

SCIENCE

13 October 1972

Vol. 178, No. 4057

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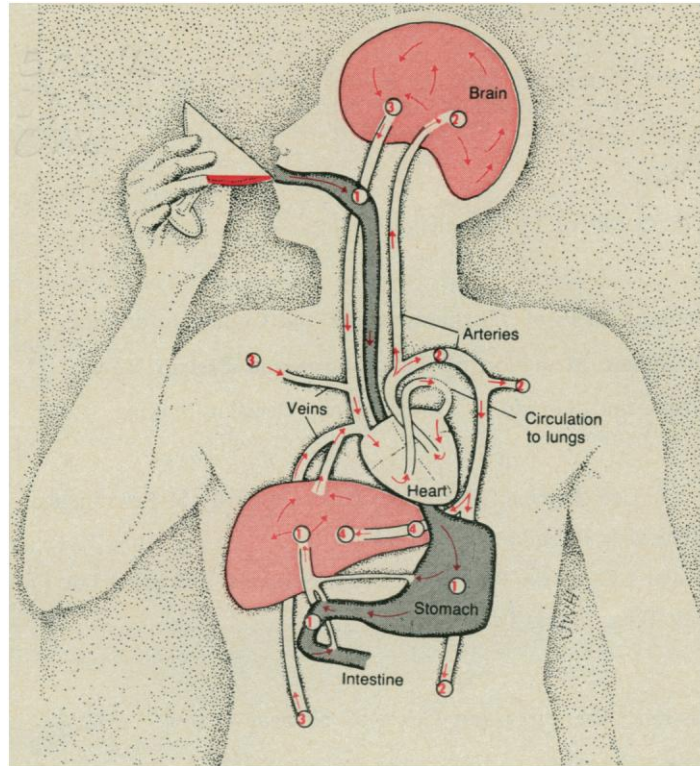
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COVER

Stridulatory file (scanning electron micrograph) of Uhler's katydid. The file is on the underside of the left forewing. Here the forewing is ventral surface up; the 134 file teeth form a 2.8-millimeter row curving posteriorly from lower left to upper center. See page 174. [Insect Attractants, Behavior and Basic Biology Research Laboratory, U.S. Department of Agriculture, Gainesville, Florida; courtesy of P. S. Callahan and T. Carlysle]

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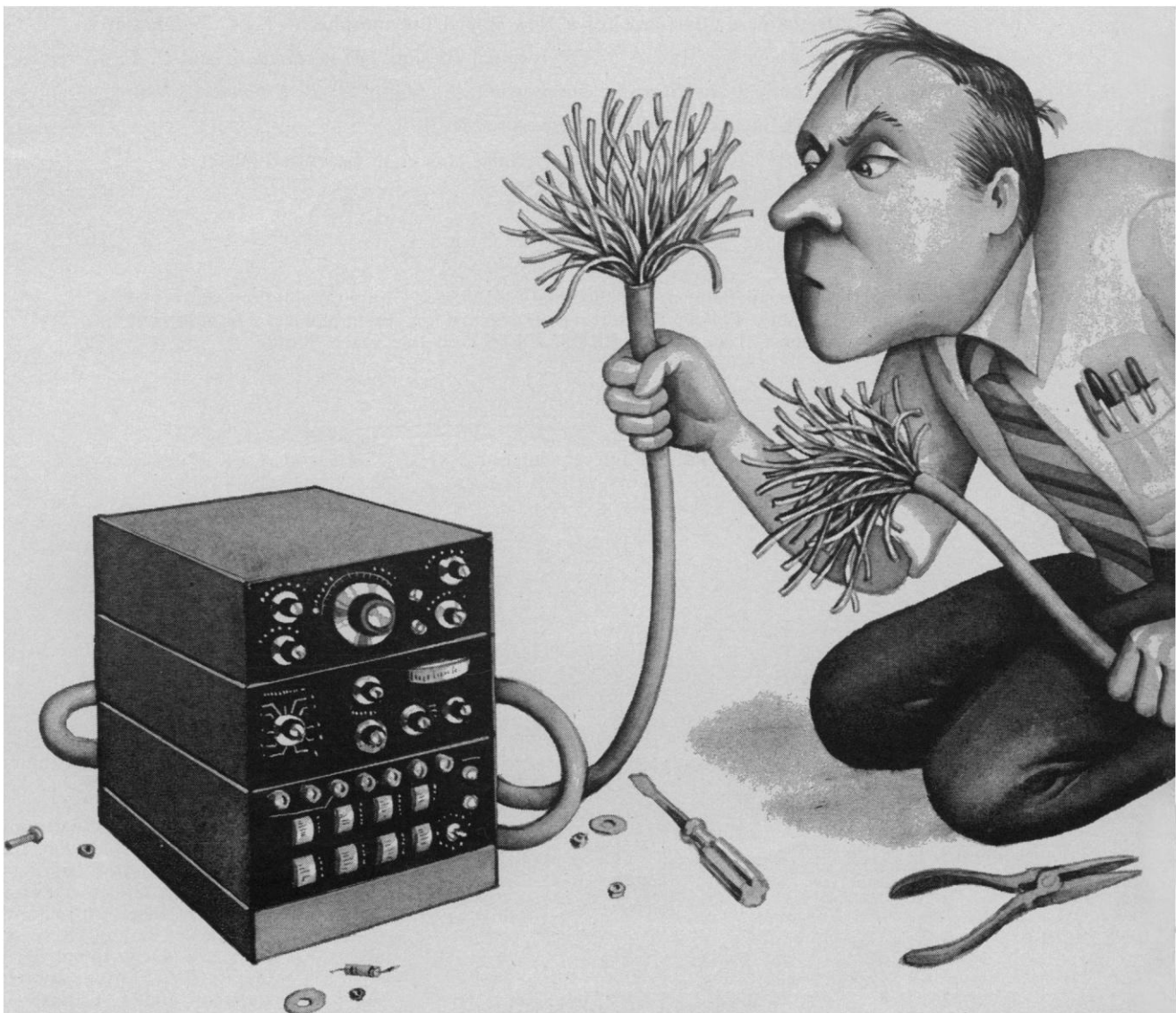
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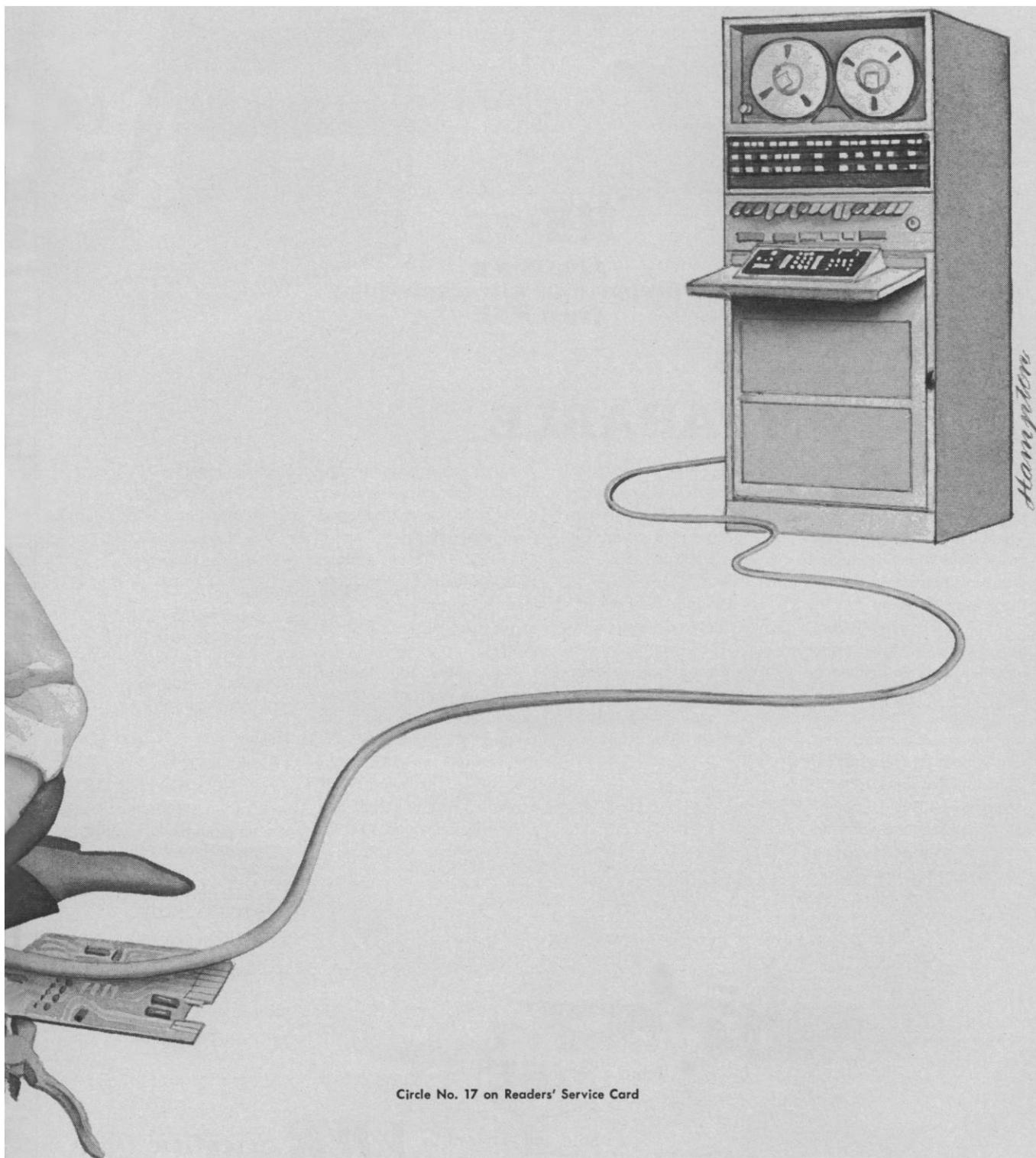
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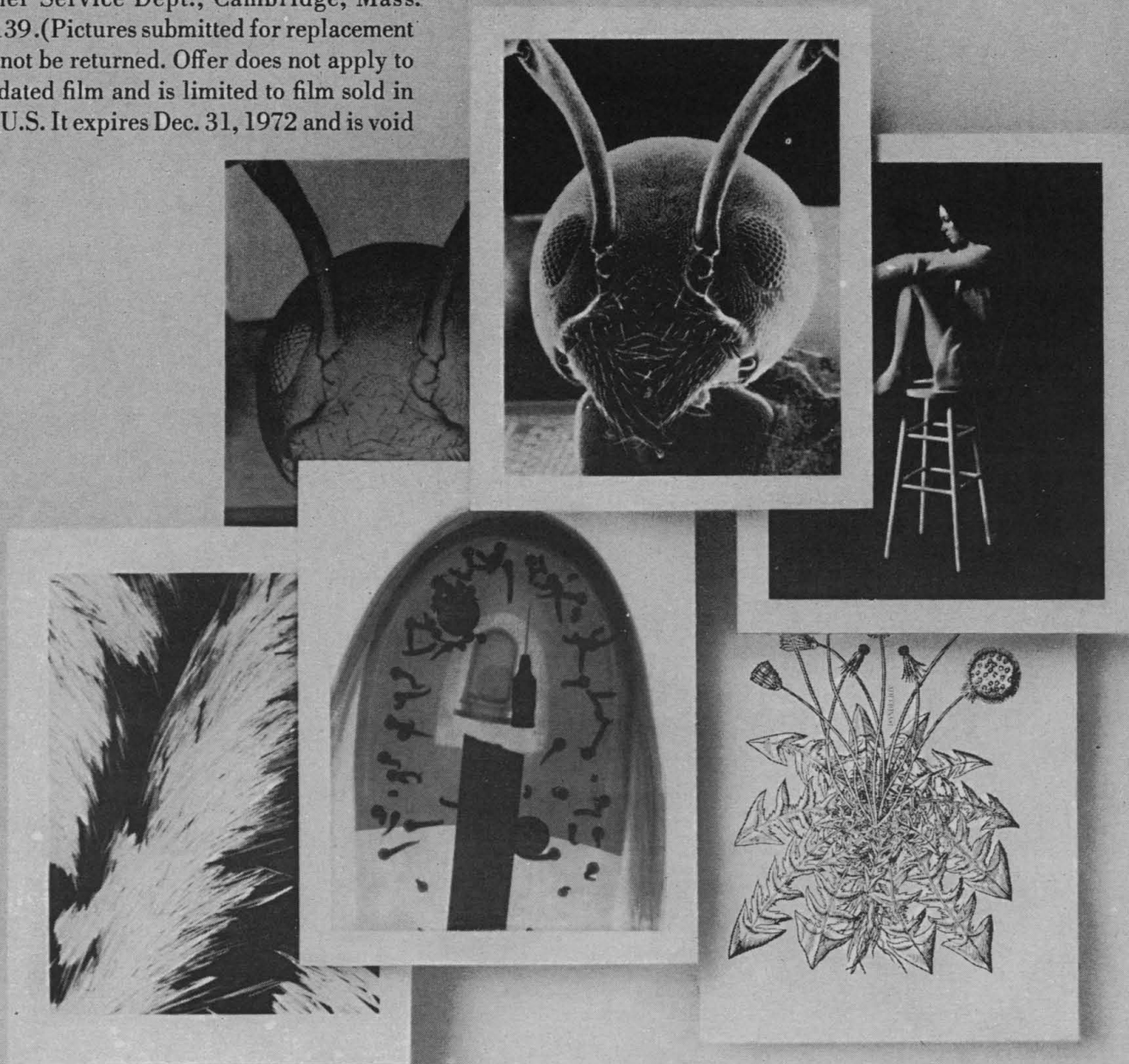
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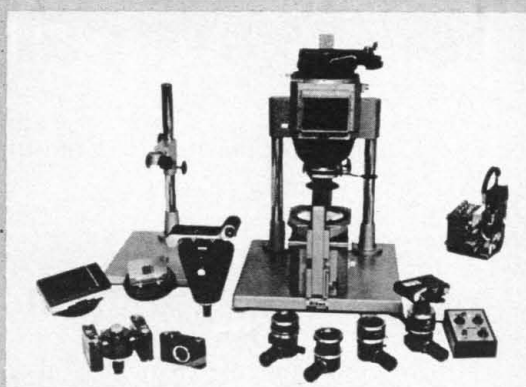


