

SCIENCE

10 September 1971

Vol. 173, No. 4001

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE



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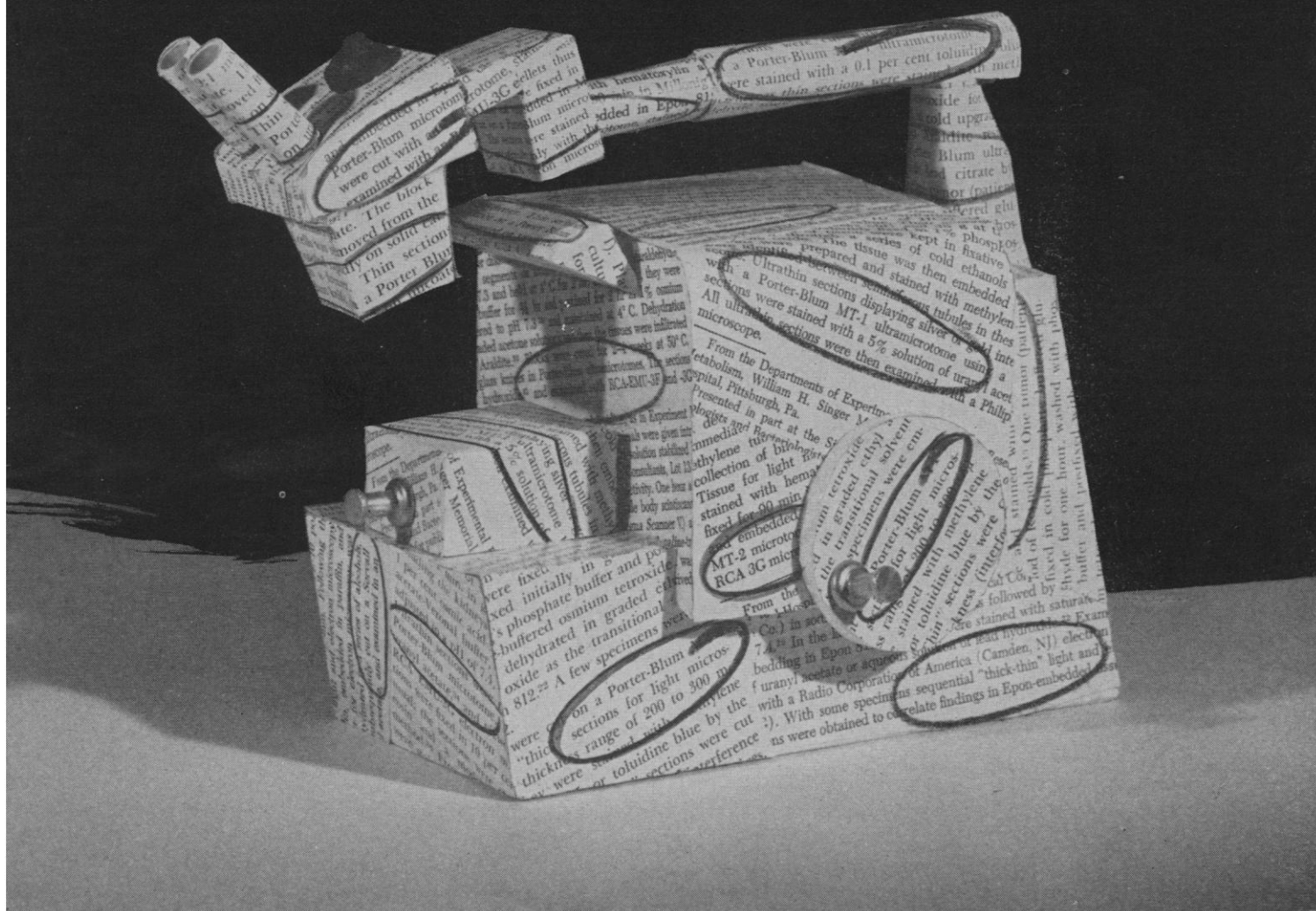
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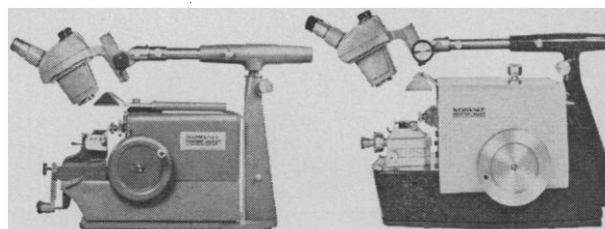


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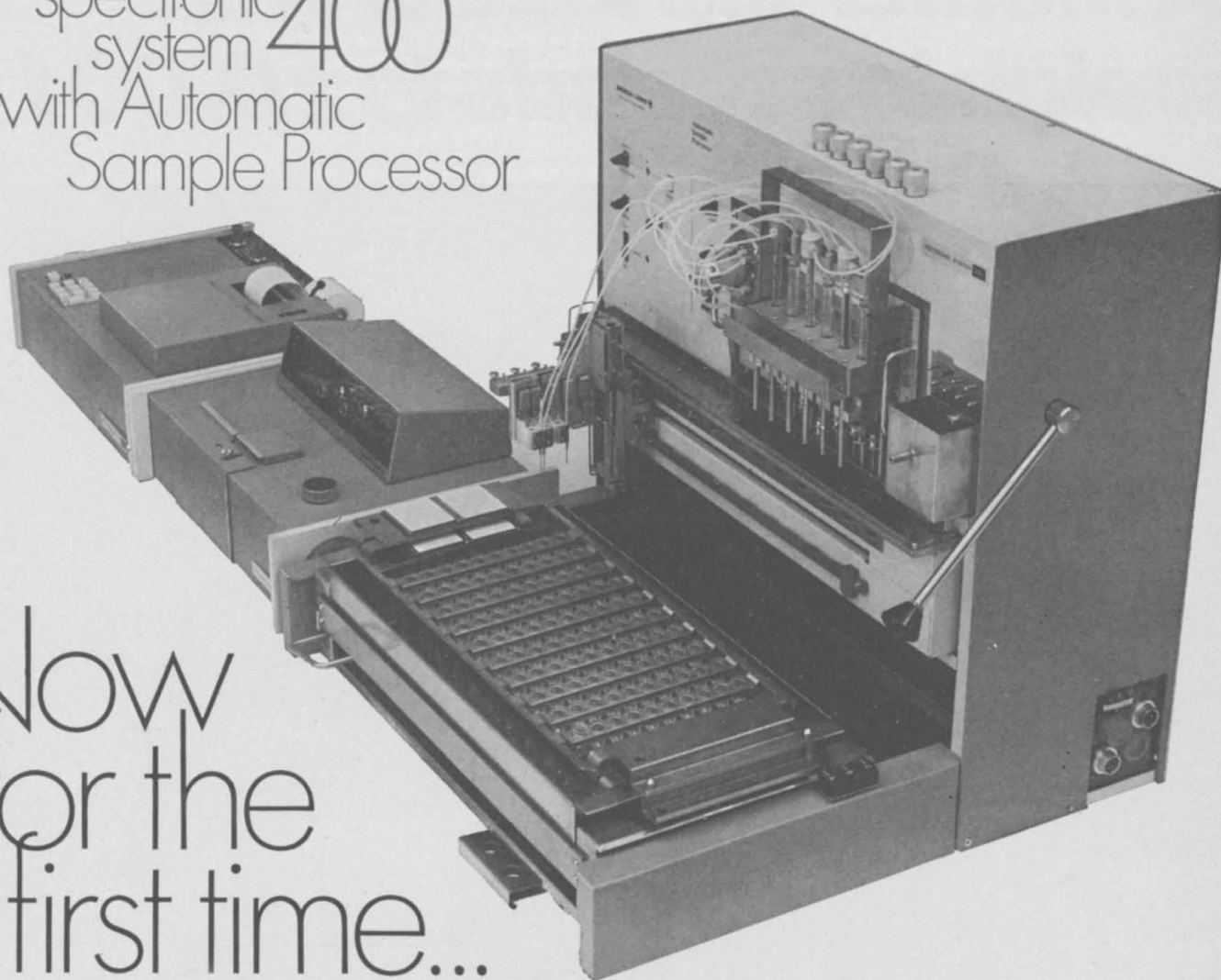


