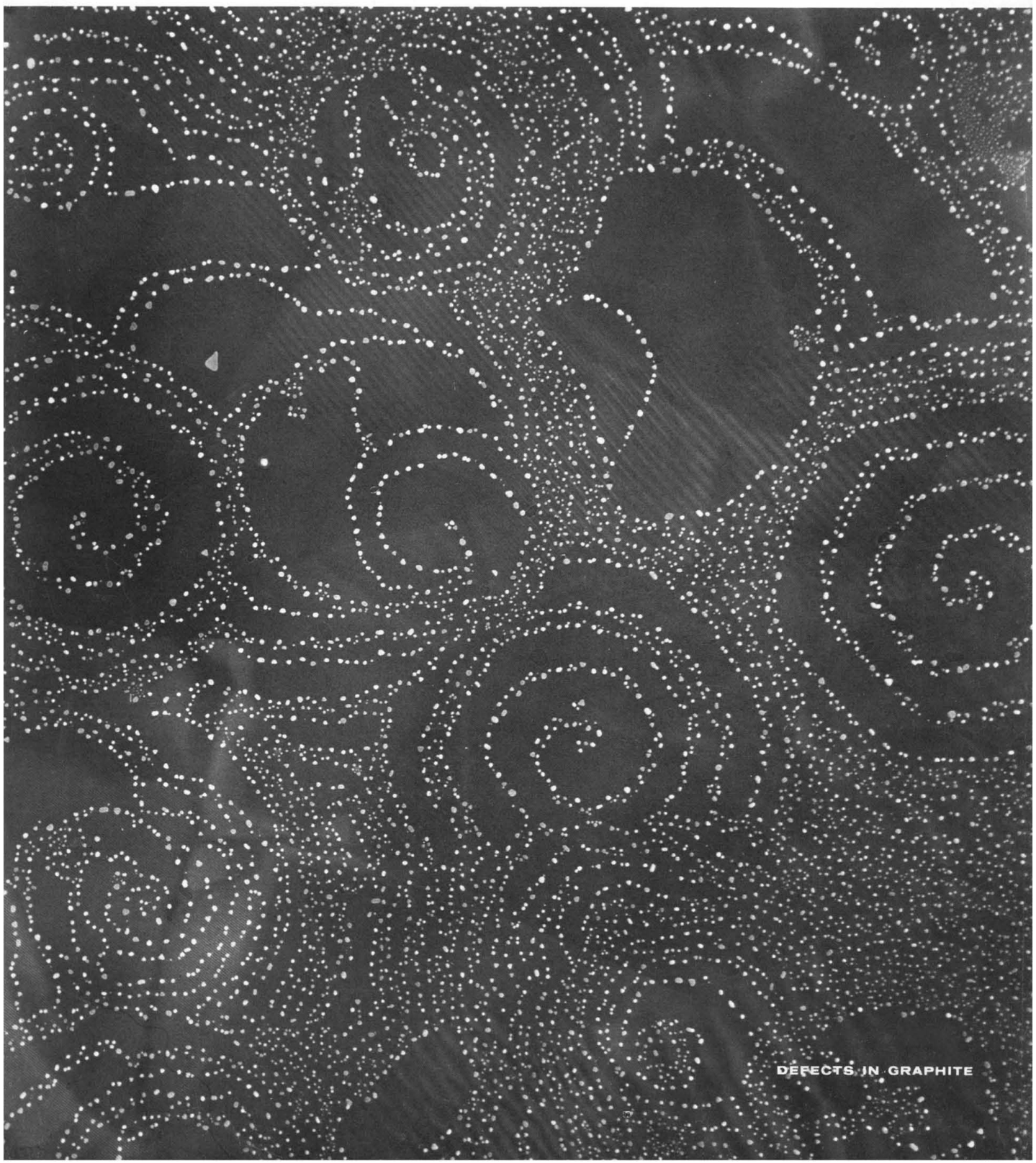
SCIENCE

12 February 1965
Vol. 147, No. 3659

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE



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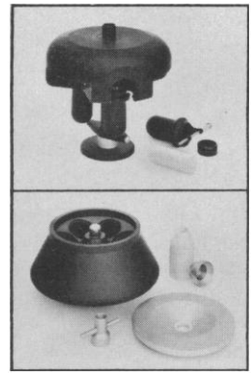

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Vol. 147, No. 3659

SCIENCE

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COVER

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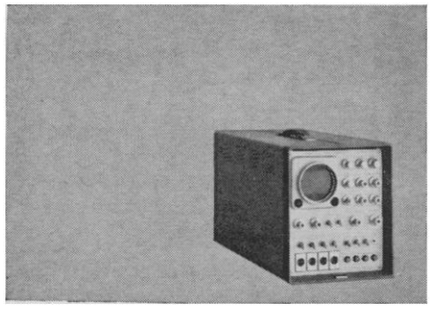

