

SCIENCE

22 August 1969

Vol. 165, No. 3895

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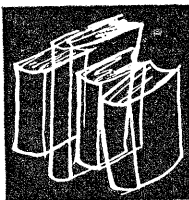
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COVER

Peromyscus boyleyi in Miller Canyon of the Huachuca Mountains, Arizona. See review of *Biology of Peromyscus* (Rodentia), page 782. [Lee R. Dice, Professor Emeritus of Zoology, University of Michigan]

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.

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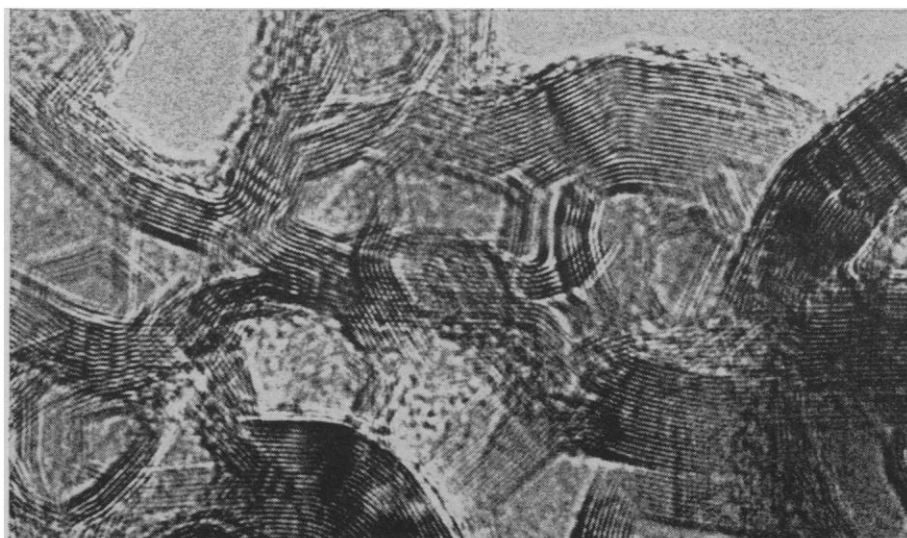
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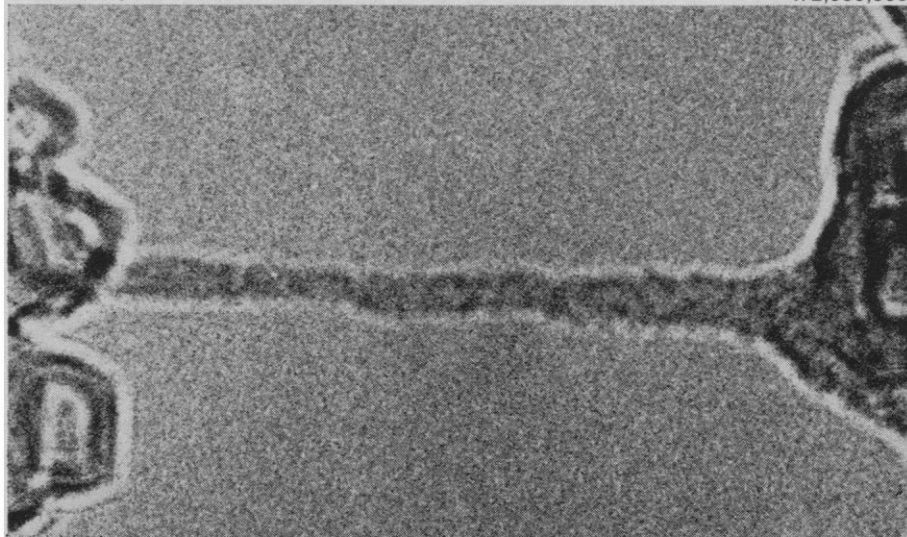
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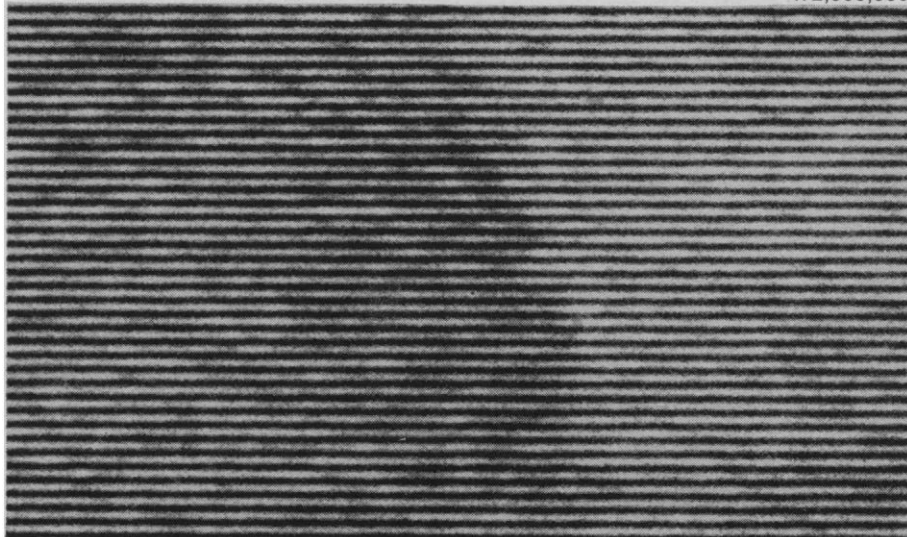
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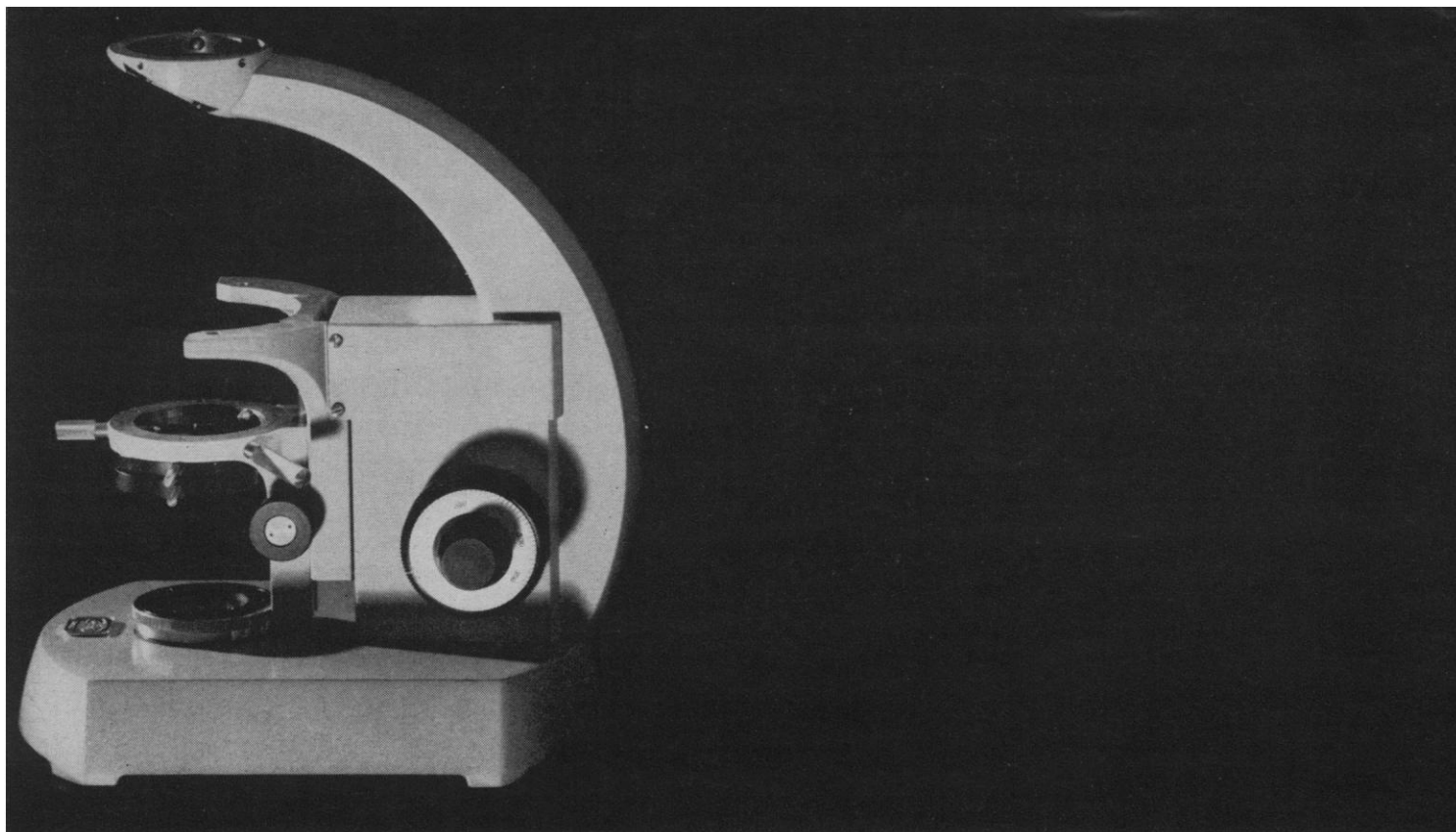
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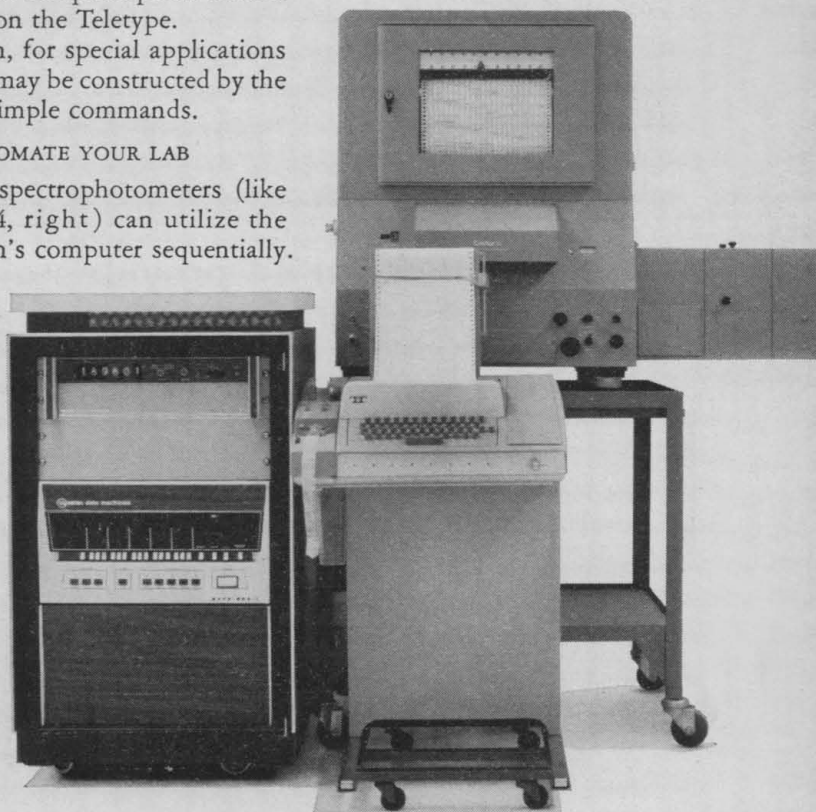
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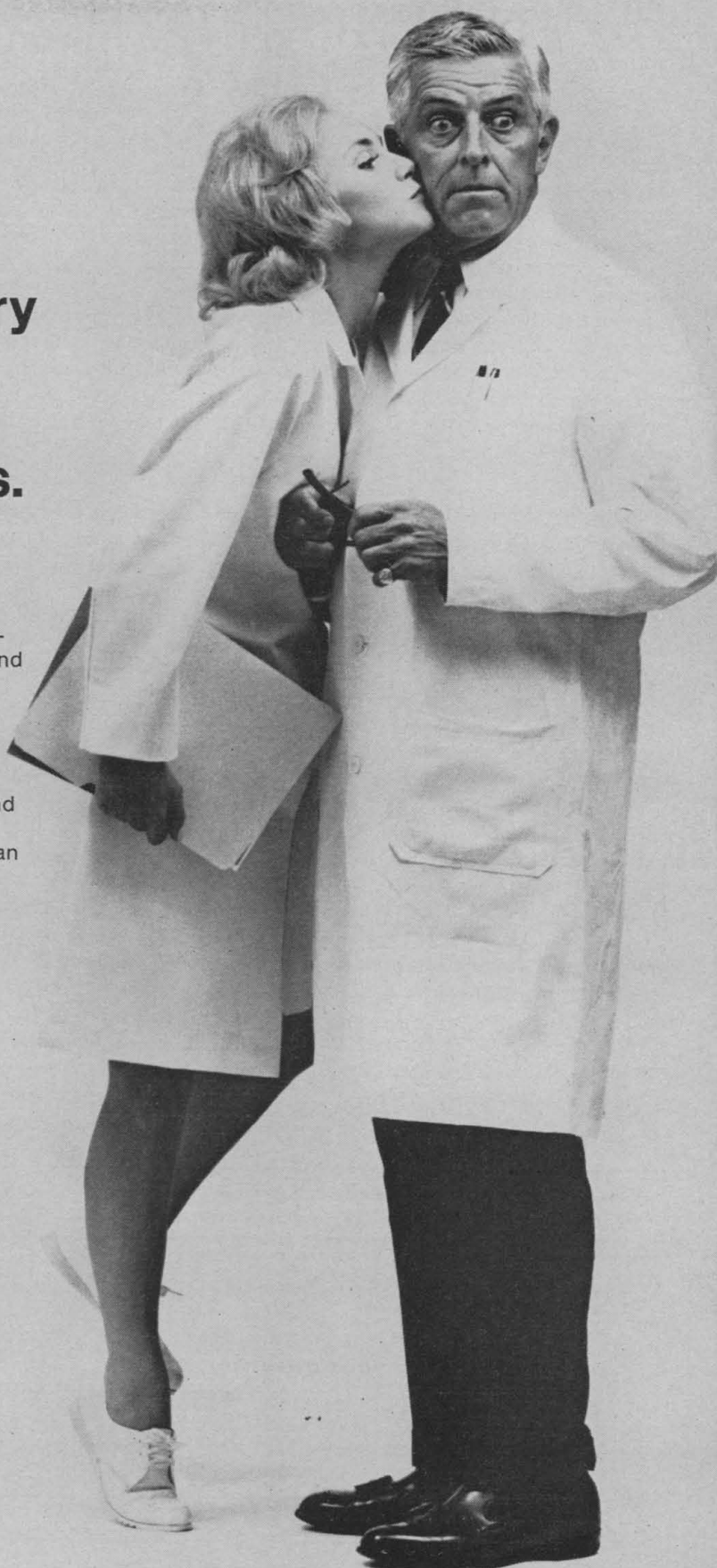
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In a number of sessions, some information was presented on slides. Authors should be contacted directly for copies. Because of a serious epidemic of influenza at the time of the Dallas meeting, a few of the contributions were not given by the originally announced authors.