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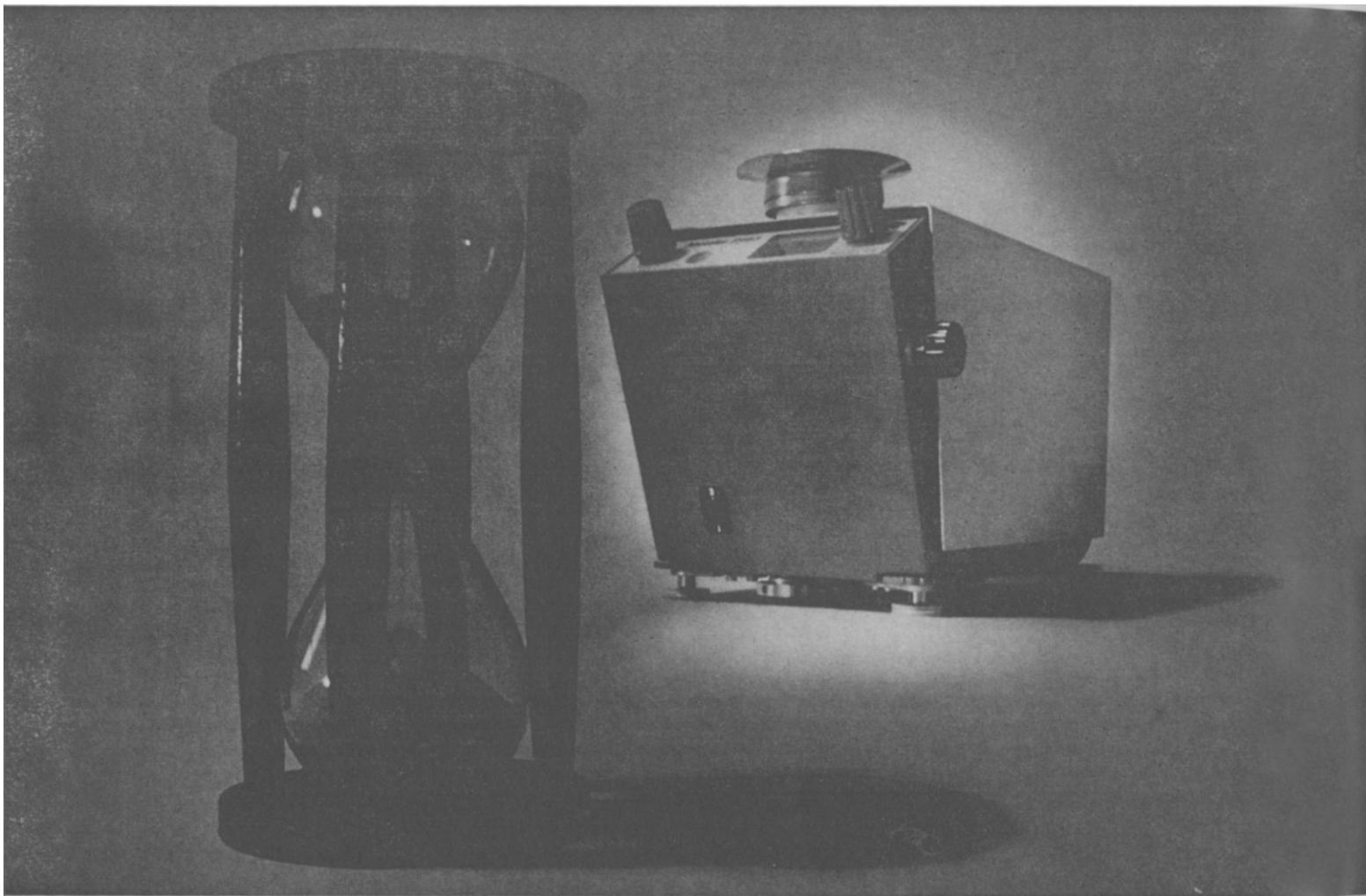
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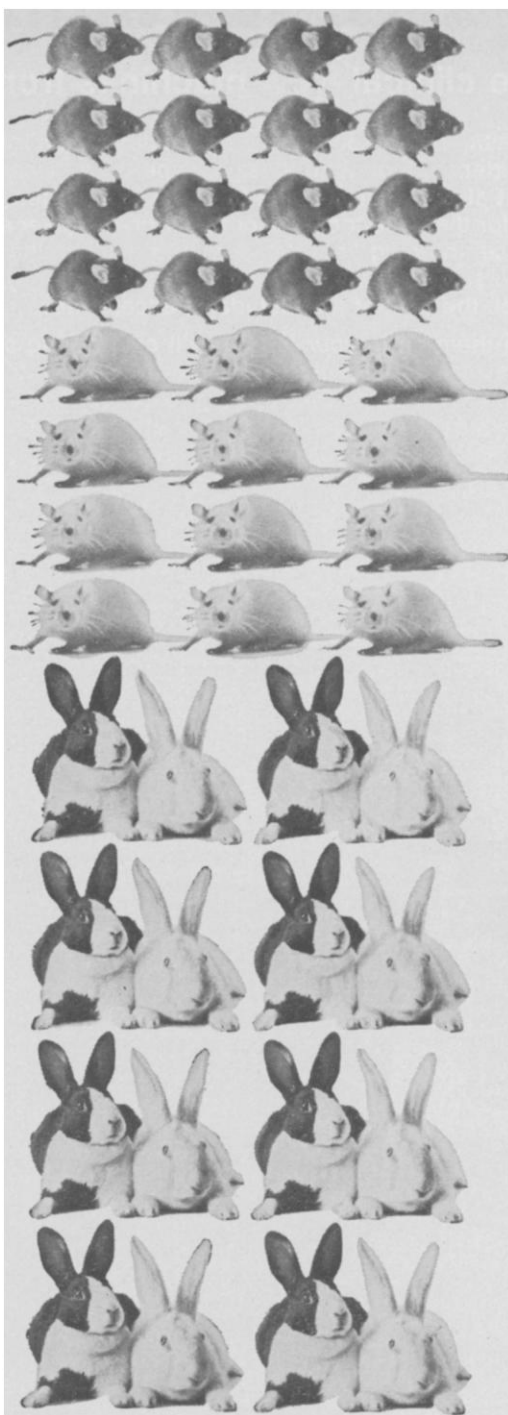
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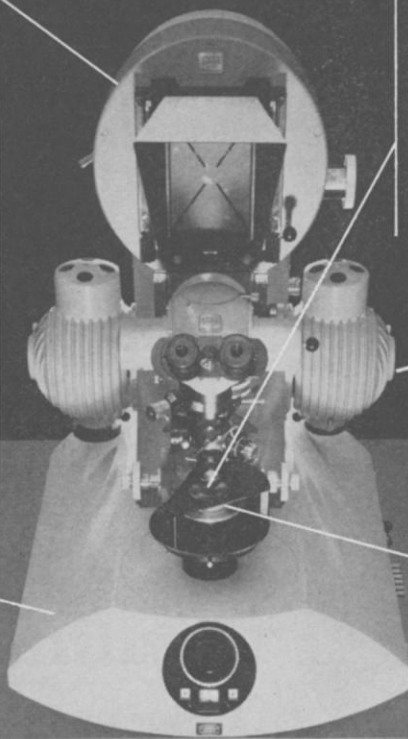
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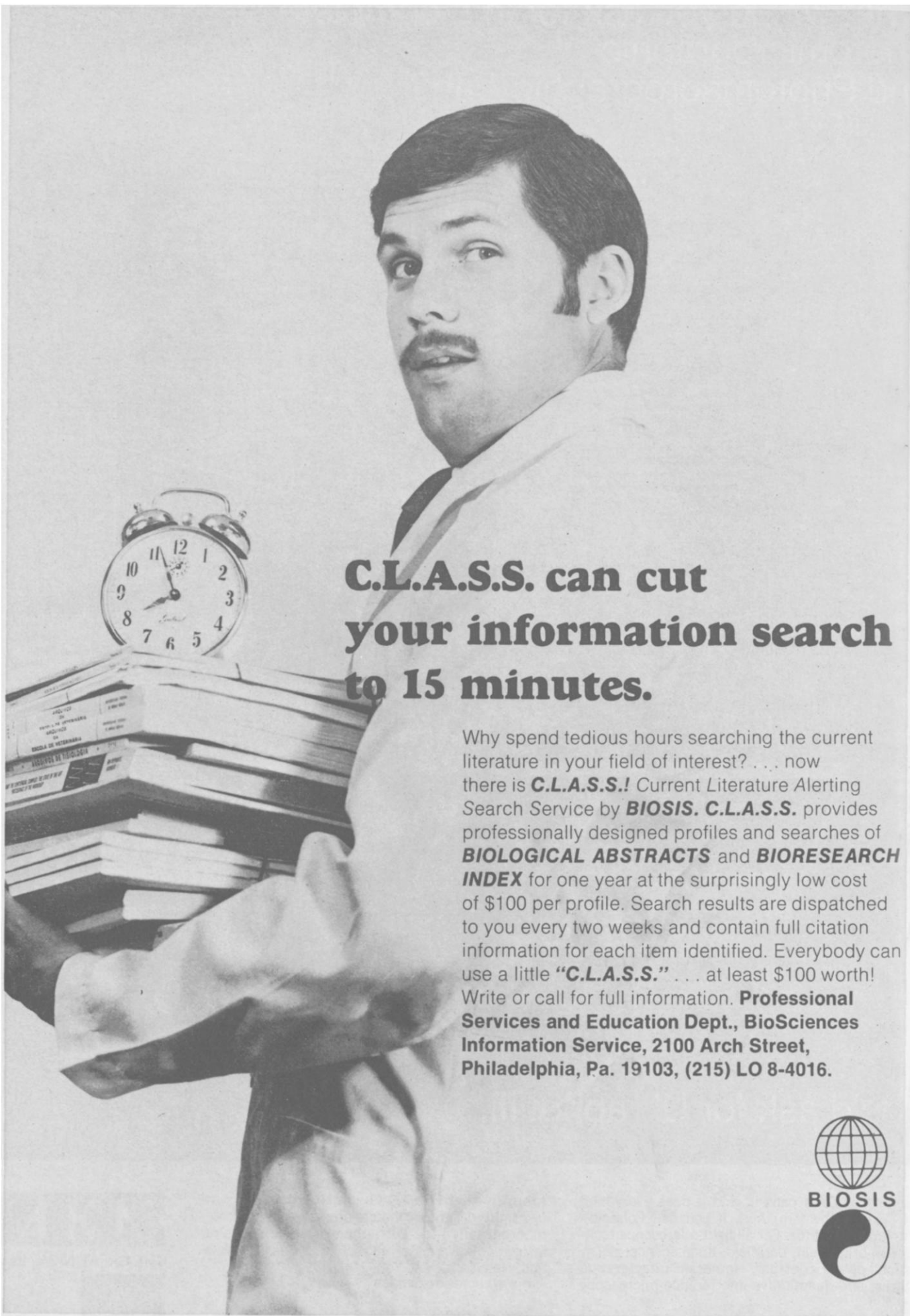
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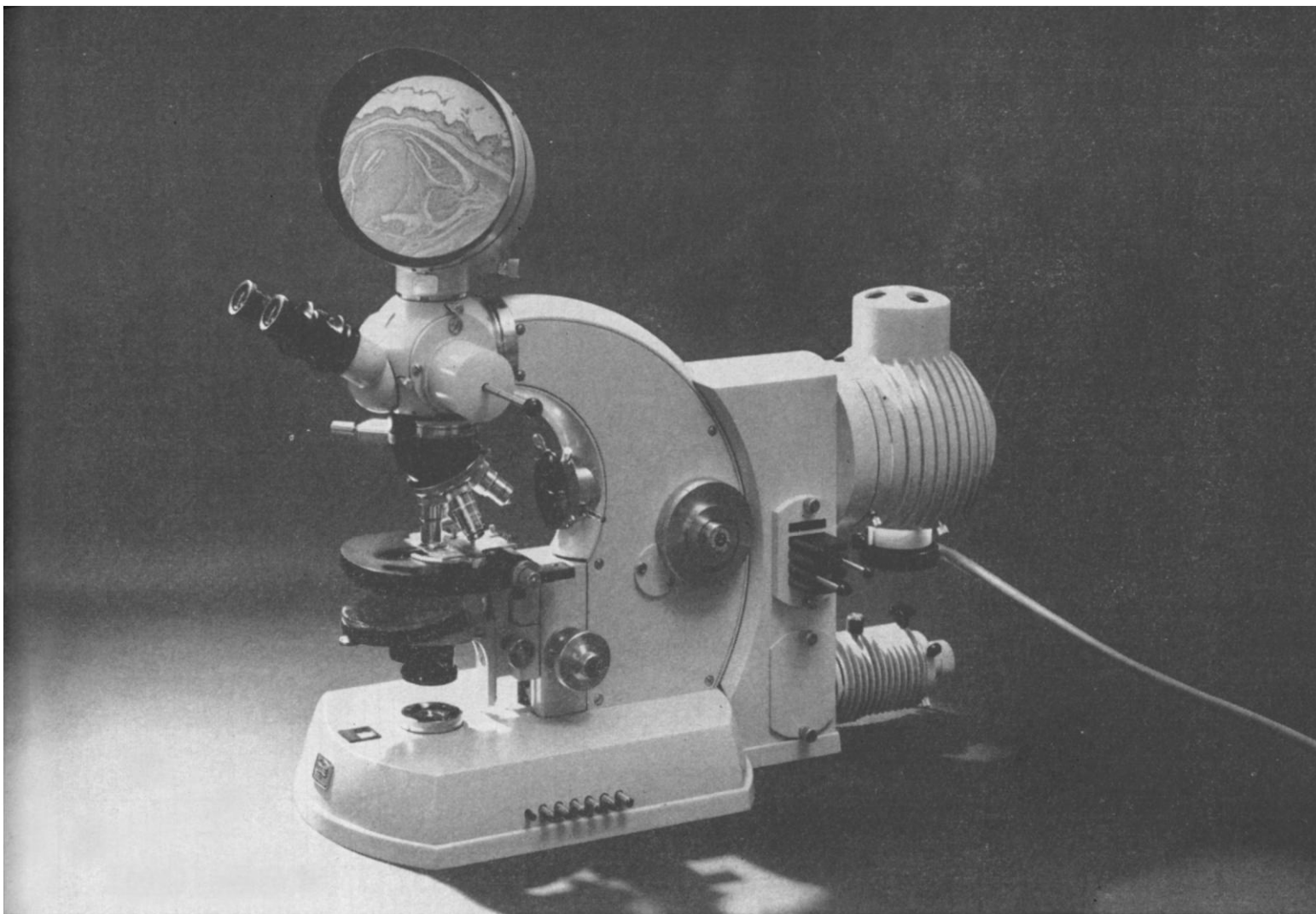


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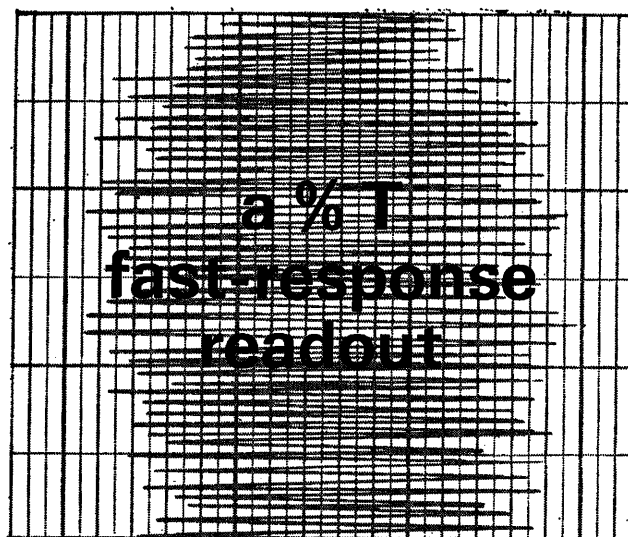
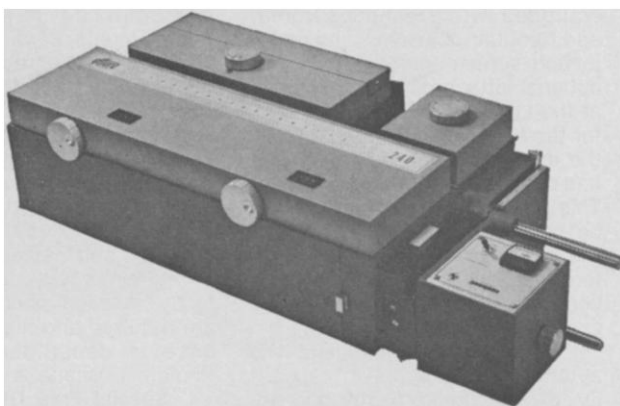
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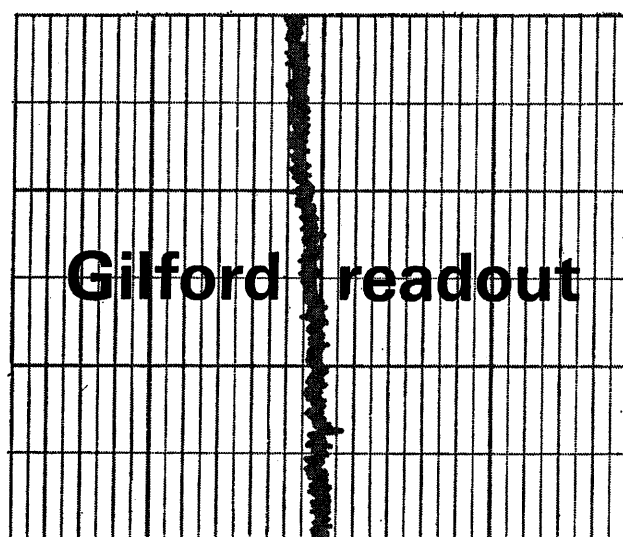
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mations to the log function. Basic price: \$1325.

