics**, 12th, Tokyo, Japan. (Y. Tazima, % National Inst. of Genetics, Yata 1, 111, Misima, Sizuokaken, Japan)

19–28. International **Paleontological** Union, Prague, Czechoslovakia. (Organizing Committee of the Session, Malostranski Namesti 19, Prague)

20–25. **World Power** Conf., 7th, Moscow, U.S.S.R. (B. P. Lebedev, Commission for Participation by the U.S.S.R. in Intern. Power Conf., State Committee for Science and Technology, Gorkii St. 11, Moscow, K-9)

21–28. British Assoc. for the Advancement of **Science,** 130th annual, Dundee, U.K. (N. C. Wright, 3 Sanctuary Bldgs. 20 Great Smith St., London, S.W.1, England)

24–29. **Gerontology,** 8th Intern. Congr., Washington, D.C. (Secretary, 9650 Rockville Pike, Bethesda, Md. 20014)

24–29. **Neuropathology,** 6th intern. congr., Copenhagen, Denmark. (E. Christensen, % Universitets Psykiatriske Lab., Rigshospitalet, Copenhagen)

24–31. **Cell Biology,** 12th intern. congr., Brussels, Belgium. (D. Dustin, 97, rue Aux Laines, Brussels)

25–30. International Union of **Pure and Applied** Chemistry, 6th, Schenectady, N.Y. (P. Cannon, General Electric Co., R & D Center, Bldg. K-1, Room 3A36, P.O. Box 8, Schenectady 12301)

25–31. **History of Science,** 12th intern. congr., Paris, France. (Mlle. S. Delorme, 12, rue Colbert, Paris)

25–31. International Union of **Physiological Sciences,** 24th, Washington, D.C. (Secretary, 9650 Rockville Pike, Bethesda, Md. 20014)

25–31. **Physical Medicine,** 5th intern. congr., Montreal, Canada. (B. Talbot, 6300 Darlington Ave., Montreal, P.Q.)

26–29. Western Hemisphere **Nutrition** Congr., San Juan, P. R. (American Medical Assoc. Council on Foods and Nutrition, 535 N. Dearborn St. Chicago, Ill 60610)

26–30. International **Health** Conf., Copenhagen, Denmark. (P. A. Wells, Royal Soc. of Health, 90 Buckingham Palace Rd., London, S.W.1, England)

26–31. International Conf. on **Cloud Physics,** Toronto, Ont., Canada. (R. List, Dept. of Physics, Univ. of Toronto, Toronto 5)

26–31. **Photobiology,** 5th intern. congr., Hanover, N.H. (S. A. Gordon, Room 202, Argonne National Lab., Argonne, Ill. 60439)

26–31. International Assoc. of **Meteorology and Atmospheric Physics,** Toronto, Ont., Canada. (R. List, Dept. of Physics, Univ. of Toronto, Toronto 5)

26–13. Australian School of **Nuclear Technology,** Lucas Heights, New South Wales. (Principal, Australian School of Nuclear Technology, Private Mail Bag, Sutherland, N.S.W.)

28–5. World **Natural Rubber** Conf., Kuala Lumpur, Malaysia (Natural Rubber Bureau, 1108 16th St., NW, Washington, D.C.)

29–31. Society of **Neurologists and Psychiatrists** of South Africa, Johannesburg. (N. Don, Pan Africa House, Jeppe St., Johannesburg)

31–2. South African **Radiological** Conf., 1st, Johannesburg, (P. Sneider, P. O. Box 4878, Johannesburg)

31–7. International Assoc. of **Logopedics and Phoniatrics,** 15th congr., Paris, France. (B. Vallancien, 16, rue Spontini, Paris 16)

BOOKS RECEIVED

(Continued from page 156)

1968. xvi + 608 pp., illus. $12.25. Prentice-Hall Series in Technical Mathematics.

As a Tale That Is Told. The autobiography of R. M. MacIver. University of Chicago Press, Chicago, 1968. x + 269 pp., illus. $7.50.

Aspects of Neural Ontogeny. A. F. W. Hughes. Logos Press, London; Academic Press, New York, 1968. xii + 249 pp., illus. $12.50.

The Atomists (1805–1933). Basil Schonland. Oxford University Press, New York, 1968. x + 198 pp., illus. $5.60.

Atoms and Elements. A Study of Theories of Matter in England in the Nineteenth Century. David M. Knight. Hutchinson, London, 1967. vi + 167 pp., illus. 30 s.