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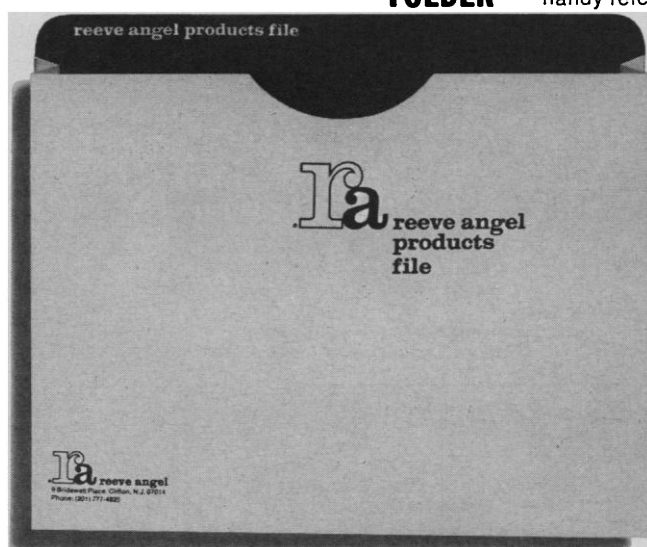
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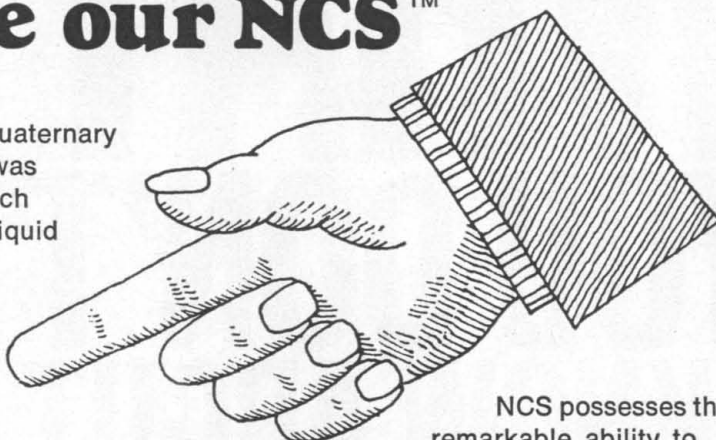
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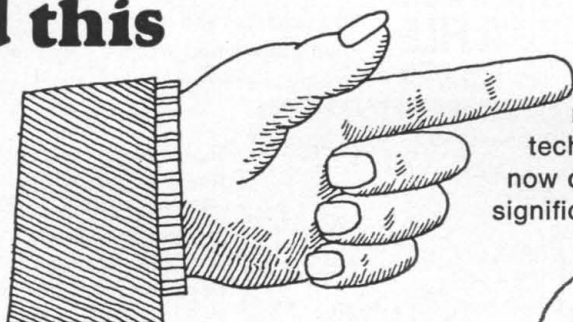


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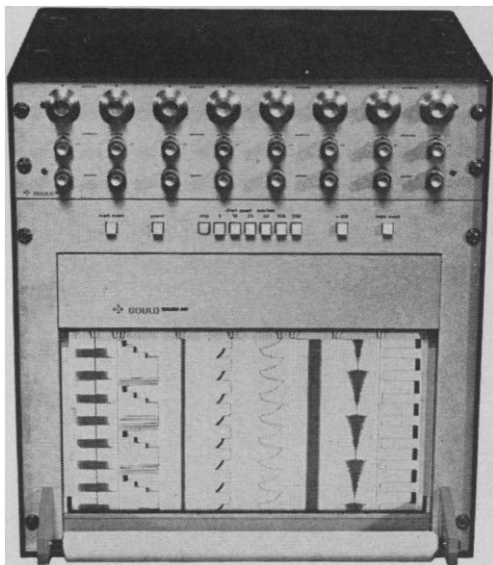
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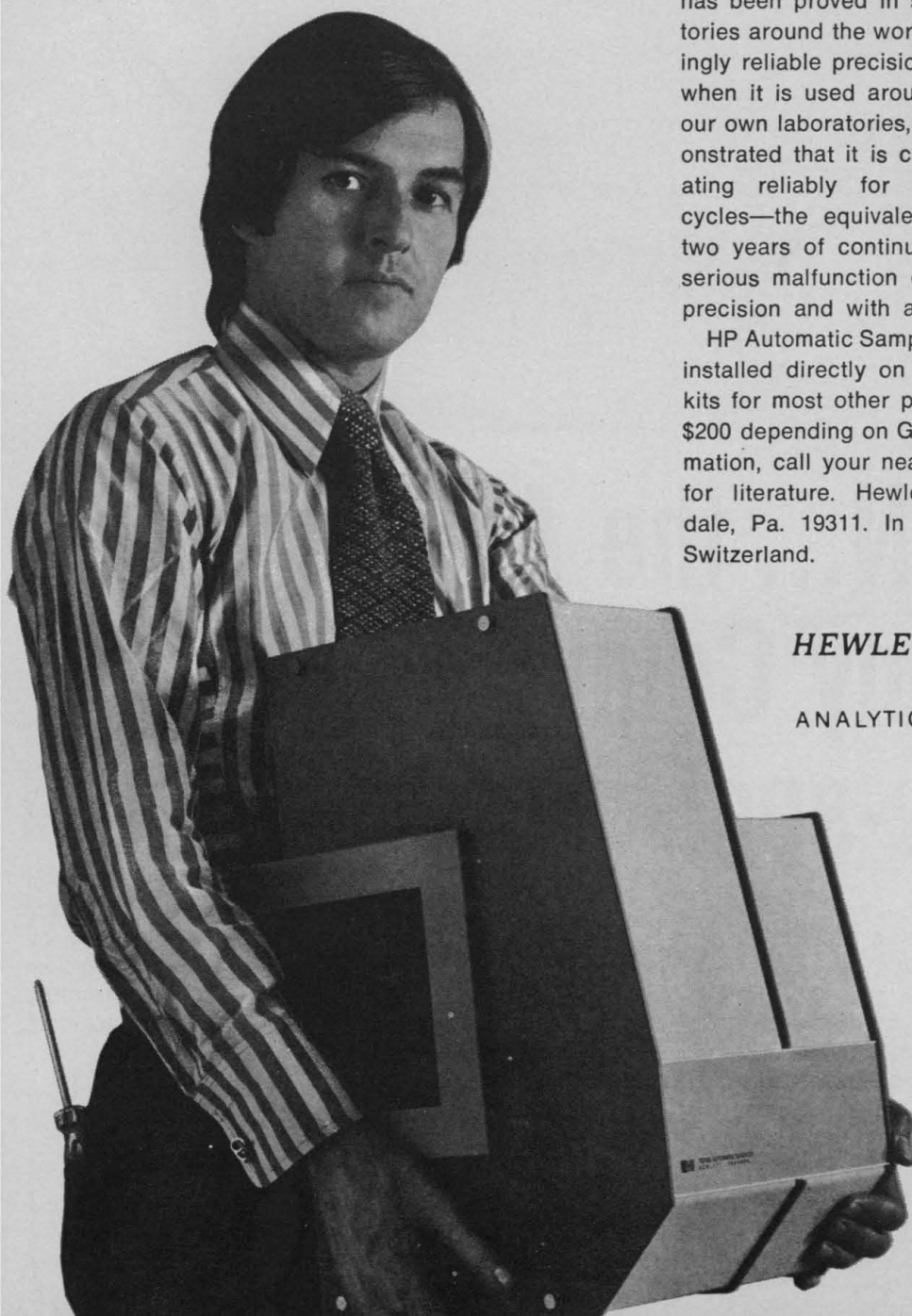
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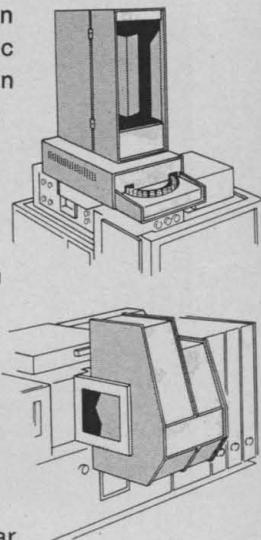
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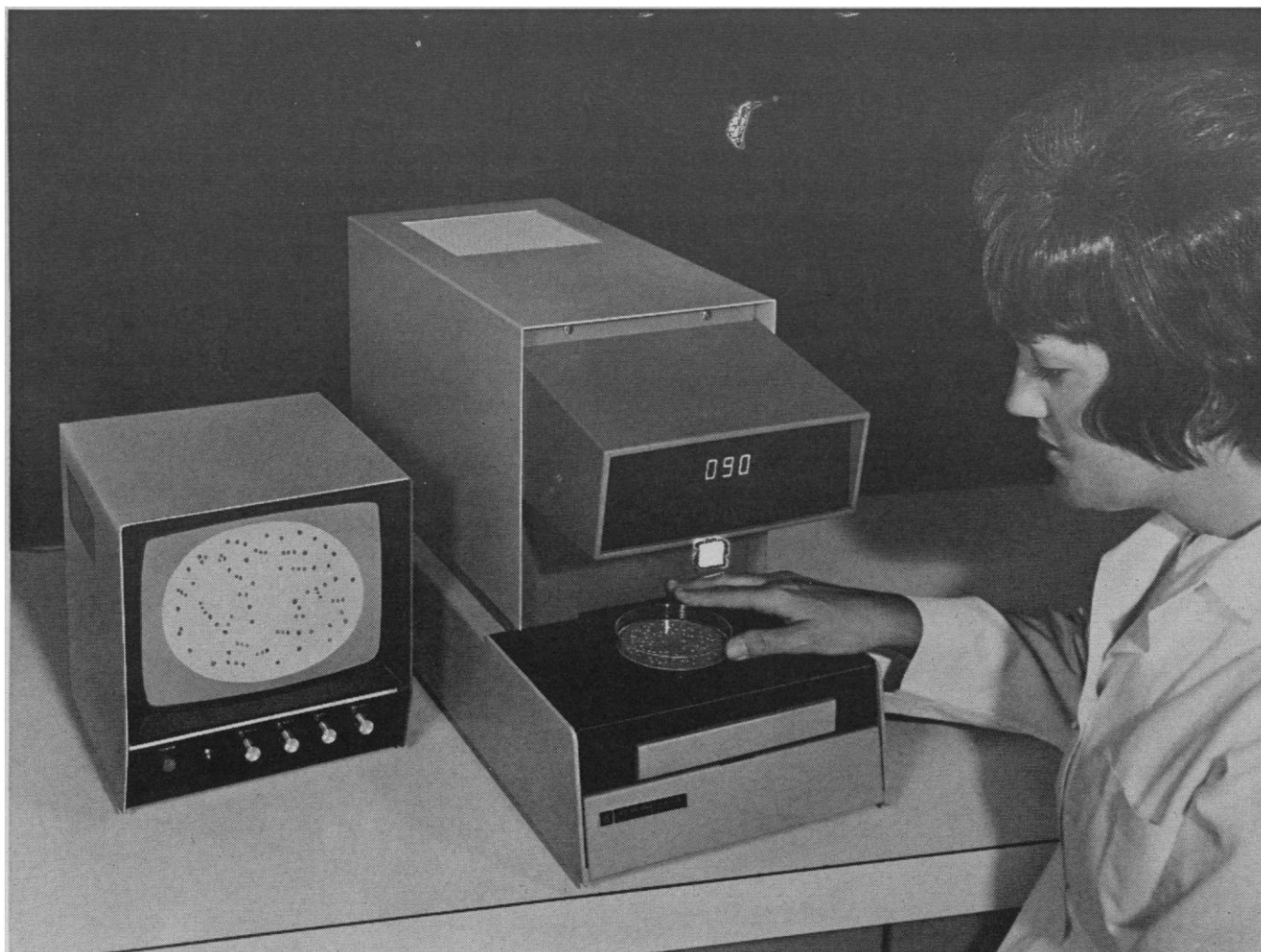


