

SCIENCE

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AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

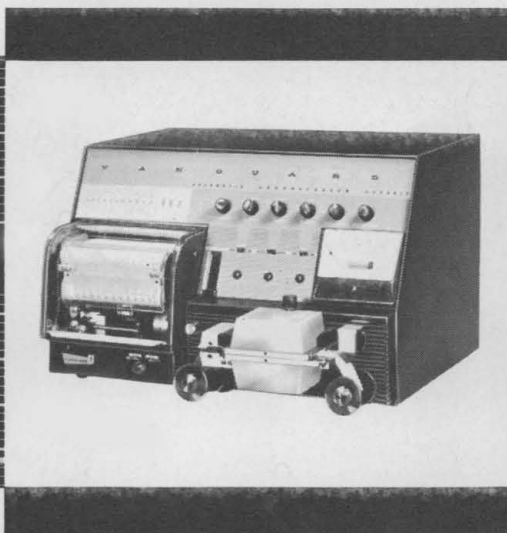


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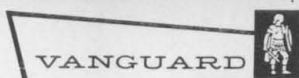
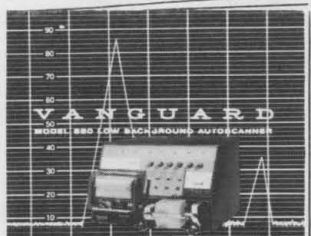
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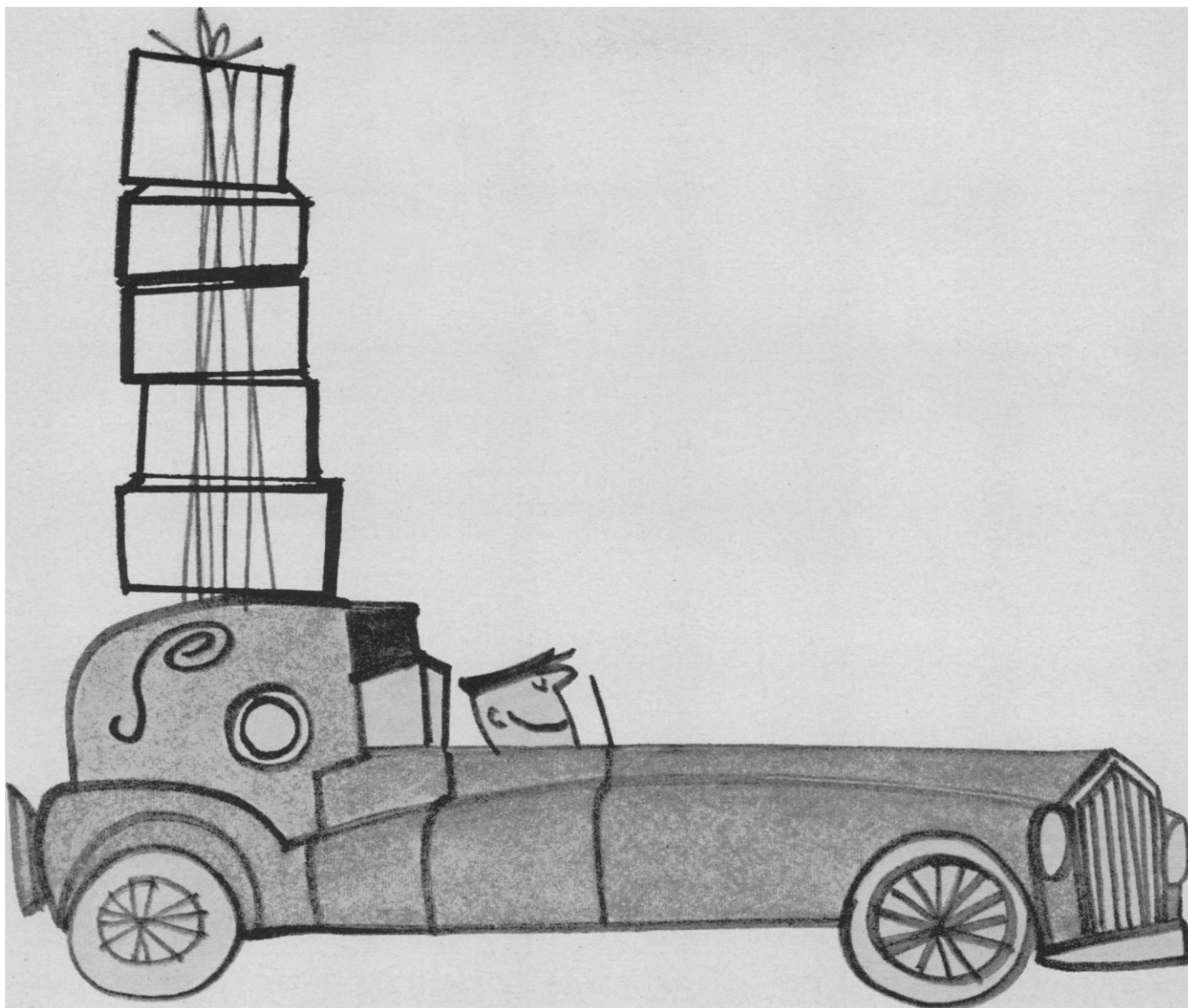
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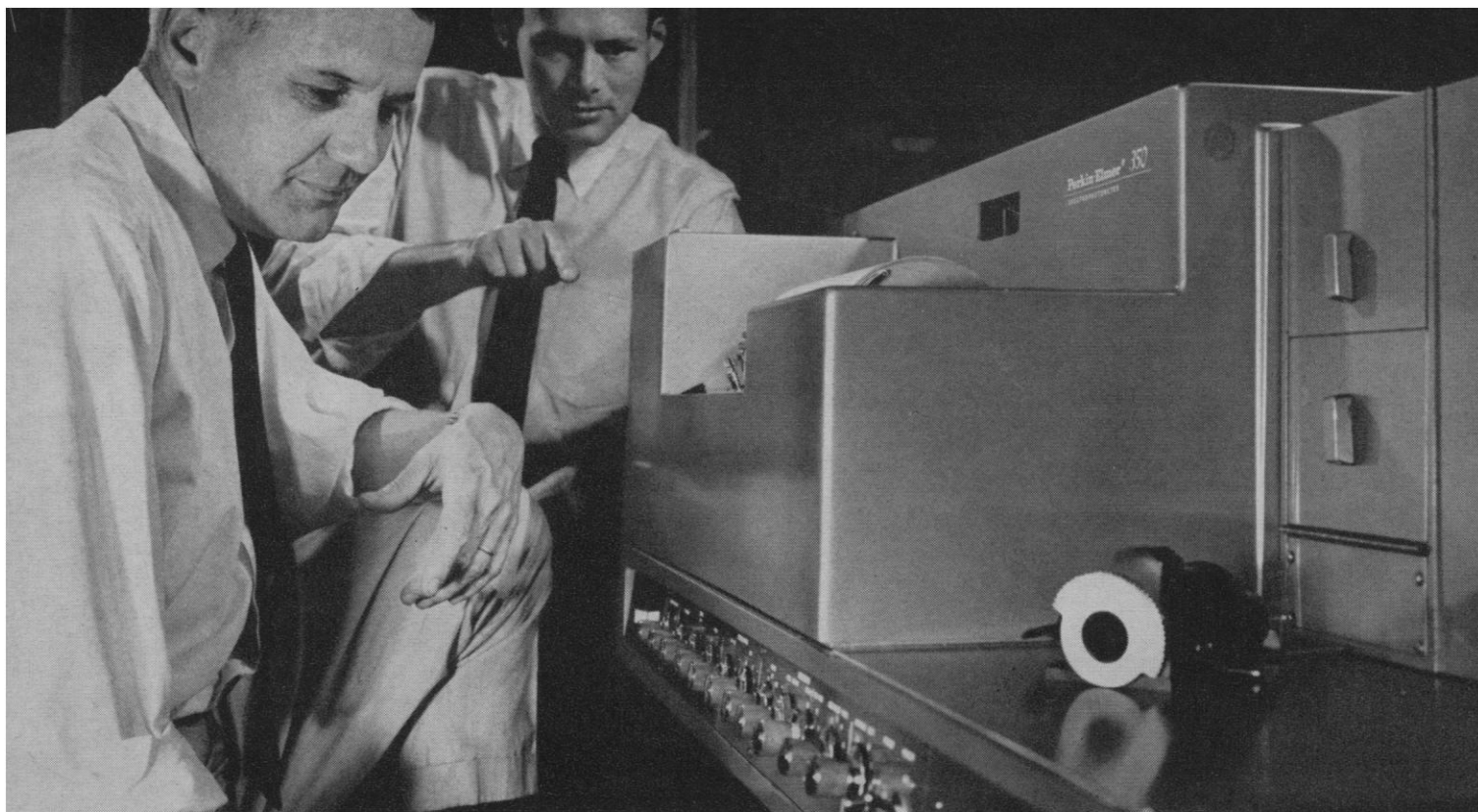
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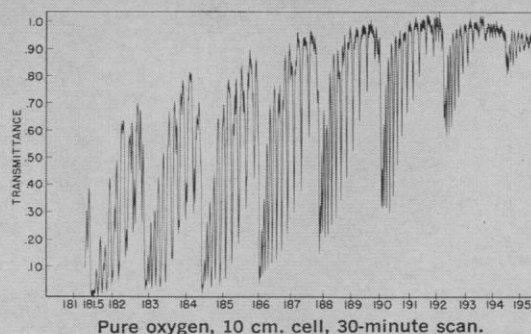
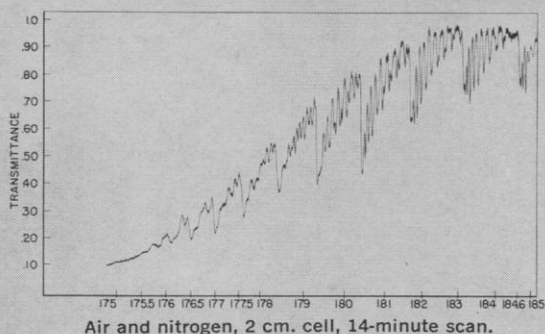
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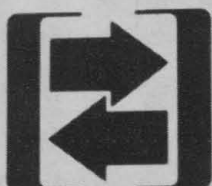
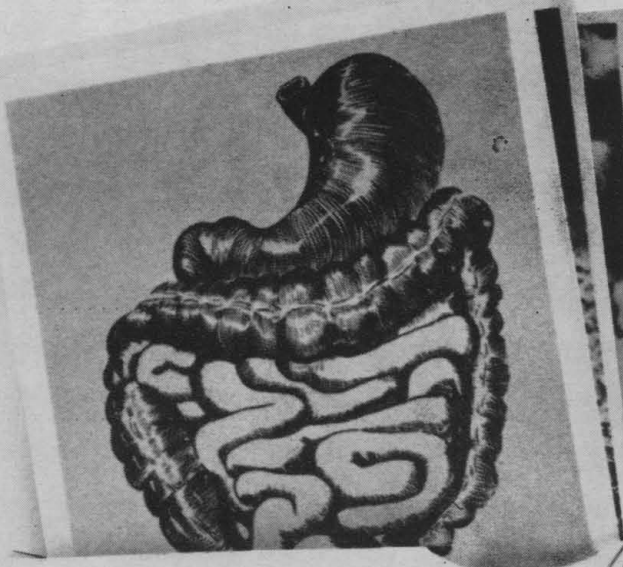
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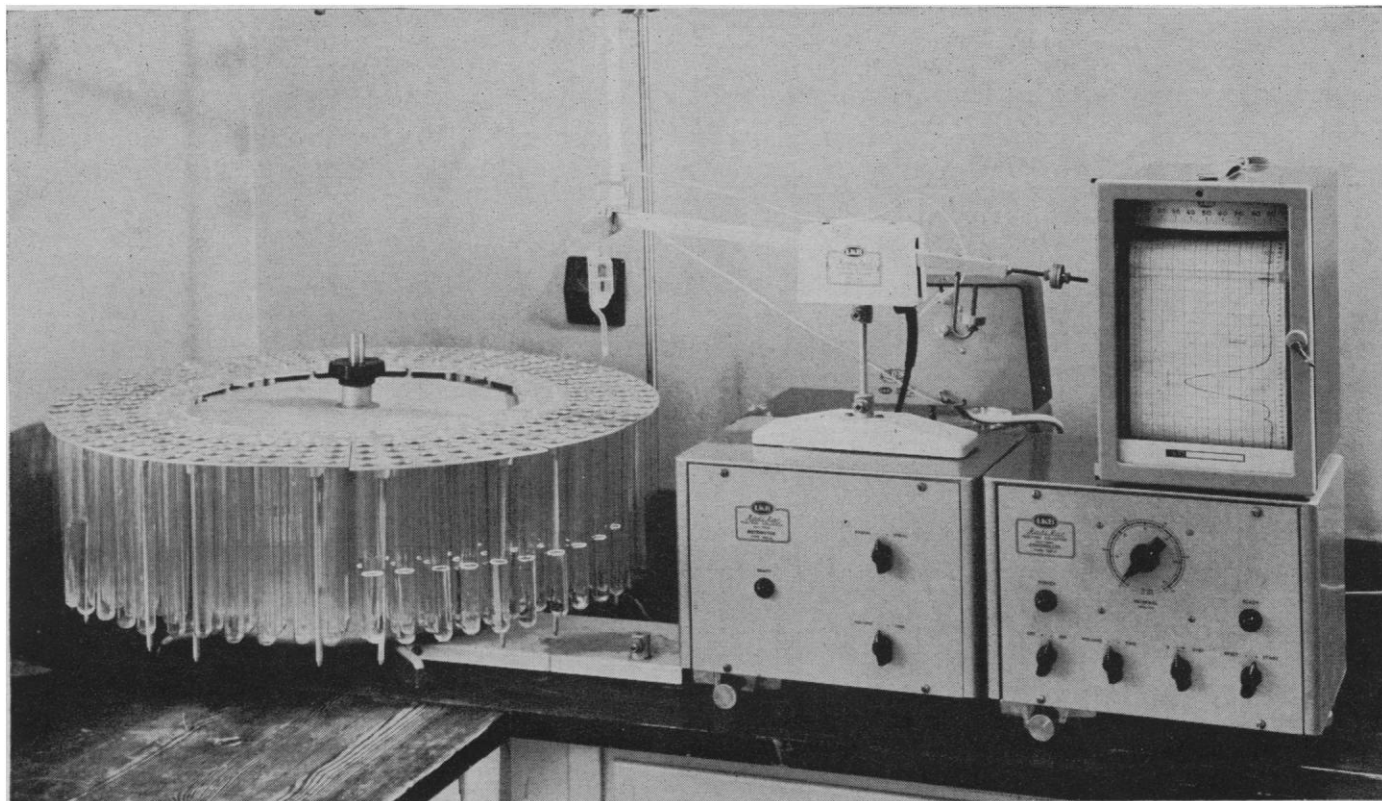
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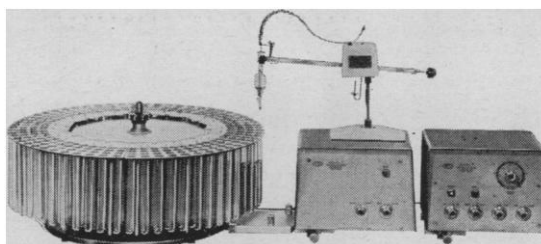
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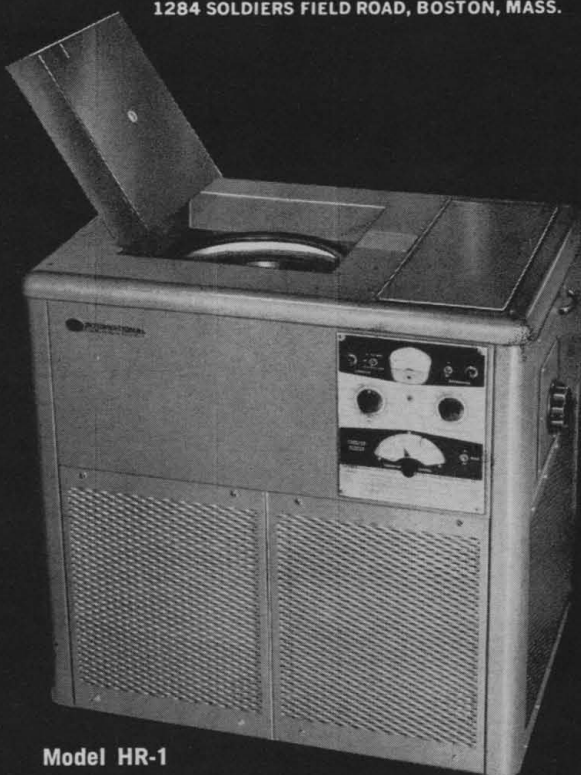
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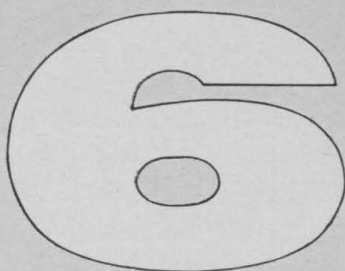