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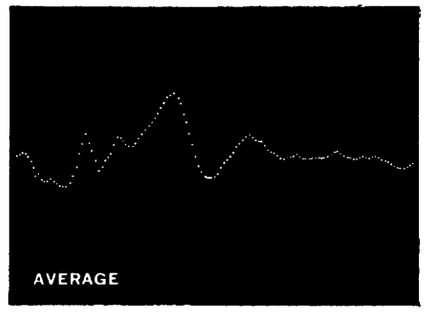

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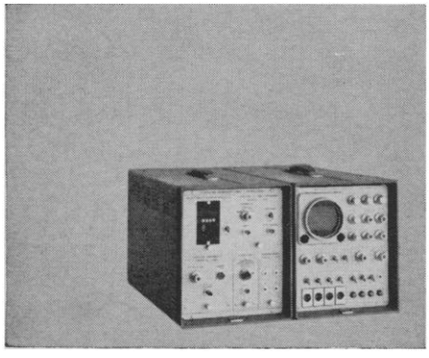

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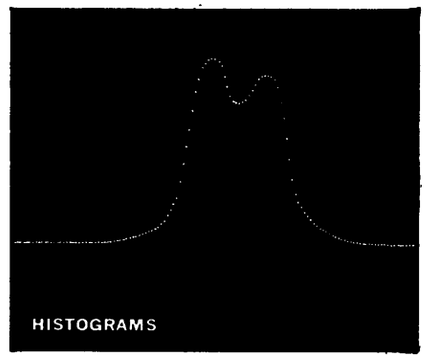

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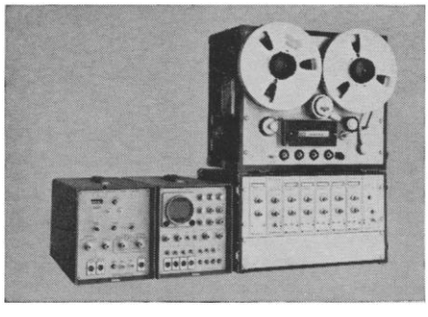

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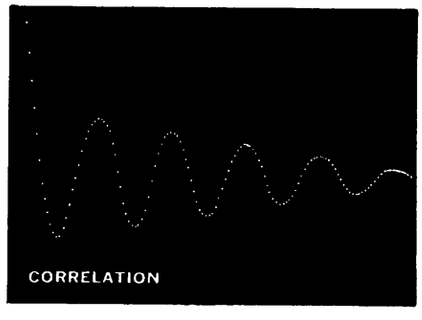

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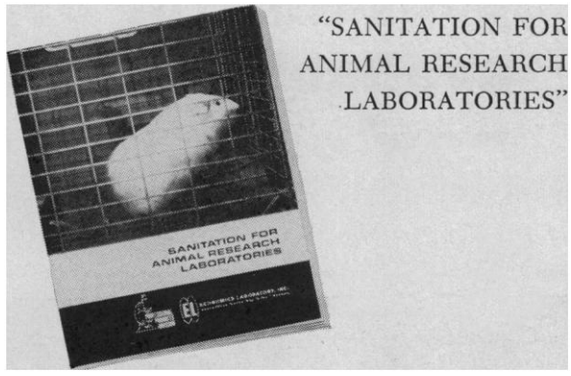