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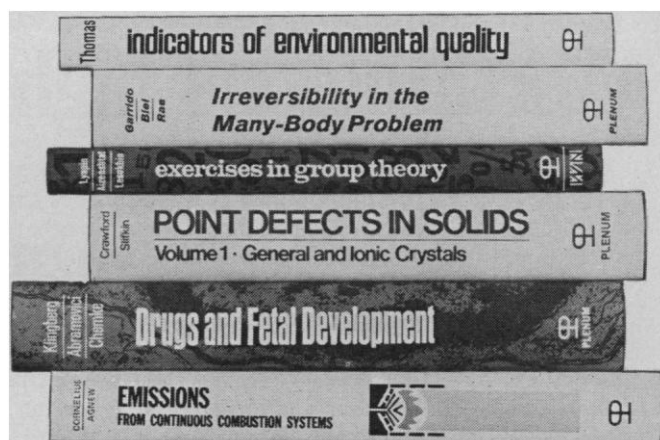
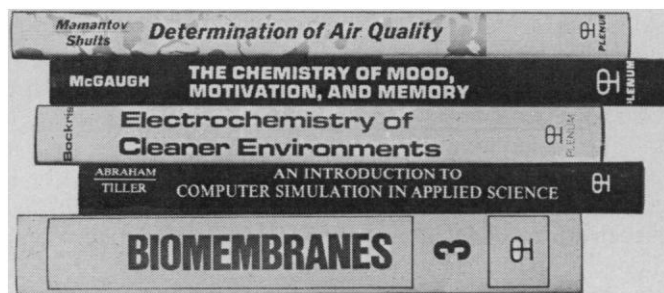
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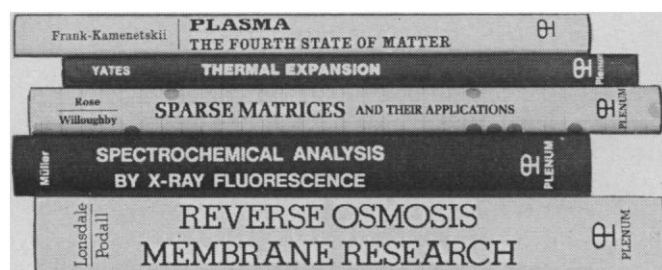
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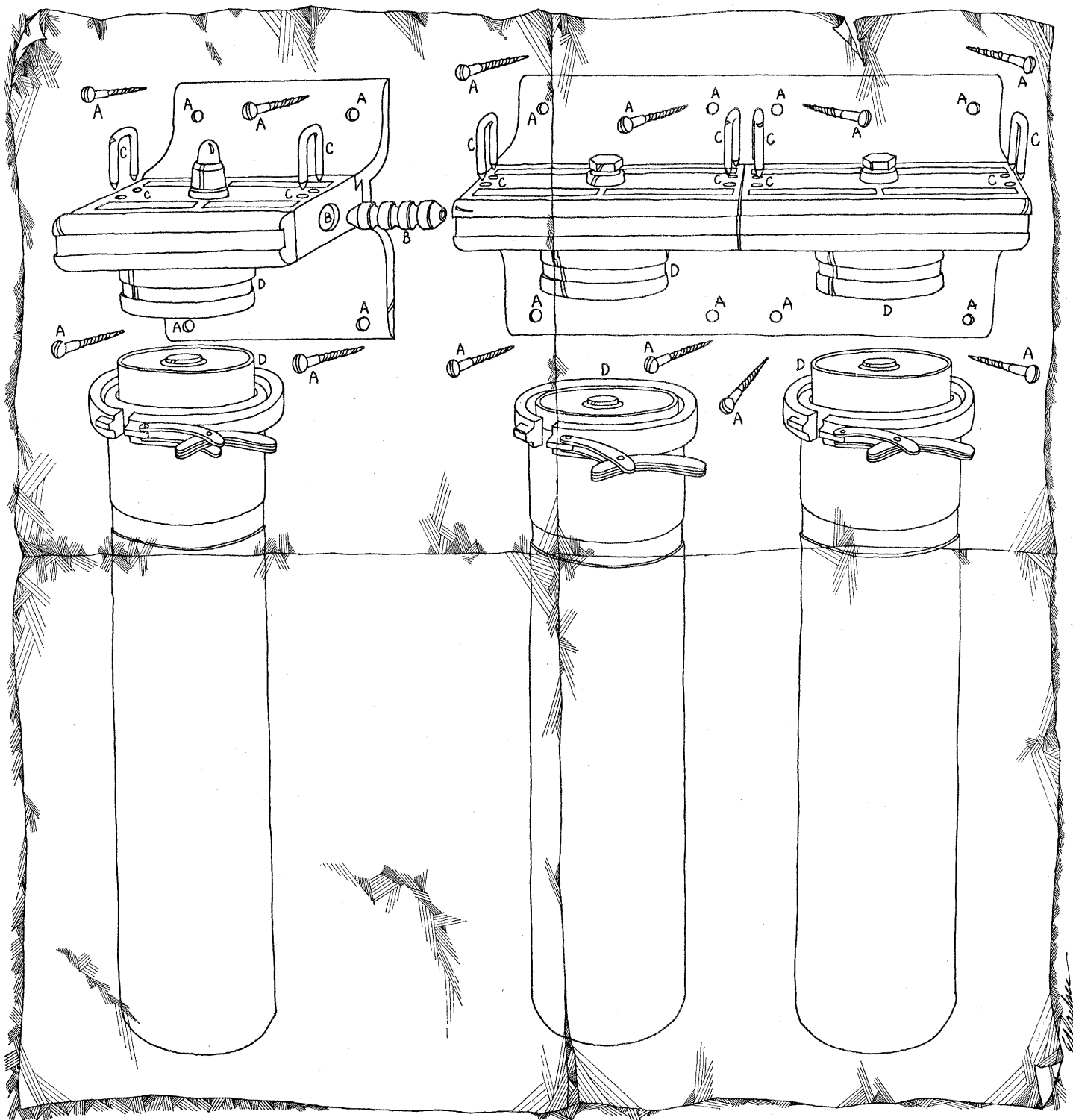
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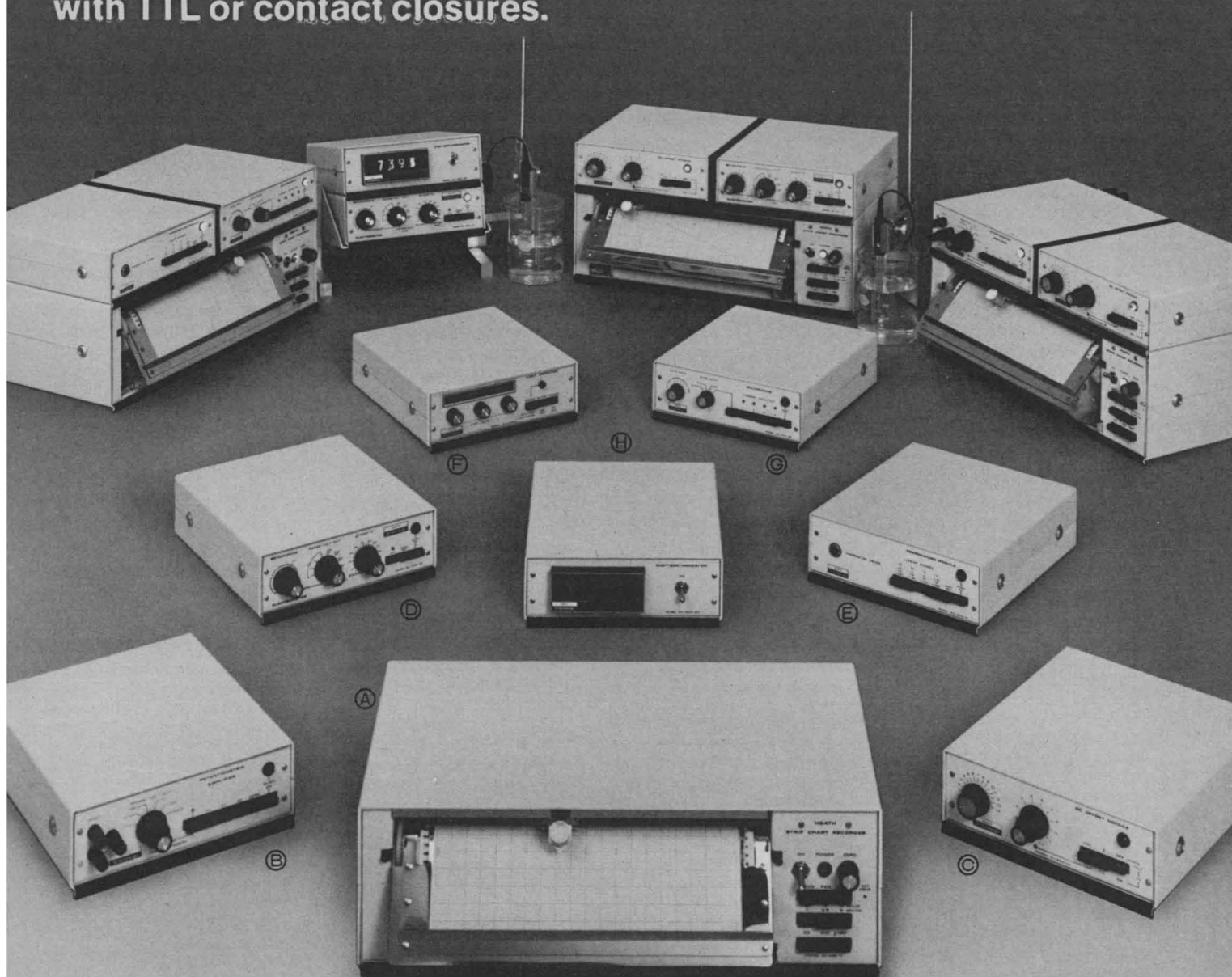