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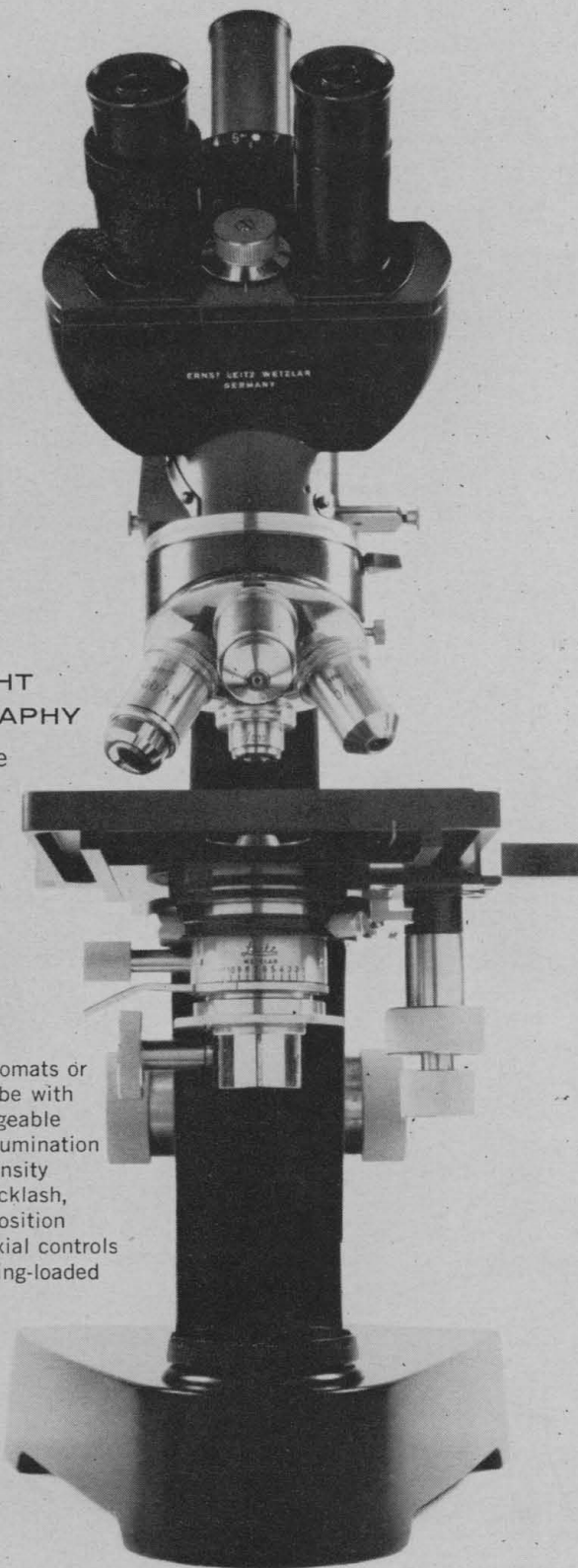
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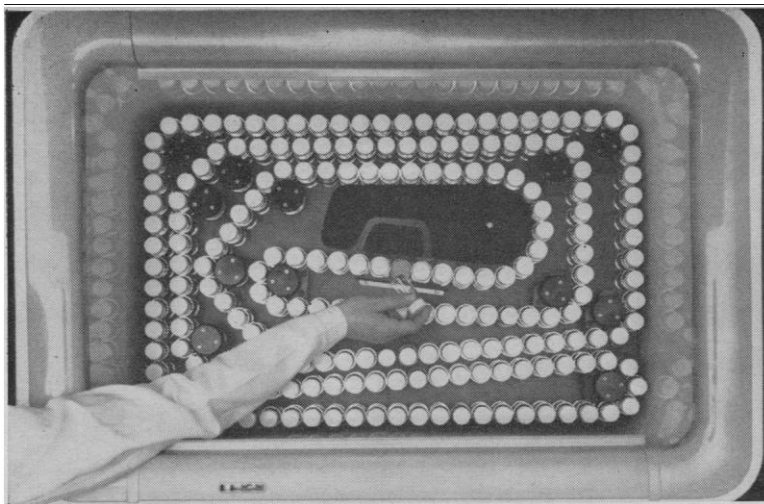
Notes from Underground

The June *Scientific American* offers as its lead article a suggestion by L. Don Leet, of Harvard University, for using seismic records to distinguish routinely between earthquakes and underground nuclear explosions. The article is essentially a research proposal, but Leet, on the basis of present evidence, is quite hopeful that further study will prove his suggestion to be the answer. Now, one of the points of disagreement in the East-West test-ban negotiations is over the American claim that, at least in the present state of the art, you cannot distinguish routinely between earthquakes and explosions, only between earthquakes and suspicious events—and that on-site inspection is necessary to determine whether a suspicious event is an earthquake or an explosion. Consequently, we thought it worth while to look a little further into the merits of Leet's suggestion.