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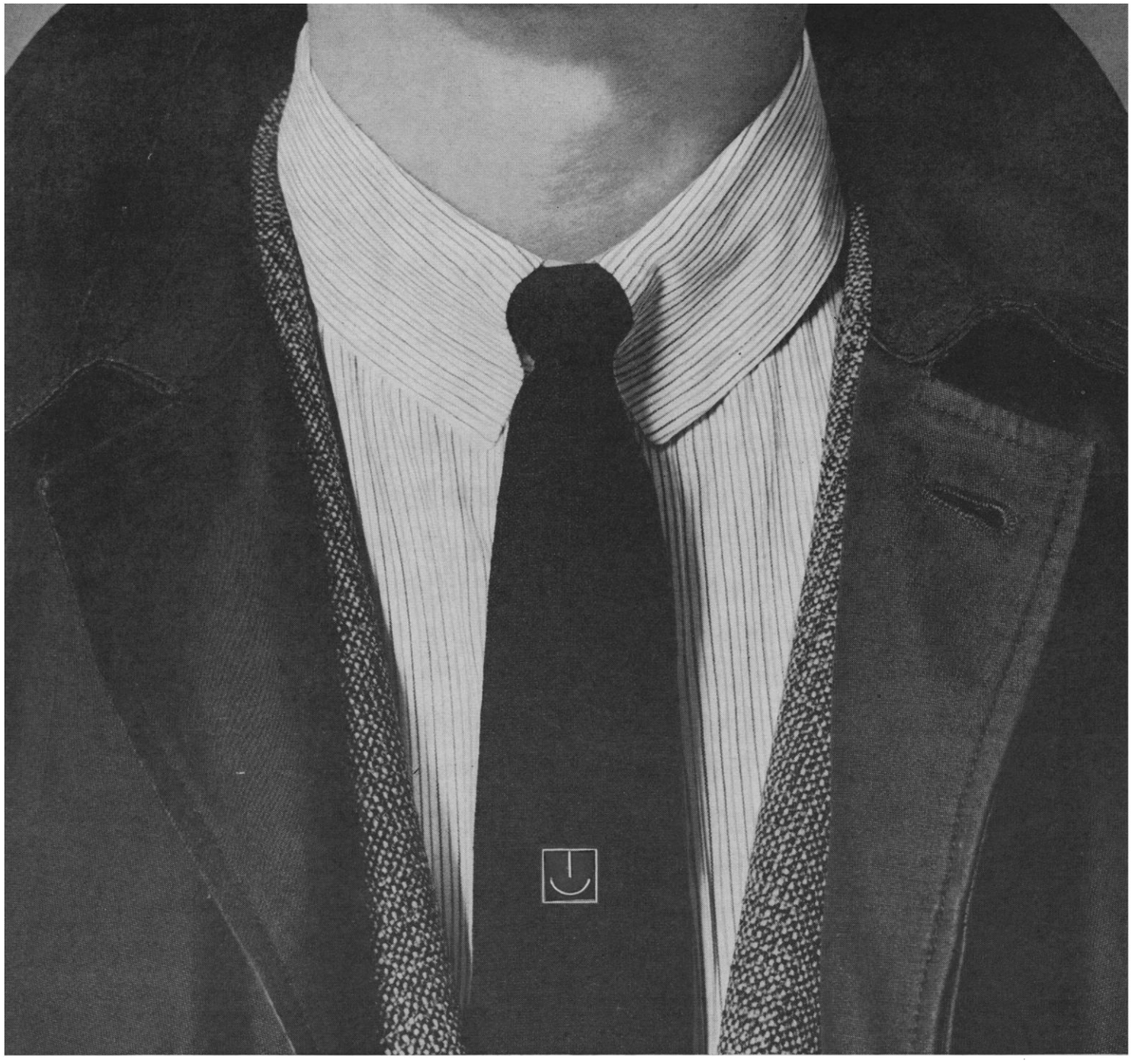