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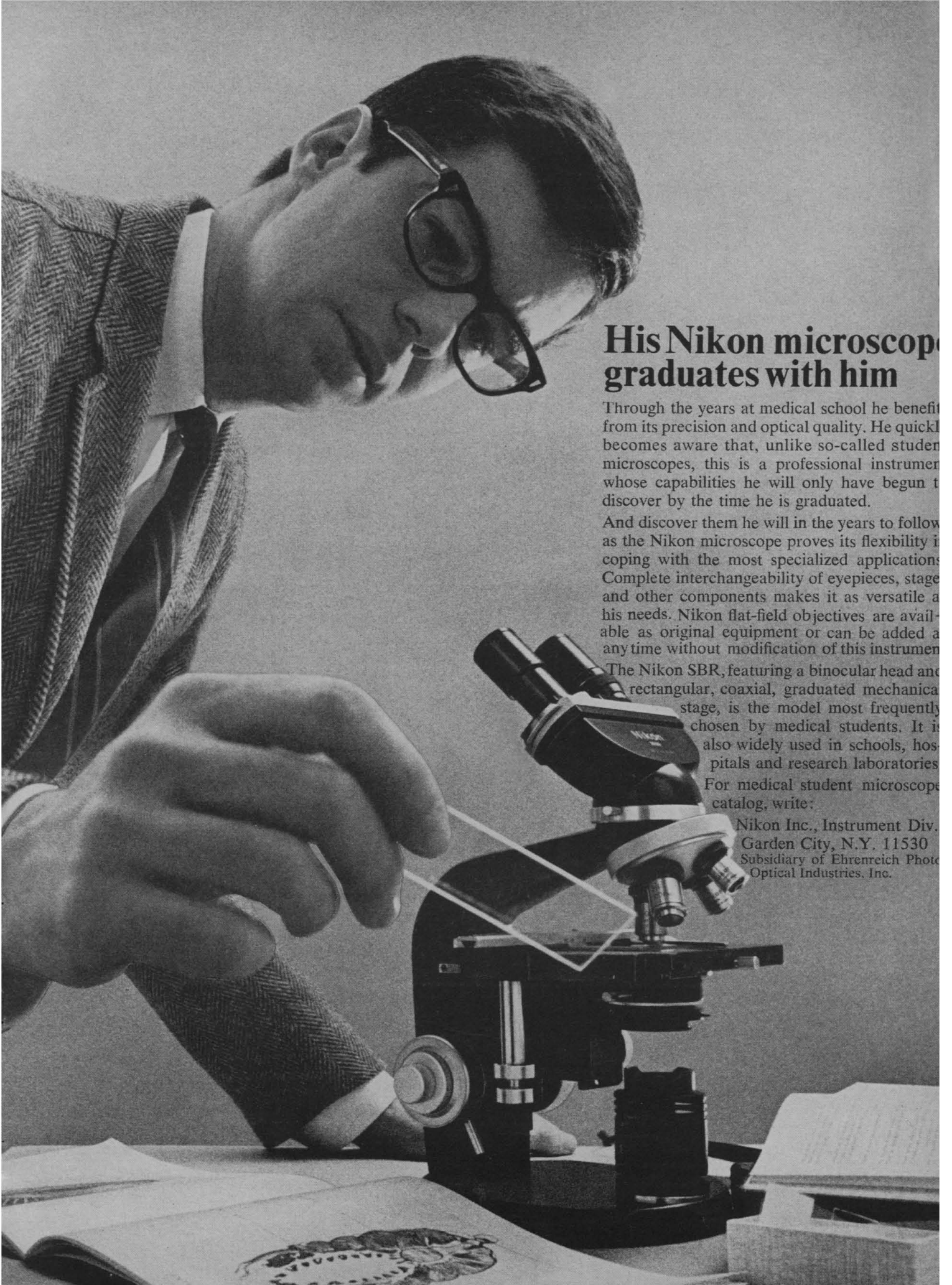
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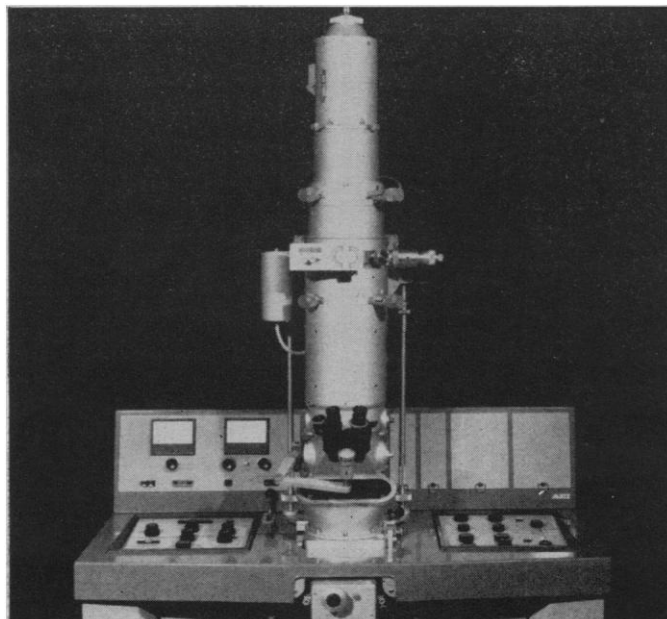
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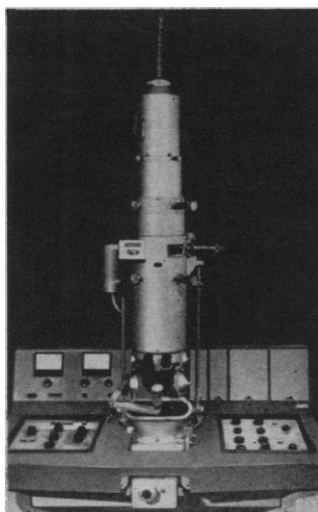
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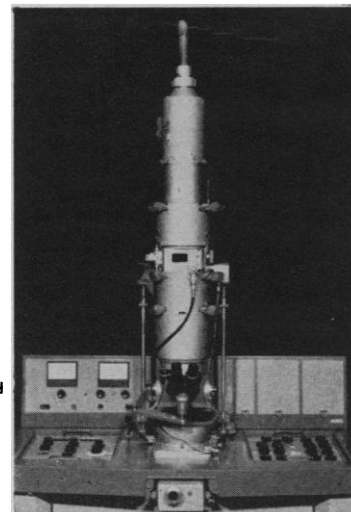