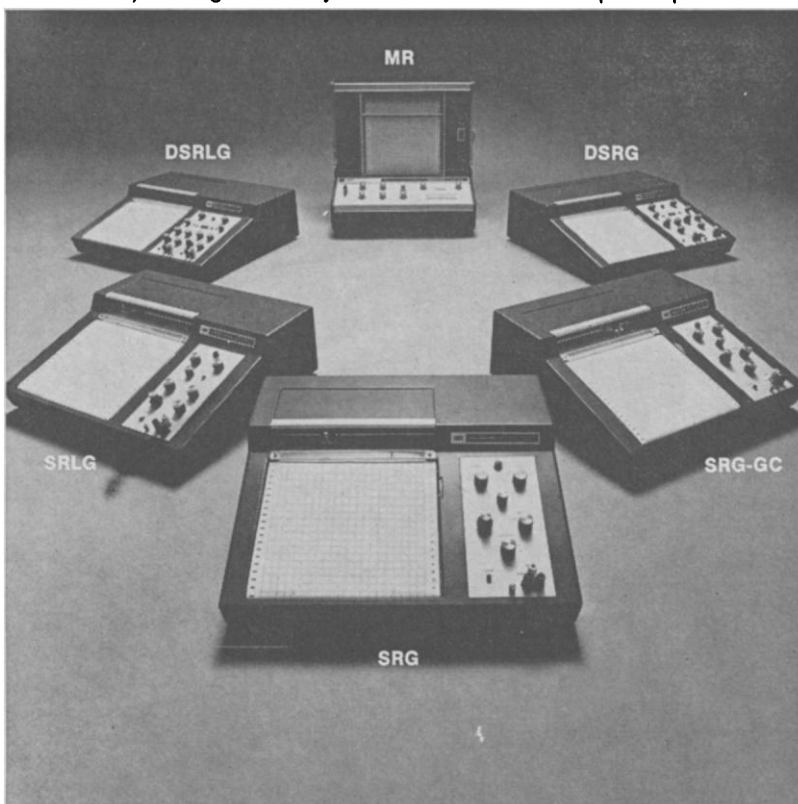
Model DSRLG: Another logical move. Two SRLG's in one dual-pen recorder. Think of what that means if you work with a spectrophotometer, photometer, or densitometer — simultaneous recording of both transmittance and absorbance. Or linear/log recording of any two time-synchronized variables. Basic price: \$2225.

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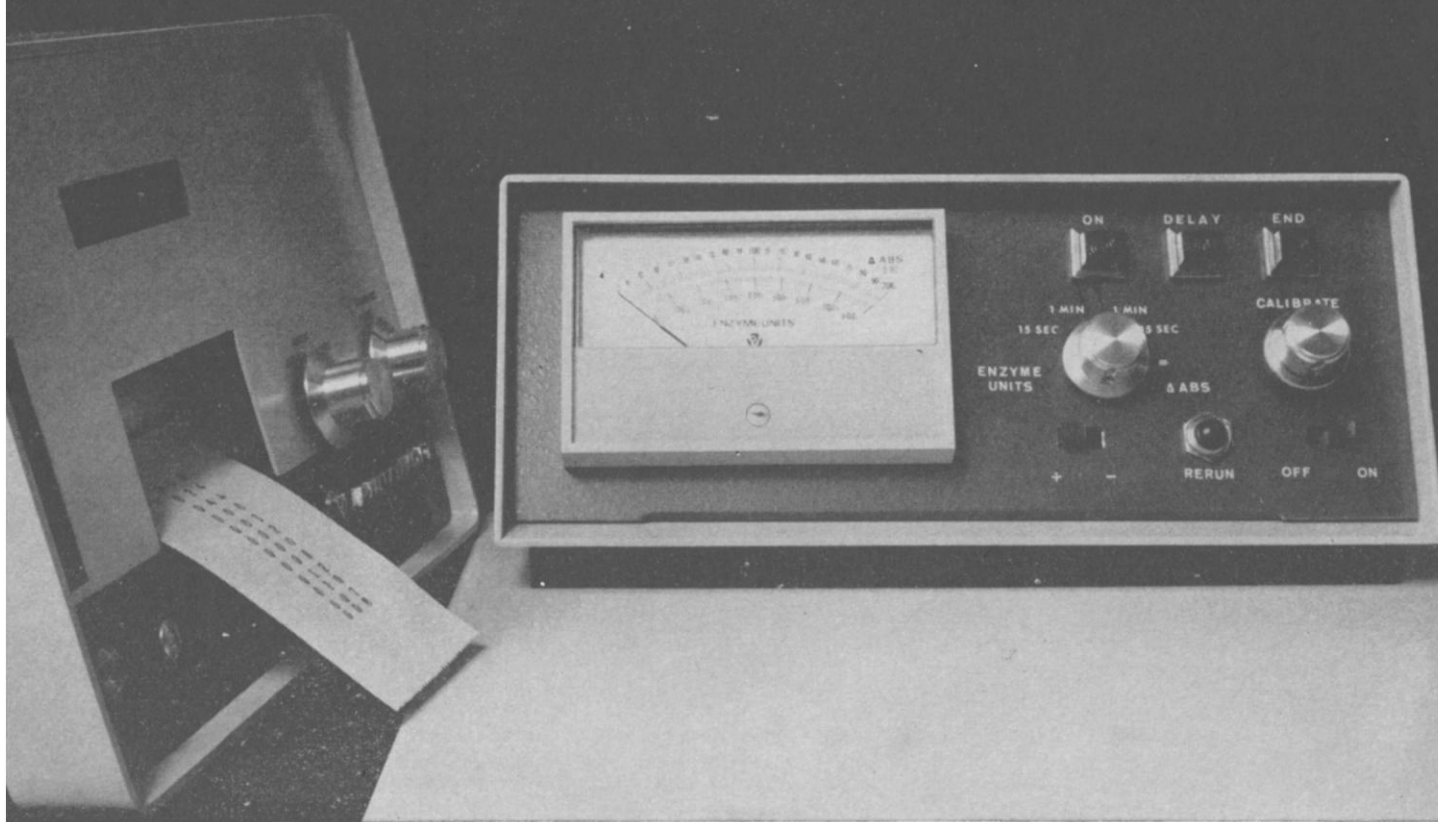
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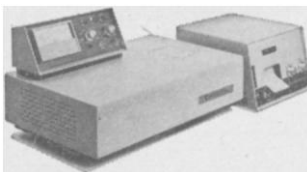
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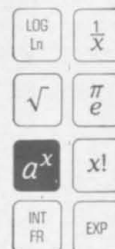
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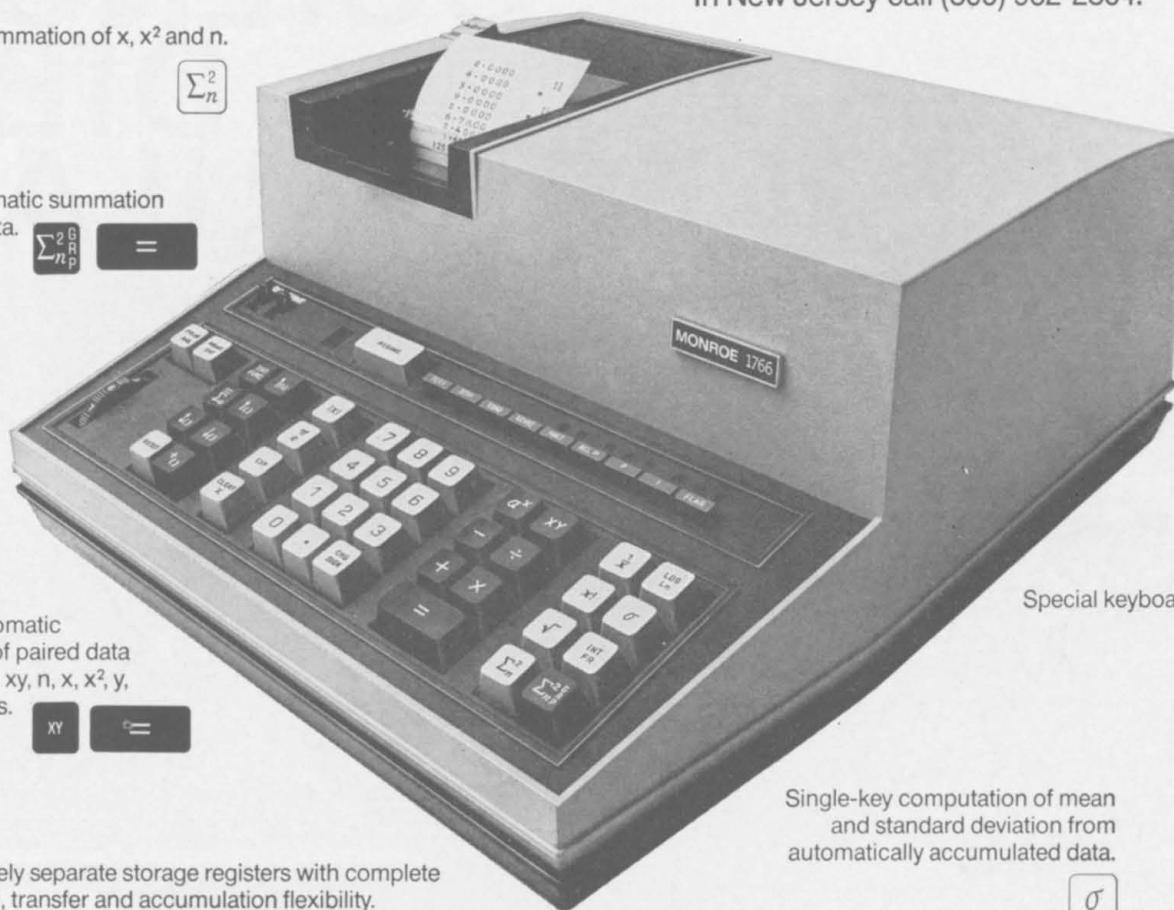
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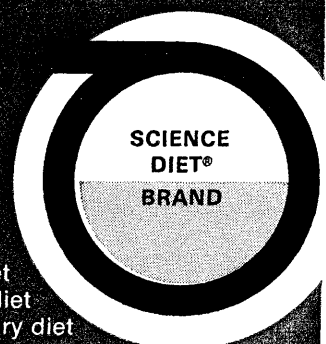
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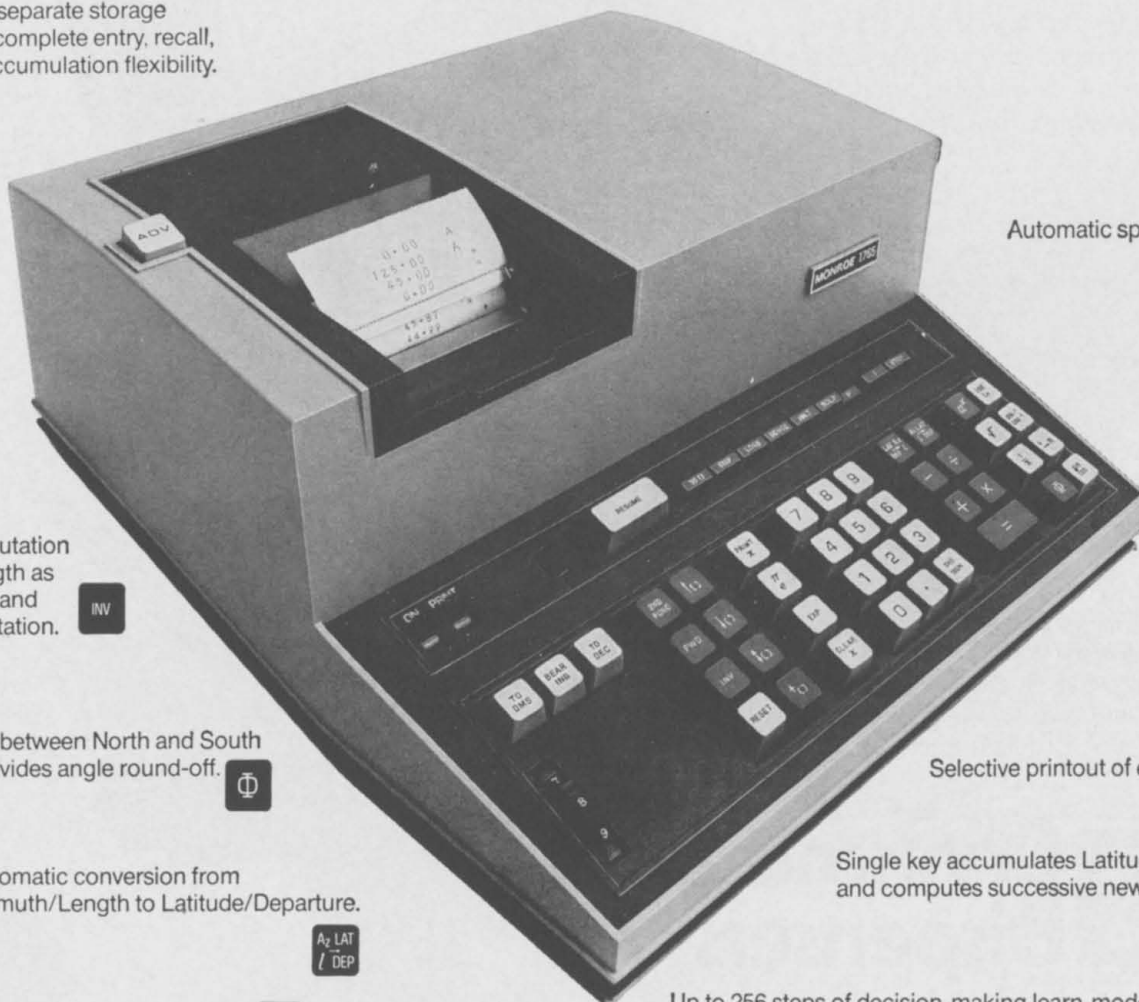
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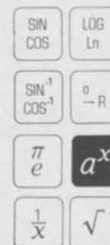
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It's accuracy ($\pm .005$ ml) makes the difference.