The Autonomic Nervous System. For Students of Physiology and of Pharmacology. J. Harold Burn. Davis, Philadelphia, ed. 3, 1968. viii + 149 pp., illus. $3.75.

Autonomous Group Functioning. An Exploration in Behaviour Theory and Measurement. P. G. Herbst. Social Science Paperbacks in association with Tavistock Publications, London, 1968 (distributed in the U.S. by Barnes and Noble, New York). xiv + 271 pp., illus. Paper, $3.25. Reprint of the 1942 edition.

Basalts. The Poldervaart Treatise on Rocks of Basaltic Composition. Vol. 2. H. H. Hess and Arie Poldervaart, Eds. Interscience (Wiley), New York, 1968. viii + 400 pp., illus. $22.

Basic Electronic Test Equipment. A Programmed Introduction. Donald H. Schuster. McGraw-Hill, New York, 1968. Unpaged, illus. $7.95.

Basic Real and Abstract Analysis. John F. Randolph. Academic Press, New York, 1968. xii + 515 pp., illus. $14.

Biblia Pauperum. Facsimile Edition of the Forty-Leaf Blockbook in the Library of the Esztergom Cathedral. Introduction, notes and subtitles by Elizabeth Soltesz. Corvina Press, Budapest, 1967. xxxi + 40 pp., illus. $12.

Bibliography for Beginners. Form A. Daniel Gore. Appleton-Century-Crofts, New York, 1968. xiv + 192 pp., illus. Paper, $1.60.

The Big Bend of the Rio Grande. A Guide to the Rocks, Landscape, Geologic History, and Settlers of the Area of Big Bend National Park. Ross A. Maxwell. University of Texas, Austin, 1968. vi + 139 pp., illus., maps. Paper, $2.

Bile Pigments. Chemical, Biological, and Clinical Aspects. Torben K. With. Translated from the German edition (Stuttgart, 1960) by J. P. Kennedy. Academic Press, New York, 1968. xiv + 830 pp., illus. $35.

Bonding Theory. Donald J. Royer. Mcgraw-Hill, New York, 1968. x + 275 pp., illus. $10.75.

Bone for Bone. Written and illustrated by Margaret Cosgrove. Dodd, Mead, New York, 1968. 128 pp. $3.95.

The Brain Drain. Papers presented at an international conference, Lausanne, Aug. 1967. Walter Adams, Ed. Macmillan, New York; Collier-Macmillan, London, 1968. xiv + 273 pp., illus. $6.95.

Brain Function. Vol. 4, Brain Function and Learning. Proceedings of the 4th conference, Los Angeles, Nov. 1964. Donald B. Lindsley and Arthur A. Lumsdaine, Eds. University of California Press, Berkeley, 1967. xiv + 364 pp., illus. $15.

Carbon-14. Vernon F. Raaen, Gus A. Ropp, and Helen P. Raaen. McGraw-Hill, New York, 1968. xii + 388 pp., illus. $15.

F. Catherwood. Architect-Explorer of Two Worlds. Victor Wolfgang von Hagen. Barre, Barre, Mass., 1968. 60 pp., illus. $6.95.

Cell Walls and Membranes. H. J. Rogers and H. R. Perkins. Spon, London, 1968 (distributed in the U.S. by Barnes and Noble, New York). xii + 436 pp., illus. $12.

Challenge to Reason. C. West Churchman. McGraw-Hill, New York, 1968. xii + 223 pp. Cloth, $5.95; paper, $3.95.

Chemistry. A Survey of Fundamentals. Lawrence P. Eblin. Harcourt, Brace and World, New York, 1968. xxvi + 676 pp., illus. $9.95.

College Algebra and Trigonometry. Daniel E. Dupree and Frank L. Harmon. Prentice-Hall, Englewood Cliffs, N.J., 1968. xii + 288 pp., illus. $7.95.