The gist of the suggestion is this. Although you cannot distinguish between earthquakes and explosions on the basis of any single feature, you might be able to do so on the basis of a certain series of criteria, if the criteria are applied to the seismic records from a world-wide network of observatories. Consider, for example, differences in the relative amplitudes of P waves and S waves over a region—for the purposes of our limited considerations, we need not go into the nature of the two kinds of waves. For earthquakes, the article contends, as you travel away from the source of the disturbance, the P wave dies out first, then the S wave. For explosions, the article continues, as you travel away from the source, the S wave dies out first, then the P wave. At considerable distances you have nothing but P waves, what Leet calls the "Lonesome P."

In looking into the merits of Leet's suggestion, we first got hold of a copy of the report of the so-called Berkner Panel. This report, "The Need for Fundamental Research in Seismology," was prepared early in 1959 at the request of the State Department and was submitted on 12 June 1959 to the other delegations at the test-ban talks. The copy which we consulted was put out July 1959, by the State Department. We learned that what Leet has to say is not altogether new. The report expresses the hope that further research on a variety of effects will turn up some way to distinguish between earthquakes and explosions. On the specific question of the relative amplitudes of P waves and S waves, there are several references. Thus, Carl Romney, of the Defense Department and a member of the panel, offers in an appendix a list of six research proposals, the fifth of which reads: "What is the ratio of S/P in earthquakes? In blasts? What are the variations in these ratios?"

To find out how things are going, we then went to see some of the people connected with Project Vela Uniform, the Defense Department's research program charged with improving U.S. ability to detect underground explosions. We obtained a copy of a report on the project that Charles Bates, of the Defense Department, recently had presented publicly. We also got hold of the January 1962 report of the Wichita Mountains Seismological Observatory, a station supported by the Defense Department. We learned that Leet's specific suggestion offers little promise. Project Vela is going forward, but the various criteria that Leet suggests are viewed more as diagnostic aids than as together constituting a definitive test. There is too much overlap in the effects of earthquakes and explosions. Thus, regarding the "Lonesome P" criterion as helping identify explosions, of the 68 distant earthquakes detected during the first 5 days of 1962 by the Wichita Mountains Seismological Observatory, 26 had "Lonesome P's."—J.T.



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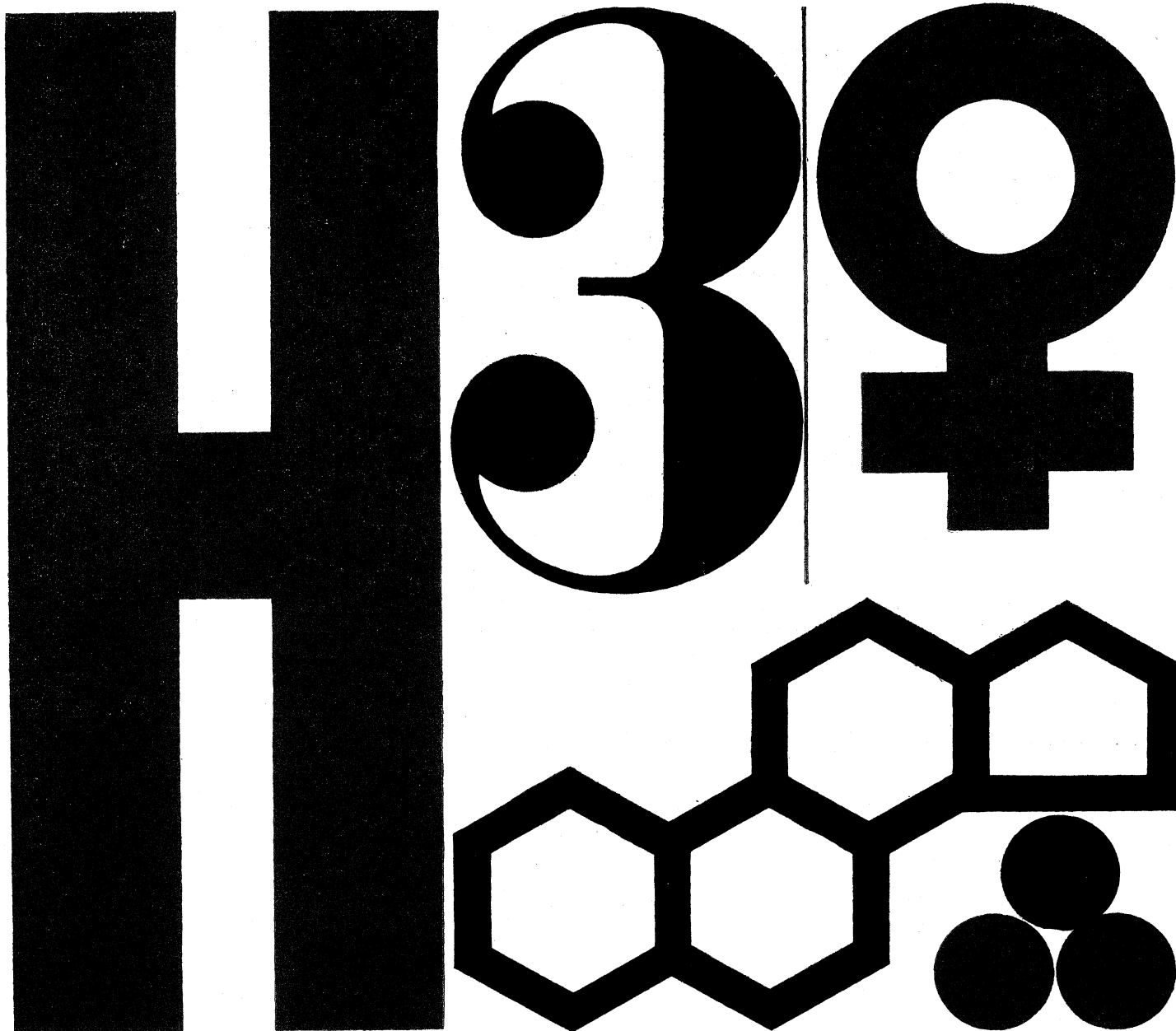
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fluorescent output on a 100-mv d-c recorder. One part per billion of quinine sulfate produces full-scale deflection with a noise level equivalent to 1 percent of this. Repeatability of measurements depends upon the uniformity of the test tubes and the sensitivity used, but reproducibility of 2 percent is obtained on sensitive range when the same tube is used. A 90 to 135 input voltage change produces a maximum of 5 percent total variation.—R.L.B. (Beckman Instruments, Inc., Dept. S240, 2500 Harbor Blvd., Fullerton, Calif.)

Extrusion rheometers are available for a variety of temperature, pressure and viscosity ranges. Results are said to be independent of wetting properties of the material under test. In operation, a series of extrusions are made through an orifice into tared containers at geometrically increasing pressures. Observed and measured values are used for applied pressure, radius, and length of orifice, and the volume of material extruded. Graphic curves drawn show the working properties of a material under different rates of shear and stress.—J.S. (Burrell Corp., Dept. S231, 2223 Fifth Ave., Pittsburgh 19, Pa.)

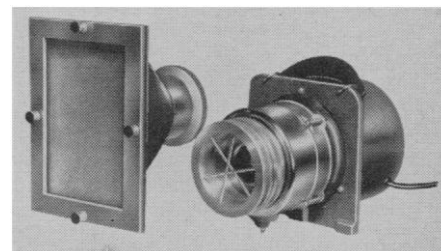
Quarter-million-volt power supply is available in two current ratings, 1 and 3 ma. The transformer is epoxy vacuum impregnated and all components are designed for 300-kv continuous duty. Ripple is held to 0.6 r.m.s. per milliamper. Main power components are immersed in insulating oil in a tank that measures 40 by 55 by 71 inches. A separate, portable control cabinet includes triple-range kilovolt-meter and milliammeter, control for adjusting output voltage, glow tubes for instrument protection, and on-off control.—J.S. (Del Electronics Corp., Dept. S248, 521 Homestead Ave., Mount Vernon, N.Y.)

Maximum transient voltage indicator (model TD761M2) is said to respond to pulses of one-half μ sec duration. It employs capacitance-compensated attenua-

tor probes to minimize the effects of lead capacitance. Accuracy is said to be ± 2 percent for transient durations of 1 μ sec to d-c and ± 5 percent for one-half μ sec durations. Seven attenuator probes are available to cover the ranges from 0 to 5 volts to 0 to 40 kv. The instrument uses solid-state circuitry and is battery operated. Accessories include: a-c power supply to replace batteries; dual-polarity probes; probe for current transients; special low-voltage, low-capacitance, high-impedance probes; and instrumentation for remote indication, counting, and recording.—J.S. (Regent Controls, Inc., Dept. S242, Stamford, Conn.)

Am:Be neutron sources are available in all sizes. Because they contain only 60 kev gamma radiation, the sources are particularly attractive where a pure neutron flux with a relatively long half-life is required. The following characteristics are cited by the manufacturer: specific activity, 3.326 c/g; neutron yield, approximately 2×10^6 neutrons per curie per second; gamma output negligible; half-life, 458.1 years. Not more than 10 g are available to a licensee without special AEC approval.—J.S. (Nuclear Materials and Equipment Corp., Dept. S241, Apollo, Pa.)

A portable, lightweight **air sampler for measuring radioactive air contamination** circulates a large volume of air through a filter, trapping particles as small as 1/100th of a micron in diameter. Thereafter, appropriate instru-



ments are used to analyze the radioactive particles that may have been caught. Filters with varying weaves are available suitable for alpha, beta, and gamma radiation. The unit is designed for continuous or random operation and may be used horizontally or vertically in environments up to 220°F. Several have been used continuously from 60 to 90 days. A technical bulletin describing this product and the required nuclear instrumentation is available from Nucleonic Corporation of America.—R.L.B. (Nucleonic Corporation of America, Dept. S239, 196 Degraw St., Brooklyn 31, N.Y.)

The material in this section is prepared by the following contributing writers:

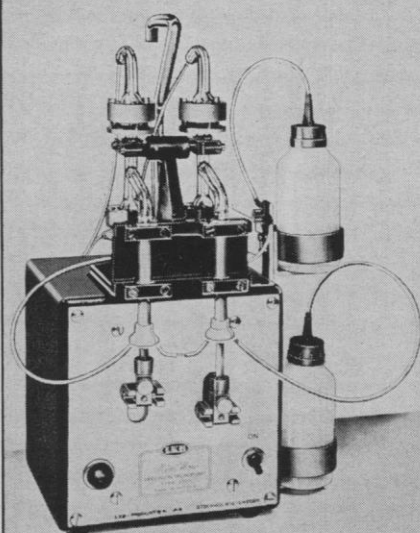
Robert L. Bowman (R.L.B.), Laboratory of Technical Development, National Heart Institute, Bethesda 14, Md. (medical electronics and biomedical laboratory equipment).

Joshua Stern (J.S.), Basic Instrumentation Section, National Bureau of Standards, Washington 25, D.C. (physics, computing, electronics, and nuclear equipment).