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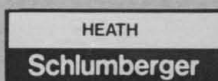
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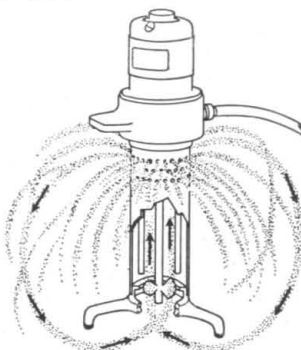
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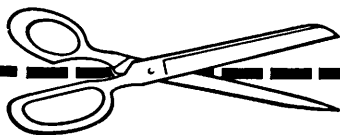
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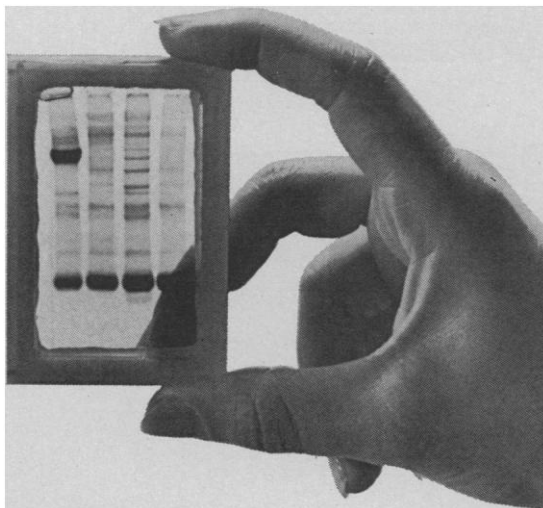
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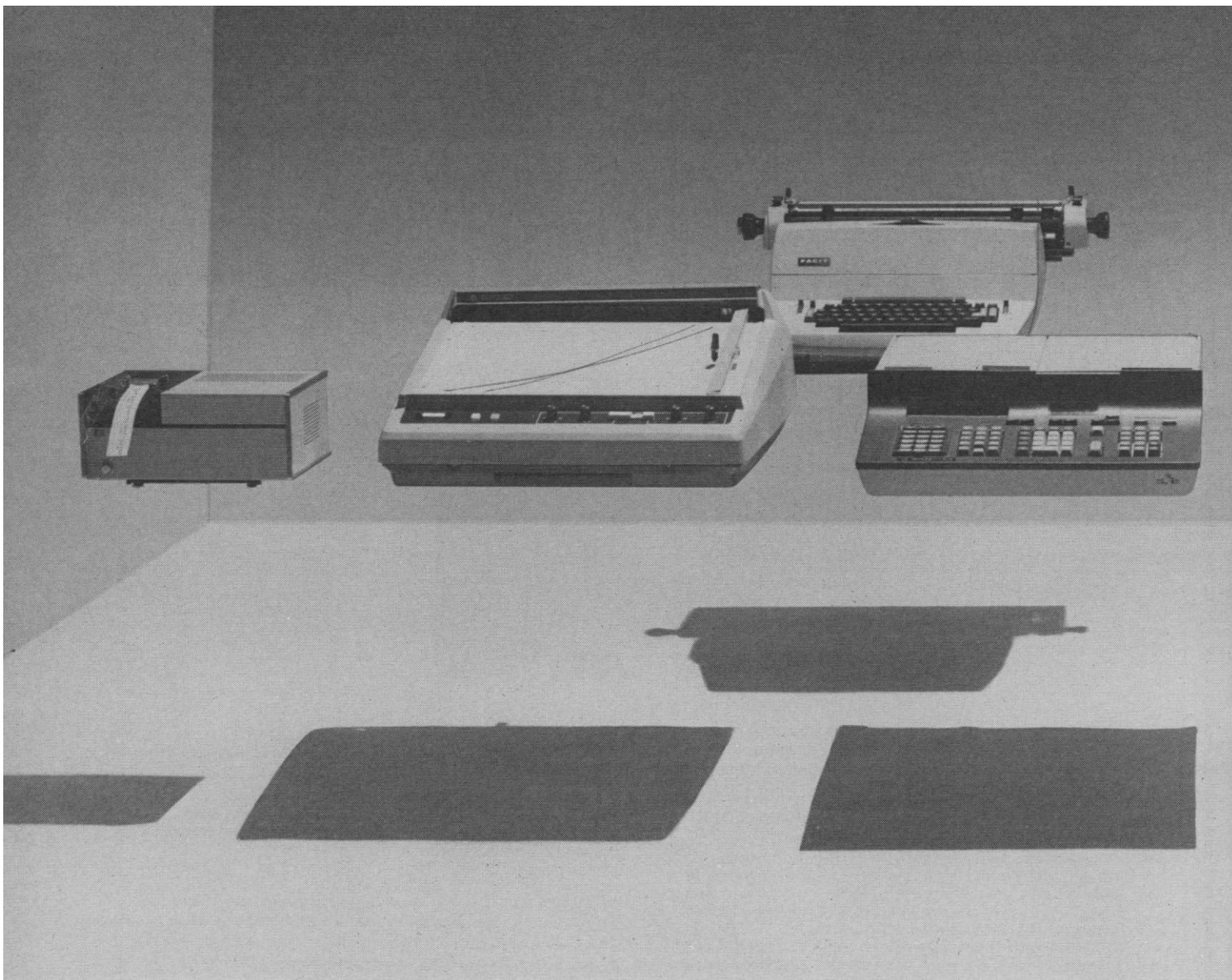
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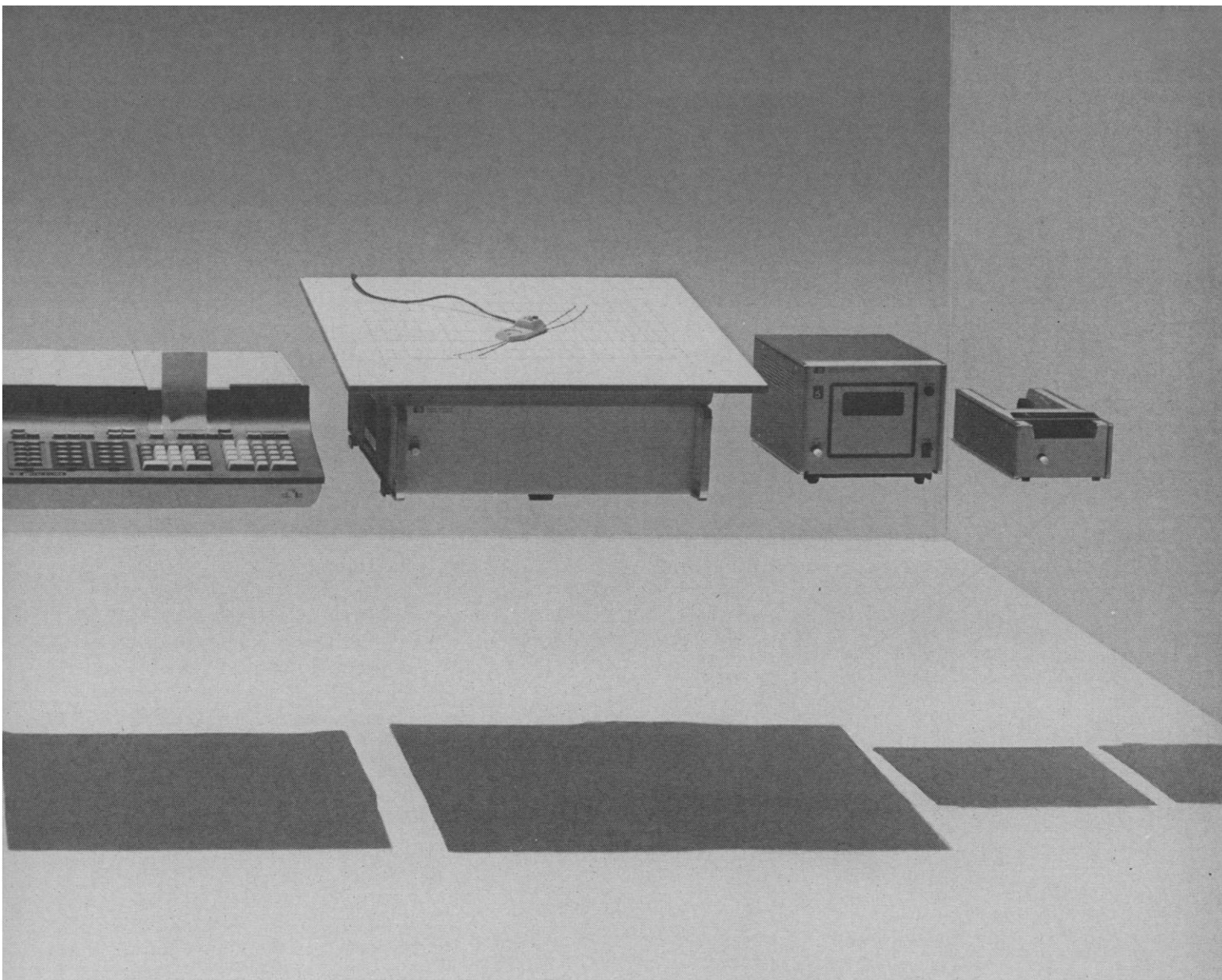
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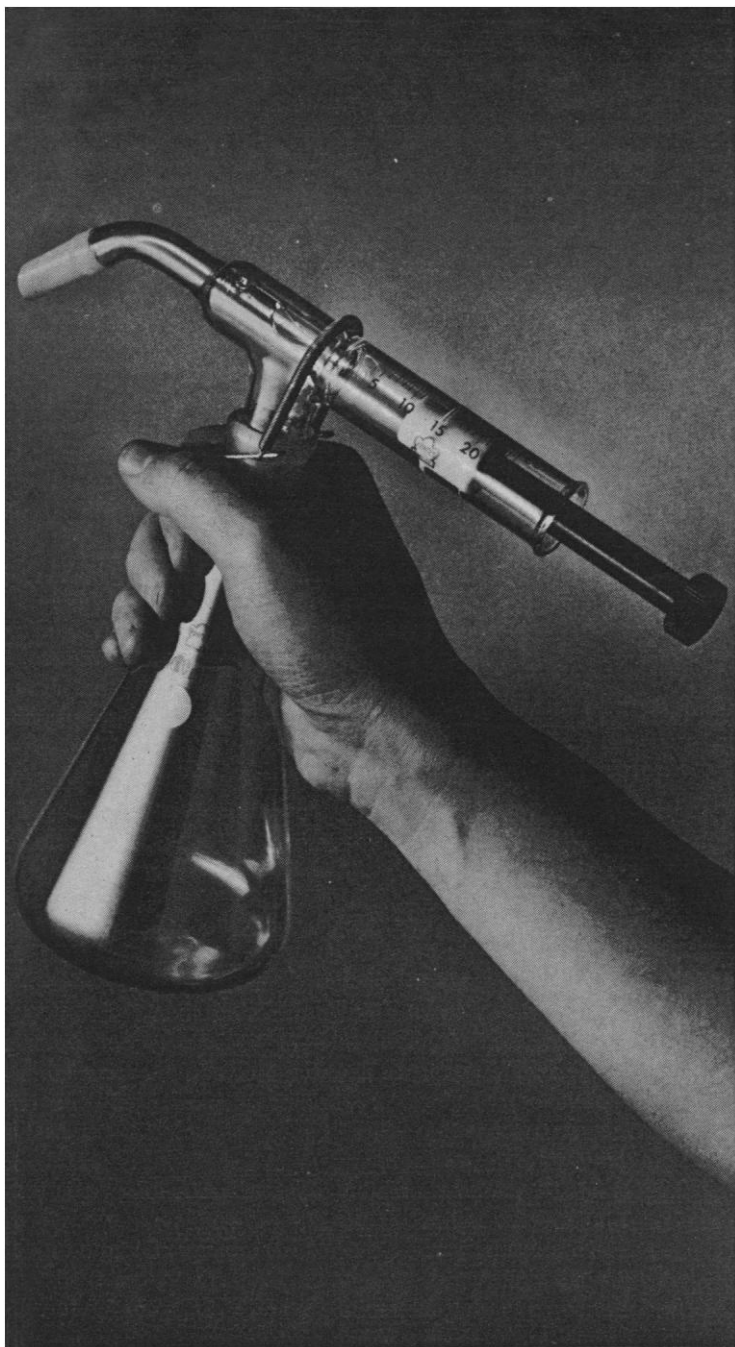
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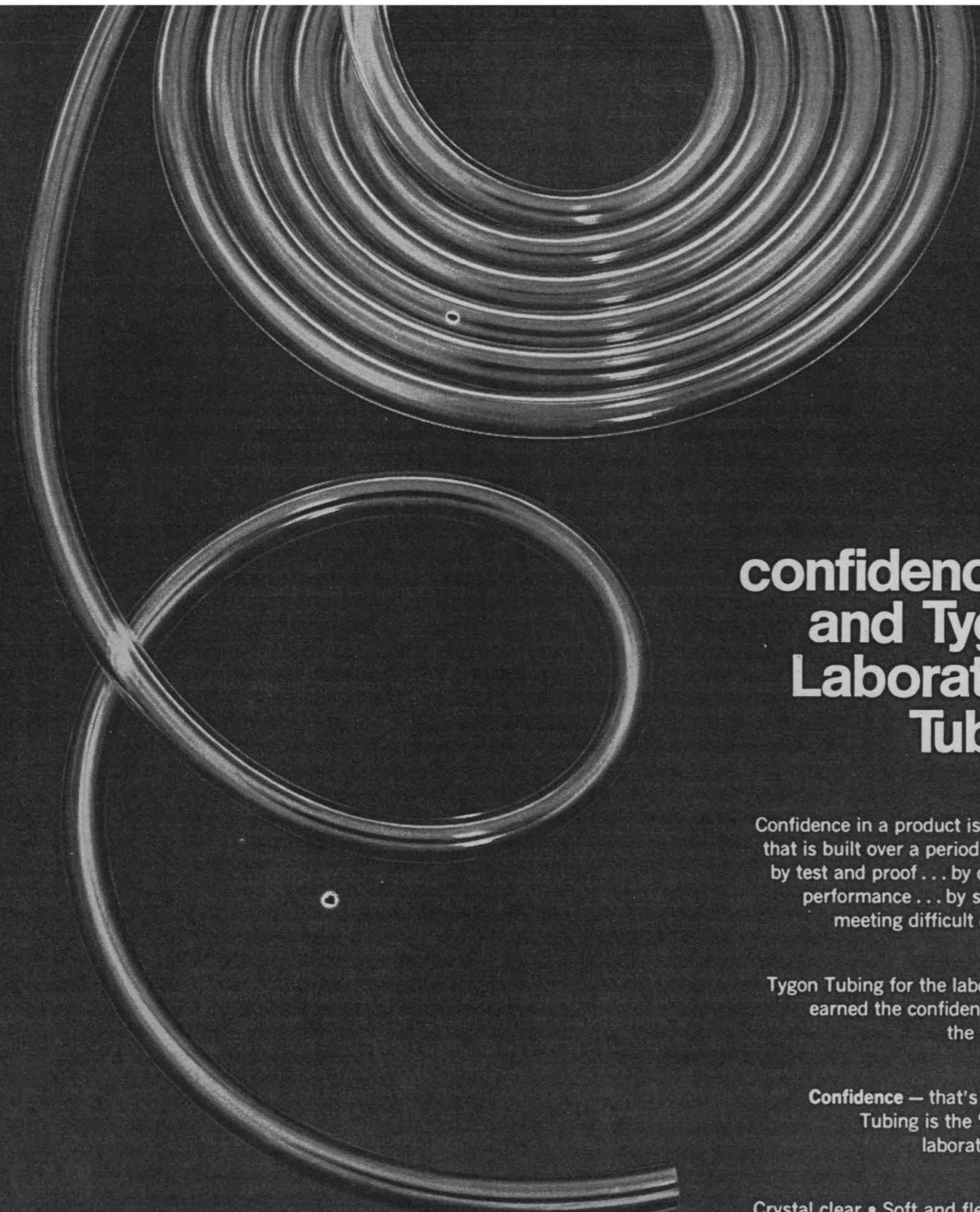
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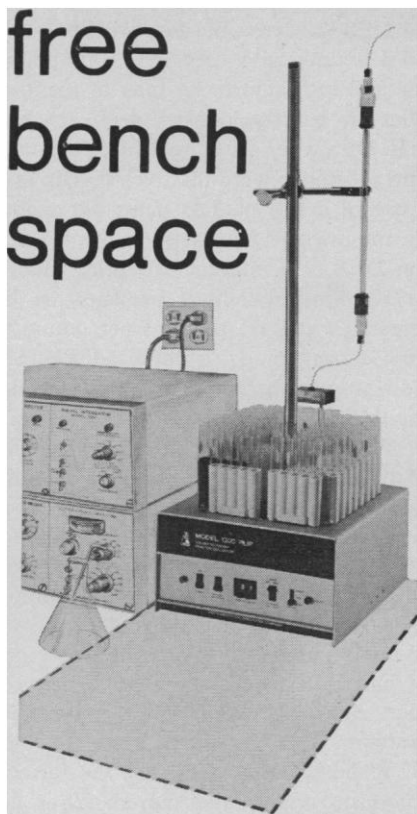
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tional Academy of Sciences, with which Wade disagrees? Why does he mention the packaging industry? Is it because food and chemical companies buy their packages from packaging companies? Or does Wade simply object to companies? A careful examination of any one of Wade's outraged comments demonstrates that they contain much outrage but little substance.

ROBERT E. MACHOL
*Graduate School of Management,
Northwestern University,
Chicago, Illinois 60611*

Nicholas Wade's fascinating report on DES contains a common statistical blunder that should be corrected. Wade writes, "Since some 30 million cattle are slaughtered each year, 1023 is not too healthy a sample from which to draw statistically valid conclusions."

This sentence is puzzling in two small ways: lack of distinction between a sample and its size, and a suggested difference between "valid" and "statistically valid." Its big problem is the assertion that sample size should depend upon population size. Unless sample size gets to be a sizable fraction of population size, the accuracy of inference from the sample hardly depends at all upon population size. A thousand-odd cattle provide for any earthly purpose exactly the same information when the population is 30 million as when it is 3 million or 60 million. What is important is how the sample is drawn from the population, and there Wade appears to be silent.

WILLIAM KRUSKAL
*Department of Statistics, University
of Chicago, Chicago, Illinois 60637*

I could find no substantiation for the headline of Nicholas Wade's report "FDA invents more tales about DES" (11 Aug., p. 503). The report, except for the end of the first paragraph, the third from the last paragraph, and the final paragraph, appears to be a straightforward account of the matter. However, the tone of the report was one of having prejudged the FDA as guilty. Is it expecting too much to look for objectivity in news reporting and headline writing in *Science*?

WARREN A. McMULLEN
*Department of Chemistry, Greenville
College, Greenville, Illinois 62246*

I would like to express my warm appreciation and congratulations to *Science* for the scholarly, well-balanced, and most timely reports on DES and on the Delaney Amendment (18 Aug.,

p. 588). These are two areas of concern that are critical to the protection of large human populations from synthetic chemical carcinogens.

I am unaware of any professional oncologists or scientists competent in these areas, apart from those who have clear economic or other constraints, who would not strongly endorse both the facts and arguments so cogently presented in these two reports.

SAMUEL S. EPSTEIN
*School of Medicine,
Case Western Reserve University,
Cleveland, Ohio 44106*

The reports by Nicholas Wade dealing with the attempts of the regulatory agencies to cope with the Delaney Amendment are important and timely. Granted that there may be a threshold dose of a carcinogen for an animal, but no one knows how to determine it. This is why the Delaney Amendment should be retained. The use of very large numbers of laboratory animals, as has been proposed, will not solve the problem. Even if the carcinogens selected are appropriate, the results of testing one or several of them in rats or mice, which consume and react for 2 years or so, cannot with surety be extrapolated to man, who can consume and react for 50, 60, or 70 years. Indeed, man's exposure can start in the womb, with the disastrous consequences to some individuals demonstrated by the case of DES, as Wade points out.