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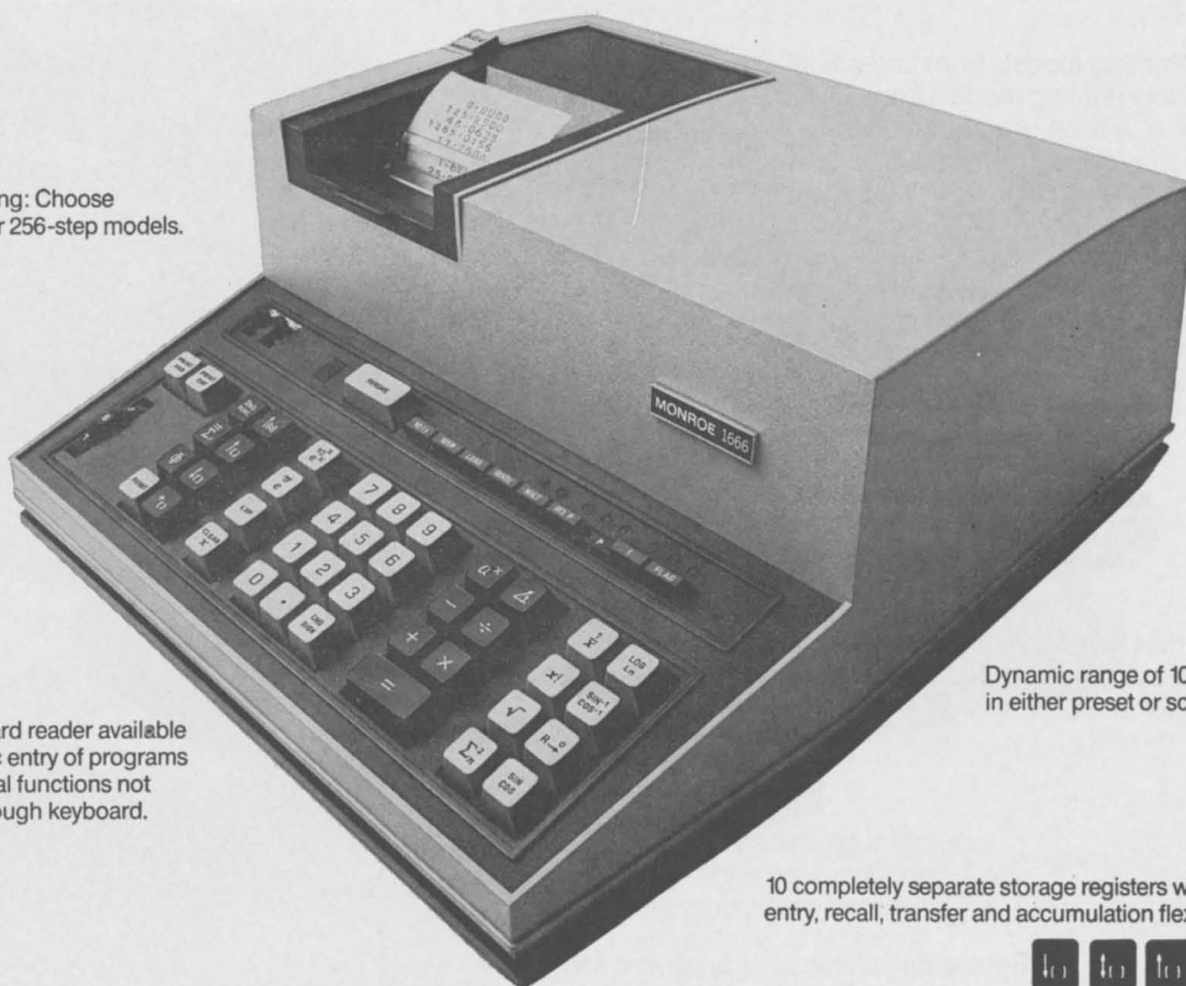
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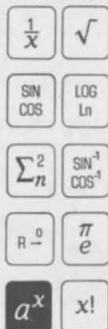
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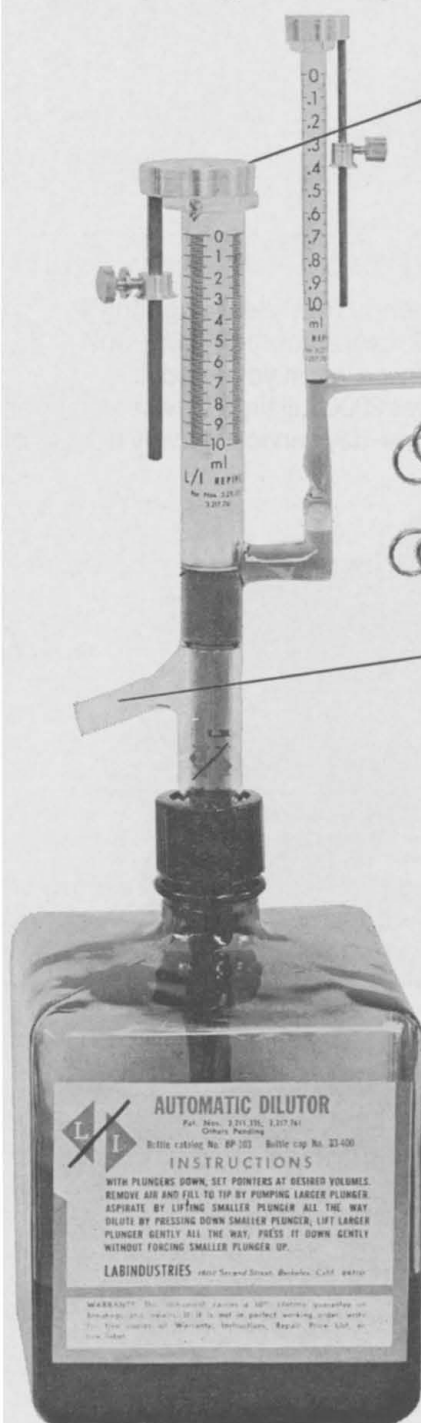
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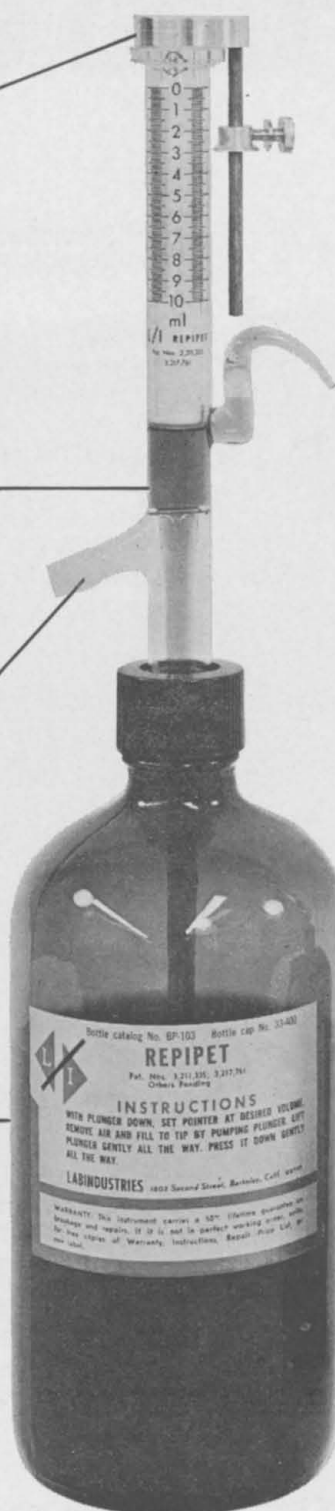
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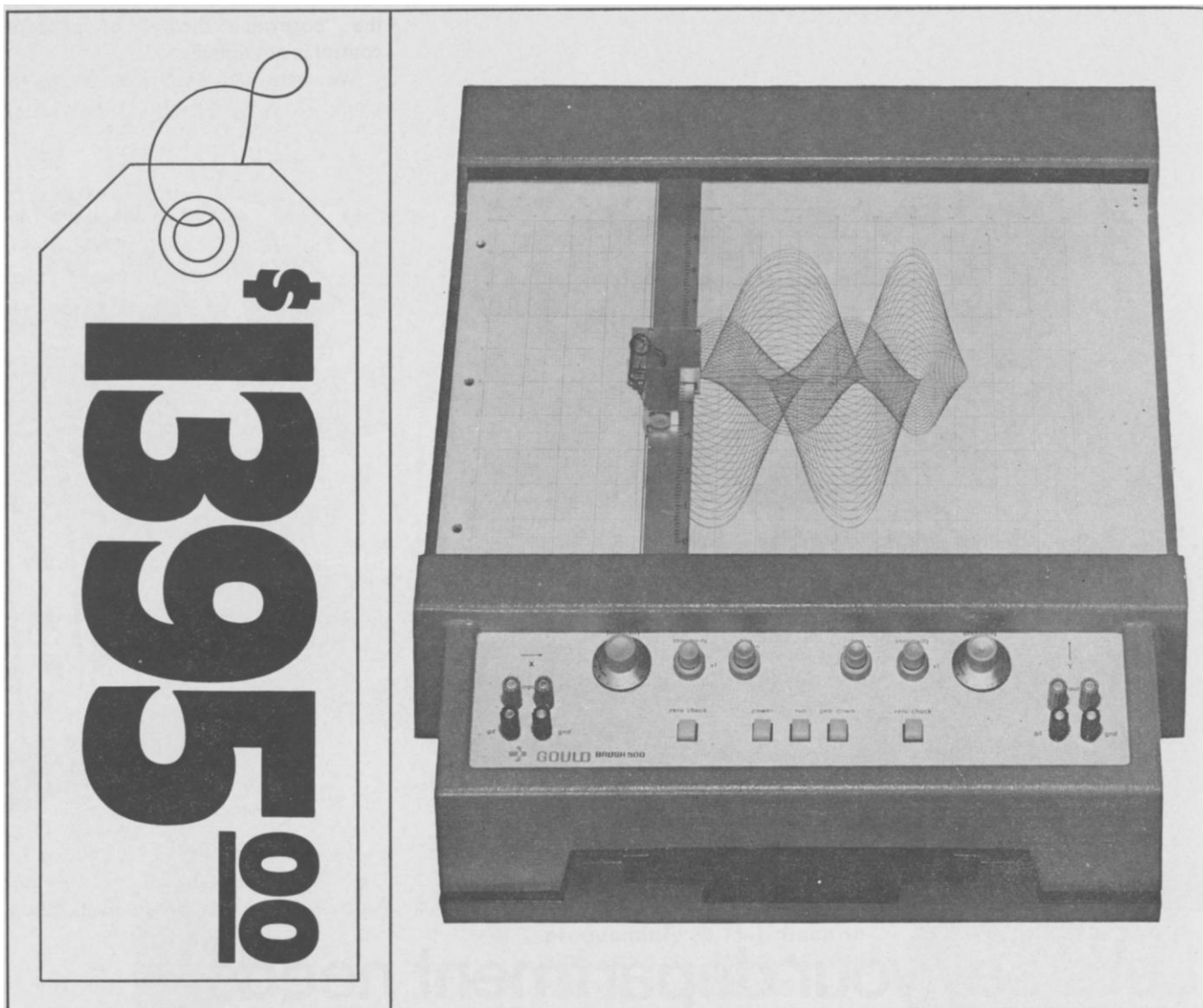
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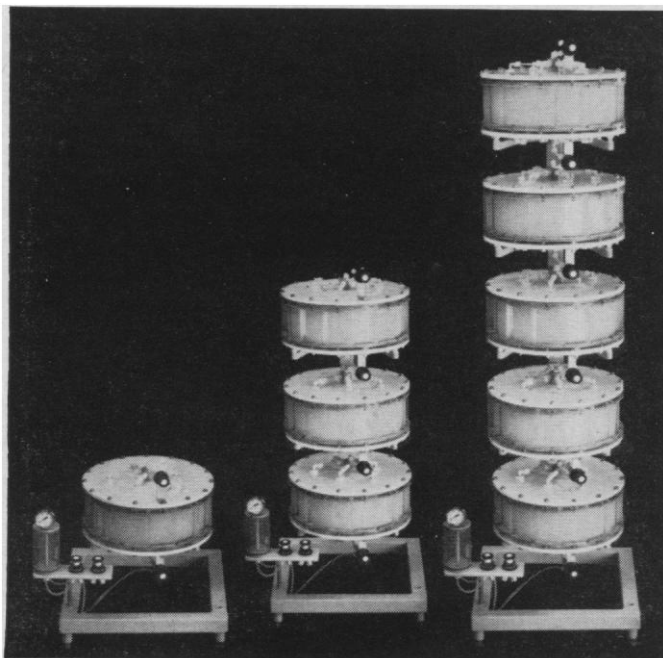
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low-sulfur fuel toward the smaller low-level sources. The best short-run strategy for reducing community exposure to episodic or localized occurrences of high SO₂ levels seems to be still an open question.