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Meetings

Forthcoming Events

July

16-20. Paramagnetic Resonance, 1st intern. conf., Jerusalem, Israel. (W. Low, Hebrew Univ. of Jerusalem, Jerusalem)

16-25 Aug. Theoretical Physics, Trieste, Italy. (Intern. Atomic Energy Agency, 11 Kärntner Ring, Vienna 1, Austria)

17-18. Data Acquisition and Processing in Medicine and Biology, conf., Rochester, N.Y. (K. Enslein, Brooks Research, Inc., P.O. Box 271, E. Rochester)

17-19. Lunar Missions, mtg., American Rocket Soc., Cleveland, Ohio. (J. J. Harford, ARS, 500 Fifth Ave., New York 36)

17-20. Fluorine Chemistry, intern. symp., Estes Park, Colo. (D. N. Gray, Denver Research Institute, Denver 10, Colo.)

17-21. American Nuclear Soc., natl. mtg., Boston, Mass. (O. J. Du Temple, ANS, 86 E. Randolph St., Chicago 1, Ill.)

17-24. Prophylactic Medicine and Social Hygiene, intern., Grado, Italy. (E. Berg-hoff, Piaristengasse 41, Vienna, Austria)

18-10. Water and Soil Utilization, intern. semin., Brookings, S.D. (I. B. Johnson, Dept. of Animal Husbandry, South Dakota State College, Brookings)

21-28. Institute on Religion in an Age of Science, annual summer conf., Star Island, N.H. (IRAS, 280 Newton St., Brookline 46, Mass.)

22-28. Cancer, intern. congr., Moscow, U.S.S.R. (L. Shabad, Academy of Medical Sciences of the U.S.S.R., 14 Solyanka, Moscow)

22-28. Latin American Congr. of Gynecology and Obstetrics, Bogotá, Colombia. (R. Camero, Apartado No. 2463, Bogotá)

27-31. Psychoanalysis, intern. forum, Amsterdam, Netherlands. (L. Salzmann, 1610 New Hampshire Ave., Washington 9, D.C.)

27-31. Recent Advances in Experimental and Theoretical Methods of Crystal Structure Research, symp., Munich, Germany. (F. Bopp, Institut für Theoretische Physik, Universität München, Schellingstrasse 4-8, Munich)

28-4. International Geographical Association (Esperantist), Odense, Denmark. (P. Thorsen, Dyblandsvangen 7, Copenhagen, Denmark)

30-10. Recent Advances in Clay Mineralogy, semin., University Park, Pa. (College of Mineral Industries and Continuing Education, Pennsylvania State Univ., University Park)

August

2-7. Long-Range Goals for Ethical Humanism, intern. congr. Blindern, Norway. (Secretariat, Intern. Humanist and Ethical Union, 152 Oudegracht, Utrecht, Netherlands)

5-8. Heat Transfer, conf. & exhibit, Houston, Tex. (A. B. Conlin, Jr., Amer. Soc. of Mechanical Engineers, 29 W. 39 St., New York 18)

5-11. Industrial Research, annual conf.,

New York, N.Y. (M. F. Garvey, 301A Seeley W. Mudd Bldg., Columbia Univ., New York 27)

5-11. Radiation Research, intern. congr., Yorkshire, England. (A. Howard, Mount Vernon Hosp., Northwood, Middlesex, England)

6-10. Society for Clinical and Experimental Hypnosis, natl. convention—International Soc. for Clinical and Experimental Hypnosis, intern. congr., Portland, Ore. (J. G. Watkins, Clinical Psychology Dept., V.A. Hospital, Portland 7)

6-10. World Federation for Mental Health, annual, Lima, Peru. (Secretary General, 19 Manchester St., London, W.1, England)

6-17. International Commission for Prevention of Alcoholism, annual, Seattle, Wash. (ICPA, 6830 Laurel St., NW, Washington 12, D.C.)

7. World Medical Esperanto Assoc., annual, Copenhagen, Denmark. (M. Jarnuszkiewicz, Majowieska 69, Krakow, Poland)

7-8. Forest Products Utilization, annual conf., Blacksburg, Va. (C. J. Holcomb, Virginia Polytechnic Inst., Blacksburg)

7-9. Low-Level Wind Conf., El Paso and Dallas, Tex. (American Meteorological Soc., 45 Beacon St., Boston 8, Mass.)

8-10. Standards Laboratories, natl. conf., Boulder, Colo. (A. E. Hess, Circuit Standards Div., Natl. Bureau of Standards, Boulder)

8-10. X-ray Analysis Applications, annual conf., Denver, Colo. (W. M. Mueller, Metallurgy Div., Denver Research Inst., Univ. of Denver, Denver 10)

8-14. Trace Gases and Natural and Artificial Radioactivity in the Atmosphere, symp., Utrecht, Netherlands. (E. C. Junge, Intern. Assoc. of Meteorology and Atmospheric Physics, 26 Blueberry Lane, Lexington, Mass.)

8-15. Fertility and Sterility, intern. congr., Rio de Janeiro, Brazil. (J. A. Cabello, Parque Melitón Porras 161, Miraflores, Lima, Peru)

10-11. Man-Machine Competition, mtg., Seattle, Wash. (Inst. of the Aerospace Sciences, 2 E. 64 St., New York 21, N.Y.)

10-18. Poultry, intern. congr., Sydney, Australia. (World's Poultry Science Assoc., 674 W. Lane Ave., Columbus 10, Ohio)

11-13. International Mathematical Union, genl. congr., Saltsjöbaden, Sweden. (R. Thorn, Intern. Congr. of Mathematicians, c/o Kungl. Järnvägsstyrelsen, Stockholm C, Sweden)

12-16. American Veterinary Medical Assoc., Miami Beach, Fla. (H. E. Kingman, Jr., AVMA, 600 S. Michigan Ave., Chicago, Ill.)

13-16. Biological Problems in Water Pollution, seminar—Effects of Radioactivity on Aquatic Environment, Concentration of Radioactive Materials and Suggested Safe Limits, symp., Cincinnati, Ohio. (C. M. Tarzwell, Taft Sanitary Engineering Center, 4676 Columbia Pkwy., Cincinnati 26)

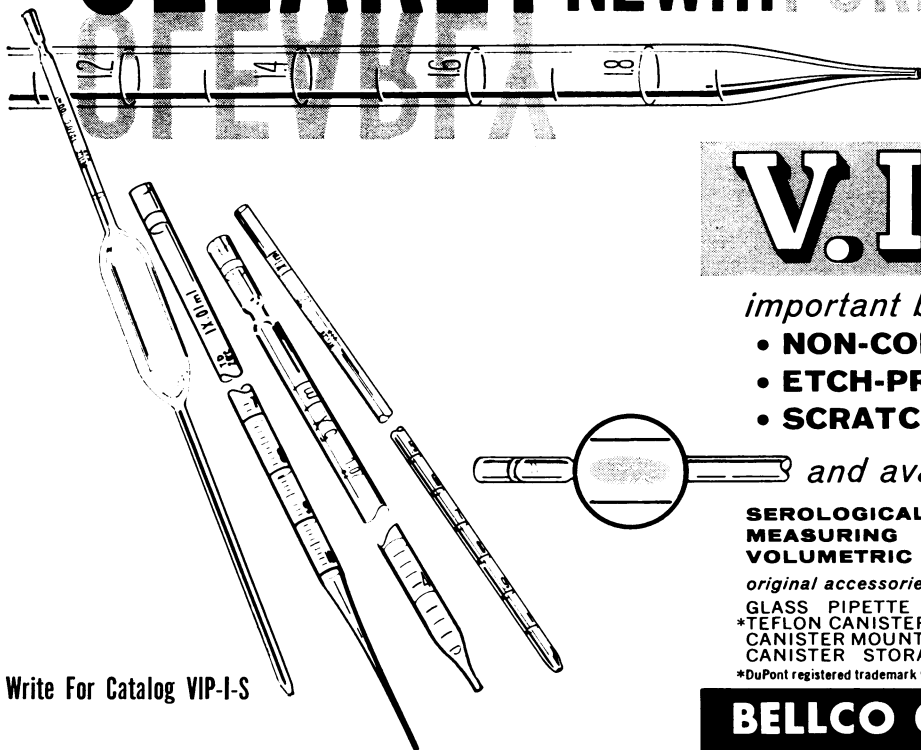
13-16. Pacific Energy Conversion Conf., San Francisco, Calif. (R. S. Gardner, Amer. Inst. of Electrical Engineers, 33 W. 39 St., New York 18, N.Y.)

13-17. Antarctic Logistics, symp., Boulder, Colo. (invitation only). (Natl. Acad. of Sciences, 2101 Constitution Ave., NW, Washington 25, D.C.)

13-17. Clay Minerals, annual conf.,

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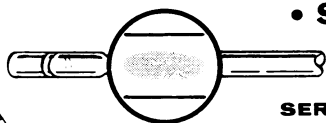


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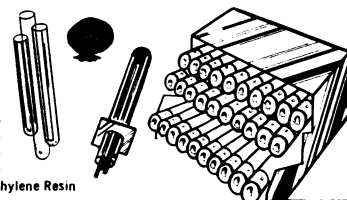
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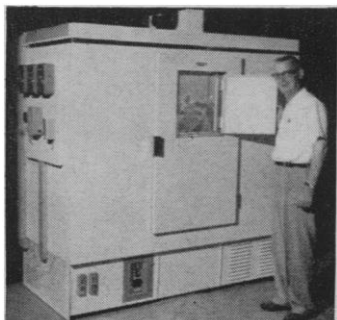
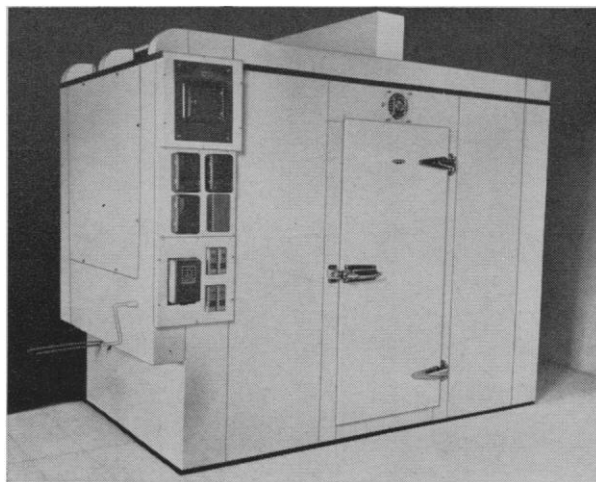
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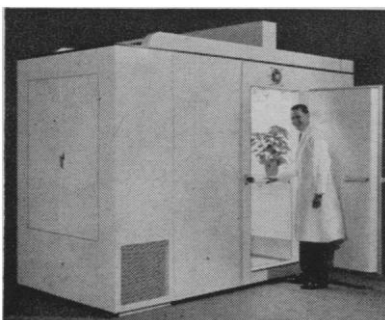
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Ottawa, Ont., Canada. (D. Hunka, Natl. Research Council, Ottawa)

13-17. Lunar Exploration, intern. conf., Blacksburg, Va. (J. B. Eades, Jr., Dept. of Aerospace Engineering, Virginia Polytechnic Inst., Blacksburg)

14-16. Cryogenic Engineering, annual conf., Los Angeles, Calif. (K. D. Timmerhaus, Chemical Engineering Dept., Univ. of Colorado, Boulder)

14-16. Precision Electromagnetic Measurements, intern. conf., Boulder, Colo. (J. F. Brockman, Natl. Bureau of Standards, Boulder)

15-17. Electronic Packaging, annual symp., Boulder, Colo. (A. Brown, 352 Chemistry Bldg., Univ. of Colorado, Boulder)

15-22. Mathematics, intern. congr., Stockholm, Sweden. (B. Eckman, Intern. Mathematical Union, c/o Ecole Polytechnique Fédérale, Zurich, Switzerland)

16-18. Communications Technology, seminar, San Diego, Calif. (R. C. Cannon, California Western Univ., 3902 Lomaland Dr., San Diego 6)

16-18. Food Microbiology, intern. symp., Montreal, Canada (by invitation). (D. A. A. Mossel, c/o Central Inst. for Nutrition Research, Catharijnesingel 61, Utrecht, Netherlands)

17-24. International Soc. for Human and Animal Mycology, congr., Montreal, Canada. (R. Vanbreuseghem, Institut de Médecine Tropicale, 155 rue Nationale, Antwerp, Belgium)

19-22. American Soc. of Animal Science, Corvallis, Ore. (C. E. Terrill, Animal

Husbandry Research Div., Agricultural Research Center, Beltsville, Md.)