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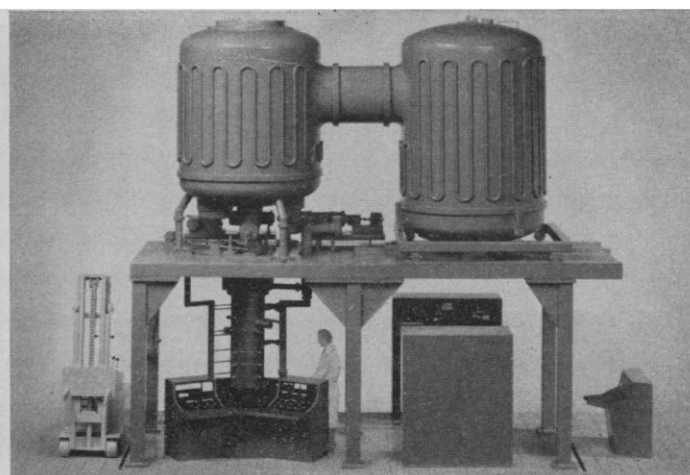
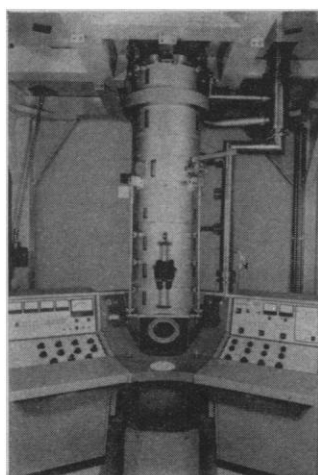


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
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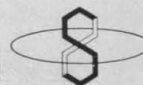
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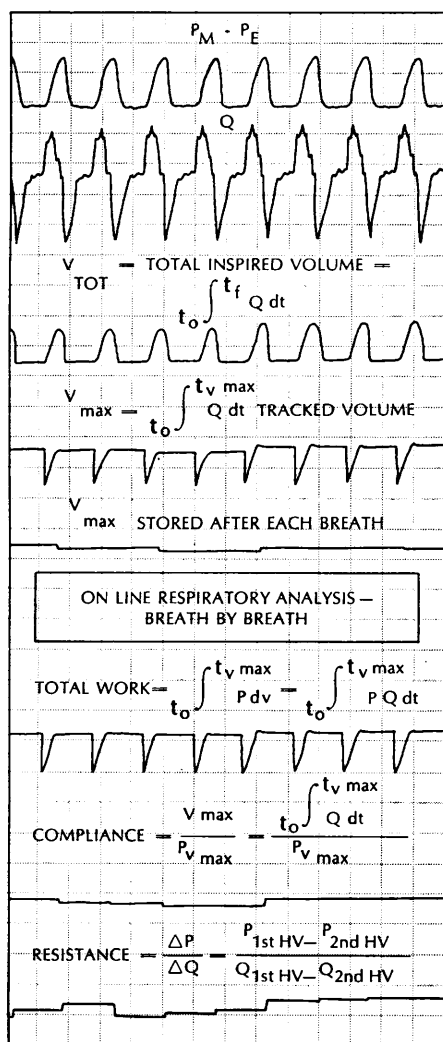


Figure 1.

Let's start with time. An analog/hybrid computer can be had for a fraction of the cost of a comparably adequate digital computer (there's money sneaking in already). That means it's feasible to tie the computer *directly* into the experiment. On-line operation, so-called. And because an analog/hybrid computer calculates essentially instantaneously, the results of the data reduction are plotted and presented to the researcher *simultaneously* with the event.

Refer now to Figure 1, which represents an analysis and display of respiratory characteristics. The two events at the top are chest pressure and volumetric flow rate through the trachea which are measured directly from the subject with appropriate transducers and presented to the analog/hybrid computer as voltage levels.

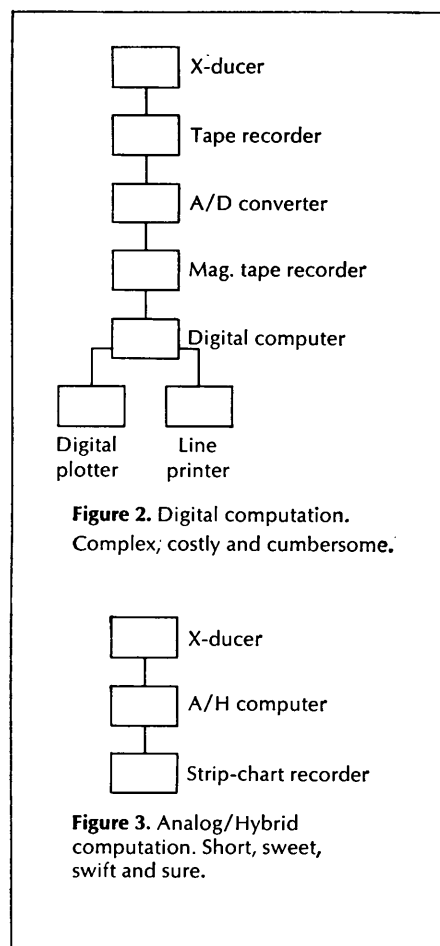


Figure 2. Digital computation. Complex, costly and cumbersome.

Figure 3. Analog/Hybrid computation. Short, sweet, swift and sure.

The analog computer performs the required calculations and presents the results on the stripchart recording simultaneously with the direct measurements.

Notice that, unlike most digital analytical techniques, the business of recording on magnetic tape, processing the tape through a digital computational facility, and waiting for the results is eliminated. This can mean reducing project time from months to days. Or from days to hours.

Now in terms of results. Because the experimenter can work on-line with an analog/hybrid computer, he sees what is happening *while* it's happening. Thus, he can perceive a trend, and modify or end his experiment accordingly. Moreover, because an analog/hybrid computer works directly to the recorder in voltages, the inelegant (and, not infrequently, less accurate) transformation of voltages-to-bits-to-voltages is eliminated, as shown in Figures 2 and 3. And very often in digital techniques, for economic reasons, compromise methods of calculation are used with further degradation of results.

Even if you don't want to work on-line, an analog computer is still the best way to go. You record voltages onto FM tape. Compute with voltages. Display voltages. Of course, unlike on-line, you do lose instantaneous interaction. But time and money are still saved. Results are still superior.

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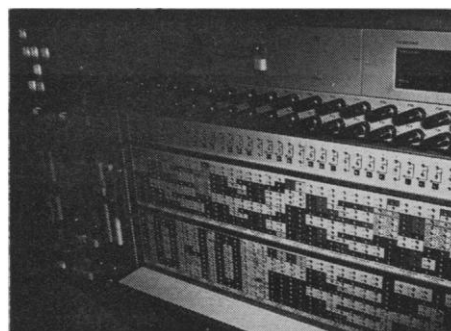


Figure 4. EAI 380 Analog/Hybrid computer. Smallest, least-expensive desktop computer available with hybrid capability.