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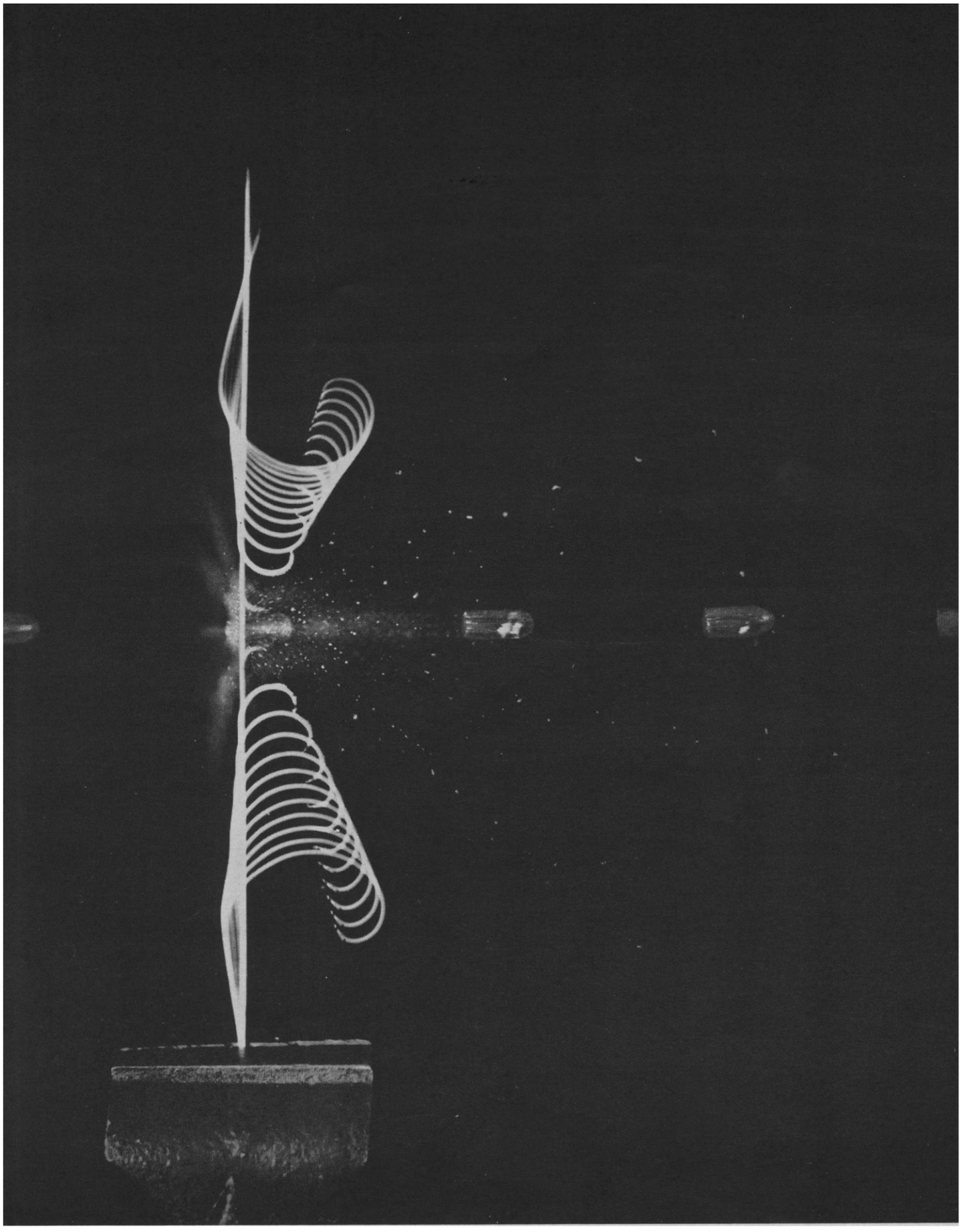