19-23. Conservation Education Assoc., annual, Stevens Point, Wis. (O. C. Sand, 17715 Westview Dr., New Berlin, Wis.)

19-23. Health, annual conf. and exhibit, University Park, Pa. (M. Cashman, Pennsylvania Dept. of Health, P.O. Box 90, Harrisburg)

19-25. Microbiology, intern. congr., Montreal, Canada. (N. E. Gibbons, Natl. Research Council, Ottawa 2, Ont., Canada)

19-26. Image Formation and Vision, intern. conf., Munich, Germany. (H. Schober, Intern. Commission for Optics, München 19, Arnulfstr. 205, AEC-Haus, Germany)

19-31. International Union of Geodesy and Geophysics, general assembly, Berkeley, Calif. (American Geophysical Union, 1515 Massachusetts Ave., NW, Washington 5, D.C.)

20-22. Progress in Nuclear Science and Engineering Education, conf., Gatlinburg, Tenn. (University Relations Div., Oak Ridge Inst. of Nuclear Studies, P.O. Box 117, Oak Ridge, Tenn.)

20-23. American Soc. of Agonomy, annual, Ithaca, N.Y. (ASA, 2702 Monroe St., Madison 5, Wis.)

20-23. Problems of Gyroscopy, symp., Celerina, Upper Engadine, Switzerland. (H. Ziegler, Comité Scientifique, UITAM, École Polytechnique Fédérale, Zurich, Switzerland)

20-24. Chemistry Congr., Abo, Finland. (E. Wänninen, Turun Yliopiston Kemian Laitos Vattenborgsvägen 5, Abo 2)

20-24. Scientific Committee on Antarctic Research, mtg., Boulder, Colo. (by invitation). (Natl. Acad. of Sciences-Natl. Research Council, 2101 Constitution Ave., NW, Washington 25, D.C.)

20-24. Soil Science Soc. of America, annual, Ithaca, N.Y. (M. Stelly, American Soc. of Agronomy, 2702 Monroe St., Madison 5, Wis.)

20-24. Structural Design of Asphalt Pavements, intern. conf., Ann Arbor, Mich. (W. K. Parr, Box 619, Univ. of Michigan, Ann Arbor)

20-25. American Soc. of Limnology and Oceanography, Madison, Wis. (G. H. Lauff, Dept. of Zoology, Univ. of Michigan, Ann Arbor)

20-25. Limnology, intern. congr., Madison, Wis. (J. C. Wright, Birge Hall, Univ. of Wisconsin, Madison 6)

21-24. Electronics, exhibit and convention, Los Angeles, Calif. (Technical Program Chairman, WESCON Business Office, 1435 S. La Cienega Blvd., Los Angeles 35)

21-24. Far Infrared Spectroscopy, intern. symp., Cincinnati, Ohio. (Office of Information, Wright Air Development Div., Wright-Patterson Air Force Base, Ohio)

21-24. Fracture in Crystalline Solids, intern. conf., Maple Valley, Wash. (Amer. Inst. of Mining, Metallurgical and Petroleum Engineers, 345 E. 47 St., New York 17, N.Y.)

21-25. International Inst. of Refrigeration, commissions mtg., Washington, D.C. (W. Pentzer, National Research Council, 2101 Constitution Ave., Washington 25)

21-25. International Scientific Committee for Trypanosomiasis Research, mtg., Dalaba, Guinea, Africa. (Commission for Technical Cooperation in Africa South of the Sahara, Private Mail Bag 2359, Lagos, Nigeria, Africa)

21-28. Acoustics, intern. congr., Copenhagen, Denmark. (F. H. B. Interslav, Tekniske Højskole, Østervoldgade 10, Copenhagen)

21-6. Pan American Sanitary Conf., Minneapolis, Minn. (Pan American Sanitary Bureau, 1501 New Hampshire Ave., NW, Washington 6, D.C.)

22-23. International Commission on Radiological Units and Measurements, mtg., Montreal, Canada (members only). (H. O. Wyckoff, X-ray Section, Natl. Bureau of Standards, Washington 25, D.C.)

22-24. Calorimetry, annual conf., Berkeley, Calif. (J. A. Morrison, Div. of Pure Chemistry, Natl. Research Council, Ottawa, Ont., Canada)

22-24. X-ray Optics and Microanalysis, intern. conf., Stanford, Calif. (L. Zeitz, Biophysics Laboratory, Stanford Univ., Stanford)

22-25. Neurology Congr., Oslo, Norway. (S. Rufsum, Rikshospitalet, Oslo)

22-26. American Assoc. for the Advancement of Science, Alaska Div., Juneau, Alaska. (A. Sosnkowski, Alaska State Museum, Box 2051, Juneau)

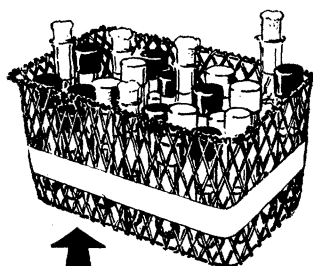
23-24. Thin Films Conf., Denver, Colo. (R. B. Feagin, Univ. of Denver Research Inst., Denver 10)

23-25. Obstetrics and Gynecology, congr., Copenhagen, Denmark. (P. Lange, Eivindsvej 36 Chl., Copenhagen)

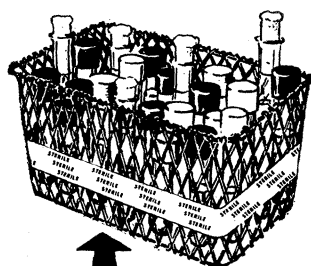
23-26. International Union of the History and Philosophy of Science, Philos-

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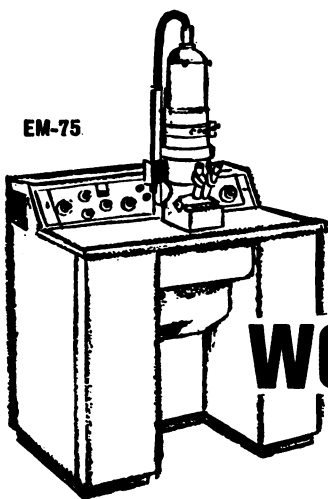
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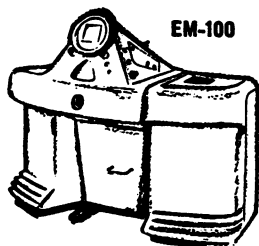


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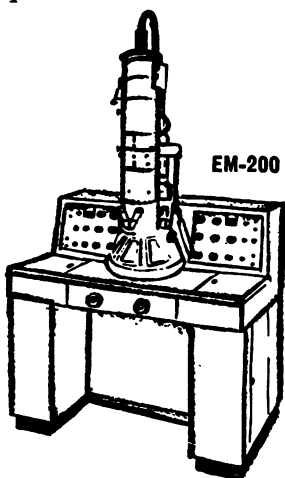
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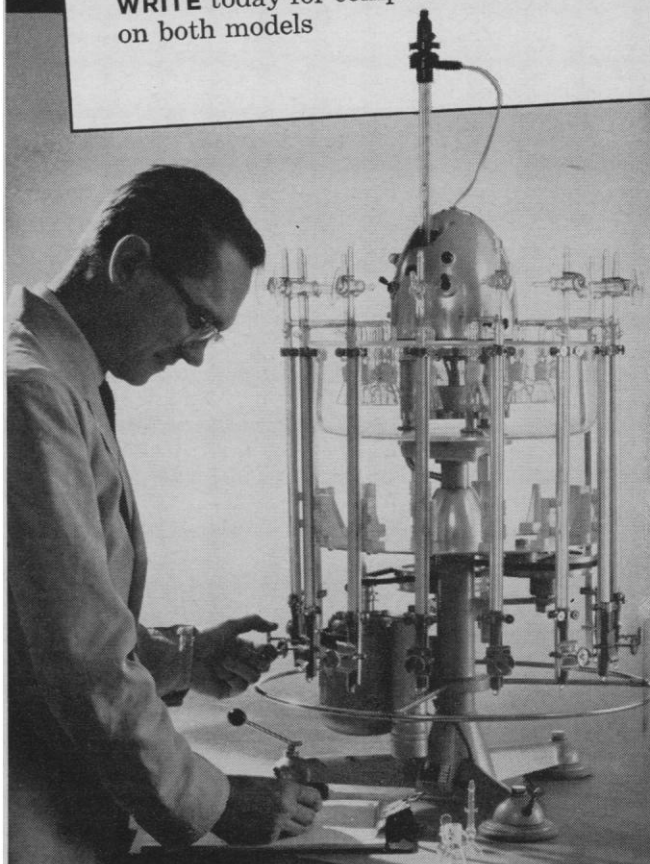
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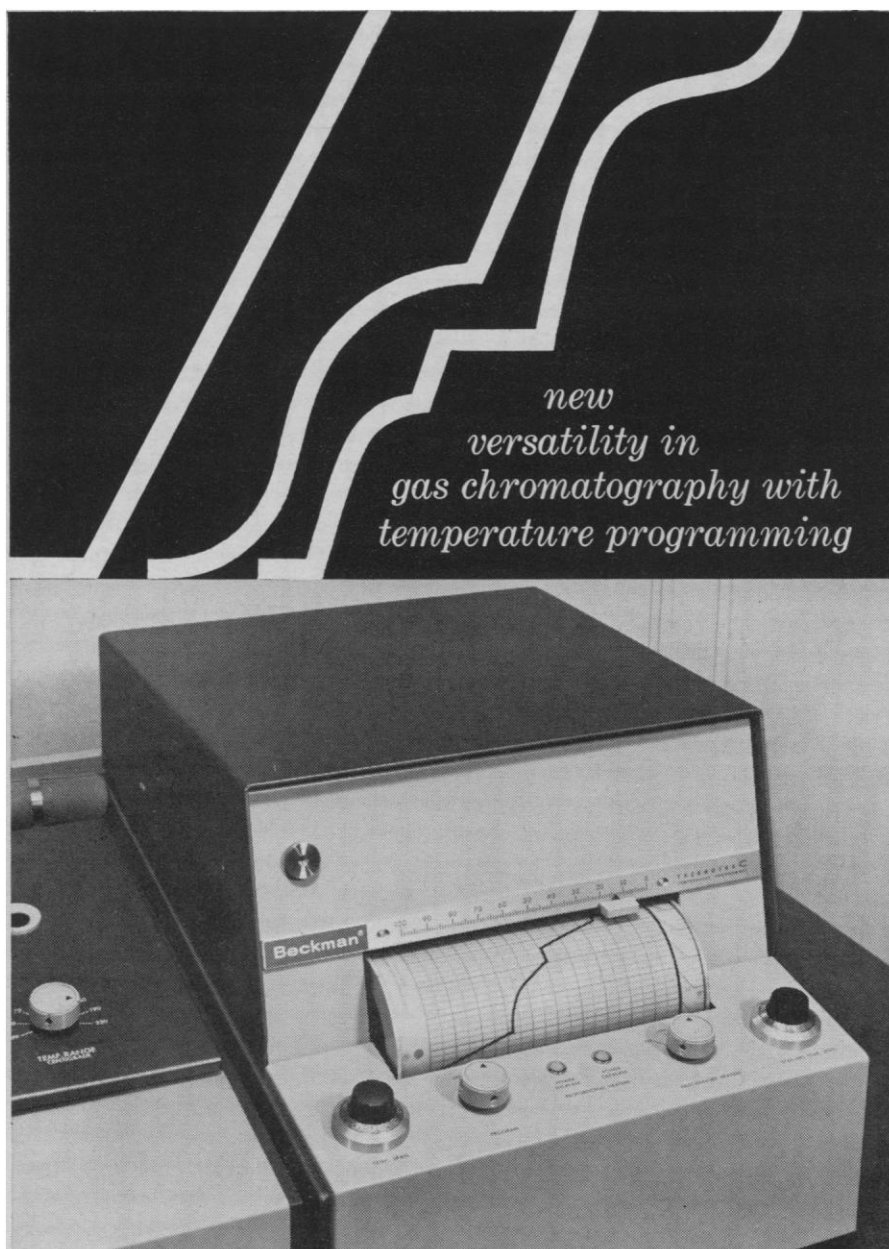
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ophy Div., genl. assembly, Helsinki, Finland. (R. Taton, 64 rue Gay-Lussac, Paris 5^e, France)