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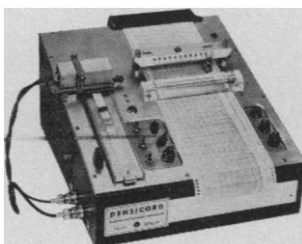
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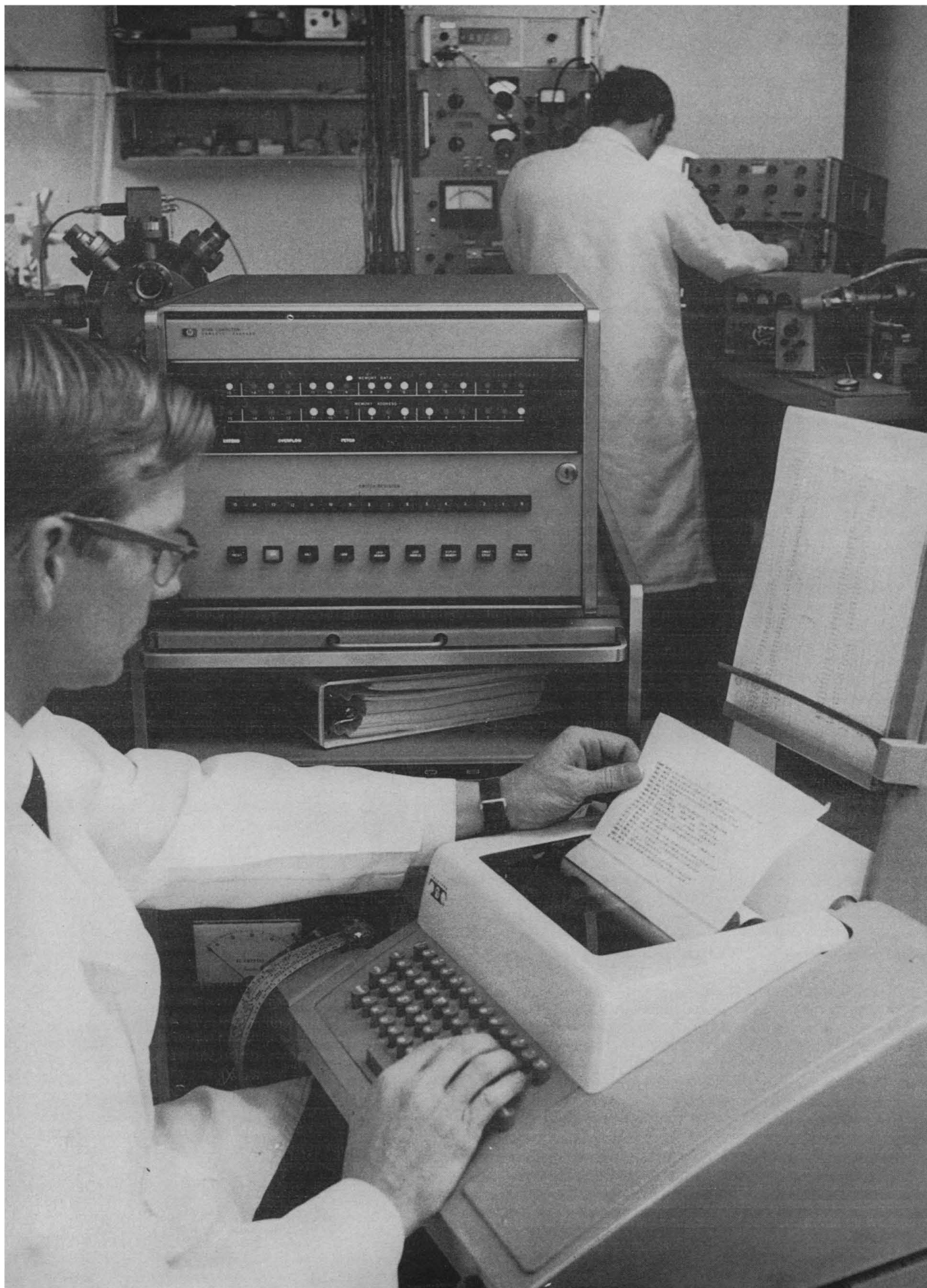
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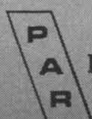
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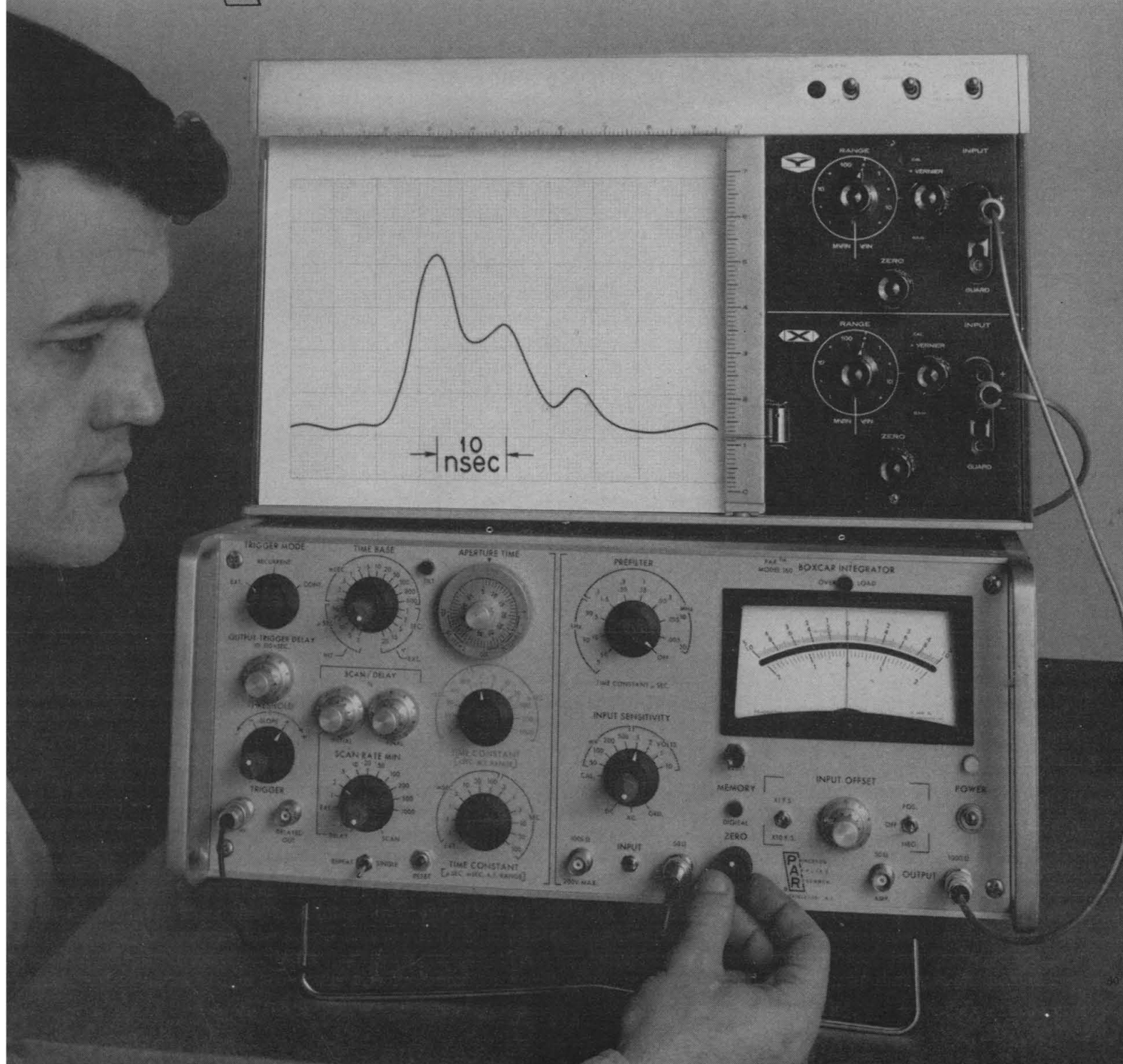
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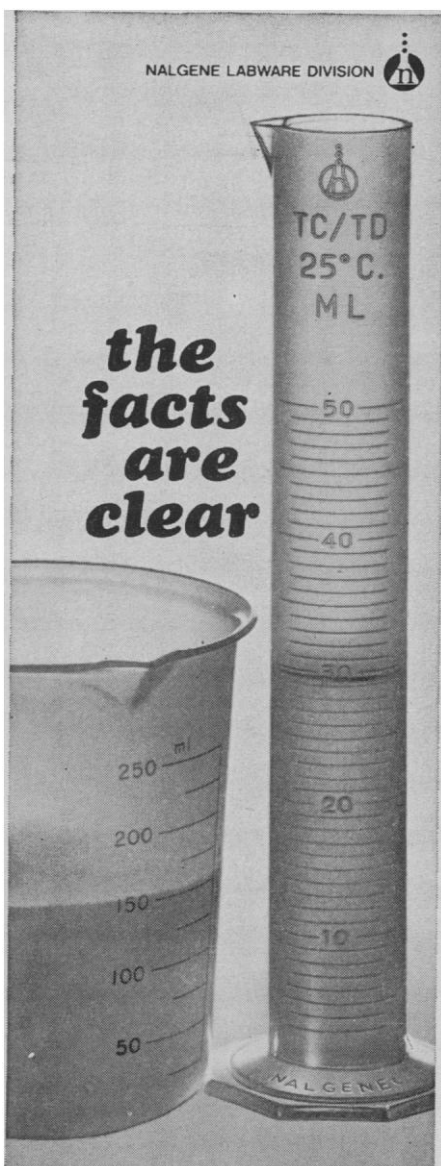
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cause they do not represent large nations. At the present time it appears that the scientifically advanced countries are widening the gap in knowledge and abilities between themselves and the smaller nations of the world as a result of the high cost of conducting modern research.

Finally, the very existence of such a facility as an international laboratory will stimulate the formulation of higher levels of problems which cannot be considered with present resources. New dimensions to oceanographic research will be added with the wider availability of the best tools of the trade.

HENRY STOMMEL
*Massachusetts Institute of Technology,
Cambridge, Massachusetts 02139*

EDWARD D. GOLDBERG
*Scripps Institution of Oceanography,
La Jolla, California 92037*

Pyrotechnics

The editors of *Science* deserve praise for the clever and subtle cover of the Fourth of July issue. Bombs bursting in air and fireworks represented by droplets of the spray of the bombardier beetle! Man is a part of nature, sermons in stones, scientists as humorists.

DAVID L. SILLS
*Population Council,
245 Park Avenue, New York 10017*

Intellectual Loneliness

Since reading various solutions for preventing the intellectual brain drain from underdeveloped countries and suggestions for improving the "intellectual loneliness" of educated and talented people in those areas (Singer, editorial, 7 June 1968, and Wolffe, editorial, 2 Aug. 1968), I have also found in my copies of *Science* (which arrive in irregular fashion) letters describing both the glut of doctoral graduates in developed countries such as Australia (Willix, 22 Nov. 1968) and the need for relevance in the training of Ph.D.'s who plan to work in underdeveloped countries (Ronkin, 3 Jan. 1969).

These editorials and letters all stress that future planning for technical manpower is essential, but it should not be done at the expense of creative and intellectual freedom. If the supply of Ph.D.'s exceeds the demand in many

Western countries, there is a great need for them in developing countries, especially in higher education, industrial research, and government services. I suggest that those Western countries with a surplus of trained people establish overseas research and development divisions which would accept requests, for the services of certain specialists, from hardpressed and understaffed developing countries. This would appear to me to be more relevant than bringing foreign associates from underdeveloped countries temporarily to our Western institutions, as it would answer their immediate problems and use available facilities, instead of farming out the work to be done in a sterile, air-conditioned (and irrelevant) setting in a North American or European institute. The presence of scientists and engineers from the developed countries would also help relieve the "intellectual loneliness" of their less fortunate colleagues in these poorer nations.

MICHAEL B. KATZ
*Canadian International Development
Agency, Department of Geology,
University of Ceylon, Peradeniya*

I am a Pakistani who received higher training in England and the United States and am now teaching in Canada. . . . Basically I agree with Ronkin's and Stone's (Letters, 6 June) proposals for certain supplementary training of foreign students. But I object to the idea of training a foreign student exclusively on the basis of the needs of his homeland, although these should be important considerations of the agencies which award fellowships. When a modified program for a particular student is requested, such a request should originate in the student's home institution or his homeland and should not be imposed upon him by the institution where he will be trained. Many universities rightfully impose a few necessary conditions on the foreign students from a developing country, such as proficiency in English, a number of extra courses as prerequisites, and so forth, but to go beyond that and offer them a compulsory modified program would appear to be a kind of selective training, depriving them of working in all other areas beyond the current needs of their homelands. Such a practice will obviously discourage development of future programs in their countries beyond those needs. . . .

As Stone pointed out, it is a fallacy that the developing countries should

not do basic research. It has been proved many times that such countries are capable of producing talented men: for example, Khorana (molecular biology) from India and Salam (theoretical physics) from Pakistan. The foreign training of these two scientists was not limited to the needs of India or Pakistan. Had they been assigned to narrowly selective programs in their early years based on the needs of their countries, they would have provided two more examples of misplacement.

The problems of educating foreign students from the developing countries are many but a selective program custom-made for them is not the answer.

S. M. HUSAIN

*Département de Biologie,
Université de Sherbrooke,
Sherbrooke, Québec, Canada*

Starvation: Weapon of Warfare

Abelson's editorial (4 Apr., p. 17) implicating malnutrition with poor learning ability should awaken scientists and politicians to world starvation problems. Winick and Rosso have also recently associated malnutrition with inadequate brain development (1). Current reports from Biafra, where great numbers of people, especially pregnant mothers and children, have been deprived of adequate protein and mineral nutrition for 2 years seem to confirm the observations of Winick and Rosso (2). The reports are that four babies out of ten born in maternities in Biafra are deformed. This would indicate that severe prenatal malnutrition can induce small fetal brain size as well as severe skeletal and muscular malformations.