The lack of knowledge of the cumulative effects of known carcinogens, let alone of the effect of other compounds and combinations of compounds about which we know little or nothing, is serious. Businessmen and industrial managers are wise in the ways of commerce, but they know little of toxicology, and no more of the even narrower field of carcinogenesis. To entrust to them the decision of whether a new food additive presents a carcinogenic hazard would be folly.

No one questions the use of a life-saving drug in an emergency situation, even though it might be carcinogenic. However, widespread use of a chemical additive of unproven safety should be discouraged. It is imperative, therefore, that the Delaney Amendment be sustained, subject to intelligent interpretation by the FDA, to minimize the possibility that large populations could be exposed to carcinogenic chemicals.

WILLIAM LIJINSKY
*Biology Division,
Oak Ridge National Laboratory,
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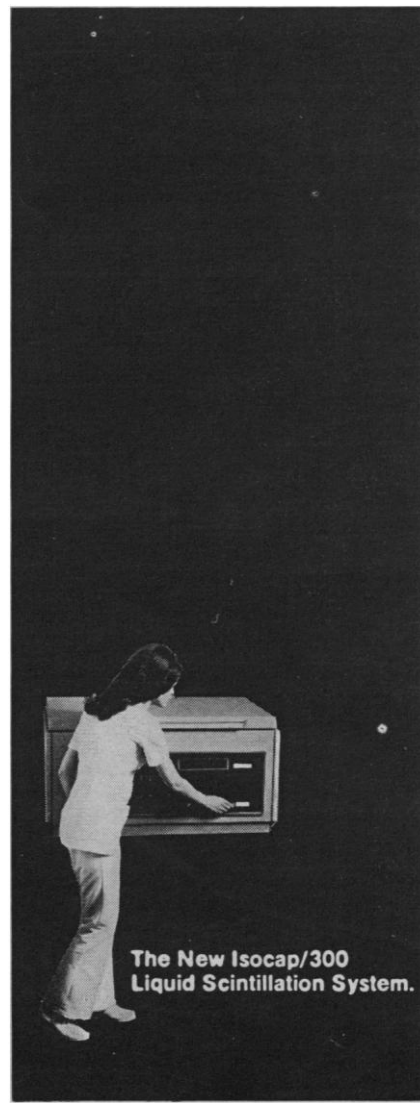
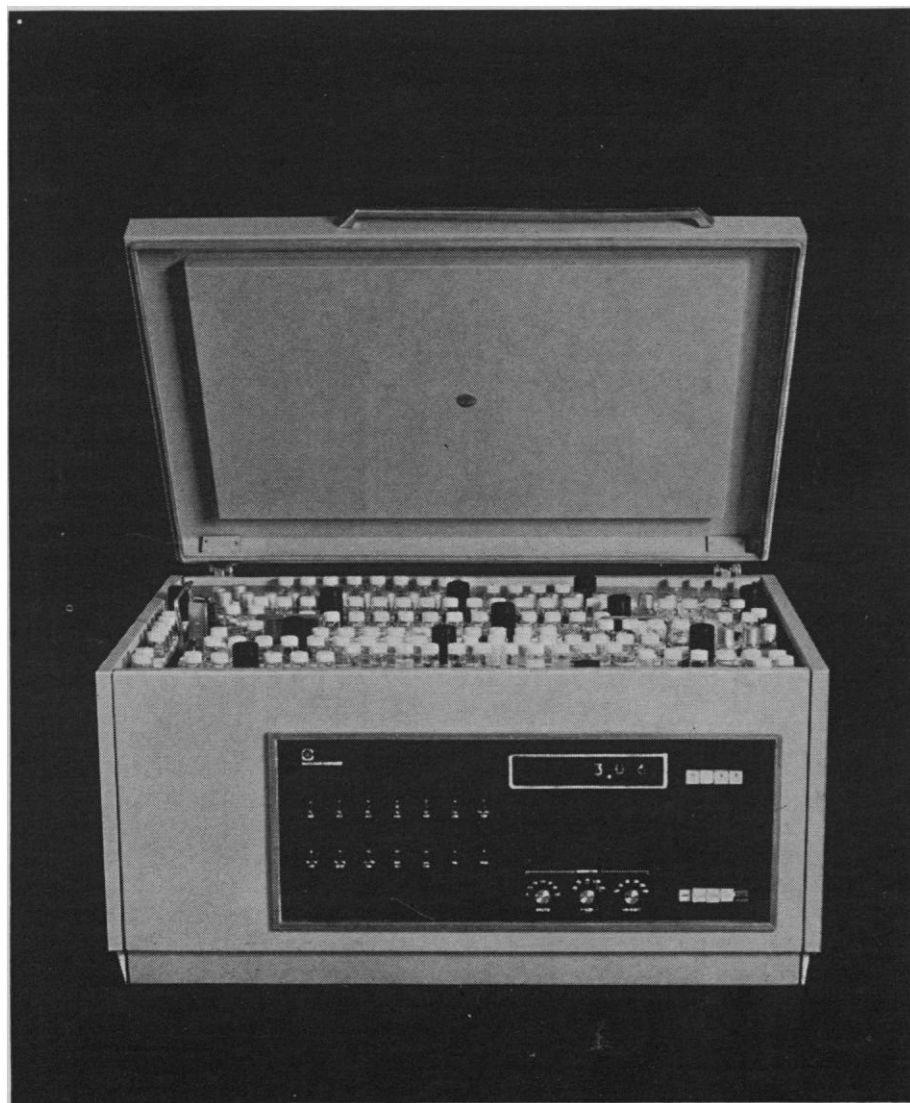
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The Quest for Environmental Indices

Our indicators of gross national product, cost of living, and unemployment are based on somewhat arbitrary definitions that can produce quite misleading results if their assumptions and limitations are not fully recognized. And yet these measures of the economy are critical factors in both formulating and evaluating economic policy. Despite their shortcomings, they are adequate for their purpose, and their use has improved both policy formulation and the level of political dialogue.

Is it possible to provide a similar set of indices for environmental quality? The Council on Environmental Quality and other organizations concerned with the environment have been grappling with this question. I am convinced that we not only *can* develop such indices, but that we *must* if the level of environmental policy and planning is to be improved.

A limited number of environmental indices, obtained by aggregating and summarizing available data, could be used to illustrate major trends and highlight the existence of significant environmental conditions. These indices could provide measures of the success of federal, state, local, and private programs in coping with environmental problems that must be solved.


Many obstacles lie in the path of developing environmental indices. For some aspects of the environment there are conceptual questions that must be answered. For example, we know that land use is a basic component of environmental quality, but at this point it is not clear what aspects of land use we should be measuring.

Good indices depend upon good data, but the environmental data now being collected are deficient in many respects. Inadequate sampling is probably the most pervasive problem. Much of our air pollution data, for example, is based on results from only one monitoring station in each community. It makes a big difference whether that single station is located next to a power plant or on the outer fringes of the suburbs. Similarly, water pollution readings are only rarely adjusted to take into account the location of the stations collecting the data. Another major problem is the excessive length of time between collections of data. Unsatisfactory systems for data storage and dissemination are often notable deficiencies.

Finally, in many cases the scientific knowledge necessary to properly weight the components of an index is lacking. How important is dissolved oxygen compared to turbidity in estimating the quality of our nation's water? How much park space does a typical urban dweller need or want? Until sound standards are set for the major aspects of the environment, a number of somewhat arbitrary assumptions will have to be made in the computation of indices.

Although there are formidable obstacles to the development of environmental indices, real progress has been made in this direction. There has been a marked increase in interest in the subject among federal, state, and local agencies and also within the academic community. The dialogue concerning environmental problems has increasingly been based on empirical evidence instead of on intuitive assumptions or political interests.

Policy-making neither can nor should become totally "scientific." Vital decisions will always depend ultimately on the values we hold and on the way we express these values through the political system. But we must also strive to make maximum use of the scientific evidence available to us, and the development of environmental indices is one important way of doing this.—RUSSELL E. TRAIN, *Chairman, Council on Environmental Quality, 722 Jackson Place, NW, Washington, D.C. 20006*



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November

1-2. American Assoc. for the **Study of Liver Disease**, Chicago, Ill. (F. Schaffner, Mount Sinai Hospital, Fifth Ave. and 100th St., New York 10029)

1-3. **Computers and Representation**, New York Acad. of Sciences, New York, N.Y. (W. Likely, NYAS, 2 E. 63 St., New York 10021)

1-3. Pittsburgh **Diffraction Conf.**, 30th, Pittsburgh, Pa. (J. H. Magill, Dept. of Metallurgy, Univ. of Pittsburgh, Pittsburgh 15213)

1-4. American Soc. of **Cytology**, 20th annual scientific mtg., New Orleans, La. (W. R. Lang, ASC, 7112 Lincoln Dr., Philadelphia, Pa. 19119)

1-5. American Soc. of **Clinical Hypnosis**, 15th annual and workshop on Clinical Hypnosis and Hypnotherapy, San Diego, Calif. (F. D. Nowlin, ASCH, 800 Washington Ave., SE, Minneapolis, Minn. 55414)

2-3. Symposium on **Opportunistic Pathogens**, Philadelphia, Pa. (Miss M. R. Carmosin, Hahnemann Medical College and Hospital of Philadelphia, 230 N. Broad St., Philadelphia 19102)

2-4. Indiana **Acad. of Science**, Notre Dame (J. D. Webster, Hanover College, Hanover, Ind. 47243)

2-4. **Gerontological Soc.**, Cleveland, Ohio. (E. Kaskowitz, GS, Suite 520, 1 Dupont Circle, NW, Washington, D.C. 20036)

2-4. **Trichinellosis** (Trichinosis), 3rd intern. conf., Miami, Fla. (W. C. Campbell, Merck Institute, Rahway, N.J., or Z. Kozar, Norwida 29, Wroclaw, Poland)

2-5. Association of **Clinical Scientists**, Chicago, Ill. (F. W. Sunderman, Jr., Drawer B, Newington, Conn. 06111)

2-6. **Research in Medical Education**, Assoc. of American Medical Colleges, Miami Beach, Fla. (J. B. Erdmann, AAMC, Suite 200, 1 Dupont Circle, NW, Washington, D.C. 20036)

4. **Methods of Learning Environmental Sciences**, Illinois Earth Science Assoc., Chicago, Ill. (M. Qutub, Dept. of Earth Science, Northeastern Illinois Univ., Bryn Mawr at St. Louis Ave., Chicago 60625)

5-9. American **Pharmaceutical Assoc.** and Acad. of Pharmaceutical Sciences, 13th annual, Chicago, Ill. (Miss K. Sullivan, APA, 2215 Constitution Ave., NW, Washington, D.C. 20037)

5-10. Latin American Assoc. for Studies on **Human Reproduction**, Buenos Aires, Argentina. (R. P. Bertola, Rafaela 5178, Buenos Aires)

5-12. International College of **Surgeons**, 5th Western Hemisphere congr., Paradise Island, Nassau, Bahamas. (Office of the President, ICS, 1516 N. Lake Shore Dr., Chicago, Ill. 60610)

6. **Diffusion in Chemical Processes**, Canadian Soc. for Chemical Engineering, Toronto, Ont. (R. Hummel, Dept. of Chemical Engineering, Univ. of Toronto, Toronto)

6-7. **Cholelithiasis—From Theory to Therapy**, Acad. of Pharmaceutical Sciences, American Pharmaceutical Assoc., 11th natl., Chicago, Ill. [D. Mufson (F70),

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Smith Kline & French Labs., 1500 Spring Garden St., Philadelphia, Pa. 19101]

6-8. **Effect of Maternal Nutrition on the Development of the Offspring**, High Wycombe, Bucks, England. (B. F. Chow, School of Hygiene and Public Health, Johns Hopkins Univ., 615 N. Wolfe St., Baltimore, Md. 21205)

6-9. American Soc. of **Cytology**, 21st annual scientific mtg., Salt Lake City, Utah. (W. R. Lang, ASC, 7112 Lincoln Dr., Philadelphia, Pa. 19119)

6-10. Symposium on **Irradiation Facilities for Research Reactors**, Intern. Atomic Energy Agency, Tehran, Iran. (J. H. Kane, Office of Information Services, U.S. Atomic Energy Commission, Washington, D.C. 20545)

6-10. American **Public Health Assoc.**, Atlantic City, N.J. (T. R. Hood, APHA, 1740 Broadway, New York 10019)

6-10. American Society of **Tropical Medicine and Hygiene**, Miami Beach, Fla. (G. R. Healy, P.O. Box 15208, Emory Univ. Branch, Atlanta, Ga. 30333)

6-11. American Soc. of **Parasitologists**, Miami, Fla. (D. V. Moore, Dept. of Microbiology, Univ. of Texas Southwestern Medical School, Dallas 75235)

8-10. Institute of **Management Sciences**, Atlantic City, N.J. (Mrs. M. R. DeMelim, IMS, 146 Westminster St., Providence, R.I. 02903)

8-10. **Operations Research Soc. of America**, Atlantic City, N.J. (R. M. Oliver, Operations Research Center, Univ. of California, Berkeley 94720)

8-10. Society of **Plastics Engineers**, 3rd natl., Pittsburgh, Pa. (J. H. Hyden, 656 W. Putnam Ave., Greenwich, Conn. 96830)

8-11. **Pulmonary Reactions to Organic Materials**, intern. conf., New York Acad. of Sciences, New York, N.Y. (W. Likely, NYAS, 2 E. 63 St., New York 10021)

8-11. **Sugars in Nutrition**, intern. conf., Nutrition Foundation, Inc., Nashville, Tenn. (R. M. Stalvey, NFI, 99 Park Ave., New York 10016)

8-12. **Medical Soc. of the United States and Mexico**, 20th, Guadalajara, Mexico. (V. E. Bryant, 333 W. Thomas Rd., Phoenix, Ariz. 85013)

9-10. **Statistical Aspects of Air Quality Data**, Triangle Universities Consortium on Air Pollution, Chapel Hill, N.C. (L. D. Kornreich, Dept. of Environmental Sciences and Engineering, Univ. of North Carolina, Chapel Hill 27514)

9-11. Mid-South **Educational Research Assoc.**, New Orleans, La. (W. M. Matthews, Dept. of Educational Administration, School of Education, Univ. of Mississippi, University 38677)