If our conclusions were misapplied by a utility or by anyone else, we are sorry. Facts can be misused. To their chagrin, scientists have had ample opportunity to learn this in the last few years.

T. R. MONGAN

*Sydney Area Transportation Study,
7 West Street, North Sydney,
New South Wales, Australia*

J. GOLDEN

*7716 Iroquois Court,
Falls Church, Virginia 22043*

Alas

Hamlet spoke of a single skull. McMahon was referring to a single scull (see 23 July, p. 350, table 1).

ANNE SYMINGTON

*745 Cella Road,
St. Louis, Missouri 63124*

Climate Change

The report by Rasool and Schneider (9 July, p. 138) presents quantitative relationships between atmospheric carbon dioxide and aerosol concentrations which may be useful. However, two of their conclusions with respect to the effects of aerosols may be misleading.

Their statement that "the surface temperature falls precipitously with increasing opacity" is a consequence of the use of a logarithmic scale in presentation of the results. A replot of their figure 2b, using linear scales, indicates that the decline in surface temperature is linear with optical thickness and hence with aerosol concentration, at least to the accuracy with which I was able to read their curves.

In the projection of possible future events, they appear to neglect the effect of naturally produced aerosols. The authors of the SCEP report (1), which Rasool and Schneider cite as their first reference, concluded that, at present, the man-made tropospheric particulate component averaged over the globe amounts to about one part in five by weight and by number. Thus, the projected increase in the next 50

years would amount to a factor closer to 2 than to 4 and a temperature change more like 1°K than 3.5°K. When combined with the effects of carbon dioxide, the net change would be less than 1°K.

Increased particulate production rates are not an inescapable consequence of increased energy production even from fossil fuels, since emission cleanups are within the range of known technology and probably also within the range of costs which could be accepted by the economies of those highly developed countries which are the major power producers.

PAUL F. GAST

Argonne National Laboratory,
Argonne, Illinois 60439

Reference

1. Report of the Study of Critical Environmental Problems (SCEP), *Man's Impact on the Global Environment* (M.I.T. Press, Cambridge, Mass., 1970).

The report by Rasool and Schneider (9 July, p. 138) on potential climatic effects of atmospheric particulate matter was of great interest to me but has also caused me considerable distress. I have studied this same problem, using a somewhat different mathematical model, and have obtained results which are in good agreement with those of Rasool and Schneider; I find that the present particulate loading would have to be increased by a factor of 5 to produce a 3°C drop in mean planetary surface temperature. This work was done in November and December of 1969 and was presented before the International Solar Energy Society in Melbourne, Australia, on 4 March 1970. At the request of the editor of that society's journal, *Solar Energy*, the paper was submitted for publication and accepted, with minor revisions, in September 1970. However, because of unexpected delays, it will not appear until later this year.

A partial publication of my results appears in a Department of Commerce publication (1).

EARL W. BARRETT

Atmospheric Physics and Chemistry
Laboratory, Environmental Research
Laboratories, National Oceanic and
Atmospheric Administration,
Boulder, Colorado 80302

Reference

1. E. W. Barrett, R. F. Pueschel, H. K. Weickmann, P. M. Kuhn, *Inadvertent Modification of Weather and Climate by Atmospheric Pollutants* (Technical Report ERL 185 APCL-15, Environmental Science Services Administration, Research Laboratories, Government Printing Office, Washington, D.C., 1970), pp. 30-35.

10 SEPTEMBER 1971



MILLIPORE

the technology that separates microorganisms from critical solutions

There's a trend in advertising to speak with disarming modesty, to lay off inflated claims and excessive promises, to talk to the consumer as if he were a grown-up human being.

We applaud the trend, especially since whatever claims and promises we make here will have to be at the expense of our own products.

We begin with this statement: membrane filtration is officially approved by the U. S. Pharmacopeia and the FDA for the preparation of sterile solutions; and this claim: most people use Millipore filters for sterilizing filtration (we think that's quite modest).

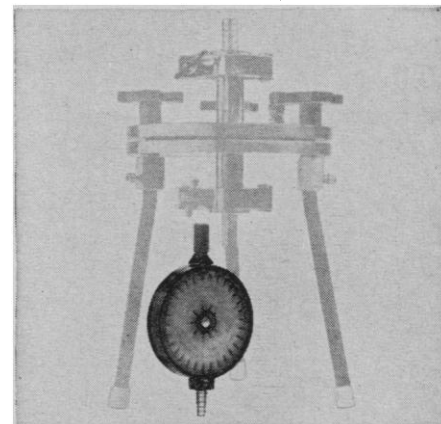
Now, in the 1-100 liter range, most sterilizing filtration is carried out by pushing solutions through a Millipore filter disc with a pore size of 0.22 μ m and a diameter of 5½ inches (142 mm). The disc is clamped in a filter holder like the one shown ghosted in the photo, which we designate as the "142" (for size). The clear object in the foreground is the subject of this message — our new Twin-90 Filter Unit.

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labor and the considerable investment in a filter holder. But then again, the shiny, plastic, leak-proof marvel of Millipore technology doesn't have much personality and we suppose there are those who prefer the old familiar feel of solid metal hardware and derive personal satisfaction from taking things apart and putting them back together again. Who knows — some may even dig autoclaves.

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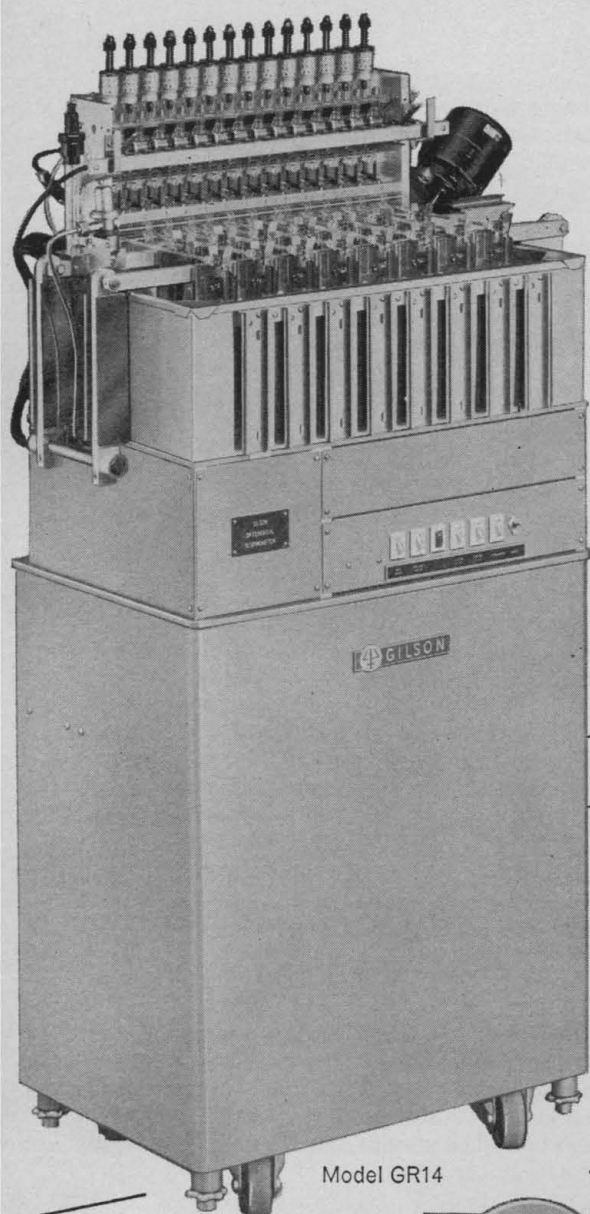
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The Topsy-turvy World of Health-Care Delivery

In a recent speech Senator J. Glenn Beall, Jr. (R-Md.), called for the establishment of a National Institute of Health-Care Delivery.* In so doing, he has focused attention on a national problem of broad scale and transcendent urgency.

Over the years the American people have prided themselves on being the best clothed, best fed, best housed, best educated, and healthiest people in the world. But recent health statistics give cause for concern. Across the board, we are not the healthiest people in the world, in spite of a number of impressive facts. The nation has spent some \$20 billion on biomedical research since the late 1940's. We now have more physicians and hospitals than ever before. And currently we spend for health services more—and the rate of expenditure is escalating more rapidly—than we have ever done before. In the last decade alone, physicians' fees have risen twice as rapidly and hospital charges four times as fast as other items in the Consumer Price Index.

The situation is a complex one. Certainly, the balance among the diseases has shifted toward the degenerative disorders. But, in addition, there are striking geographic variations in the availability of health resources. There are marked differences in availability for urban and rural populations and for the poor and the more affluent. Most insurance coverage is inadequate in that it excludes outpatient and preventive services and only partially accommodates catastrophic incidents. And, generally, resources, particularly those for unusual treatment, are poorly utilized everywhere. (If, for example, the utilization of health-care resources were improved by only 10 percent, the saving would be \$5 billion. But, with a high proportion of third-party payments, there is little incentive for efficiency. Instead, the trend is to use the higher-cost facilities and services and to make as many of these available as possible.)

The essential ingredients of the Beall proposal merit serious examination. By 1970, health-care delivery had become the nation's second largest industry. But last year only \$18 million was spent on research in this area. No other industry can make such a claim. The National Institutes of Health are charged with the technical aspects of prevention and treatment. The Health Services and Mental Health Administration is concerned with health-care delivery, but it has other responsibilities as well. A major tour de force is needed now—an administrative mandate backed by appropriate funding—to dramatize the importance of rational organization and planning of services, even though such action would add yet another agency to the welter already existing in the health field. Future legislation would do well to direct its sole attention to the social sciences, both basic and applied, which underlie effective organization and management. Furthermore, the importance of testing and evaluation should receive significant consideration. Already, a number of alternative systems—for instance, group practice, private prepaid care, a variety of community health-care schemes, and health maintenance organizations—are in various stages of design and development, and a nation with an established scientific tradition must certainly recognize the importance of pilot projects.

If the magnificent benefits of American medical research are meant for all of our people, then an effective science of health-care delivery is as important as the medical research itself.—WILLIAM BEVAN

* J. Glenn Beall, Jr., "A proposed institute of health-care delivery," *Congr. Rec.*, 15 June 1971, p. S 9086.