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Neurophysiology Laboratory,
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Boston 15, Massachusetts

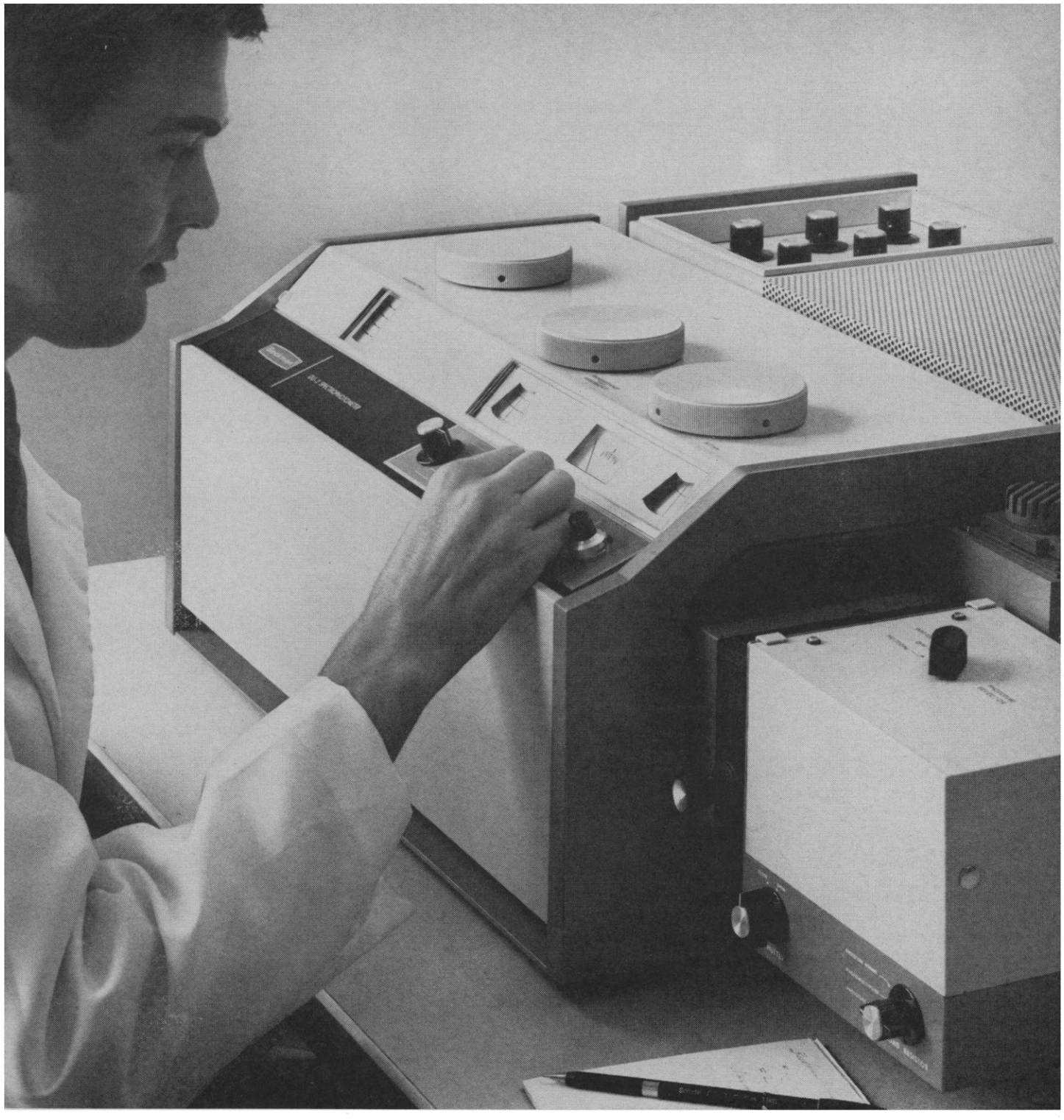
As a form of unselfish, preeminently useful international communication, reprint exchange has few parallels. Commercializing it would benefit few, not even publishers, and would hurt nearly everyone. Aside from the resulting dehumanization, increase in trouble and costs (a check for a 20-cent reprint adds 50 percent to the price), and dampening of the spirit of cooperation, commercialization would hurt those who need reprints most but can afford them least—young graduate students, scientists in areas poorly served by literature sources, and especially scientists in countries where payment problems would greatly restrict the receipt of needed reprints. . . .