The scientific community should publicize these findings in order to educate governments of the inherent dangers of severe malnutrition, whether it is in the ghettos, in Appalachia, in Mississippi, or in Biafra. . . . It would appear that future generations are equally threatened if starvation becomes a legalized weapon of warfare.

PAUL O. OKONKWO

*Coagulation Laboratory,
Boston City Hospital,
818 Harrison Avenue,
Boston, Massachusetts 02118*

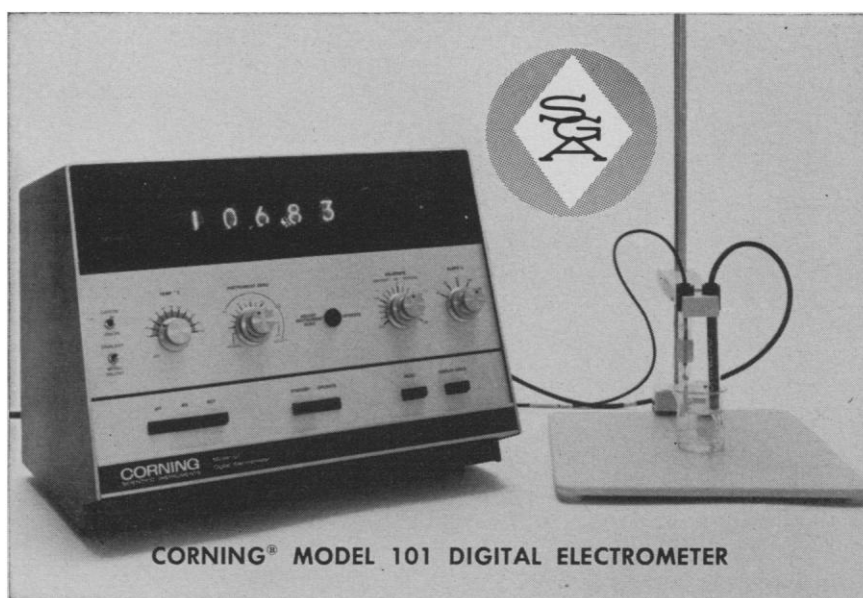
References

1. M. Winick and P. Rosso, *J. Pediat.* 74, 774 (1969).
2. B. Gans, *Lancet* 1969-I, 660 (1969).

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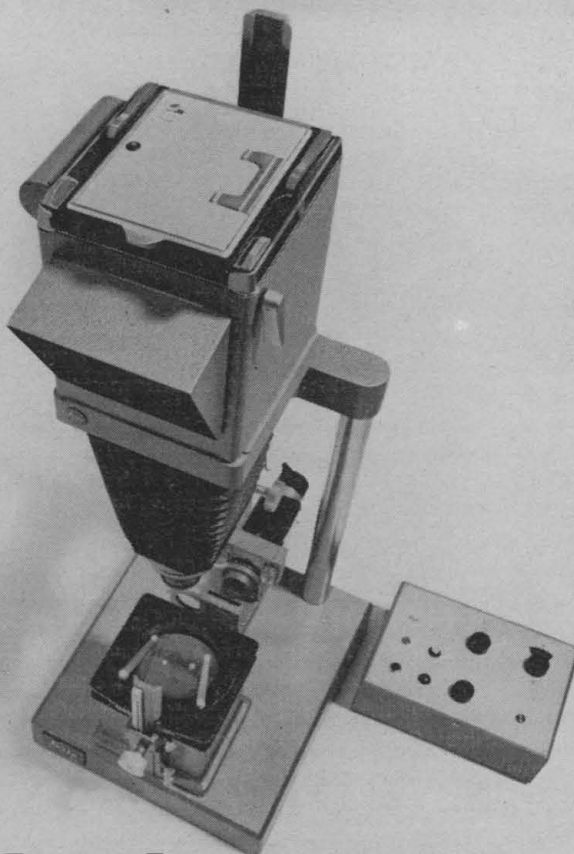
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For Full Technological Assessment

In 1966 Allen Astin, Isadore Perlman, and I were asked to visit Czechoslovakia to complete arrangements between our own National Academy of Sciences and the Czechoslovakian Academy of Sciences for an exchange of scientists between the two countries. We were most hospitably received and were taken to visit the many institutes under the aegis of the Czechoslovakian and Slovakian academies. In Bratislava I came upon one with the intriguing name, "The Institute for the Study of the Biological Landscape." I inquired about the meaning of this title and the objectives of the Institute and was told a tale of considerable interest.

At the close of World War II, the economic planners decided that a large aluminum processing plant was to be located somewhere in Slovakia. Military authorities strongly preferred a site in one of the narrow valleys of the Lower or Middle Tatra. Some scientists demurred on the ground that the smelter fumes would cause damage, but they had no hard facts to present, and the plant was constructed in the valley. At that time, the available fuel was the local coal, high in sulfur content. Within a few months, it became evident that the valley had a typical atmospheric inversion layer that trapped fumes in the valley. As the sulfur dioxide content of the air increased, all plants were killed, and all animals that were not killed were driven away. The mill workers had to live at a considerable distance, and at times—so I was told—they even had to wear gas masks in order to continue work. The result was an almost total industrial disaster that might have been foreseen. Hence arose the belated recognition of the need to study the "biological landscape."

This is only one example, on a limited scale, of the destruction that man today is visiting upon his environment. Many other examples were related at a conference held in December 1968 on the ecological aspects of international development, a brief report of which has been published.* Particularly glaring consequences of lack of foresight followed the completion of Aswan High Dam on the Nile. Clearly not included in the reckoning was the catastrophic effect upon the sardine fisheries of the eastern Mediterranean. Another effect of the Aswan Dam has been the rapid spread through the Egyptian population of infestation with parasitic blood flukes, or schistosomes, whose intermediate hosts are snails. The snails, of course, spread through the irrigation canals. Finally, there is the matter of the very brief life of the reservoirs impounding the irrigation waters. When a river carries a heavy burden of silt—like the Nile or the Colorado or nearly all rivers in arid lands—the reservoir is filled with mud very quickly. What is to happen to the irrigation when the reservoir is filled?

Whether it be Nile or Colorado or Mekong, every river system presents unique features. Each is a local system that is itself part of a wider system of interacting regions and successive times.

These issues, multiplied by hundreds for the sum of our technological alterations of the natural terrestrial environment, explain why environmental scientists today speak with louder insistence of the need for a new approach to technological assessment. No piecemeal, limited approach can suffice. The biological, psychological, and sociocultural aspects, as well as the engineering and physicochemical aspects, must be introduced into the full analysis, and long-range economic aspects cannot be ignored in the prospect of immediate gain.—BENTLEY GLASS, *State University of New York at Stony Brook*

* H. Henkin, *Environment* 11 (No. 1), 28 to 35, 48 (1969).

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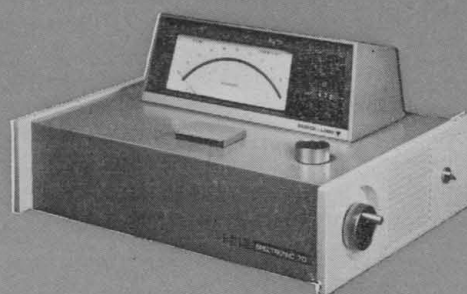


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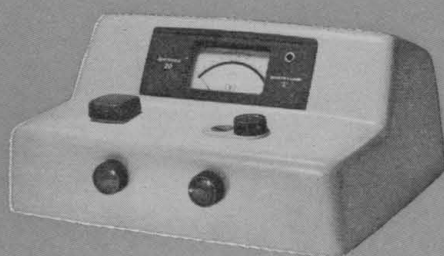
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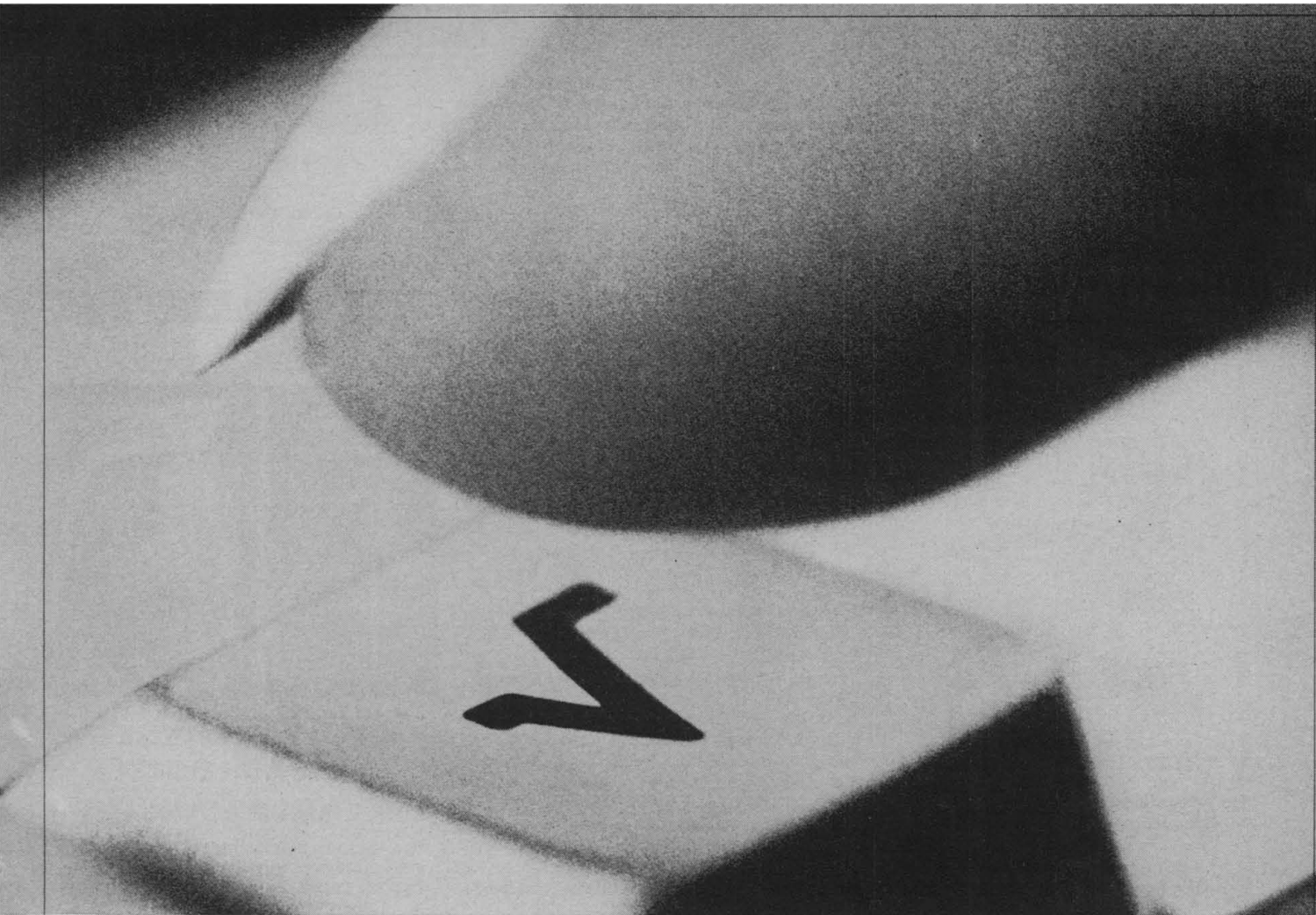