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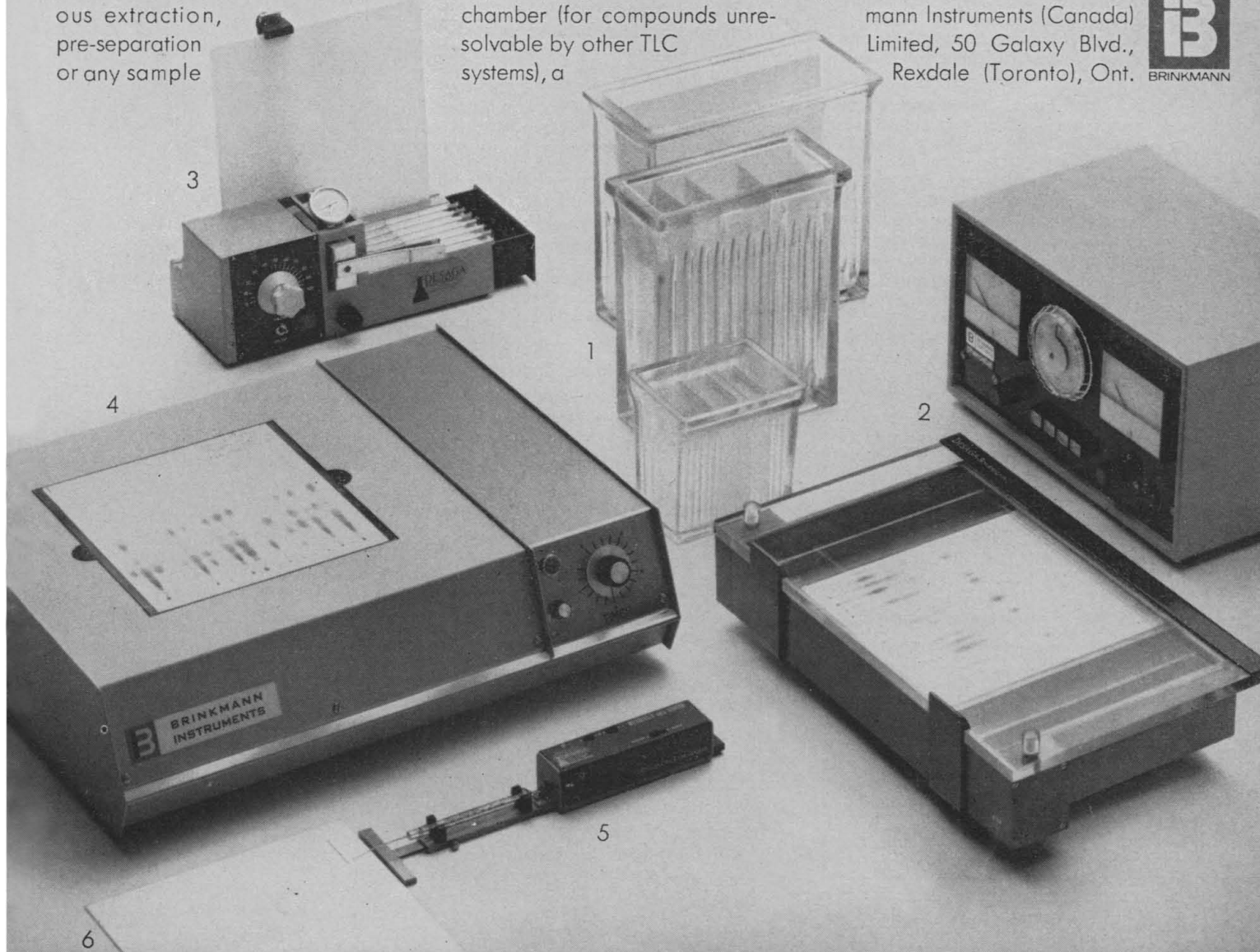
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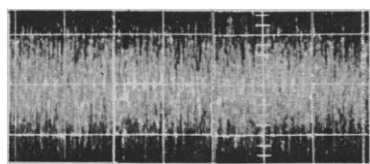
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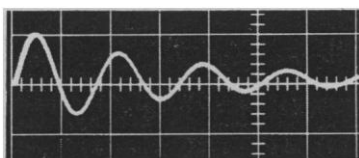
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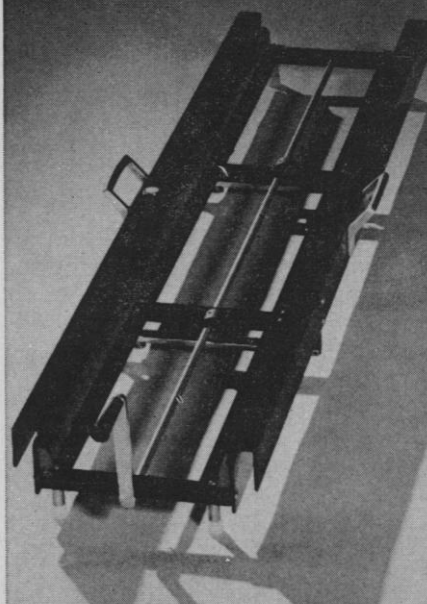
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crossover from singlet to triplet state had occurred. This leads to a spin correlation time in this system of $\sim 10^{-8}$ second. A. Rassat discussed the ESR spectrum of bis-nitroxides in which the singlet-triplet energy separation varied between the extremes of much less and much greater than the electron-nuclear (nitrogen) hyperfine interaction. When the dipolar electron-electron coupling is small, solution ESR spectra can be observed for those molecules with population in the triplet state. In the solid state, measurement of the D and E dipolar splittings can be used to assign molecular geometry to the bis-nitroxide or to a diketone precursor. I. Moritani, head of the Japanese participants, described the stereospecific *cis* addition of di- or tri-benzocycloheptatrienylcarbene to the 2-butenes. Evidence was presented that the carbene existed in the triplet state. It was concluded that a stereospecific *cis* addition is not a diagnostic evidence for the ground state structure of a carbene. Closs emphasized that the rate of singlet-triplet intersystem crossing and the relative rates of singlet and triplet addition to the double bond must be considered carefully.

The decomposition of acyl and aroyl peroxide was considered by J. C. Martin (University of Illinois), K. Tokumaru (University of Tokyo), and M. Kobayashi (Tokyo Metropolitan University). Martin showed by ^{18}O labeling that the thermal decomposition of acetyl peroxide involves a caged pair of radicals in which statistical scrambling of the oxygen atoms occurs. Concerted 1,3 or 3,3 sigma-tropic rearrangements were excluded unequivocally. Tokumaru demonstrated that benzophenone-sensitized photodecomposition of benzoyl peroxide gave a triplet caged radical pair which diffused apart with $k_d \sim 10^{10} \text{ sec}^{-1}$. Since the lifetime of the cage is much less than the time needed for spin correlation ($k \sim 10^8 \text{ sec}^{-1}$), and since chemical reaction (bond breaking or formation) cannot occur with a change in multiplicity (singlet \rightleftharpoons triplet), geminate cage recombination to give phenyl benzoate is eliminated. Kobayashi discussed aromatic phenylation with the phenyl radical generated from a variety of sources including benzoyl peroxide, *N*-nitrosoacetanilide, phenyldiazonium hydroxide and tosylate, phenylazotriphenylmethane, and the novel system of phenyldiazonium salt plus sodium nitrite in dimethyl sulfide solution at 20°C. The reaction

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may proceed via the diazonium nitrite, $C_6H_5N=NONO$.

Photochemical generation of radicals from hydrated vicinal triketones was discussed by Y. Otsuji (Osaka Prefectural University). Alloxan or triketo dihydrophenalene gave products suggestive of loss of the hydroxy radical from the photoexcited state.

G. A. RUSSELL

*Department of Chemistry,
Iowa State University of
Science and Technology, Ames 50010*

Forthcoming Events

October

1-2. Wisconsin Acad. of Sciences, Arts and Letters, Baraboo. (J. R. Batt, 5001 University Ave., Madison, Wis.)

1-5. American College of Apothecaries, Baltimore, Md. (R. A. Benedict, ACA, 7758 Wisconsin Ave., Washington, D.C. 20014)

3-6. American Ceramic Soc., Electronics Div., Kiamesha Lake, N.Y. (L. C. Hoffman, E. I. du Pont de Nemours & Co., Inc., Bldg. 336, Experimental Sta., Wilmington, Del. 19898)

3-6. American Oil Chemists' Soc., Atlantic City, N.J. (J. C. Lyon, 508 S. 6 St., Champaign, Ill. 61820)

3-8. Electrochemical Soc., Cleveland, Ohio. (E. G. Enck, ES, P.O. Box 2071, Princeton, N.J. 08540)

3-8. Water Pollution Control Federation, 44th annual, San Francisco, Calif. (WPCF, 3900 Wisconsin Ave., Washington, D.C. 20016)

4-6. Turbulence in Liquids, Rolla, Mo. (G. K. Patterson, Dept. of Chemical Engineering, Univ. of Missouri, Rolla 65401)

4-7. Instrument Soc. of America, 26th annual, Chicago, Ill. (ISA, 530 William Penn Pl., Pittsburgh, Pa. 15219)

4-8. American Dietetic Assoc., 54th annual, Philadelphia, Pa. (R. M. Yakel, 620 N. Michigan Ave., Chicago, Ill. 60611)

5-8. Optical Soc. of America, Ottawa, Ont., Canada. (J. W. Quinn, OSA, 2100 Pennsylvania Ave., NW, Washington, D.C.)

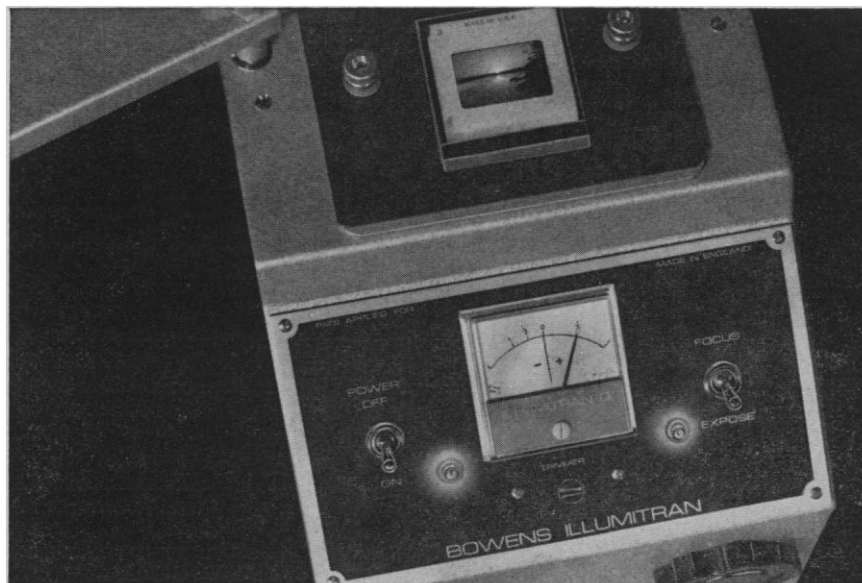
5-12. International Bureau of Weights and Measures, 14th general assembly, Paris, France. (J. Terrien, Pavillon de Breteuil, 92 Sevres, France)

8-10. Joint Conf. on Sensing of Environmental Pollutants (AIAA, ISA, ACS, IEEE, NASA, and NOAA), Palo Alto, Calif. (Instrument Soc. of America, 400 Stanwix St., Pittsburgh, Pa.)

9. Paleontological Research Institution, Ithaca, N.Y. (Mrs. K. V. W. Palmer, PRI, 1259 Trumansburg Rd., Ithaca, N.Y. 14850)

9-10. American College of Dentists, Atlantic City, N.J. (R. J. Nelsen, ACD, 7316 Wisconsin Ave., Bethesda, Md. 20014)

10-14. American Assoc. of Cereal Chemists, Dallas, Tex. (R. Tarleton, AACCC, 1821 University Ave., St. Paul, Minn. 55104)



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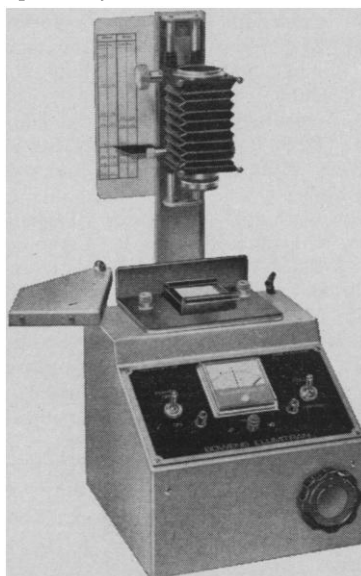
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10-14. **Rare Earth Research**, 9th conf., Blacksburg, Va. (L. T. Taylor, Dept. of Chemistry, Virginia Polytechnic Inst. and State University, Blacksburg 24061)

10-15. **Latin-American Cancer Congr.**, 5th, Caracas, Venezuela. (CILAC, Aptdo 1126, Caracas)

10-15. **American Chemical Soc.**, intern. rubber conf., Cleveland, Ohio. (Rubber Div., ACS, 1155 16th St., NW, Washington, D.C. 20036)

11-13. **Electron Devices**, Institute of Electrical and Electronics Engineers, Inc., Washington, D.C. (H. D. Toombs, Texas Instruments, Inc., P.O. Box 5012, MS 922, Dallas, Tex. 75222)

11-13. **Society for Industrial and Applied Mathematics**, Madison, Wis. (SIAM, 33 S. 17 St., Philadelphia, Pa. 19103)

11-14. **Association of Official Analytical Chemists**, 85th annual, Washington, D. C. (L. G. Ensminger, AOAC, Box 540, Benjamin Franklin Sta., Washington, D.C. 20044)

11-15. **National Bureau of Standards Inst. on Materials Research**, Boston, Mass. (T. E. Madey, Surface Chemistry Section, Natl. Bureau of Standards, Washington, D.C. 20234)

11-15. **American Public Health Assoc.**, Minneapolis, Minn. (J. R. Kimmey, 1740 Broadway, New York 10019)

11-15. **American Assoc. for Laboratory Animal Science**, New York, N.Y. (J. J. Garvey, AALAS, Central Office, Box 10, Joliet, Ill. 60434)

11-15. **American Vacuum Soc.**, Boston, Mass. (Mrs. D. M. Hoffman, RCA Laboratories, Princeton, N.J. 08540)

12-13. **Industrial Health Foundation**, 36th annual, Pittsburgh, Pa. (R. T. P. deTreville, 5231 Center Ave., Pittsburgh)

12-13. **Methods for Predicting the Future**, Pomona, Calif. (Center for Executive Development, 1044 Concord St., Costa Mesa, Calif. 92626)

12-14. **Luminescence Dosimetry**, 3rd intern. conf., Riso, Denmark. (V. Majdahl, Atomic Energy Research Establishment, Riso)

12-15. **Canadian Chemical Engineering Conf.**, 21st, Montreal, P.Q. (Chemical Inst. of Canada, Suite 906, 151 Slater St., Ottawa 4, Ont.)