FRANK T. MANHEIM
U.S. Geological Survey,
Woods Hole, Massachusetts

Meetings: Do's and Don'ts

The views expressed by Page ("The globe trotters," 20 Nov. 1964, p. 1001) and Wolstenholme ("Obese degeneration of scientific congresses," 16 Sept. 1964, p. 1337) are shared by many scientists. Having attended scientific meetings since 1930, I have noticed their growth in size and their decline in usefulness as a source of information, as a forum for the free exchange of ideas, and as a source of new acquaintances. Prior to World War II, scientific and technological meetings were windows through which one was privileged to view the research and engineering activities of others. Today, not only is the view obscured by the large attendance but also the scene, if one is so fortunate as to get a peek through the window, is identical to that of a similar meeting 6 months or so earlier. It is the purpose of this letter to call attention to one scientific meeting which was planned to stimulate the intellectual curiosity of the scientists and which was a forum at which the scientists had ample opportunities to subject their ideas to critical reviews. This was the Third International Conference on Atmospheric and Space Electricity, held in Montreux, Switzerland, in May 1963.

As chairman, I had no constraints imposed on me. I was given complete freedom to formulate the program and to organize the meeting. Letters were dispatched to all the scientists active in the discipline, inviting them to define what, in their views, were the im-



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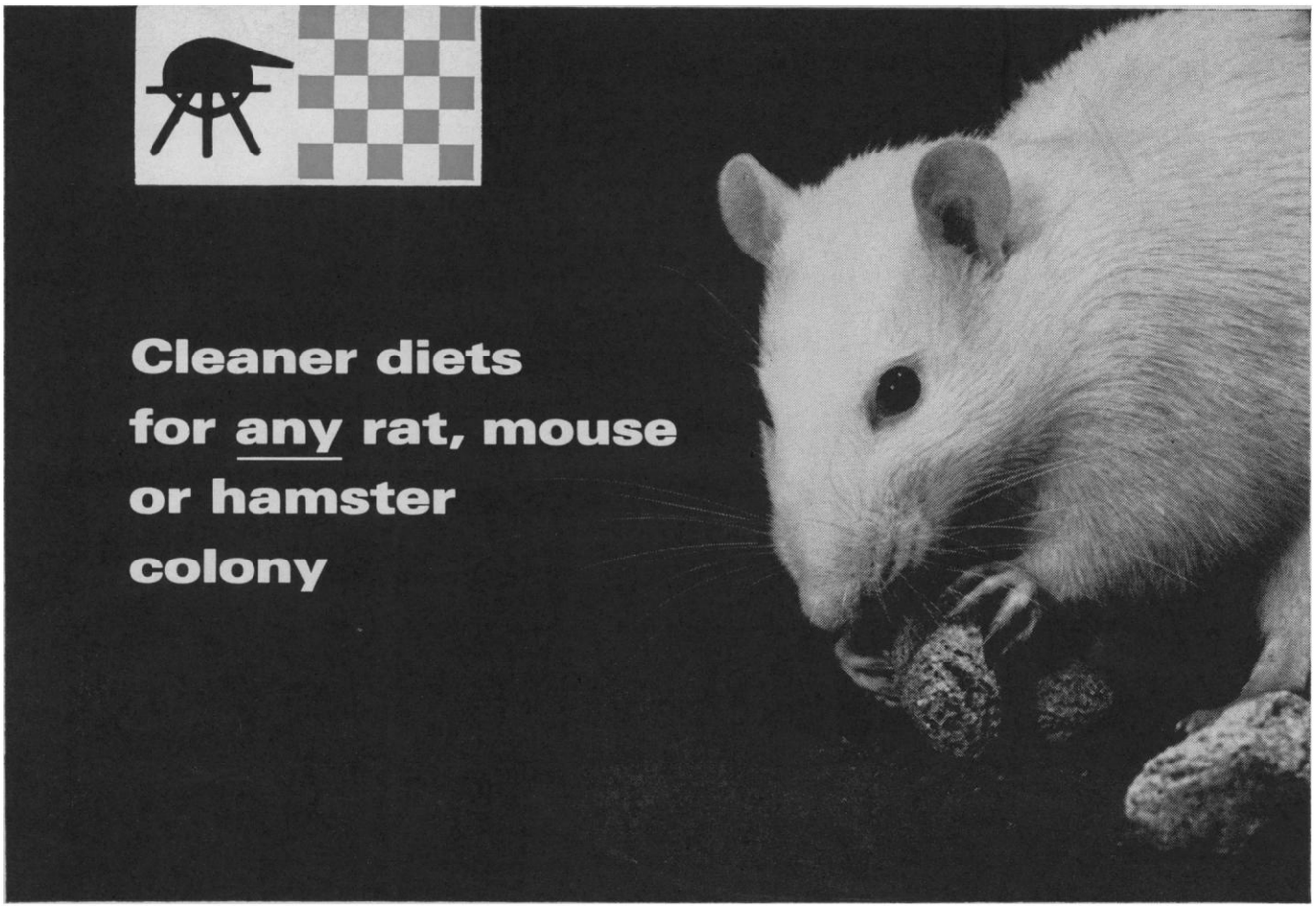
The Martian Environment

The United States is in process of committing itself to an expanded space program. The Space Board of the National Academy of Sciences, which has provided many of the goals of the program, recently stated, "The new goal for the period 1971–1985 should be scientific exploration of Mars. . . . Mars is of great scientific interest first because it offers the best opportunity in our solar system for shedding light on extraterrestrial life. . . ." A search for life on Mars is thus one of the major scientific justifications given for a program that is likely to cost as much as $100 billion during the next two decades.

Our present knowledge of Mars is incomplete, but the facts available provide little basis for thinking that life will be found there. Mars is arid. The total condensable water in a column from the surface of the planet to the top of the atmosphere is about 14 microns (0.00055 inch). White polar caps grow and shrink with the seasons. An average cap thickness of 1 centimeter has been estimated. Considering the small amount to be vaporized and the aridity of the atmosphere, it seems unlikely that liquid water ever exists on the planet. Mars is cold. The average temperature is 230°K. At midday the temperature at the subsolar point can be as high as 298°K, but at night the temperature drops far below freezing, to about 220°K. Recent work indicates a thin atmosphere with a surface pressure of about 25 millibars. In addition to the trace of water, the only constituent known to be present is carbon dioxide (about 5 percent). Oxygen, if present, accounts for no more than about 0.1 percent of the atmosphere. Toxic carbon monoxide, produced by irradiation of CO_2, could be a constituent.

The severity of the Martian environment does not seem to have been realistically taken into account in plans for the exploration of Mars. Exobiologists are very apprehensive lest space probes carry earth-type organisms to Mars. Extensive and expensive precautions are being taken in an effort to guarantee that there be not one chance in 10^4 of a single organism's being carried to the planet. Because of the precautions, many years and billions of dollars could be added to the space program. Before spending large sums on sterilization the space agency should determine whether sterilization is necessary, by encouraging relatively inexpensive studies here on earth. A few laboratory experiments have been performed in so-called Martian environments. Workers have usually failed to control the water content properly and to test the effects of compounds likely to be produced by solar radiation.