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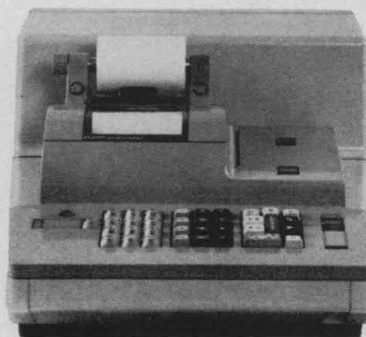
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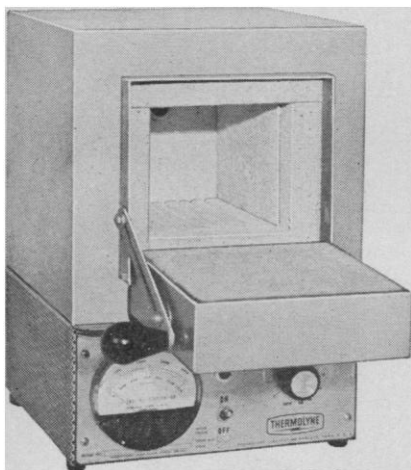
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30-2. **Analytical Chemistry in Nuclear Technology**, 13th conf., Gatlinburg, Tenn. (L. J. Brady, Oak Ridge National Lab., P.O. Box X, Oak Ridge, Tenn. 37830)

October

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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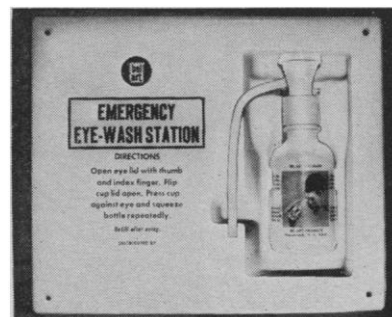


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13-14. **Psychological Aspects of Perception**, New York, N.Y. (E. Harms, 158 E. 95 St., New York 10028)

13-16. **Association of Official Analytical Chemists**, Washington, D.C. (L.G. Ensinger, 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)

13-17. **Symposium on Radiation Safety Problems in the Design and Operation of "Hot" Facilities**, Saclay, France. (J. H. Kane, Div. of Technical Information, U.S. Atomic Energy Commission, Washington, D.C. 20545)

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, New Mexico State Univ., Las Cruces)

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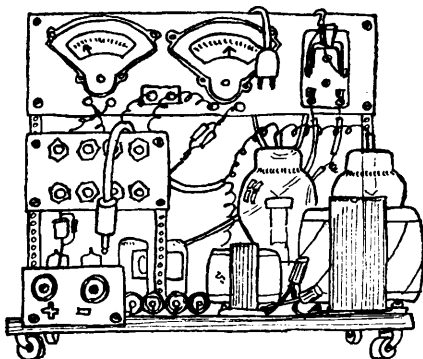
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24-26. **Orton Soc.**, 20th annual, New York, N.Y. (V. A. Graff, The Society, 15 Claremont Ave., New York 10027)

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)

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

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

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

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

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

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

November

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

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

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

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

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

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

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

4-5. **Chemical Marketing Research Assoc.**, Toronto, Canada. (P. E. Levesque,

FMC Corp., 633 Third Ave., New York 10017)

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

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

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

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

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

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

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

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

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

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

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

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

10-14. **American Public Health Assoc.**, 97th annual, Philadelphia, Pa. (B. F. Mattison, APHA, 1740 Broadway, New York 10019)

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

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

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

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

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

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

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

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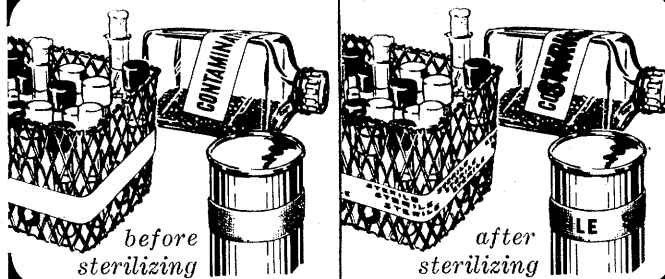
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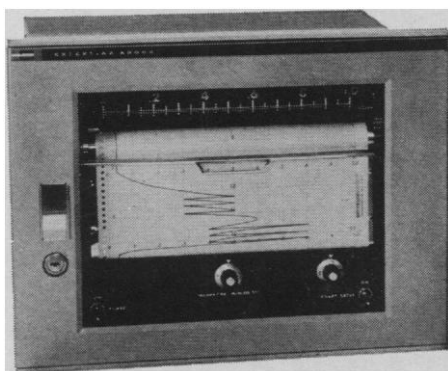
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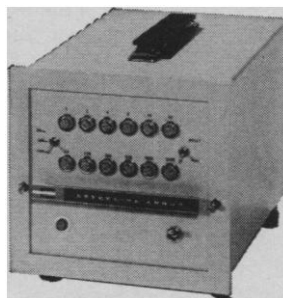
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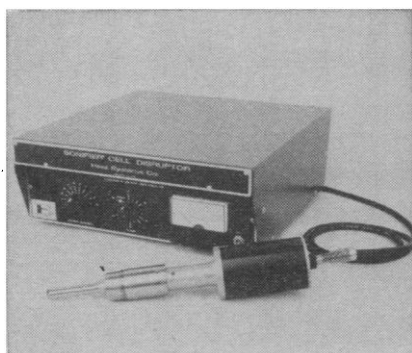


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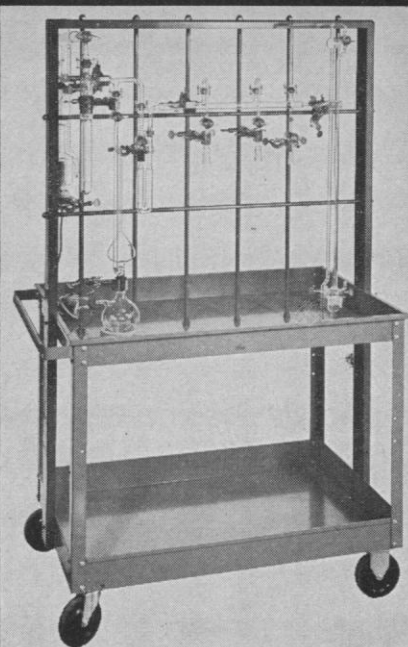
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16-20. American Assoc. of **Blood Banks**, Houston, Tex. (L. J. James, AABB, 30 N. Michigan Ave., Chicago, Ill. 60602)

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

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

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

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

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

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

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

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

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

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

20-24. **Audio Engineering Soc.**, 37th conv., New York, N.Y. (J. D. Colvin, Room 428, 60 E. 42 St., New York 10017)

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

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

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

December

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

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

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

3-6. American Assoc. of **Physicists in Medicine**, Chicago, Ill. (J. G. Kereiakes,

SCIENCE, VOL. 165

Radioisotope Lab., Cincinnati General Hospital, Cincinnati, Ohio 45229)

5-6. **Oklahoma Acad. of Science**, Edmond. (J. T. Self, 730 South Oval, Univ. of Oklahoma, Norman 73069)

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

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

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

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

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

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

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

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

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

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

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

8-11. **Oak Ridge Associated Universities Symp. in Medicine**, 12th, Oak Ridge, Tenn. (R. M. Kniseley, Medical Div., Oak Ridge Associated Universities, Oak Ridge 37830)

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

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

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

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

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

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

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

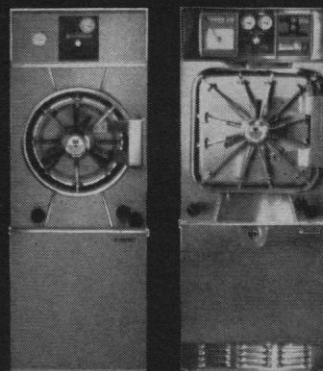
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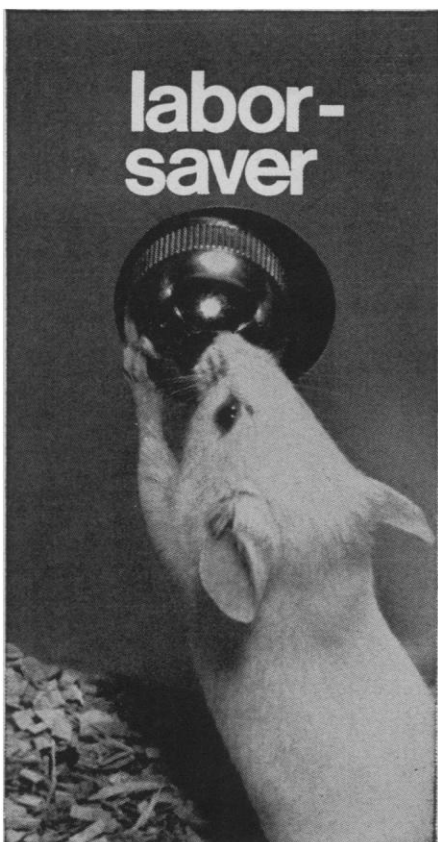
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Books Received

(Continued from page 786)

Walter E. Tolles, Ed. 536 pp., illus. Paper. \$21.50. *Annals of the New York Academy of Sciences*, vol. 157, art. 1.

Déformation Plastique des Métaux et Alliages. A summer school, Nancy, 1967. G. Champier and G. Saada, Eds. Masson, Paris, 1968. vi + 318 pp., illus. Paper, 80 F.