The College Environment. Alexander W. Astin. American Council on Educa-

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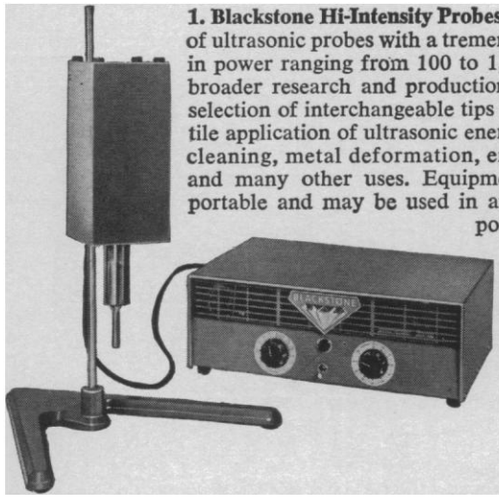

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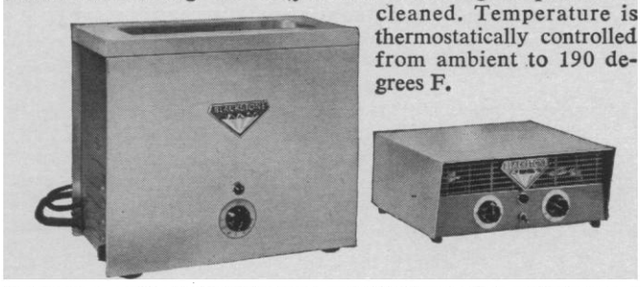

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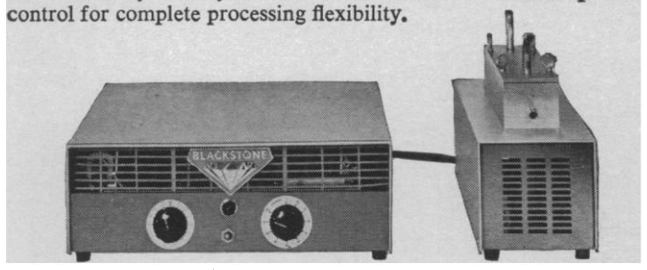

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tion, Washington, D.C., 1968. xii + 187 pp., illus. Cloth, $5; paper, $3.

Communication in Science. Documentation and Automation. Proceedings of a Ciba Foundation symposium, London, Nov. 1966. Anthony de Reuck and Julie Knight, Eds. Little, Brown, Boston, 1967. xii + 274 pp., illus. $12.50.

A Comparative Quantitative Phonology of Russian, Czech, and German. Henry Kučera and George K. Monroe. Elsevier, New York, 1968. xii + 113 pp. $12.

Computers. A Programming Problem Approach. R. Clay Sprowls. Harper and Row, New York, ed. 2, 1968. xii + 399 pp., illus. $9.95.

Delinquency and Crime. Cross-Cultural Perspectives. Ruth Shonle and Jordan T. Cavan. Lippincott, Philadelphia, 1968. vi + 244 pp. $5.95.

Depression. Clinical, Experimental, and Theoretical Aspects. Aaron T. Beck. Hoeber Medical Division (Harper and Row), New York, 1967. xiv + 370 pp., illus. $10.50.

Developmental Language Disability. Adult Accomplishments of Dyslexic Boys. Margaret B. Rawson. Johns Hopkins Press, Baltimore, 1968. xvi + 127 pp., illus. $5.50.

Differential Equations with Application. Paul D. Ritger and Nicholas J. Rose. McGraw-Hill, New York, 1968. xiv + 545 pp., illus. $9.50.

Dispersion Fuel Elements. A. N. Holden. Gordon and Breach, New York, 1967. x + 255 pp., illus. $4.50; to libraries, $12.50. 20 percent discount if prepaid.

The Dynamics of Machinery. Jeremy Hirschhorn. Barnes and Noble, New York, 1968. xvi + 447 pp., illus. $9.75.

Electric Network Theory, Laplace Transform Technique. Myril B. Reed and Georgia B. Reed. International Textbook Co., Scranton, Pa., 1968. xii + 235 pp., illus. $9.

Electromagnetic Radiation in Space. Proceedings of the 3rd ESRO Summer School in Space Physics, Alpbach, Austria, July–Aug. 1965. J. G. Emming, Eds. Springer-Verlag, New York; Reidel, Dordrecht-Holland, 1967. viii + 307 pp., illus. $17.40.

Electromechanical Devices for Energy Conversion and Control Systems. Vincent Del Toro. Prentice-Hall, Englewood Cliffs, N.J., 1968. xx + 617 pp., illus. $13.75.

Electron Paramagnetism. Juan A. McMillan. Reinhold, New York, 1968. xii + 226 pp., illus. $14.50.

Electronic Digital Techniques. Paul M. Kintner. McGraw-Hill, New York, 1968. xiv + 315 pp., illus. $11.95.