9-12. Society for **Psychophysiological Research**, Boston, Mass. (B. M. Shmavonian, Dept. of Behavioral Science, Temple Univ. Medical School, c/o Eastern Pennsylvania Psychiatric Inst., Henry Ave., Philadelphia, Pa. 19129)

10-12. **Precambrian Iron Deposits**, Soc. of Economic Geologists, Minneapolis, Minn. (SEC, P.O. Box 1549, Knoxville, Tenn. 37901)

11-14. American **Medical Women's Assoc.**, Columbus, Ohio. (Mrs. G. F. Conroy, AMWA, 1740 Broadway, New York 10019)

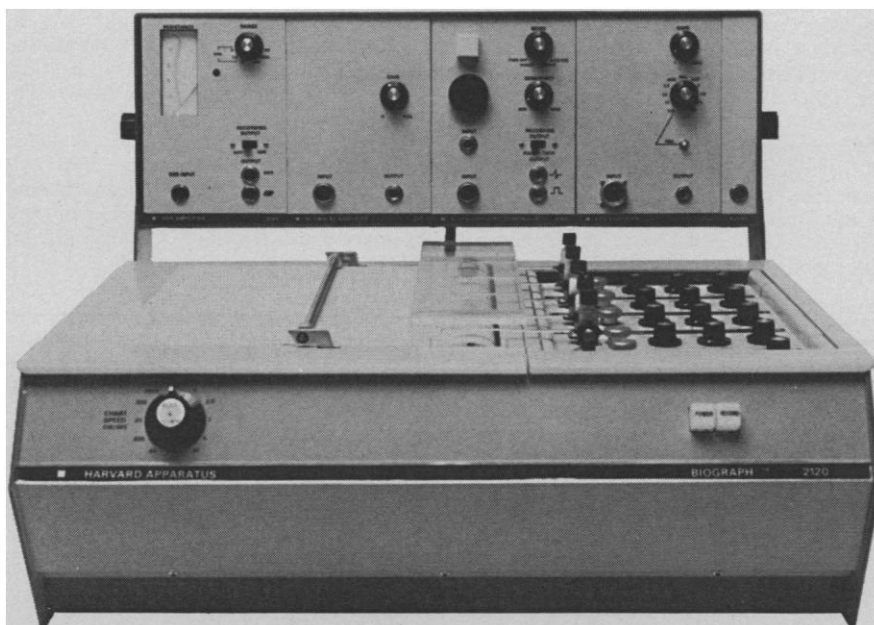
12-15. Academy of **Psychosomatic Medicine**, San Diego, Calif. (A. J. Krakowski,

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12-17. International **Health Soc.** of the United States, Atlantic City, N.J. (J. P. Pappas, IHSUS, 960 E. 3 St., Chattanooga, Tenn. 37403)

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13-14. **LAMPF Users Group**, 6th, Los Alamos, N.M. (L. Agnew, Liaison Officer, LAMPF Users Group, Post Office Box 1663, Los Alamos 87544)

13-14. **Nutrition and Fetal Development**, Natl. Foundation-March of Dimes, New York, N.Y. (M. Winick, Inst. of Human Nutrition, College of Physicians and Surgeons, Columbia Univ., 511 W. 166 St., New York 10032)

13-15. **Collection and Analysis of Astrophysical Data**, intern. symp., Charlottesville, Va. (W. R. Burns, Natl. Radio Astronomy Observatory, Edgemont Rd., Charlottesville 22901)

13-15. **Geochemical Soc.**, Minneapolis, Minn. (E. E. Angino, State Geological Survey, Univ. of Kansas, Lawrence 66044)

13-15. **Geological Soc.** of America, Minneapolis, Minn. (E. B. Eckel, GSA,

Post Office Box 1719, Boulder, Colo. 80302)

13-15. **Paleontological Soc.**, Minneapolis, Minn. (W. O. Addicott, U.S. Geological Survey, 345 Middlefield Rd., Menlo Park, Calif. 94025)

13-16. American Inst. of **Aeronautics and Astronautics**, Anaheim, Calif. (AIAA, 1290 Ave. of the Americas, New York 10019)

13-17. American **Nuclear Soc.**, Washington, D.C. (O. J. Du Temple, ANS, 244 E. Ogden Ave., Hinsdale, Ill. 60521)

13-17. American **Physical Soc.**, Plasma Physics Div., Monterey, Calif. (W. W. Havens, Jr., 335 E. 45 St., New York 10017)

13-17. Symposium on **Radiation Preservation of Food**, Intern. Atomic Energy Agency and Food and Agriculture Organization of the United Nations, Bombay, India. (J. H. Kane, Office of Information Services, U.S. Atomic Energy Commission, Washington, D.C. 20545)

14-16. Society of **Manufacturing Engineers**, Baltimore, Md. (R. W. Taylor, SME, 20501 Ford Rd., Dearborn, Mich. 48128)

15-16. American College of **Preventive Medicine**, Atlantic City, N.J. (W. Bentley, 801 Old Lancaster Rd., Bryn Mawr, Pa. 19010)

15-17. **Planets, Stars and Nebulae Studied with Photopolarimetry**, 23rd colloquium, Intern. Astronomical Union, Tucson, Ariz. (T. Gehrels, Lunar and Planetary Lab., Univ. of Arizona, Tucson 85721)

16-17. Society of **Naval Architects and Marine Engineers**, 80th, New York, N.Y. (SNAME, 74 Trinity Pl., New York 10006)

16-17. **Wash-out Processes in Fresh Water Systems**, 5th symp. on water resources research, Huron, Ohio. (C. E. Herdendorf, Center for Lake Erie Area Research, College of Biological Sciences, Ohio State Univ., 484 W. 12 Ave., Columbus 43210)

16-18. **School Science and Mathematics Assoc.**, Chicago, Ill. (D. R. Winslow, SSMA, P.O. Box 246, Bloomington, Ind. 47401)

16-20. American **Heart Assoc.**, Dallas, Tex. (J. M. Hundley, AHA, 44 E. 23 St., New York 10010)

17. American **Geographical Soc.**, New York, N.Y. (B. W. Adkinson, AGS, Broadway at 156th St., New York 10032)

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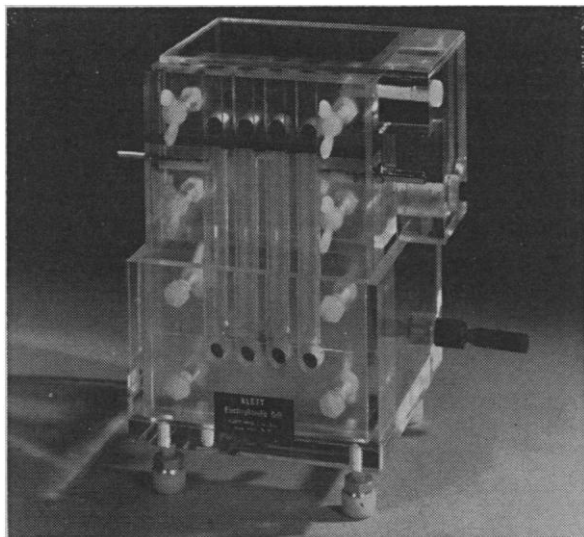
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18-21. American **Speech and Hearing Assoc.**, San Francisco, Calif. (K. O. Johnson, ASHA, 9030 Old Georgetown Rd., Washington, D.C. 20014)

19-22. Pan American **Medical Assoc.**, 47th, Miami Beach, Fla. (J. J. Eller, 745 Fifth Ave., New York 10022)

19-25. International Inst. on **Drug Dependence**, 3rd, Manila, Philippine Islands.

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2. Winer, A.D., J. Biol. chem., **239**, PC 3598 (1964)

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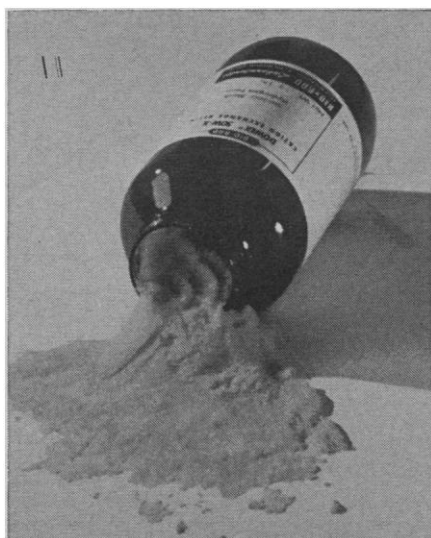
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25-1. **Radiological Soc. of North America**, Chicago, Ill. (H. L. Baker, Jr., 200 First St., SW, Rochester, Minn. 55901)

26. **American College of Nutrition**, 13th, Cincinnati, Ohio. (A. L. Luhby, 1249 First Ave., New York 10029)

26-29. **American Medical Assoc.**, Cincinnati, Ohio (E. B. Howard, AMA, 535 N. Dearborn, Chicago, Ill. 60610)

26-29. **Association of Military Surgeons**, Washington, D.C. (W. Welham, 8502 Connecticut Ave., Chevy Chase, Md. 20015)

26-30. **American Inst. of Chemical Engineers**, 65th annual, New York, N.Y. (F. J. Van Antwerpen, AICE, 345 E. 47 St., New York 10017)

26-30. **Energy Crises Forum**, American Soc. of Mechanical Engineers, annual mtg., New York, N.Y. (M. Jones, ASME, 345 E. 47 St., New York 10017)

26-30. 42nd intern., **Exploration, Energy, Environment, Society of Exploration Geophysicists**, Anaheim, Calif. (C. H. Morris, U.S. Geological Survey, 7744 Federal Bldg., 300 N. Los Angeles St., Los Angeles, Calif. 90012)

26-1. **Radiological Society of North America**, Chicago, Ill. (M. D. Frazer, 713 E. Genesee St., Syracuse, N.Y. 13210)

27-28. **Photochemical and Photophysical Processes**, Austin, Tex. (A. J. Bard, Dept. of Chemistry, Univ. of Texas, Austin 78712)

27-30. **Entomological Soc. of America**, Montreal, P.Q., Canada. (W. P. Murdoch, ESA, 4603 Calvert Rd., College Park, Md. 20740)

27-1. **Symposium on the Management of Radioactive Wastes from Fuel Reprocessing**, European Nuclear Energy Agency and Intern. Atomic Energy Agency, Paris, France. (J. H. Kane, Office of Information Services, U.S. Atomic Energy Commission, Washington, D.C. 20545)

28-29. **National Land Use Policy Conf.**, Soil Conservation Soc. of America, Des Moines, Iowa. (J. R. Johnston, SCSA, 7515 NE Ankeny Rd., Ankeny, Iowa 50021)

28-30. **Digital Satellite Communication**, 2nd intern. conf., Paris, France. (Secretariat, Colloque International sur les télécommunications numériques par satellite, 16, rue de Presles, Paris 15°)

28-1. **Acoustical Soc. of America**, Miami Beach, Fla. (Mrs. B. H. Goodfriend, ASA, 335 E. 45 St., New York 10017)

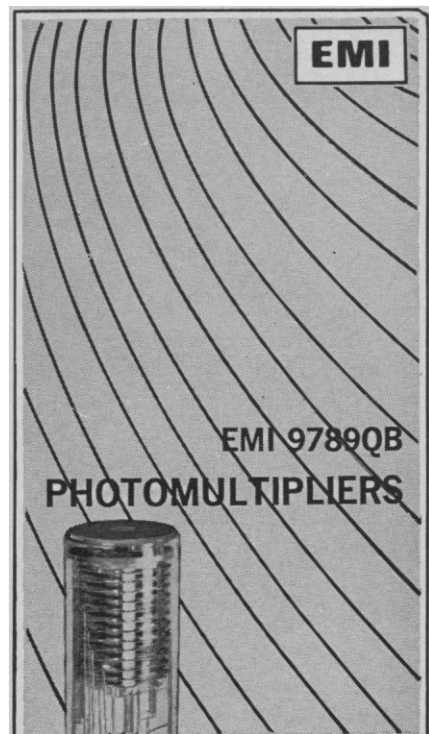
28-1. **Magnetism and Magnetic Materials**, Denver, Colo. (W. D. Doyle, Dept. of Physics, Univ. of York, Hishington, York YO 15-D.D., England)

29-1. **Conference on Polymeric Materials for Unusual Service Conditions**, Moffett Field, Calif. (M. A. Golub, Ames Research Center, Natl. Aeronautics and Space Administration, 223-6, Moffett Field 94035)

29-3. **American Anthropological Assoc.**, Toronto, Ont., Canada. (E. J. Lehman, AAA, 1703 New Hampshire Ave., NW, Washington, D.C. 20009)

29-3. **Biotelemetry**, intern. symp., Pretoria, South Africa. (Symp. Secretariat, S. 57 C.S.I.R., P.O. Box 395, Pretoria)

30-1. **South-Wide Symp. on Human Nematode Intestinal Parasites**, Atlanta,



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Ga. (J. W. Follette, Malnutrition and Parasite Project, 002 Maxcy College, Univ. of South Carolina, Columbia 29208)

30-2. **Mechanisms of Drug Action**, 6th annual symp., Intra-Science Research Foundation, Santa Monica, Calif. (S. M. Pokras, ISRF, P.O. Box 430, Santa Monica 90406)

30-3. American **Psychoanalytic Assoc.**, New York, N.Y. (Miss H. Fischer, APA, 1 E. 57 St., New York 10022)

December

1-2. American College of **Chemosurgery**, Miami, Fla. (R. S. Moraites, 7721 Montgomery Rd., Cincinnati, Ohio 45236)

2-7. American Acad. of **Dermatology**, Bal Harbour, Fla. (F. A. J. Kingery, 2250 Flanders St., Portland, Ore. 97210)

3-6. American Soc. of **Hematology**, Hollywood, Fla. (S. Robinson, ASH, 330 Brookline Ave., Boston 02215)

3-7. American Soc. of **Hospital Pharmacists**, Las Vegas, Nev. (J. A. Oddis, ASHP, 4630 Montgomery Ave., Bethesda, Md. 20014)

4-5. **A Comparison of the Continental and Marine Quaternary Record**, American Quaternary Assoc., Miami, Fla. (C. Emiliani, Rosenstiel School of Marine and Atmospheric Science, 10 Rickenbacker Causeway, Miami 33149)

4-7. American **Geophysical Union**, San Francisco, Calif. (A. F. Spilhaus, Jr., AGU, 1707 L St., NW, Washington, D.C. 20036)

4-7. International **Pollution Engineering** Congr., Cleveland, Ohio. (Clapp & Poliak, Inc., 245 Park Ave., New York 10017)

4-7. **Sea-Air Interaction in Polar Regions**, Committee on Polar Research, Natl. Acad. of Sciences-Natl. Research Council, San Francisco, Calif. (L. DeGoes, NAS-NRC, 2101 Constitution Ave., NW, Washington, D.C. 20418)

4-7. **Thermal Discharge—Engineering and Ecology**, Institution of Engineers, Australia, Sydney. (Secretary, IEA, 157 Gloucester St., Sydney, New South Wales 2000)

4-8. **Electron Spin Resonance and Nuclear Magnetic Resonance Spectroscopy in Biology and Medicine**, New York Acad. of Sciences, New York, N.Y. (W. Likely, NYAS, 2 E. 63 St., New York 10021)

4-8. **Free Time and Freedom**, Union Mondiale Organismes pour la Sauvegarde de l'Enfance et de l'Adolescence 5th intern. conf., Paris, France. (Secrétariat Général, UMOSEA, 28 place Saint-Georges, 75, Paris 9^e)

4-8. International Symp. on **Water Resources Planning**, Ministry of Water Resources, Government of Mexico, and Intern. Assoc. of Hydrological Sciences, Mexico City. (G. Cruickshank, Subsecretario de Planeación, Secretaría de Recursos Hidráulicos, Reforma No. 69-11^o Piso, Mexico, D.F.)