24-25. Friends of the Pleistocene, Rocky Mountain section, annual field trip, Twin Falls, Idaho. (H. E. Malde, U.S. Geological Survey, Federal Center, Denver, Colo.)

24-31. Child Psychiatry, intern. congr., Scheveningen, Netherlands. (Secretary, c/o Holland Organizing Center, Lange Voorhout 16, The Hague, Netherlands)

24-25. Plant Phenolics Group of North America, annual, Corvallis, Ore. (V. C. Runeckles, Imperial Tobacco Co. of Canada, P.O. Box 6500, Montreal, Quebec, Canada)

24-1. Surveying, intern. congr., Vienna, Austria. (A. Barvir, Intern. Federation of Surveyors, Krotenthallergasse 3, Vienna 8)

24-2. International Pharmaceutical Students' Federation, congr., Barcelona, Spain. (A. Damen, IPSF, Spaargarenstraat 26, Oegstegeest-Leiden, Netherlands)

25-26. International Chiropractors Assoc., annual, Davenport, Iowa. (G. R. Price, 741 Brady St., Davenport)

25-31. Environmental Control of Plant Growth, intern. symp., Canberra, Australia. (L. T. Evans, C.S.I.R.O., Div. of Plant Industry, P.O. Box 109, Canberra City, A.C.T., Australia)

26. American Assoc. of Electromyography and Electrodiagnosis, annual, New York, N.Y. (M. K. Newman, 16861 Wyoming Ave., Detroit 21, Mich.)

26-29. American Inst. of Chemical Engineers, natl. mtg., Denver, Colo. (F. H. Poettmann, Ohio Oil Co., P.O. Box 269, Littleton, Colo.)

26-29. Soil Conservation Soc. of America, Washington, D.C. (H. W. Pritchard, 838 Fifth Ave., Des Moines 14, Iowa)

26-31. American Inst. of Biological Sciences—American Assoc. for the Advancement of Science, Pacific Div., Corvallis, Ore. (AIBS, 2000 P St., NW, Washington 6, D.C.)

The following 27 meetings are being held under AIBS auspices during the annual meeting in Corvallis:

American Bryological Soc. (R. O. Belkengren, Dept. of Botany & Plant Pathology, Oregon State Univ., Corvallis)

American Fern Soc. (L. Dennis, Dept. of Botany & Plant Pathology, Oregon State Univ., Corvallis)

American Fisheries Soc. (J. H. Wales, Fish & Game Management, Oregon State Univ., Corvallis)

American Microscopical Soc. (H. K. Phinney, Dept. of Botany & Plant Pathology, Oregon State Univ., Corvallis)

American Phytopathological Soc. (E. K. Vaughan, Dept. of Botany & Plant Pathology, Oregon State Univ., Corvallis)

American Soc. for Horticultural Science. (S. B. Apple, Jr., Dept. of Horticulture, Oregon State Univ., Corvallis)

American Soc. of Human Genetics. (J. D. Mohler, Dept. of Zoology, Oregon State Univ., Corvallis)

American Soc. of Limnology & Oceanography. (J. Pattullo, Dept. of Oceanography, Oregon State Univ., Corvallis)

American Soc. of Plant Physiologists. (H. J. Evans, Dept. of Botany & Plant Pathology, Oregon State Univ., Corvallis)

American Soc. of Plant Taxonomists. (K. L. Chambers, Dept. of Botany & Plant

SCIENCE, VOL. 136

Pathology, Oregon State Univ., Corvallis)
American Soc. of Zoologists. (A. W. Pritchard, Dept. of Zoology, Oregon State Univ., Corvallis)

Biometric Soc. (L. D. Calvin, Statistical Laboratory, Oregon State Univ., Corvallis)

Botanical Soc. of America. (L. E. Jones, Dept. of Botany and Plant Pathology, Oregon State Univ., Corvallis)

Ecological Soc. of America. (W. W. Chilcote, Dept. of Botany & Plant Pathology, Oregon State Univ., Corvallis)

Genetics Soc. of America. (R. Bogart, Dept. of Dairy & Animal Husbandry, Oregon State Univ., Corvallis)

Mycological Soc. of America. (C. M. Leach, Dept. of Botany & Plant Pathology, Oregon State Univ., Corvallis)

National Assoc. of Biology Teachers. (S. E. Williamson, Dept. of Science Education, Oregon State Univ., Corvallis)

Nature Conservancy. (R. M. Storm, Dept. of Zoology, Oregon State Univ., Corvallis)

Phi Sigma Soc. (W. H. Brandt, Dept. of Botany & Plant Pathology, Oregon State Univ., Corvallis)

Phycological Soc. of America. (H. K. Phinney, Dept. of Botany & Plant Pathology, Oregon State Univ., Corvallis)

Plant Phenolics Group of America. (H. Aft, Forest Products Laboratory, Oregon State Univ., Corvallis)

Society for Industrial Microbiology. (R. Bogart, Dept. of Dairy and Animal Husbandry, Oregon State Univ., Corvallis)

Society for the Study of Evolution, (W. F. Stephen, Dept. of Entomology, Oregon State Univ., Corvallis)

Society for the Study of Development and Growth. (A. W. Pritchard, Dept. of Zoology, Oregon State Univ., Corvallis)

Society of General Physiologists. (E. J. Dornfeld, Dept. of Zoology, Oregon State Univ., Corvallis)

Society of Protozoologists. (S. E. Knapp, Dept. of Veterinary Medicine, Oregon State Univ., Corvallis)

Tomato Genetics Cooperative. (W. A. Frazier, Dept. of Horticulture, Oregon State Univ., Corvallis)

The following nine meetings are being held under AAAS auspices during the annual meeting of the Pacific Division:

American Meteorological Soc. (L. D. Calvin, Statistical Laboratory, Oregon State Univ., Corvallis)

American Nature Study Soc. (R. E. Storm, Dept. of Zoology, Oregon State Univ., Corvallis)

American Soc. of Ichthyologists & Herpetologists, Western Div. (R. E. Storm, Dept. of Zoology, Oregon State Univ., Corvallis)

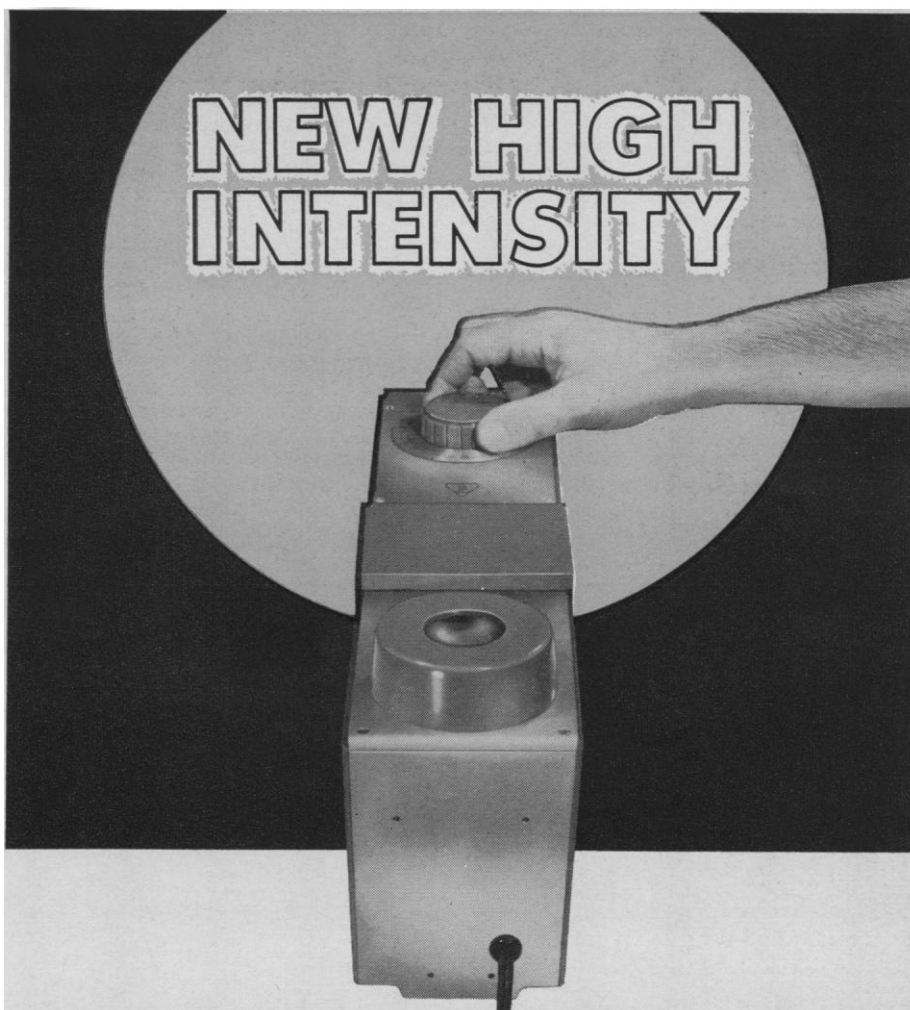
American Soc. of Limnology & Oceanography, Pacific Div. (J. Pattullo, Dept. of Oceanography, Oregon State Univ., Corvallis)

Institute of Food Technologists. (C. E. Samuels, Dept. of Food & Dairy Technology, Oregon State Univ., Corvallis)

Oregon Acad. of Science. (F. A. Gillfillan, Dean of Sciences, Oregon State Univ., Corvallis)

Oregon Marine Biological Soc. (J. H. Wilson, Public Health Service, Portland, Ore.)