37. Deutsche Pflanzenschutz-Tagung der Biologischen Bundesanstalt für Land- und Forstwirtschaft. Coburg, October 1968. Parey, Berlin, 1969. x + 236 pp., illus. Paper, DM 50. Mitteilungen aus der Biologischen Bundesanstalt für Land- und Forstwirtschaft, Berlin-Dahlem, Heft 132.

Early Agricultural Machinery. Michael Partridge. Praeger, New York, 1969. viii + 32 pp., illus. + 16 plates. \$8.95.

The Economy of Cities. Jane Jacobs. Random House, New York, 1969. xiv + 274 pp., illus. \$5.95.

Electromagnetic Scattering on Spherical Polydispersions. D. Deirmendjian. Elsevier, New York, 1969. xx + 292 pp., illus. \$14. Rand Corporation Research Study.

Elementary Particle Theory. Relativistic Groups and Analyticity. Proceedings of the 8th Nobel Symposium, Aspenäsgråden, Lerum, Sweden, 1968. Nils Svartholm, Ed. Interscience (Wiley), New York, Almquist and Wiksell, Stockholm, 1969. 400 pp., illus. \$31.75.

The Elementary Structures of Kinship. Claude Lévi-Strauss. Translated from the French edition (Paris, 1967) by James Harle Bell, John Richard von Sturmer, and Rodney Needham, Ed. Beacon, Boston, ed. 2, 1969. xlii + 542 pp., illus. \$15.

The Elements of Genetics. C. D. Darlington and K. Mather. Schocken, New York, 1969. xvi + 448 pp., illus. Cloth, \$7.50; paper, \$2.95. Reprint, with a new introduction by C. D. Darlington, of the 1949 edition.

The Emergence of Order in Developing Systems. The 27th symposium of the Society for Developmental Biology, New York, 1968. Michael Locke, Ed. Academic Press, New York, 1968. xxviii + 356 pp., illus. Paper, \$10. *Developmental Biology*, supplement 2.

Enzyme Induction by Viruses. Saul Kit and Del Rose Dubbs. Karger, Basel, 1969 (U.S. distributor, Phiebig, White Plains, N.Y.). x + 114 pp., illus. \$6.50. Monographs in Virology, vol. 2.

Essais sur L'Évolution. Theodosius Dobzhansky and Ernest Boesiger. Monograph 9. Masson, Paris, 1968. x + 184 pp., illus. 54 F. Les Grands Problèmes de la Biologie.

Expédition Antarctique Belgo-Néerlandaise 1964. Belgisch-Nederlandse Antarctische Expeditie 1964. Ionosphere. H. A. Vandeveld. Expéditions Antarctiques Belgo-Néerlandaises, Brussels, 1968. 180 pp., illus. Paper.

Extraction et Purification des Espèces Chimiques. D. Gagnaire, P. Jaulmes, and R. Bugarel. Masson, Paris, 1969. viii + 560 pp., illus. 170 F. Monographies de Chimie Organique, vol. 5.

Fire Investigation. Including Fire-

Related Phenomena: Arson, Explosion, Asphyxiation. Paul L. Kirk. Wiley, New York, 1969. x + 262 pp., illus. \$8.95.

Foundations of College Chemistry. Daniel B. Murphy and Viateur Rousseau. William F. Kieffer, editorial consultant. Ronald Press, New York, 1969. xvi + 680 pp., illus. \$10.50.

Fracture. An Advanced Treatise. Vol. 1, Microscopic and Macroscopic Fundamentals. H. Liebowitz, Ed. Academic Press, New York, 1968. xviii + 598 pp., illus. \$29.60.

Fracture. An Advanced Treatise. Vol. 4, Engineering Fracture Design. H. Liebowitz, Ed. Academic Press, New York, 1969. xvi + 456 pp., illus. \$23.

Fundamentals of Rock Mechanics. J. C. Jaeger and N. G. W. Cook. Methuen, London, 1969 (U.S. distributor, Barnes and Noble, New York). xiv + 514 pp., illus. \$19.

Generalized Feynman Amplitudes. Eugene R. Speer. Princeton University Press, Princeton, N.J.; University of Tokyo Press, Tokyo, 1969. x + 122 pp. Paper, \$3.50. *Annals of Mathematics Studies*, No. 62.

Genetic and Environmental Influences on Behaviour. A symposium, 1967. J. M. Thoday and A. S. Parkes, Eds. Plenum, New York, 1969. x + 218 pp., illus. \$14. *Eugenics Society Symposia*, No. 4.

Genius and Creative Intelligence. Nathaniel D. Mitron Hirsch. Philosophical Library, New York, 1969. 340 pp. \$10. Reprint of the 1931 edition.

Geological Investigations by the Australian National Antarctic Research Expeditions, 1965. D. S. Trail, I. R. McLeod, P. J. Cook, and G. R. Wallis. Bureau of Mineral Resources, Geology and Geophysics, Canberra, Australia, 1967. viii + 48 pp., illus. + 6 plates. Paper, \$1.40. BMR Report No. 118. Also issued as ANARE Scientific Report, Series A (III) Geology, Publication No. 100.

Grain Storage. The Role of Fungi in Quality Loss. Clyde M. Christensen and Henry H. Kaufmann. University of Minnesota Press, Minneapolis, 1969. x + 154 pp. + plates. \$6.50.

Handbook of Clinical Neurology. P. J. Vinken and G. W. Bruyn, Eds. Vol. 5, Headaches and Cranial Neuralgias. North-Holland, Amsterdam; Interscience (Wiley), New York, 1968. xii + 416 pp., illus. \$36; by subscription, \$30.50.

Handbook of Clinical Neurology. P. J. Vinken and G. W. Bruyn, Eds. Vol. 6, Diseases of the Basal Ganglia. North-Holland, Amsterdam; Interscience (Wiley), New York, 1969. xii + 892 pp., illus. \$77; by subscription, \$65.50.

Handbuch der Tierernährung. In 2 volumes. Vol. 1, Allgemeine Grundlagen. Walter Lenkeit, Knut Breirem, and Edgar Crasemann, Eds. Parey, Hamburg, 1969. xxxii + 706 pp., illus. DM 268.

Holography. State of the Art Review, 1969. Thomas Kallard, Ed. Optosonic Press, New York, 1969. vi + 182 pp., illus. Paper, \$12.

Interface Conversion for Polymer Coatings. Proceedings of a symposium, Warren, Mich., 1967. Philip Weiss and G. Dale Cheever, Eds. Elsevier, New York, 1968. xiv + 390 pp., illus. \$20. General Motors Research Symposia.



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(per Hjort, P., et al., J. Lab. Clin. Med. 46:89, 1955)

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(per Bachmann, F., et al., Thrombos. Diath. Haemorrh. 2:24, 1958)

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**FACTOR II, VII, X DEFICIENT PLASMA
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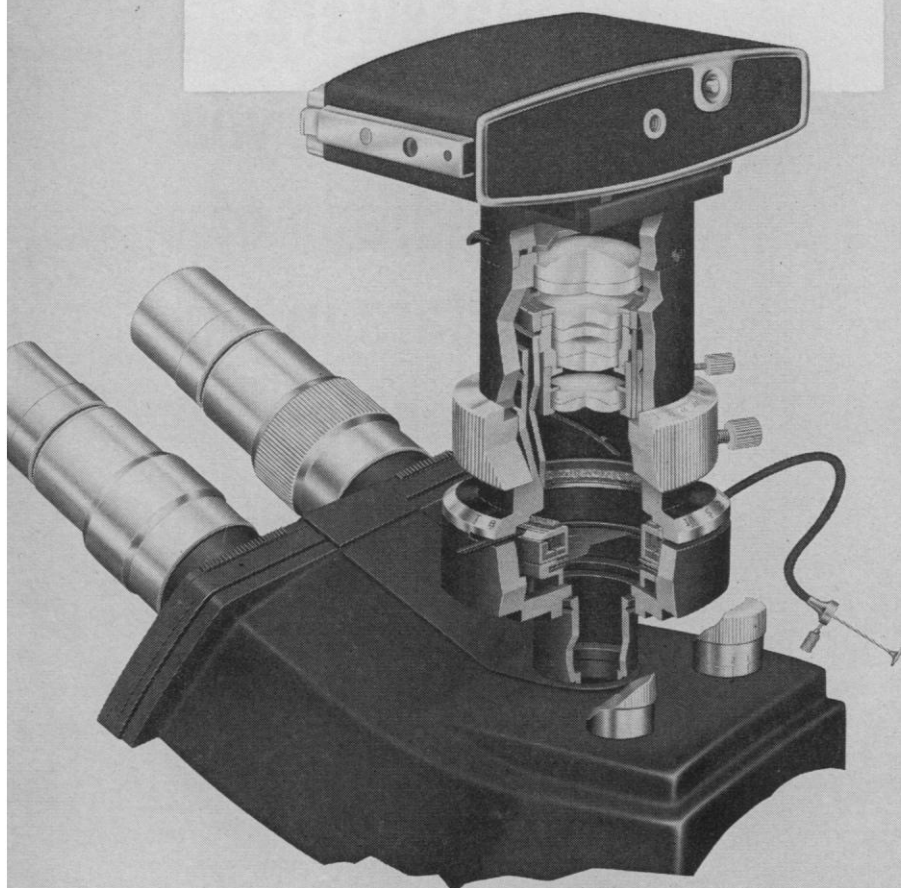


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International Review of Experimental Pathology. Vol. 7. G. W. Richter and M. A. Epstein, Eds. Academic Press, New York, 1969. xiv + 442 pp., illus. \$24.

An Introduction to Chemical Nomenclature. R. S. Cahn. Plenum, New York; Butterworths, London, ed. 3, 1968. x + 118 pp., illus. Paper, \$3.50.

Introduction to Quantum Field Theory. Paul Roman. Wiley, New York, 1969. xviii + 638 pp., illus. \$18.

An Introduction to Virology. Clyde R. Goodheart. Saunders, Philadelphia, 1969. x + 438 pp., illus. \$10.

Mathematics. Its Content, Methods, and Meaning. A. D. Aleksandrov, A. N. Kolmogorov, and M. A. Lavrent'ev, Eds. Translated from the Russian edition (Moscow, 1956). M.I.T. Press, Cambridge, Mass., ed. 2, 1969. Vol. 1 (S. H. Gould and T. Bartha, Translators, xiv + 386 pp., illus.); vol. 2 (S. H. Gould, Translator, xii + 404 pp., illus.); vol. 3 (K. Hirsch, Translator, xii + 388 pp., illus.). Paper, \$3.95 per volume; the set, boxed, \$10.