5-7. **Measurement of Computer Systems**, American Federation of Information Processing Societies, Inc., Anaheim, Calif. (C. Enos, AFIPS, 210 Summit Ave., Montvale, N.J. 07645)

6-7. **Physical Properties of Solids at High Pressure**, Inst. of Physics, Intern. Assoc. for the Advancement of High Pressure Science and Technology, European High Pressure Research Group, and High

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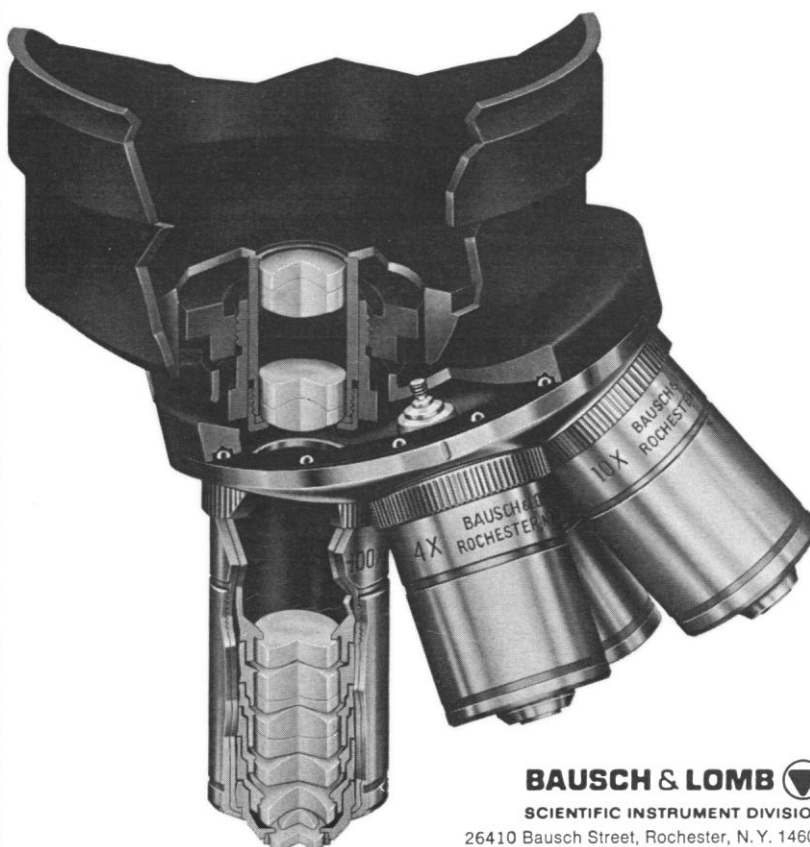
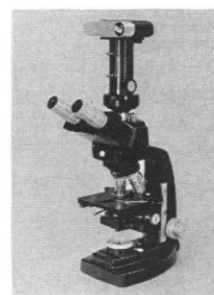
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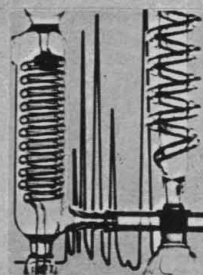
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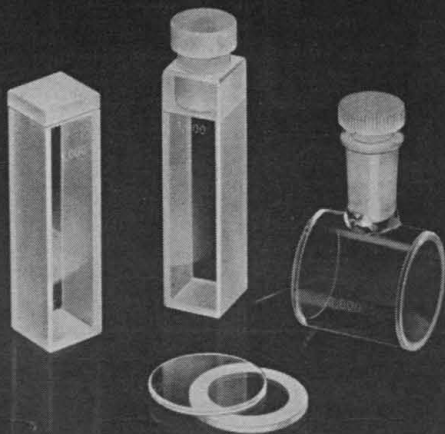
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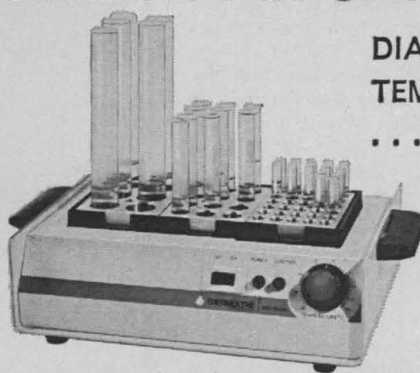
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7-9. American **Rheumatism** Assoc., Pittsburgh, Pa. (Miss L. Bonfiglio, ARA, 1212 Ave. of the Americas, New York 10036)

8-10. American Acad. of **Psychoanalysis**, New York, N.Y. (J. Barnett, AAP, 40 Gramercy Park N., New York 10024)

9-10. Oklahoma Acad. of **Science**, Oklahoma City. (J. T. Self, 730 Van Vleet Oval, Univ. of Oklahoma, Norman 73069)

9-11. Symposium on **Rabies**, Intern. Assoc. of Biological Standardization, Lyon, France. (Institut d'Hygiène, 1211 Geneva 4, Switzerland)

10-13. Association of **Military Surgeons** of the United States, Washington, D.C. (W. Welham, AMSUS, 8505 Connecticut Ave., Chevy Chase, Md. 20015)

11-14. **Health Physics** Soc., 7th mid-year topical symp., San Juan, Puerto Rico. (P. Paraskevoudakis, Puerto Rico Nuclear Center, College St., Mayaguez 00708)

11-15. American Soc. of **Agricultural Engineers**, Chicago, Ill. (J. L. Butt, ASAE, P.O. Box 229, St. Joseph, Mo. 49085)

11-15. **Neutron Monitoring for Radiation Protection Purposes**, Intern. Atomic Energy Agency, Vienna, Austria. (J. H. Kane, Office of Information Services, U.S. Atomic Energy Commission, Washington, D.C. 20545)

11-15. **Uncertainties in Hydrologic and Water Resources System**, sponsored by Intern. Assoc. of Hydrologic Sciences, American Geophysical Union, U.S. Geological Survey (Water Resources Div.), Tucson, Ariz. (C. C. Kisiel, Dept. of Hydrology and Water Resources, Univ. of Arizona, Tucson 86721)

14-16. Symposium on **Computer and Information Science**, 4th intern., Miami Beach, Fla. (COINS-72, Center for Informatics Research, 339 Larsen Hall, Univ. of Florida, Gainesville 32601)

14-19. American Acad. of **Optometry**, New York, N.Y. (C. C. Koch, AAO, 214-215 Foshay Tower, Minneapolis, Minn. 55402)

15-16. **Cerebral Function** Symp., 4th annual, San Juan, Puerto Rico. (L. Smith, Cortical Function Lab., Porter Memorial Hospital, 2525 S. Downing St., Denver, Colo. 80210)

17-21. **Gerontological** Soc., San Juan, Puerto Rico. (E. Kaskowitz, GS, Suite 520, 1 Dupont Circle, Washington, D.C. 20036)

18-22. **Relativistic Astrophysics**, 6th Texas symp., New York, N.Y. (A. G. W. Cameron, Belfer Graduate School of Science, Yeshiva Univ., New York 10033)

26-30. Western Soc. of **Naturalists**, Arcata, Calif. (D. H. Montgomery, Dept. of Biological Sciences, California Polytechnic State College, San Luis Obispo 93401)

26-30. Society of **Systematic Zoology**, Washington, D.C. (J. A. Peters, Natl. Museum of Natural History, Washington, D.C. 20650)

26-31. American Assoc. for the **Advancement of Science**, 139th, Washington, D.C. (Meetings Office, AAAS, 1444 N St., NW, Washington, D.C. 20005)

26-31. **Animal Behavior** Soc., Washington, D.C. (N. M. Jessop, Dept. of

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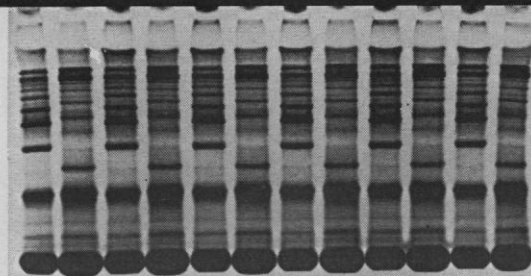
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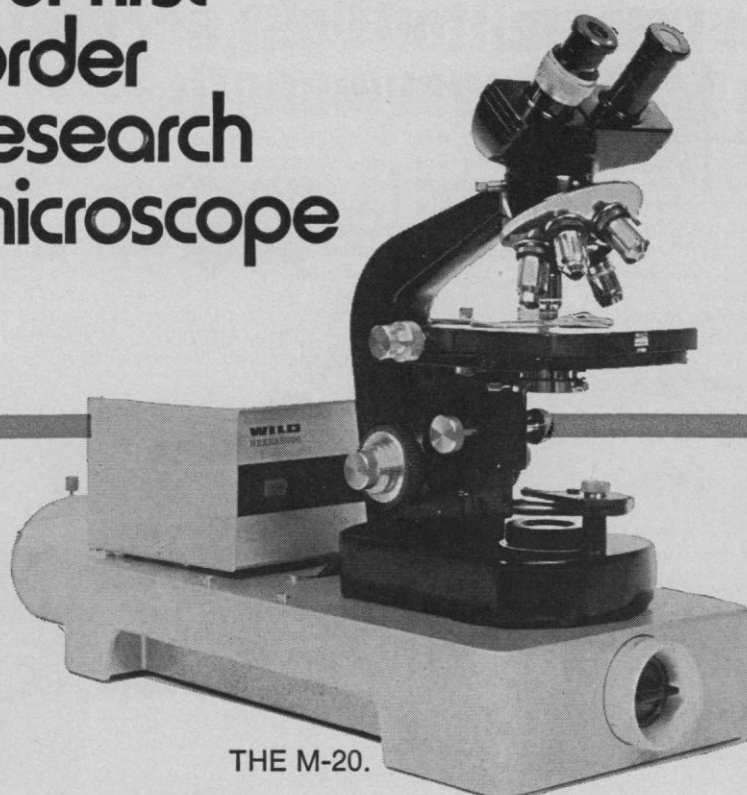
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26-31. **Metric Assoc.**, Washington, D.C. (R. W. Mattoon, Chemical Physics, Dept. 408, Abbott Labs., North Chicago, Ill. 60064)

27-29. Society for the **History of Technology**, Washington, D.C. (M. Kranzberg, Crawford Hall, Case Western Reserve Univ., Cleveland, Ohio 44106)

27-29. American **Philosophical Assoc.**, Eastern Div., Boston, Mass. (N. E. Bowie, Hamilton College, Clinton, N.Y. 13323)

27-29. American **Physical Soc.**, Los Angeles, Calif. (W. W. Havens, Jr., APS, 335 E. 45 St., New York, N.Y. 10017)

27-30. **Archaeological Inst. of America**, Philadelphia, Pa. (E. A. Whitehead, AIA, 260 W. Broadway, New York 10013)

28-30. American **Economic Assoc.**, Toronto, Ont., Canada. (R. Fels, 1313 21 Ave. S., Nashville, Tenn. 37212)

28-30. **History of Science Soc.**, Washington, D.C. (R. H. Stuewer, Div. of General Education, Boston Univ., Boston, Mass. 02215)

January

3-5. **Solid State Physics Conf.**, 10th annual, Inst. of Physics, Manchester, England. (Meetings Officer, Inst. of Physics, 47 Belgrave Sq. London, SW1X 8QX, England)

8-10. American Inst. of **Aeronautics & Astronautics**, Washington, D.C. (J. J. Harford, AIAA, 1290 Ave. of the Americas, New York 10019)

9-12. American **Astronomical Soc.**, Las Cruces, N.M. (H. M. Gurin, AAS, 211 FitzRandolph Rd., Princeton, N.J. 08540)

9-13. National Soc. of **Professional Engineers**, Salt Lake City, Utah. (P. H. Robbins, NSPE, 2029 K St., NW, Washington, D.C. 20006)

14-19. **Protein Phosphorylation in Control Mechanisms**, Miami, Fla. (W. J. Whelan, Dept. of Biochemistry, School of Medicine, Univ. of Miami, P.O. Box 875, Biscayne Annex, Miami 33152)

15-16. **Regional Environmental Management Conf.**, San Diego, Calif. [L. E. Coate, REMC, County of San Diego, Environmental Development Agency, Integrated Regional Environmental Management (IREM) Project, 1600 Pacific Hwy., San Diego 92101]