Society of Systematic Zoology. (J. D. Lattin, Dept. of Entomology, Oregon State Univ., Corvallis)



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Western Soc. of Soil Science. (T. L. Jackson, Dept. of Soils, Oregon State Univ., Corvallis)

26-31. International Commission for Uniform Methods of Sugar Analysis, session, Berlin, Germany. (F. Schneider, Langer Kamp 5, Braunschweig, Germany)

26-1. International Federation of Information Processing Societies, annual, Munich, Germany. (I. L. Auerbach, Auerbach Electronics Corp., 1634 Arch St., Philadelphia 3, Pa.)

26-1. Radiology, intern. congr., Montreal, Canada. (C. B. Peirce, Suite 204, 1555 Summerhill Ave., Montreal 25)

26-2. History of Science, intern. congr., Ithaca, N.Y. (26-31 Aug.), and Philadelphia, Pa. (31 Aug.-2 Sept.). (Secretary, Intern. Congr. of the History of Science, Cornell Univ., Ithaca)

27-28. Culture Collections, specialists'

conf., Ottawa, Ont., Canada (by invitation). (S. M. Martin, Div. of Applied Biology, National Research Council, Ottawa 2)

27-28. Scandinavian Neurosurgical Soc., annual, Odense, Denmark. (B. Broager, Neurokirurgisk Afdeling, Bispebjerg Hospital, Copenhagen, Denmark)

27-29. American Physical Soc., Seattle, Wash. (H. A. Shugart, Univ. of California, Berkeley 4)

27-29. Ballistic Missile and Space Technology, symp., Los Angeles, Calif. (C. T. Morrow, Aerospace Corp., P.O. Box 95085, Los Angeles 45)

27-29. Mathematical Assoc. of America, summer mtg., Vancouver, B.C. (H. L. Alder, MAA, Dept. of Mathematics, Univ. of California, Davis)

27-29. Metallurgy of Semiconductor Materials, conf., Philadelphia, Pa. (Amer. Inst. of Mining, Metallurgical, and Petro-

leum Engineers, 345 E. 47 St., New York 17, N.Y.)

27-30. American Assoc. of Clinical Chemists, Santa Monica, Calif. (G. F. Lanchantin, Cedars of Lebanon Hosp., Los Angeles, Calif.)

27-30. American Astronomical Soc., New Haven, Conn. (H. J. Smith, Yale Observatory, 135 Prospect St., New Haven)

27-30. American Soc. for Pharmacology and Experimental Therapeutics, Nashville, Tenn. (H. G. Mandel, George Washington Univ. School of Medicine, 1337 H St., NW, Washington 5, D.C.)

27-30. British Orthopaedic Assoc.-Scandinavian Orthopedic Assoc., Copenhagen, Denmark. (A. Monberg, Orthopedic Service, St. Joseph Hospital, Copenhagen)

27-31. American Congr. of Physical Medicine and Rehabilitation, annual, New York, N.Y. (G. Gullickson, Jr., 30 N. Michigan Ave., Chicago 2, Ill.)

27-31. Space Technology and Science, intern. symp., Tokyo, Japan. (F. Tamaki, Inst. of Industrial Science, Univ. of Tokyo, Shin-Ryudo-cho 10, Minato-ku, Tokyo)

27-1. Application of Automatic Control in Prosthetics Design, intern. symp., Opatija, Yugoslavia. (Yugoslav Committee for Electronics and Automation, Terazije 23, Belgrade)

27-1. Combustion, intern. symp., Ithaca, N.Y. (Combustion Symp. Office, Upson Hall, Sibley School of Mechanical Engineering, Cornell Univ., Ithaca)

27-1. International Assoc. of Logopedics and Phoniatrics, annual, Padua, Italy. (C. Croatto-Martinolli, Via Bergamo 10, Padua)

27-1. International Council of the Aeronautical Sciences, congr., Stockholm, Sweden. (Mr. Bergquist, Flugtechniska Föreningen, Bromma 11, Stockholm)

27-2. Chemistry of Natural Products, intern. symp., Prague, Czechoslovakia. (Symposium Secretariat, P.O. Box 159, Prague 6, Dejvice)

27-8. International Dairy Federation, annual, Copenhagen, Denmark. (IDF, 10 rue Ortélius, Brussels 4, Belgium)

28-31. American Physiological Soc., Buffalo, N.Y. (R. G. Daggs, APS, 9650 Wisconsin Ave., Washington 14, D.C.)

28-31. Catholic Intern. Federation of Hospital Institutions, congr., Evian, France. (A. A. M. Sanders, Carel van Bylandtlaan 8, The Hague, Netherlands)

29-31. Association for Computing Machinery, natl. mtg., Syracuse, N.Y. (J. Moshman, Council for Economic & Industry Research, 1200 Jefferson Davis Hwy., Arlington 2, Va.)

29-2. American Sociological Assoc., Washington, D.C. (T. Parsons, Emerson Hall, Cambridge 38, Mass.)

29-3. Prehistoric and Protohistoric Sciences, intern. congr., Rome, Italy. (L. Cardini, c/o Museo Preistorico L. Pigorini, Via del Collegio Romano 26, Rome)

29-4. International Assoc. of Logopedics and Phoniatrics, congr., Padua, Italy. (C. Martinolli, IALP, Via Bergamo 10, Padua)

29-5. British Assoc. for the Advancement of Science, annual, Manchester, England. (BAAS, 3 Sanctuary Buildings, Great Smigh St., London, S.W.1, England)

29-5. Electron Microscopy, intern. congr., Philadelphia, Pa. (Congress on



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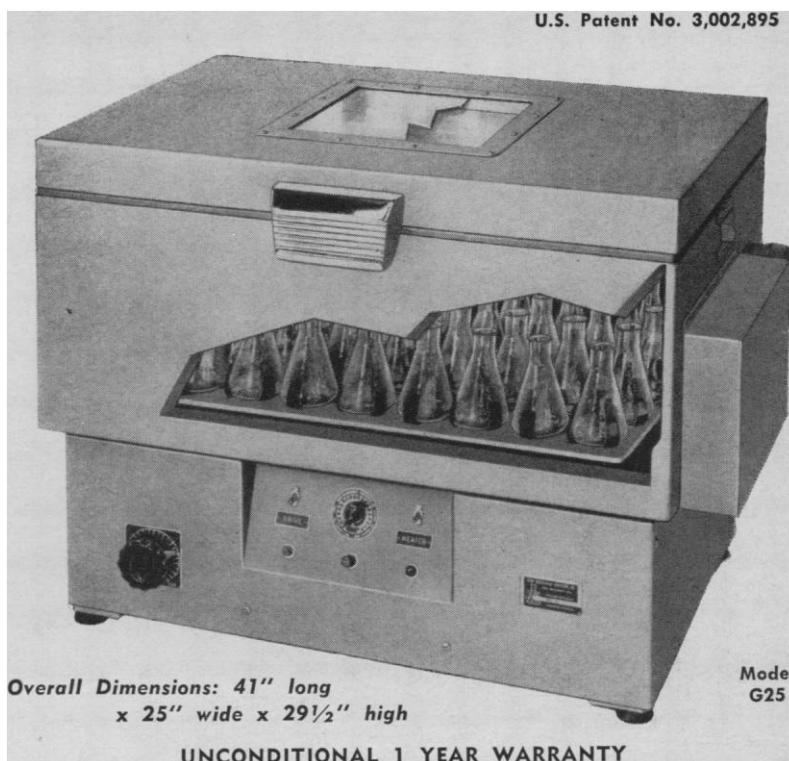
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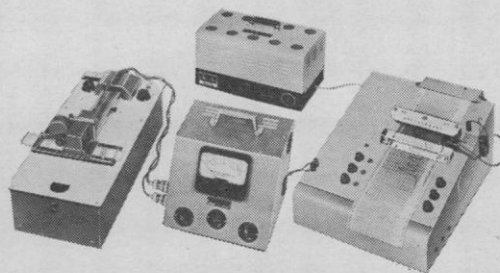
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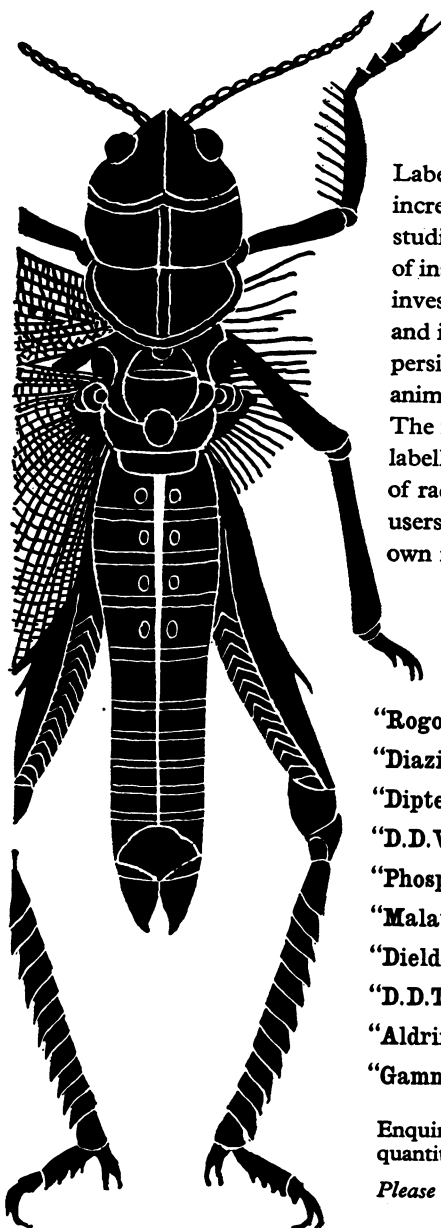
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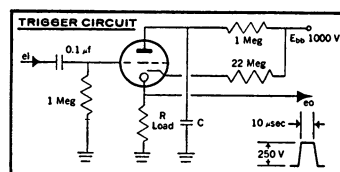
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30. Alpha Epsilon Delta, Lafayette, Ind. (M. L. Moore, 7 Brookside Circle, Bronxville, N.Y.)