In most proposals for detecting life on Mars it is tacitly assumed that life there would be similar to that on earth. Some experiments call for the culturing of possible Martian organisms in media brought from earth. The hypothetical organisms are to be the beneficiaries of an unaccustomed luxurious environment. Two proposed experiments make more sense. In these, gas-liquid chromatography and mass spectrometry would be used. A sample of Martian soil would be pyrolized under controlled conditions, and the off-gases analyzed. By this means compounds suggestive of terrestrial life could be identified. In addition, compounds derived from bizarre forms of life could be observed, as well as unexpected chemicals in the atmosphere and on the surface. In looking for life on Mars we could establish for ourselves the reputation of being the greatest Simple Simons of all time. A few inexpensive experiments to probe the nature of the atmosphere and surface of Mars might save us from considerable eventual disappointment.—PHILIP H. ABELSON



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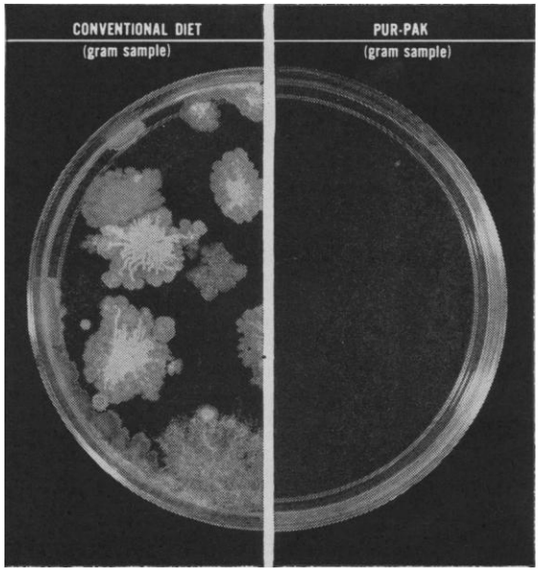

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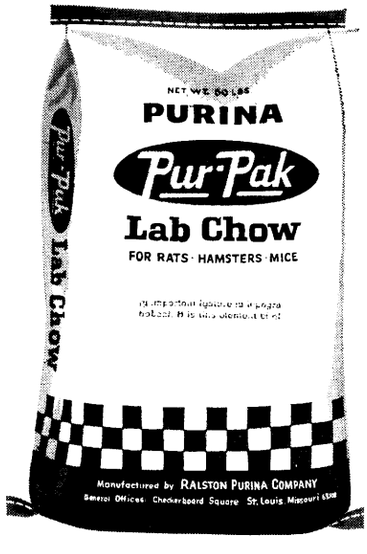

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standardization of tests, measurements, and criteria used in studying cold acclimatization. T. Sasaki (Kumamoto University) analyzed the conflicting data on seasonal variation in basal metabolism. Japanese investigators concur that metabolism is higher in winter than in summer; American investigators report less or no seasonal change. Composition of the diet was shown to play a major role in these differences: as the intake of carbohydrate decreases and that of fat increases, the annual range of metabolism narrows.

As for the planning of cooperative research (the sixth session), the most significant feature of the seminar was the unanimous desire to explore problems identified through joint investigations. It was agreed that bioclimatologists must study the adaptability of living organisms in an ecological context, for the environment of the organism includes much more than the atmosphere. The adaptability of man is the result of biological processes as much as of cultural ones.

Broad areas in which there was deep interest in developing specific joint research proposals included: (i) adaptability of the Ainu of Hokkaido, and (ii) bioclimatological studies of problems in human ecology, such as physiological regulations in various population groups, the impact of changing culture on biological processes, and medical aspects of human ecology (air pollution and seasonal and regional variation of disease). Investigations of comparative animal physiology and of plant environmental physiology will also be invaluable.

F. SARGENT, II
University of Illinois, Urbana

S. ITOH
Hokkaido University School of Medicine, Sapporo, Japan

Forthcoming Events

February

17–19. American Acad. of **Occupational Medicine**, annual, Columbus, Ohio. (G. M. Hemmett, AAOM, Eastman Kodak Co., 343 State Street, Rochester 4, N.Y.)

17–19. **Solid State Circuits**, intern. conf., Inst. of Electrical and Electronics Engineers, Philadelphia, Pa. (R. Emberson, IEEE, Box A, Lenox Hill Station, New York. N.Y. 10021)

17–21. American College of **Cardiology**, annual, Boston, Mass. (Executive Director of the College, Empire State Building, New York, N.Y. 10001)

18–19. Mechanical and Transplant **Heart Substitutes**, symp., Heart Assoc. of Southeastern Pennsylvania, Philadelphia. (L. L. Perry, HASP, 318 S. 19 St., Philadelphia 19103)

18–20. **Skin Bacteria** in Infection, symp., San Francisco, Calif. (Administrative Secretary, Div. of Dermatology, Univ. of California, San Francisco Medical Center, San Francisco 94122)

19–20. **Comparative Psychopathology**—Animal and Human, annual symp., American Psychopathological Assoc., New York, N.Y. (F. J. Kallmann, APA, 722 W. 168 St., New York 10032)

20. **Reliability**, 6th annual West Coast symp., American Soc. for Quality Control, Los Angeles, Calif. (A. S. Golant, Rocketdyne, Canoga Park, Calif.)