15-17. **Lunar Dynamics and Observational Coordinate Systems**, Houston, Tex. (J. D. Mulholland, Lunar Science Inst., 3303 NASA Rd. 1, Houston 77058)

15-18. American **Crystallographic Assoc.**, Gainesville, Fla. (Mrs. E. E. Snider, ACA, 335 E. 45 St., New York 10017)

15-19. **Geophysics of the Earth and the Oceans**, 2nd intern. conf., Australian Inst. of Physics and Australian Soc. of Exploration Geophysicists, Sydney. (B. D. Johnson, School of Earth Sciences, Macquarie Univ., North Ryde, New South Wales 2113, Australia)

22-26. **Nuclear Power Plant Control and Instrumentation**, Intern. Atomic Energy Agency, Prague, Czechoslovakia. (J. H. Kane, Office of Information Services, U.S. Atomic Energy Commission, Washington, D.C. 20545)

24-28. American College of **Psychiatrists**, New Orleans, La. (P. A. Martin,

16300 N. Park Dr., Southfield, Mich. 48075)

25-29. American **Mathematical Soc.**, Dallas, Tex. (G. L. Walker, AMS, P.O. Box 6248, Providence, R.I. 02904)

26. **Bibliographical Soc. of America**, New York, N.Y. (Miss C. Hover, Box 397, Grand Central Sta., New York 10017)

27-29. **Mathematical Assoc. of America**, Dallas, Tex. (H. Alder, Dept. of Mathematics, Univ. of California, Davis 95616)

28-1. American Soc. of **Heating, Refrigeration, and Air-Conditioning Engineers**, Chicago, Ill. (A. T. G. Boggs III, ASHRAE, 345 E. 47 St., New York 10017)

28-3. American **Library Assoc.**, Washington, D.C. (R. Wedgworth, ALA, 50 E. Huron St., Chicago, Ill. 60611)

28-6. North American Conf. on **Fertility and Sterility**, U.S. Intern. Foundation for Studies in Reproduction, Acapulco, Mexico. (Mrs. F. Royce, 112-44 69th Ave., Forest Hills, N.Y. 11375)

29-1. American Assoc. of **Physics Teachers**, Albany, N.Y. (W. V. Johnson, AAPT, 1785 Massachusetts Ave., NW, Washington, D.C. 20036)

31-2. Western **Spectroscopy Assoc.**, Pacific Grove, Calif. (G. R. Haugen, L-404, Univ. of California, Lawrence Livermore Lab., Livermore 94550)

February

8-9. **Geodesy/Solid Earth and Ocean Physics Research**, 2nd conf., American Geophysical Union, Columbus, Ohio. (A. F. Spilhaus, Jr., AGU, 1707 L St., NW, Washington, D.C. 20036)

8-9. Association for **Hospital Medical Education**, Chicago, Ill. (T. G. Kummer, AHME, 1911 Jefferson Davis Hwy., Arlington, Va. 22202)

9-16. American Soc. of **Clinical Pathologists**, Honolulu, Hawaii. (G. F. Stevenson, ASCP, 2100 W. Harrison St., Chicago, Ill. 60612)

10-11. **Medical Education**, 69th annual congr., American Medical Assoc., Chicago, Ill. (C. H. W. Ruhe, AMA Council on Medical Education, 535 N. Dearborn St., Chicago 60610)

10-14. American Acad. of **Allergy**, Washington, D.C. (J. O. Kelley, AAA, 225 E. Michigan St., Milwaukee, Wis. 53202)

10-15. Society for **Range Management**, Boise, Idaho. (F. T. Colbert, SRM, 2120 S. Birch St., Denver, Colo. 80222)

14-16. **Solid-State Circuits**, intern. conf., Inst. of Electrical and Electronics Engineers, Inc., Philadelphia, Pa. (L. Winner, 152 W. 42 St., New York 10036)

14-18. American College of **Cardiology**, San Francisco, Calif. (W. D. Nelligan, ACC, 9650 Rockville Pike, Bethesda, Md. 20014)

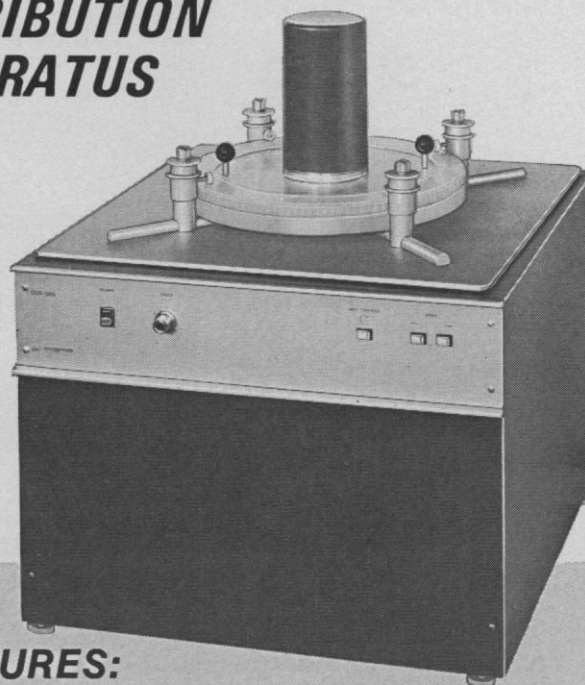
16-17. Symposium on **Immunopharmacology**, New York Heart Assoc., New York, N.Y. (I. Saulpaugh, NYHA, 2 E. 64 St., New York 10021)

18-24. **Effects of Low-Frequency Magnetic and Electric Fields on Biological Communication Processes**, Natl. Science Foundation, Neuroelectric Soc., and Intern. Inst. for Medical Electronics and Biological Engineering, Snowmass-at-Aspen, Colo. (A. Sances, Jr., NS, 8700 W. Wis-

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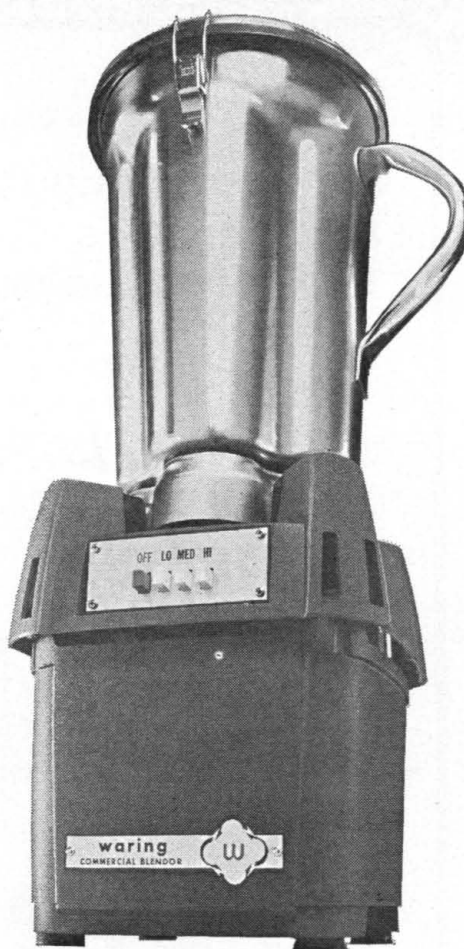


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19-22. International Symp. on **Hydro-metallurgy**, Chicago, Ill. (D. J. I. Evans, Research and Development Div., Sherritt Gordon Mines Ltd., Fort Saskatchewan, Alta., Canada)

20. National Assoc. of **Medical Examiners**, Las Vegas, Nev. (P. Hudson, P.O. Box 2488, Chapel Hill, N.C. 27514)

20-23. American Acad. of **Forensic Sciences**, Las Vegas, Nev. (J. T. Weston, 44 Medical Dr., Salt Lake City, Utah, 84113)

21-24. Society of **Professors of Education**, Chicago, Ill. (R. E. Bayles, School of Education, Atlanta Univ., Atlanta, Ga. 30314)

21-6. American **Medical Assoc.** and **Weizmann Inst. of Science**, Tel Aviv, Israel. (Israel Scientific Conf., Dept. of Intern. Medicine, AMA, 535 N. Dearborn St., Chicago, Ill. 60610)

24-27. American Assoc. of **Pathologists and Bacteriologists**, Washington, D.C. (A. J. French, Univ. of Michigan Medical Center, Ann Arbor 48104)

24-3. International Acad. of **Pathology**, U.S.-Canadian Div., Washington, D.C. (L. D. Stoddard, Dept. of Pathology, Medical College of Georgia, Augusta 30902)

25. Oregon Acad. of **Science**, Salem. (H. D. Reese, Dept. of Chemistry, Oregon State Univ., Corvallis 97331)

25-1. American Inst. of **Mining, Metallurgical and Petroleum Engineers**, Chicago, Ill. (J. B. Alford, AIMMPE, 345 E. 47 St., New York 10017)

25-3. Continuing Education for **Excellence in Medicine and Surgery**, American Soc. of Contemporary Medicine and Surgery, Miami Beach, Fla. (Miss V. Kendall, Suite 1629, ASCMS, 30 N. Michigan Ave., Chicago, Ill. 60602)

26-1. American **Educational Research Assoc.**, New Orleans, La. (R. A. Der-shimer, AERA, 1126 16th St., NW, Washington, D.C. 20036)

27-2. **Biophysical Soc.**, Columbus, Ohio. (M. O. Dayhoff, Natl. Biomedical Research Foundation, Georgetown Univ. Medical Center, 3900 Reservoir Rd., NW, Washington, D.C. 20007)

28-3. American Assoc. of **Petroleum Geologists**, Rocky Mountain Div., Salt Lake City, Utah. (Miss K. Watson, AAPG, 1444 S. Boulder, Tulsa, Okla. 74101)

March

1-2. **Fracture and Flaws**, 13th annual symp., American Soc. of Mechanical Engineers and American Soc. for Metals, Albuquerque, N.M. (D. Buchanan, Organization 9310K, Sandia Labs., Albuquerque 87115)

3-9. American **Concrete Inst.**, annual, Atlantic City, N.J. (ACI, Box 4754 Redford Sta., Detroit, Mich. 48219)

5-9. **Medical Data Processing Symp.**, Inst. for Research and Automation, Toulouse, France. (E. E. Van Brunt, Permanente Medical Group, 3779 Piedmont Ave., Oakland, Calif. 94611)

8-11. Southern **Anthropological Soc.** (9th annual) and American **Ethnological Soc.**, Wrightsville Beach, N.C. (T. Fitzgerald, Dept. of Sociology and Anthropology, Univ. of North Carolina at Greensboro, Greensboro 27412)

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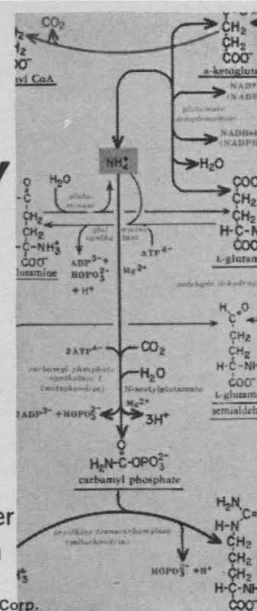
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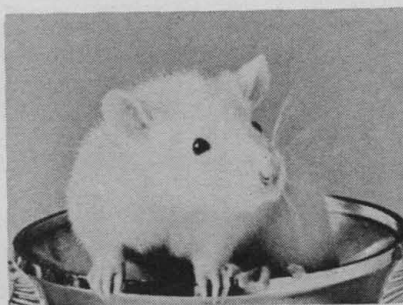
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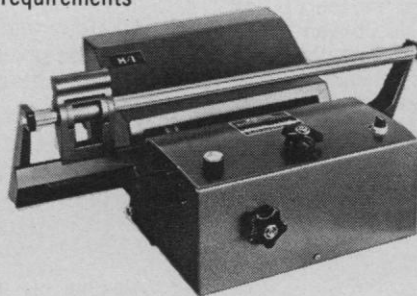
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NEWS AND COMMENT

(Continued from page 146)

civil engineering department, Pennsylvania State University. . . . **Charles D. King**, assistant professor of sociology, Texas Tech University, to chairman, sociology and social work department, Indiana State University. . . . **Edwin B. Kurtz**, chairman, biology department, Kansas State Teachers College, to head, life science department, University of Texas of the Permian Basin. . . . **George F. Cahill, Jr.**, professor of medicine, Harvard University, to chairman, medicine department, University of Connecticut. . . . **Philip E. Greenman**, osteopathic physician, New York, to chairman, bio-mechanics department, Michigan State University. . . . **Francis A. Wood**, professor of plant pathology, Pennsylvania State University, to chairman, plant pathology department, University of Minnesota. . . . **Harvey White**, head, radiology department, Children's Memorial Hospital, also to chairman, radiology department, Northwestern University Medical School. . . . **William T. Fitts, Jr.**, professor of surgery, University of Pennsylvania School of Medicine, to chairman, surgery department at the school. . . . **John M. McKenna**, professor of microbiology, University of Missouri, to chairman, microbiology department, Texas Tech University. . . . **Anthony P. Simonelli**, associate professor of pharmacy, University of Michigan, to chairman, pharmaceuticals department, University of Connecticut. . . . **John S. Harris**, professor of administrative and public management, University of Wisconsin, Madison, to dean, College of Arts and Sciences, Indiana State University. . . . **Richard S. Mayer**, professor of chemical engineering, Ohio University, to dean, College of Engineering and Technology at the university. . . . **Robert L. Leopold**, acting chairman, community medicine department, University of Pennsylvania, appointed chairman. . . . **Herbert Pardes**, assistant professor of psychiatry, Downstate Medical Center, State University of New York, to chairman, psychiatry department at the center. . . . **Frederick G. Adams**, presidential assistant for allied health research, University of Connecticut, to dean, School of Allied Health Professions at the university.

Erratum: In "Atmospheric carbon dioxides: Its role in maintaining phytoplankton standing crops" by D. W. Schindler *et al.* (29 September, page 1192), line 17, paragraph 2, column 3, page 1193, should read "yield an invasion of carbon of 0.07" instead of "yield . . . 0.04."

SCIENCE, VOL. 178