12-15. **Neurological Surgeons**, Bal Harbor, Fla. (B. S. Patrick, University Medical Center, 2500 N. State St., Jackson, Miss. 39216)

13-16. **National Assoc. of Biology Teachers**, Chicago, Ill. (J. P. Lightner, NABT, 1420 N St., NW, Washington, D.C. 20005)

13-17. **Medical Soc. of the United States and Mexico**, 19th annual, Scottsdale, Ariz. (Mrs. V. E. Bryant, Executive Secretary, 333 W. Thomas Road, Phoenix)

14. **Fibrous Structures in Biomedical Applications**, Fiber Soc., Princeton, N.J. (L. Rebenfeld, P.O. Box 625, Princeton 08540)

15. **Medical Correctional Assoc.**, New York, N.Y. (M. O. Tuchler, 4426 N. 36 St., Phoenix, Ariz. 85018)

16-17. **Groundwater Pollution Conf.**, St. Louis, Mo. (W. Cate, Underwater Research Inst., 3411 Hampton Ave., St. Louis 63139)

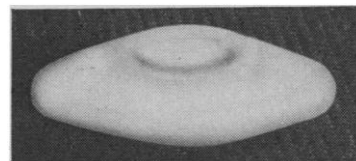
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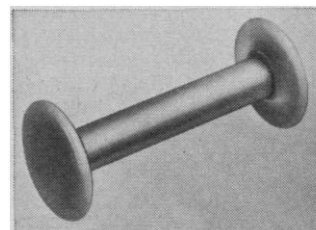
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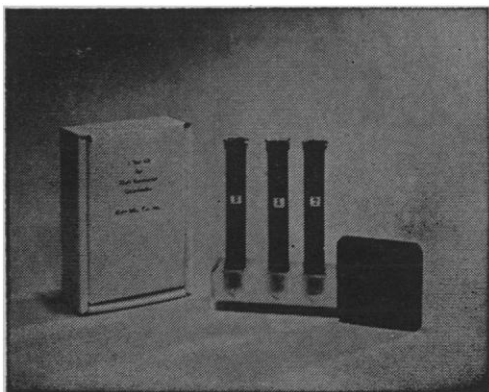
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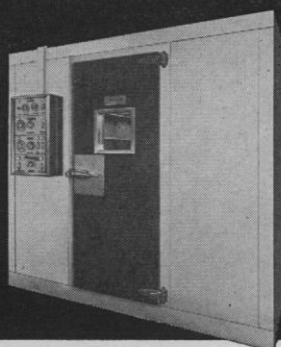
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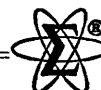
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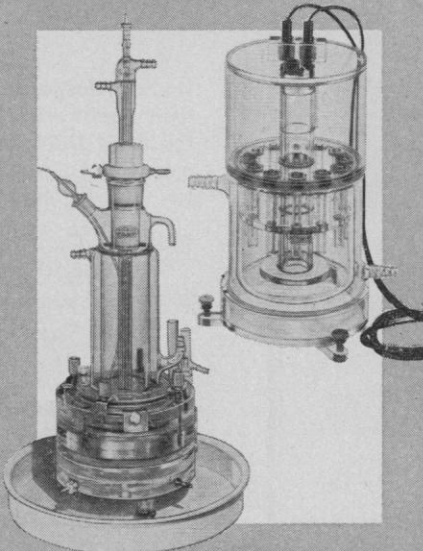
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tion and Maintenance Management Conf., Los Angeles, Calif. (Inst. of Sanitation Management, 1710 Drew St., Clearwater, Fla. 33515)

16-21. American Acad. of Pediatrics, 40th annual, Chicago, Ill. (R. G. Frazier, 1801 Hinman Ave., Evanston Ill. 60201)

17-21. American Nuclear Soc., Miami Beach, Fla. (O. J. Du Temple, ANS, 244 E. Ogden Ave., Hinsdale, Ill. 60521)

17-25. World Congr. on Fertility and Sterility, 7th, Tokyo and Kyoto, Japan. (M. Hayashi, Dept. of Obstetrics and Gynecology, Toho Univ., XI-I West 6, Omori, Otaku, Tokyo)

18-20. Chemistry and Spectroscopy, 10th Pacific congr., Anaheim, Calif. (sponsored by Society of Applied Spectroscopy and American Chemical Soc.) (A. Abu-Shumays, Cary Instruments, 2724 S. Peck Rd., Monrovia, Calif. 91016)

18-20. Soil Microcommunities Conf., Syracuse, N.Y. (D. L. Dindal, State University College of Forestry, Syracuse 13210)

18-21. American Soc. for Metals, Detroit, Mich. (A. R. Putnam, ASM, Metals Park, Ohio 44073)

18-21. Technology for Productivity, Detroit, Mich. (R. J. Seman, American Soc. for Metals, Metals Park, Ohio 44073)

18-22. Microdosimetry, 2nd symp., Stresa, Italy. (H. G. Ebert, Direction Générale, Centre Commun de Recherche, C.C.E., rue de la Loi, 200, 1040 Bruxelles, Belgique)

18-21. International Federation for Hygiene, Preventive Medicine, and Social Medicine Congr., Madrid, Spain. [Secretariat, Escuela Nacional de Sanidad, Facultad de Medicina (Pabellon No. 1), Ciudad Universitaria, Madrid-3]

18-22. Society for Appltd Spectroscopy, St. Louis, Mo. (Miss J. E. Westmeyer, Titanium Pigment Div., National Lead Co., Carondelet Sta., St. Louis 63111)

18-22. EUROCON 71, Inst. of Electrical and Electronics Engineers, Inc., Lausanne, Switzerland. (A. Rannestad, Chairman, Technical Programme Committee, N.D.R.E., P.O. Box 25, N-2007 Kjeller, Norway)

18-22. American College of Surgeons, 57th annual clinical congr., Atlantic City, N.J. (T. E. McGinnis, ACS, 55 E. Erie St., Chicago, Ill. 60611)

19-21. Antimicrobial Agents and Chemotherapy, 11th interscience congr., Atlantic City, N.J. (R. W. Sarber, American Soc. for Microbiology, 1913 Eye St., NW, Washington, D.C. 20006)

19-22. Acoustical Soc. of America, Denver, Colo. (Miss B. H. Goodfriend, ASA, 335 E. 45 St., New York 10017)

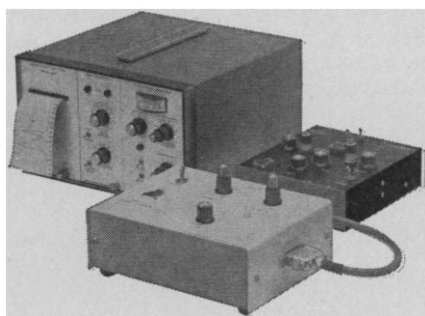
19-22. Society for Experimental Stress Analysis, Milwaukee, Wis. (B. E. Rossi, SESA, 21 Bridge Sq., Westport, Conn.)

19-22. American Soc. for Microbiology, Atlantic City, N.J. (R. W. Sarber, ASM, 1913 Eye St., NW, Washington, D.C. 20006)

20-21. Chemurgic Council, 33rd annual, Washington, D.C. (J. W. Ticknor, CC, 350 Fifth Ave., New York 10001)

20-22. Transplutonium Symp., 3rd. Argonne, Ill. (D. C. Stewart, Chemistry Div., Argonne National Lab., 9700 Cass Ave., Argonne 60439)

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21-23. American Acad. of Clinical Toxicology, Philadelphia, Pa. (E. G. Ccmstock, P.O. Box 2565, Houston, Tex. 77001)

21-23. Unconventional Photographic Systems, Washington, D.C. (Soc. of Photographic Scientists and Engineers, 1330 Massachusetts Ave., NW, Washington, D.C. 20005)

21-24. Society for Psychophysiological Research, Clayton, Mo. (K. M. Kleinman, Dept. of Psychology, Southern Illinois Univ., Edwardsville 62025)

22-27. American Soc. for Information Science, Washington, D.C. (ASIS, Suite 804, 1140 Connecticut Ave., NW, Washington, D.C. 20036)

23-26. American Inst. of Biological Sciences, 2nd natl., Miami Beach, Fla. (Miss A. Barker, National Biological Congr., 3900 Wisconsin Ave., NW, Washington, D.C. 20016)

25-27. Symposium on Insulin Action, Toronto, Ont., Canada. (I. B. Fritz, Univ. of Toronto, 112 College St., Toronto 101)

25-27. Canadian Manufacturers of Chemical Specialties Assoc., 14th annual, Toronto, Ont. (J. Chevalier, CMCSA, Suite 1004, Dominion Sq. Bldg., 1010 Ste. Catherine St. W, Montreal 2, P.Q.)

25-27. Implementing Nuclear Safeguards, Manhattan, Kan. (R. B. Leachman, Diversion Safeguard Program, Cardwell Hall, Kansas State University, Manhattan 66502)

25-29. Water Resources Conf., 7th, Washington, D.C. (S. C. Csallany, American Water Resources Assoc., Illinois State Water Survey, Univ. of Illinois, Urbana 61801)

27-30. Gerontological Soc., Houston, Tex. (GS, 1913 S. Signal Hills, Kirkwood, Mo. 63122)

27-30. Society for Neuroscience, Washington, D.C. (Miss M. G. Wilson, SN, 2101 Constitution Ave., NW, Washington, D.C. 20418)

29-30. Theoretical Physics Conf., Schenectady, N.Y. (J. B. Comly, General Electric Research & Development Center, P.O. Box 8, Schenectady)

29-1. Association of American Medical Colleges, 82nd annual, Washington, D.C. (J. B. Erdmann, 1 Dupont Circle, NW, Washington, D.C. 20036)

30-5. American Concrete Inst., Buffalo, N.Y. (ACI, Box 4754, Redford Station, 22400 W. Seven Mile Rd., Detroit, Mich. 48219)

31-3. Academy of Psychosomatic Medicine, Sarasota, Fla. (A. J. Krakowski, 202A Cornelia St., Plattsburgh, N.Y. 12901)

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1-3. Electrical Insulation and Dielectric Phenomena Conf., National Acad. of Sciences-National Research Council, Williamsburg, Va. (R. A. Cliffe, National Acad. of Sciences, 2101 Constitution Ave., NW, Washington, D.C. 20418)

1-3. Geological Soc. of America (with Paleontological Soc., Mineralogical Soc.

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of America, Soc. of Economic Geologists, Soc. of Vertebrate Paleontology, Geochemical Soc., National Assoc. of Geology Teachers, and Geoscience Information Soc.), Washington, D.C. (W. L. Newman, Nontechnical Reports, U.S. Geological Survey, Washington, D.C. 20242, or W. Cochran, Managing Editor, *Geotimes*, 2201 M St., NW, Washington, D.C. 20037)

3-5. Pittsburgh **Diffraction** Conf., 29th annual, Pittsburgh, Pa. (J. E. Gragg, Dept. of Metallurgy and Materials Science, Carnegie-Mellon Univ., Schenley Park, Pittsburgh 15213)

3-5. **Nuclear Science** Symp. (IEEE Nuclear Science Group, AEC, and NASA), San Francisco, Calif. (K. A. More, Bendix Corp., Aerospace Systems Div., 3300 Plymouth Rd., Ann Arbor, Mich. 48107)

3-6. American Soc. of **Cytology**, 19th annual scientific mtg., Washington, D.C. (W. R. Lang, ASC, 7112 Lincoln Dr., Philadelphia, Pa. 19119)

3-7. American Soc. of **Criminology**, San Juan, Puerto Rico. (Miss C. G. Schultz, Dept. of Sociology, Ohio State Univ., Columbus 43210)

4-5. **Energy** Conf., Albany, N.Y. (R. I. Brown, Environmental Studies, ULB 35, State Univ. of New York at Albany, 1400 Washington Ave., Albany)

4-6. **Nuclear Physics**, American Physical Soc., Tucson, Ariz. (W. W. Havens, Jr., APS, 335 E. 45 St., New York 10017)

6. **Earth Science Education** Symp., 2nd annual, La Salle, Ill. (T. Brehman, Maine Township High School North, Des Plaines, Ill.)