30-2. World Acad. of Art and Science, 1st plenary mtg., Brussels, Belgium. (H. Boyko, WAAS, 1 Ruppig St., P.O. Box 534, Rehovot, Israel)

30-5. Photo Interpretation, symp., Delft, Netherlands. (Secretariat, Commission VII, Intern. Training Center for Aerial Survey, Kanaalweg 3, Delft)

31-8. Horticulture, intern. congr., Brussels, Belgium. (General Secretariat, Intern. Soc. for Horticultural Science, 233 Coupure Links, Ghent, Belgium)

September

1-3. Astronomical League, Albuquerque, N.M. (H. C. Sehested, 3223 Westcliff Rd. W., Fort Worth, Tex.)

1-7. Wilderness Soc., Mt. McKinley Natl. Park, Alaska. (H. Zahniser, 2144 P St., NW, Washington 7)

2-5. Neuropsychopharmacology, intern. congr., Munich, Germany. (P. Deniker, c/o Hôpital Sainte-Anne, 1 rue Cabanis, Paris 14^e, France)

2-7. AAAS Laurentian Hormone Conf., Quebec, Canada. (G. Pincus, 222 Maple Ave., Shrewsbury, Mass.)

2-7. Information Theory, intern. symp., Brussels, Belgium. (M. Selleslags, Université Libré, 50 Avenue Franklin D. Roosevelt, Brussels)

2-8. Brain Edema, symp., Vienna, Austria. (P. Bailey, c/o NINDB, Institut Bunge, Berchem-Antwerp, Belgium)

2-9. Prophylactic Medicine and Social Hygiene, intern. congr., Bad Aussee, Austria. (E. Berghoff, Piaristengasse 41, Vienna VIII, Austria)

3-5. Psychometric Soc., St. Louis Mo. (W. G. Mollenkopf, Procter & Gamble Co., P.O. Box 599, Cincinnati 1, Ohio)

3-6. Alpine Meteorology, intern. congr., Sauze d'Oux-Sestriere, Italy. (M. Bos-solasco, Società Italiana di Geofisica e Meteorologia, P.O. Box 3145, Genoa, Italy)

3-7. Advanced-Technology Management, natl. conf., Seattle, Wash. (Inst. of Radio Engineers, 1 E. 79 St., New York 21)

3-7. Anesthesiology Congr., Vienna, Austria. (R. Kucher, Postgraduate Medical School, Alserstr. 4, Vienna IX)

3-7. Antarctic Biology, symp., Paris, France. (R. Carrick, c/o Antarctic Div., D.S.I.R., P.O. Box 6022, Wellington, New Zealand)

3-7. Institute of Management Sciences, Dublin, Eire (T. Fabian, c/o *Mathe-matica*, 76 Nassau St., Princeton, N.J.)

3-7. International College of Experimental Phonology, congr., Padua, Italy. (B. Vallancien, 16 rue Spontini, Paris 16^e, France)

3-7. Microwave Tubes, intern. congr., Delft, Netherlands. (Congress Office, P.O. Box 62, Eindhoven, Netherlands)

3-7. Passivity, intern. symp., Toronto, Ont., Canada. (Mr. Cohen, Natl. Research Council of Canada, Ottawa, Canada)

3-7. Transsonicum Symp., Aachen, Germany. (K. Oswatitsch, c/o Institut für

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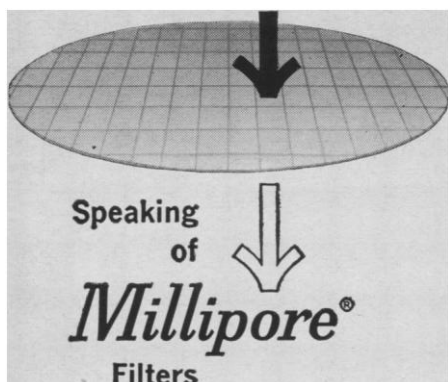
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3-7. Water Pollution Research, intern. conf., London, England. (J. E. Holmstrom, Scientific Conf. Center, Headington Hill Hall, Oxford, England)

3-8. Chemical Machinery, Engineering, and Automation, intern. congr., Brno, Czechoslovakia. (F. Brabec, Czechoslovak Scientific and Technical Soc., Siroka 5, Prague I, Czechoslovakia)

3-8. Corpuscular Photography, intern. symp., Munich, Germany. (H. Fireser, Inst. for Scientific Photography of the Munich Inst. of Technology, Munich)

3-8. Intern. Dairy Federation, intern. congr., Copenhagen, Denmark. (K. Frederiksen, Raadhuspladsen 3, Aarhus, Denmark)

3-8. Neohippocratic Medicine, intern. congr., Montpellier, France; Cos, Greece; and Salerno, Italy. (M. Martiny, 10 rue Alfred-Roll, Paris 17^e, France)

4-7. Association for Computing Machinery, natl. conf. and exhibit, Syracuse, N.Y. (R. S. Jones, Sylvania Electric Products, Inc., Camillus, N.Y.)

4-7. Problems of Exercise Metabolism, intern. seminar, Milan, Italy. (R. Margaria, Inst. of Physiology, Univ. of Milan, Milan)

4-8. Syphilis and Other Treponematoses, intern. forum, Washington, D.C. (W. Griggs, Communicable Diseases Center, U.S. Public Health Service, Atlanta, Ga.)

5-6. Blood Transfusion, intern. seminar, Mexico, D. F., Mexico (Comité Intern. de la Croix-Rouge, Geneva, Switzerland)

5-7. High-Polymer Science, annual forum, Windsor, Ont., Canada. (L. Breiman, Research and Development Div., Polymer Corp. Ltd., Sarnia, Ont.)

5-7. Measurement of Thermal Radiation Properties of Solids, symp., Dayton, Ohio. (C. R. Andrews, Univ. of Dayton, Dayton 9)

5-7. Temperature Acclimation, intern. symp., Leiden, Netherlands. (A. Nixon, Organizing Committee, 9650 Wisconsin Ave., Washington 14)

5-8. American Political Science Assoc., Washington, D.C. (E. M. Kirkpatrick, APSA, 1726 Massachusetts Ave., NW, Washington 6)

5-8. Internal Medicine, intern. congr., Munich, Germany. (H. Ludwig, Buergerhospital, Basel, Switzerland)

5-9. International Soc. of Audiology, congr., Leiden, Netherlands. (A. Spoor, Ear-Nose-Throat Dept., Academisch Ziekenhuis, Leiden)

5-11. International Council for Building Research Studies and Documentation, Cambridge, England. (General Secretariat, c/o Bouwcentrum, 700 Weena, P.O. 299, Rotterdam, Netherlands)

6-7. Honor Soc. of Phi Kappa Phi, Madison, Wis. (L. R. Guild, 3839 Wilshire Blvd., Los Angeles 5, Calif.)

6-7. Problems in Chemistry and Physics of Non-Metallic Solids, symp., Quebec City, P.Q., Canada. (P. A. Giguere, Dept. of Chemistry, Laval Univ., Quebec City)

6-8. Acclimation to Cold and Heat, symp., Leiden, Holland. (Executive Officer, Federation of American Societies for Experimental Biology, 9650 Wisconsin Ave., Washington, D.C.)

6-8. Pacific Slope Biochemical Conf., annual, Seattle, Wash. (P. E. Wilcox, Biochemistry Dept., Univ. of Washington, Seattle 5)

6-8. Parapsychological Assoc., annual, Durham, N.C. (G. R. Schneider, 17 Kent Ave., Hastings-on-Hudson, N.Y.)

6-11. International Soc. of Blood Transfusion, biennial congr., Mexico, D.F., Mexico. (R. Medina, Avenue Chapultepec 522, Mexico 20)

6-16. International Institution for Production Engineering Research, The Hague, Netherlands. (IIPER, 233 Boulevard Raspail, Paris 14^e, France)

7-8. Anthropology, annual conf., Carson City, Nev. (R. Shutler, Jr., Dept. of Archaeology, Nevada State Museum, Carson City)

7-9. International Geographical Union, commission on national atlases, Budapest, Hungary. (K. A. Salishchev, Univ. of Moscow, Moscow, Leninskije Gory, U.S.S.R.)

7-10. American Statistical Assoc., Minneapolis, Minn. (D. C. Riley, ASA, 1757 K St., NW, Washington 6)

7-12. Crystal Lattice Defects, intern. conf., Kyoto, Japan. (R. R. Hasiuti, Univ. of Tokyo, Bunkyo-ku, Tokyo, Japan)

8-11. Institute of Management Sciences, Ann Arbor, Mich. (T. Fabian, c/o Mathematica, 76 Nassau St., Princeton, N.J.)

9-12. Society of Mining Engineers, fall meeting, Gatlinburg, Tenn. (SME, 345 E. 47 St., New York 17)

9-14. American Chemical Soc., natl. meeting, Atlantic City, N.J. (A. T. Windstead, Natl. Meetings Dept., ACS, 1155 Sixteenth St., NW, Washington 6)

9-14. American Congr. on Surveying and Mapping—American Soc. of Photogrammetry, St. Louis, Mo. (Convention Headquarters, ACSM, Box 2731, Souard Station, St. Louis 4)

9-14. Homeopathic Medicine, intern. congr., Bad Godesberg, Germany. (W. Schwarzhaupt, Sachsenring 73, Cologne, Germany)

9-14. Illuminating Engineering Soc., Dallas, Tex. (C. L. Amick, Day Brite Lighting, Inc., P.O. Box 141, St. Louis 66, Mo.)

9-14. International College of Surgeons, biennial, New York, N.Y. (H. E. Turner, 1516 Lake Shore Dr., Chicago 11, Ill.)

9-15. Dermatology, intern. congr., Washington, D.C. (E. D. Osborne, 71 North St., Buffalo, N.Y.)

9-15. International Soc. of Hematology, congr., Mexico, D.F., Mexico (L. Sánchez-Yllades, c/o Instituto de Estudios Médicos y Biológicos, Apartado postal 25228, México 20, D.F.)

9-15. Paediatrics, intern. congr., Lisbon, Portugal. (M. Cordeiro, Clinica Pediatrica Universitaria, Hospital Santa Maria, Avenue 28 de Maio, Lisbon 4)

10-12. Geochemical Soc., organic geochemistry group, Milan, Italy. (U. Colombo, G. Donegani Research Inst., Montecatini Co., Via del Lavoro 4, Novara, Italy)

10-14. Applied Meteorology, natl. conf., Hampton, Va. (D. A. Lea, Navy Weather Research Facility, Naval Air Station, Norfolk 11, Va.)