Elements of Control Systems Analysis. Classical and Modern Approaches. Chih-Fan Chen and I. John Haas. Prentice-Hall, Englewood Cliffs, N.J., 1968. viii + 471 pp., illus. $13.50.

Elements of General Biological Chemistry. An Introduction to the Molecular Basis of Life. John R. Holum. Wiley, New York, ed. 2, 1968. xvi + 576 pp., illus. $8.95.

Emulsion Science. Philip Sherman, Ed. Academic Press, New York, 1968. x + 496 pp., illus. $21.

Energy Flow in Biology. Biological Organization as a Problem in Thermal Physics. Harold J. Morowitz. Academic Press,

New York, 1968. xii + 179 pp., illus. $9.50.

Engineering and the Liberal Arts. A Technologist's Guide to History, Literature, Philosophy, Art, and Music. Samuel C. Florman. McGraw-Hill, New York, 1968. x + 278 pp. $8.95.

Essential Mathematics for College Students. Francis J. Mueller. Prentice-Hall, Englewood Cliffs, N.J., ed. 2, 1968. viii + 230 pp., illus. Paper, $4.75.

Every Man His Way. Readings in Cultural Anthropology. Alan Dundes, Ed. Prentice-Hall, Englewood Cliffs, N.J., 1968. xviii + 551 pp., illus. Paper, $4.95.

Freud. Political and Social Thought. Paul Roazen. Knopf, New York, 1968. xii + 332 pp. $6.95.

Fundamentals of Optics and Modern Physics. Hugh D. Young. McGraw-Hill, New York, 1968. xvi + 510 pp., illus. $8.95.

La Genèse des Sols en tant que Phénomène Géologique. Esquisse d'une Théorie Géologique et Géochimique. Biostasie et Rhexistasie. H. Erhart. Masson, Paris, ed. 2, 1967. 177 pp. 31 F.

Genetics for Medical Students. E. B. Ford. Methuen, London, ed. 6, 1967 (distributed in the United States by Barnes and Noble, New York). xii + 211 pp., illus. $3.50.

Helmholtz on Perception. Its Physiology and Development. Richard M. Warren and Roslyn P. Warren. Wiley, New York, 1968. x + 277 pp., illus. $9.95.

High Energy Physics. Hal Hellman. Illustrated by Edward A. DeVille. Lippincott, Philadelphia. 1968. 192 pp. $4.75.

The History of Life. A. Lee McAlester. Prentice-Hall, Englewood Cliffs, N.J., 1968. viii + 151 pp., illus. Cloth, $5.95; paper, $2.50.

How to Find Out in Philosophy and Psychology. D. H. Borchardt. Pergamon, New York, 1968. viii + 97 pp., illus. Cloth, $3.50; paper, $2.

Human Aging and Behavior. Recent Advances in Research and Theory. George A. Talland, Ed. Academic Press, New York, 1968. xiv + 322 pp., illus. $12.

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Industry and Tropical Health VI. Proceedings of the 6th Conference of the Industrial Council for Tropical Health, Boston, Oct. 1966. Published for the Industrial Council for Tropical Health by the Harvard School of Public Health, Boston, 1967. 214 pp., illus. $10; $5, professional rate.

Interference Microscopy for the Biologist. S. Tolansky. Thomas, Springfield, Ill., 1968. xii + 166 pp., illus. $11.75.

Intermediate Structure in Nuclear Reactions. Lectures by Richard H. Lemmer, Leonard S. Rodberg, James E. Young, J. J. Griffin, and Alexander Lande. Hugh P. Kennedy and Rudloph Schrils, Eds. University of Kentucky Press, Lexington, 1968. x + 219 pp., illus. Paper, $7.50.

International Action to Avert the Impending Protein Crisis. Report to the Economic and Social Council of the Advisory Committee on the Application of Science and Technology to Development. United

Nations, New York, 1968. viii + 106 pp. Paper, $1.50.

Introduction to Chemistry. Amos Turk, Herbert Meislich, Frank Brescia, and John Arents. Academic Press, New York, 1968. xiv + 577 pp., illus. $9.75.

Introduction to Electronics. H. Alex Romanowitz and Russell E. Puckett. Wiley, New York, 1968. xx + 763 pp., illus. $10.95.

Introduction to Fluid Mechanics. Stephen Whitaker. Prentice-Hall, Englewood Cliffs, N.J., 1968. xvi + 457 pp., illus. $12.

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