Measurements in Applied Physics. A. A. Burr, K. J. Dean, and R. J. Trebilcock. Chapman and Hall, London, 1968 (U.S. distributor, Barnes and Noble, New York). viii + 230 pp., illus. Paper, \$6.

Le Métabolisme des Lipides dans les Plantes Supérieures. P. Mazliak. Masson, Paris, 1968. iv + 224 pp., illus. Paper, 80 F. Monographies de Physiologie Végétale, No. 3.

Les Méthodes Analytiques dans les Recherches sur le Métabolisme des Médicaments. Jean Hirtz. Masson, Paris, 1968. x + 368 pp., illus. Paper, 98 F. Monographies de Pharmacie.

Methods for Chemical Analysis of Fresh Waters. H. L. Golterman and R. S. Clymo, Eds. Published for the International Biological Programme by Blackwell Scientific Publications, Oxford, 1969. xviii + 174 pp., illus. Paper, 30s. IBP Handbook No. 8.

Methods for the Measurement of the Primary Production of Grassland. C. Milner and R. Ellyn Hughes, with contributions by C. H. Gimingham, G. R. Miller, and R. O. Slatyer. International Biological Programme, London; Blackwell Scientific Publications, Oxford, 1968 (U.S. distributor, Davis, Philadelphia). xii + 74 pp., illus. Paper, \$1.25. IBP Handbook No. 6.

Microbiologie Générale. Jacques C. Senez. Editions Doin, Paris, 1968. 592 pp., illus. 105 F. "Biologie" series.

Microbiology in Health and Disease. Martin Frobisher, Lucille Sommermeyer, and Robert Fuerst. Saunders, Philadelphia, ed. 12, 1969. x + 550 pp., illus. \$9.25.

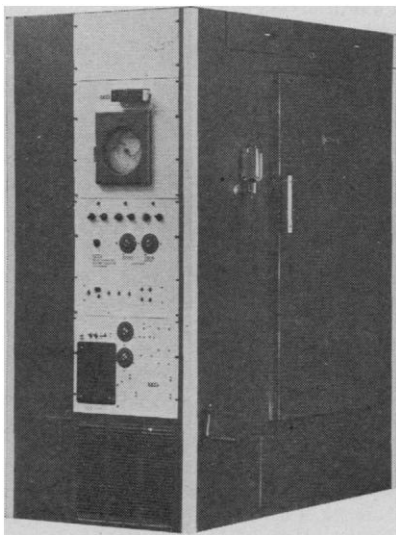
Microwave Components. P. A. Matthews and I. M. Stephenson. Chapman and Hall, London, 1968 (U.S. distributor, Barnes and Noble, New York). viii + 196 pp., illus. \$9.50. Modern Electrical Studies.

Modern General Topology. Jun-iti Nagata. North-Holland, Amsterdam; Wolters-Noordhoff, Groningen; Interscience (Wiley), New York, 1968. viii + 356 pp. \$14.75. Bibliotheca Mathematica, vol. 7.

Modern Principles of Mathematics. Robert T. Craig. Prentice-Hall, Englewood

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Cliffs, N.J., 1969. xii + 404 pp., illus. \$8.95.

Morphology and Taxonomy of the Adult Males of the Families Pseudococcidae and Eriococcidae (Homoptera: Coccioidea). S. A. Affi. British Museum (Natural History), London, 1968. 212 pp., illus. Paper, £5. Bulletin of the British Museum (Natural History). Supplement 13.

The National Halothane Study. A Study of the Possible Association between Halothane Anesthesia and Postoperative Hepatic Necrosis. A report of the Subcommittee on the National Halothane Study, of the Committee on Anesthesia, National Academy of Sciences-National Research Council, Washington, D.C. John P. Bunker, William H. Forrest, Jr., Frederick Mosteller, and Leroy D. Vandam, Eds. National Institutes of Health, Bethesda, Md., 1969 (available from the Superintendent of Documents, Washington, D.C.). xii + 420 pp., illus. Paper, \$3.75.

Nuclear Standards for Chemistry and Technology. Nuclear Standards for Industry, Science, Government and Consumer. Proceedings of a symposium, Atlantic City, 1968. H. F. Beeghly, J. P. Cali, and W. W. Meinke, Eds. National Bureau of Standards, Washington, D.C., 1968 (available from the Superintendent of Documents, Washington, D.C.). vi + 258 pp., illus. Paper, \$1.25. NBS Special Publication No. 310.

La Nutrition Minérale des Végétaux. M. V. Homès and G. H. van Schoor. Masson, Paris, 1969. vi + 164 pp., illus. Paper, 60 F. Monographies de Physiologie Végétale, No. 4.

Observations Aérologiques. Aërologische Waarnemingen. Statistiques Quinquennales, Station d'Uccle, 1951-1955. Institut Royal Météorologique, Brussels, 1968. 76 pp. Paper.

The Optics of Dipole Magnets. John J. Livingood. Academic Press, New York, 1969. xviii + 262 pp., illus. \$13.50.

L'Oscilloscope Normal et à Échantillonnage. Principes et Utilisations. J. Henry. Masson, Paris, 1969. iv + 112 pp., illus. Paper, 36 F.

Outline Course of Pure Mathematics. A. F. Horadam. Pergamon, New York, 1968. xvi + 578 pp., illus. \$9.

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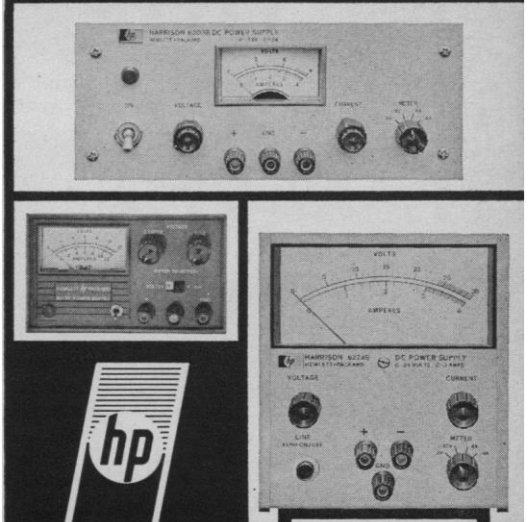
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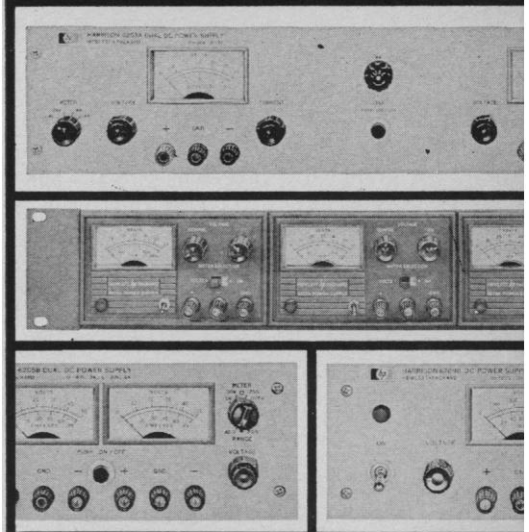
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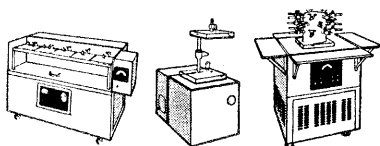
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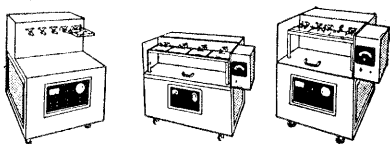
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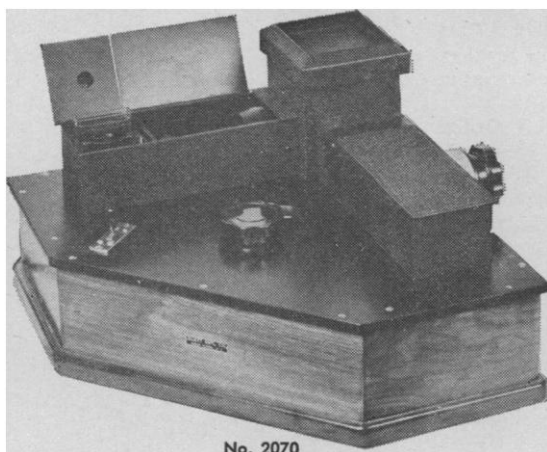
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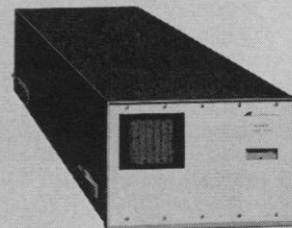
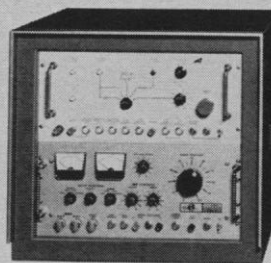
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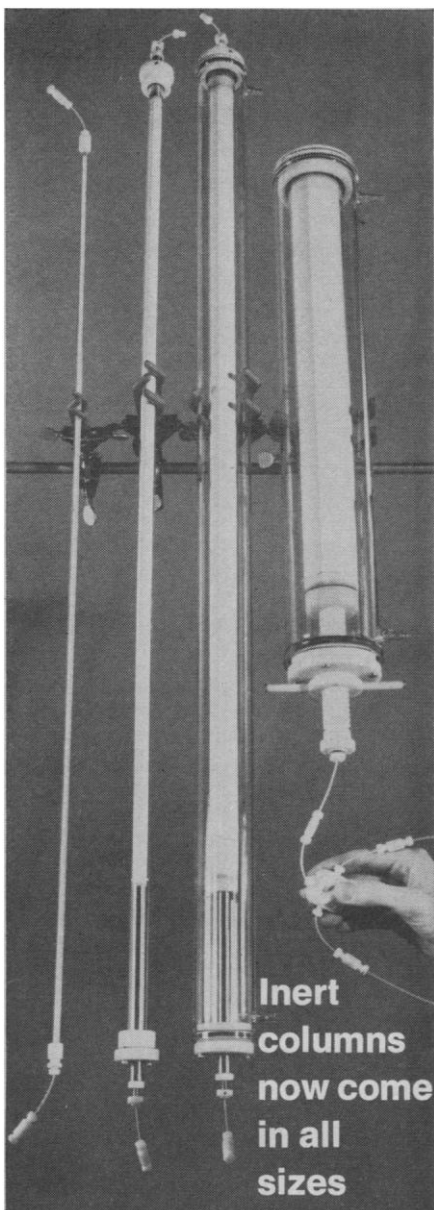
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