7-10. American Assoc. for **Clinical Immunology and Allergy**, New Orleans, La. (S. H. Jaros, P.O. Box 965, D.T.S., Omaha, Nebr. 68101)

7-11. **Exploration Today—Energy Tomorrow**, Soc. of Exploration Geophysicists, 41st annual intern. mtg., Houston, Tex. (SEG, P.O. Box 3098, Tulsa, Okla. 74101)

7-11. American Soc. for **Information Science**, 34th annual, Denver, Colo. (Miss S. Wormley, Suite 804, ASIS, 1140 Connecticut Ave., NW, Washington, D.C. 20036)

8. **Conversion of Wastes to Profit** Symp., Toronto, Ont., Canada. (R. G. W. Laughlin, Canadian Soc. for Chemical Engineering, 151 Slater St., Ottawa 4)

8-10. **Biochemistry of Complex Carbohydrate Polymers**, an Integrated View, International Union of Biochemistry, Bariloche, Argentina. (H. G. Pontis, Casilla de Correo 138, San Carlos de Variloche, Province de Rio Negro, Argentina)

8-10. International Soc. for the **Study of Biological Rhythms**, Little Rock, Ark. (J. E. Pauly or L. E. Scheving, Dept. of Anatomy, Univ. of Arkansas Medical Center, Little Rock 72201)

9-16. American **Heart** Assoc., Anaheim, Calif. (J. M. Hundley, AHA, 44 E. 23 St., New York 10010)

10-12. Eastern **Analytical** Symp. (American Chemical Soc., Soc. for Applied Spectroscopy, and American Microchemical Soc.), New York, N.Y. (I. L. Simmons, M&T Chemicals, Inc., P.O. Box 1104, Rahway, N.J. 07605)

11-12. **Endocrine and Nonendocrine**

Hormone Producing Tumors, 16th annual clinical conf., Houston, Tex. (Mrs. J. Brandenberger, Information Coordinator, Univ. of Texas M.D. Anderson Hospital and Tumor Inst., Texas Medical Center, Houston 77025)

12-14. Association of **Clinical Scientists**, 40th mtg., Washington, D.C. (F. W. Sunderman, Hahnemann Medical College and Hospital, 230 N. Broad St., Philadelphia, Pa. 19102)

12-16. **Atomic Industrial** Forum, American Nuclear Soc., Washington, D.C. (ANS, 850 Third Ave., New York 10022)

14-15. **Cerebral Function** Symp. on Hemisphere Disconnection and Cerebral Function, Coronado, Calif. (W. L. Smith, Cortical Function Lab., Porter Memorial Hospital, 2525 S. Downing, Denver, Colo. 80210)

15-17. American **Petroleum** Inst., San Francisco, Calif. (API, 1271 Ave. of the Americas, New York 10020)

15-18. Joint **Computer** Conf., Las Vegas, Nev. (American Federation of Information Processing Societies, 210 Summit Ave., Montvale, N.J. 07645)

15-19. **Clinical Uses of Radionuclides**: Critical Comparison with Other Techniques, 13th symp., Oak Ridge, Tenn. (E. C. Rosenow, American College of Physicians, 4200 Pine St., Philadelphia, Pa. 19104)

16-18. Conference on the **Quality of the Environment**, Columbus, Ohio. (R. A. Tybout, Ohio State Univ., 166 Denny Hall, 164 W. 17 Ave., Columbus 43210)

16-19. **Magnetism and Magnetic Mate-**

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ELEMENTARY PARTICLES: SCIENCE, TECHNOLOGY AND SOCIETY

edited by **LUKE C. L. YUAN**, Brookhaven National Laboratory, Upton, L. I., N. Y.

This book provides a comprehensive review of some important and interesting developments in recent years in science and technology which were brought forth as a consequence of the valuable accomplishments in particle physics research. The book deals with the interactions that exist between elementary particle physics research and other branches of science (biology, chemistry, medicine, and engineering.) Topics discussed in the book include: physics and particle physics, interactions in astrophysics, interactions in chemistry, interactions in accelerator and engineering applications, interactions in biology, interactions in medicine, and interactions in geochemistry.

October 1971, about 300 pp., in preparation

CURRENT TOPICS IN COMPARATIVE PATHOBIOLOGY

Volume 1

edited by **THOMAS C. CHENG**, Inst. for Pathobiology and Dept. of Biology, Lehigh Univ., Bethlehem, Pa.

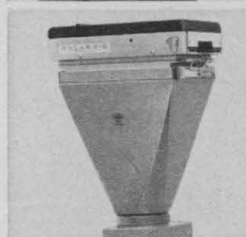
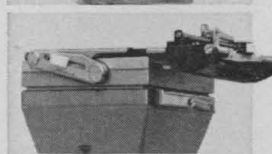
This work reviews research on the fundamental nature of disease states, their causative agents and processes, and the reactions they provoke. The volume includes data from such fields as virology, microbiology, parasitology, entomology, toxicology, immunology, comparative physiology and biochemistry, developmental biology and cytology.

CONTENTS: EDWARD A. STEINHAUS and Y. TANADA: Diseases of Insect Integument. LIONEL E. MAWDESLEY-THOMAS: Neoplasia in Fish: A Review. SAMMY M. RAY: Paralytic Shellfish Poisoning: A Status Report. SHIH L. CHANG: Small, Free-Living Amebas: Cultivation, Quantitation, Identification, Classification, Pathogenesis, and Resistance. Author Index-Subject Index. September 1971, 274 pp., \$15.00

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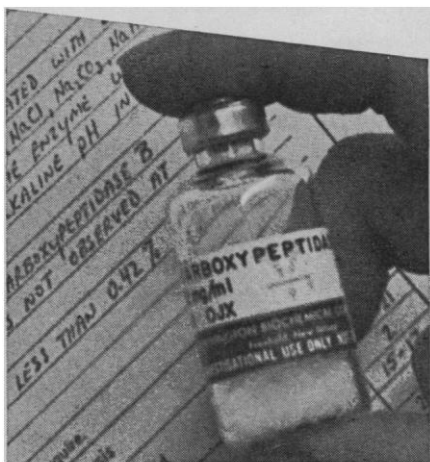
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rials, 17th annual conf., Chicago, Ill. (H. C. Wolfe, American Inst. of Physics, 335 E. 45 St., New York 10017)

18-19. Sickle Cell Disease Symp., New York, N.Y. (H. Abramson, National Foundation, 315 Park Ave. South, New York 10010)

18-20. School Science and Mathematics Assoc., Detroit, Mich. (D. R. Winslow, P.O. Box 246, Bloomington, Ind. 47401)

18-21. American Anthropological Assoc., New York, N.Y. (E. J. Lehman, 1703 New Hampshire Ave., NW, Washington, D.C. 20009)

20. Resources of the World's Oceans Symp., New York, N.Y. (H. R. Frey, New York Inst. of Ocean Resources, Inc., South Street Seaport Museum, 16 Fulton St., New York 10038)

24-26. World Federation for Mental Health, Hong Kong. (C. L. Wong, Hong Kong Assoc. for Mental Health, Hong Kong)

25-27. Central Assoc. of Science and Mathematics Teachers, Detroit, Mich. (D. R. Winslow, P.O. Box 246, Bloomington, Ind. 47401)

28-1. American Medical Assoc., clinical conv., New Orleans, La. (E. B. Howard, AMA, 535 N. Dearborn St., Chicago, Ill. 60610)

28-2. American Inst. of Chemical Engineers, San Francisco, Calif. (F. J. Van Antwerpen, AICE, 345 E. 47 St., New York 10017)

28-2. American History of Mechanical Engineers, 92nd annual, Washington, D.C. (M. Jones, Information Services, ASME, 345 E. 47 St., New York 10017)

28-3. Radiological Soc. of North America, Chicago, Ill. (M. D. Frazer, RSNA, 713 E. Genesee St., Syracuse, N.Y. 13210)

28-4. World Congr. of Psychiatry, 5th, Mexico City, Mexico. (Secretariado del "V" Congreso Mundial de Psiquiatría, Apartado Postal No. 20-123/24, Mexico D.F., Mexico)

29-2. Entomological Soc. of America, Los Angeles, Calif. (W. P. Murdoch, ESA, 4603 Calvert Rd., College Park, Md. 20740)

29-3. Symposium on Analytical Methods in the Nuclear Fuel Cycle, International Atomic Energy Agency, Vienna, Austria. (J. H. Kane, Div. of Technical Information, U.S. Atomic Energy Commission, Washington, D.C. 20545)

29-4. International College of Surgeons, 4th Western Hemisphere congr., Panama City, Panama. (Office of the President, ICS, 1516 N. Lake Shore Dr., Chicago, Ill. 60610)

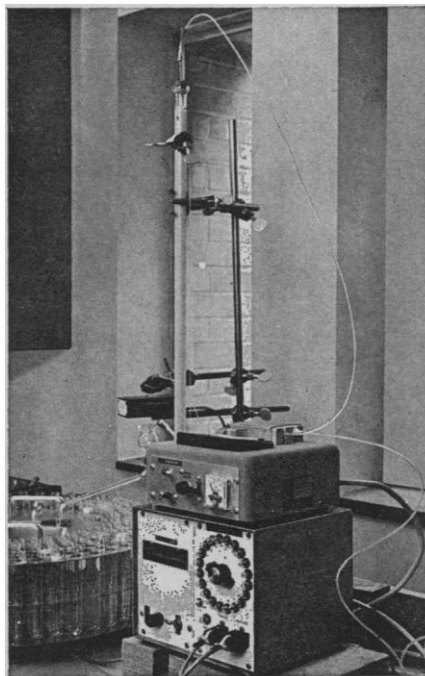
30. Nutritional Requirements of Vitamin K, Assoc. of Vitamin Chemists, Rosemont, Ill. (J. McGillivray, International Minerals and Chemicals, Route 45 and Winchester Rd., Libertyville, Ill. 60048)

30-3. American Soc. of Tropical Medicine and Hygiene, Boston, Mass. (G. R. Healy, P.O. Box 15208, Emory Univ. Branch, Atlanta, Ga. 30333)

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1-3. Electron and Atomic Physics, American Physical Soc., Atlanta, Ga. (W. W. Havens, Jr., APS, 335 E. 45 St., New York 10017)

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BOOKS RECEIVED

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Crystallography and Crystal Defects. A. Kelly and G. W. Groves. Addison-Wesley, Reading Mass., 1971. xii, 428 pp. + plates. \$15.

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Design of Solid-State Power Supplies. Eugene R. Hnatek. Van Nostrand Reinhold, New York, 1971. xvi, 444 pp., illus. \$19.75.

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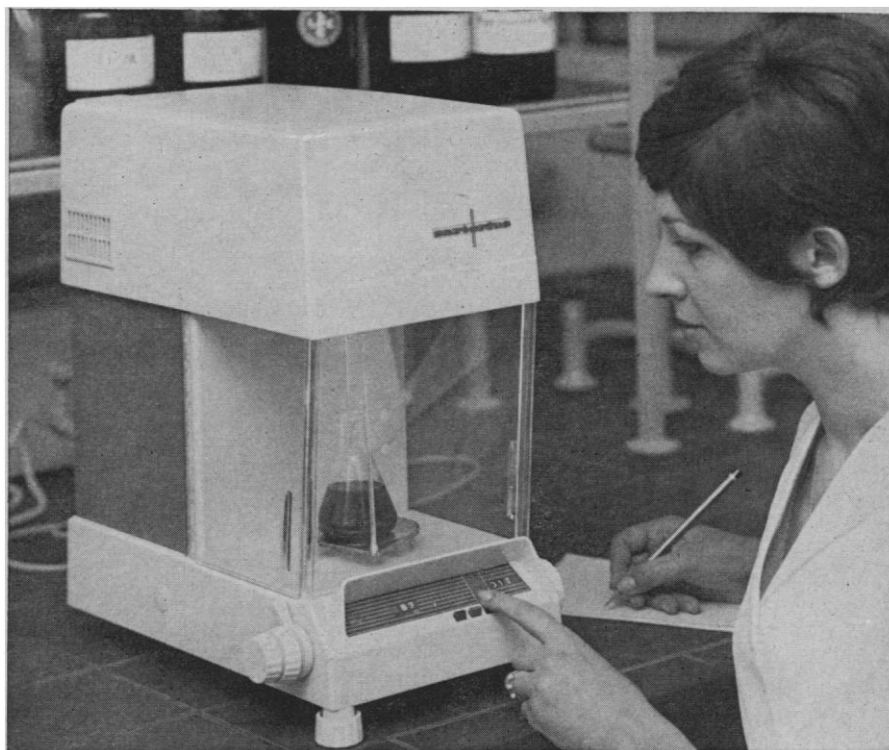
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A Staff Report on Cantometrics

Editor: Alan Lomax

384 pp., 7½ × 10¼, Illustrations, Bibliography, Index, 1968. 2nd Printing 1971. AAAS members' cash orders \$14.50. Regular price \$16.75.

Working with a large sample of recorded songs and filmed dances from all world culture areas, the Cantometrics Project has discovered some of the ways in which song and dance style vary by culture area. Strong statistical relationships have been established between a set of basic factors of social and economic structure and performance style. The book reports on an imaginative yet rigorous exploration of the paralinguistic and parakinesic realms and a thoroughgoing test of the hypothesis that factors of culture style are primary forces in shaping all human behavior. Performance style here becomes a psychocultural indicator, and, for the first time, the social and cultural import of the expressive act is firmly established.

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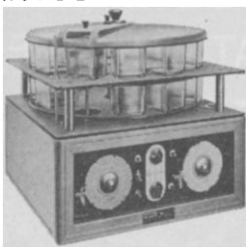
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