20–26. Caribbean **Dental** Convention, 4th annual, Port of Spain, Trinidad. (K. Henry, Dental Assoc. of Trinidad and Tobago, 109 Frederick St., Port of Spain)

21–22. Chicago **Dental** Soc./Acad. of Dentistry for the Handicapped, Chicago, Ill. (R. T. Kirk, Acad. of Dentistry for the Handicapped, Box 213, Springfield, Ohio)

21–25. Technical Assoc. of the **Pulp and Paper** Industry, 50th annual, New York, N.Y. (A. E. Dembitz, TAPPI, 360 Lexington Ave., New York 10017)

22–26. American Soc. for **Metals**, western metal and tool exposition and conf., Los Angeles, Calif. (ASM, Metals Park, Ohio 44073)

22–26. Society for **Nondestructive Testing**, spring convention, Los Angeles, Calif. (SNT, 914 Chicago Ave., Evanston, Ill. 60202)

23–24. National **Dairy** Engineering Conf., East Lansing, Mich. (C. W. Hall, Agricultural Engineering Dept., Michigan State Univ., East Lansing)

23–25. **High Polymer** Conf., East German Chemical Soc., Magdeburg. (East German Chemical Soc., Unter den Linden 68/70, Berlin W.8)

24–26. **Biophysical** Soc., 9th annual, San Francisco, Calif. (R. B. Setlow, Biophysical Soc., Oak Ridge National Laboratory, P.O. Box Y, Oak Ridge, Tenn. 37831)

24–26. American **Crystallographic** Assoc., Suffern, N.Y. (W. L. Kehl, ACA, Gulf Research and Development Corp., P.O. Box 2038, Pittsburgh, Pa. 15230)

24–28. Canadian Assoc. of **Radiologists**, annual, Toronto, Ontario. (Miss A. I. Ekstrand, CAR, 1555 Summerhill Ave., Montreal, Canada)

25–26. Society for **Information Display**, 5th natl. convention and symp., Santa Monica, Calif. (R. E. Bernberg, 591 Tigertail Road, Los Angeles, Calif. 90049)

25–27. American Acad. of **Forensic Sciences**, annual, Chicago, Ill. (W. J. R. Camp, 1853 W. Polk St., Chicago 12)

26–27. American **Physical Soc.**, Norman, Okla. (R. G. Sachs, Argonne National Laboratory, Argonne, Ill. 60440)

27–15. Apr. **Commonwealth Mining and Metallurgical** Congr., Australasian Inst. Mining and Metallurgy, Australia and New Zealand. (AIMM, Osborne House, 299 Little Collins St., Melbourne, C.1, Victoria, Australia)

28–3. **Gas Turbine** Conf., American Soc. Mechanical Engineers, Washington, D.C.

(D. J. Schneider, ASME, 345 E. 47 St., New York, N.Y. 10017)

28–5. **Analytical Chemistry and Applied Spectroscopy**, conf., Spectroscopy Soc. of Pittsburgh, Pittsburgh, Pa. (W. G. Fateley, Mellon Inst., 4400 Fifth Ave., Pittsburgh)

March

1–2. Systems for the **Intellectual Organization of Information**, seminar, Rutgers Univ., New Brunswick, N.J. (S. Artandi, Graduate School of Library Service, Rutgers Univ., New Brunswick)

1–4. **Unmanned Spacecraft**, Los Angeles, Calif. (R. D. DeLauer, TRW/Space Technology Laboratories, Norton Air Force Base, San Bernardino, Calif.)

1–5. National Council on the **Aging**, 14th annual, Washington, D.C. (NCA, 49 W. 45 St., New York, N.Y. 10036)

1–5. Society of **Plastics Engineers**, annual, Boston, Mass. (G. P. Fong, c/o Sweetheart Plastics Inc., Guildware Park, Wilmington, Mass.)

4–5. Physical Basis of **Radioisotope Applications**, Wantage, England. (C. G. Clayton, U.K. Atomic Energy Authority, Wantage Research Laboratory, Wantage)

4–6. Fundamental **Cancer Research**, 19th annual symp., Univ. of Texas, Houston. (D. N. Ward, Univ. of Texas Medical Center, Houston 77025)

4–6. Central **Surgical** Assoc., Milwaukee, Wis. (C. E. Lischer, 457 N. Kingshighway, St. Louis 8, Mo.)

5–6. **Congenital Malformations of the Central Nervous System**, intern. colloquium, Paris, France. (J. Chevreux, c/o Service de M. le Prof. Leon Michaux, Hôpital de la Salpetrière, Boulevard de l'Hôpital, Paris[13e])

5–7. American Assoc. of **Pathologists and Bacteriologists**, Philadelphia, Pa. (M. I. O'Connor, Williams and Wilkins Co., 428 E. Preston St., Baltimore, Md. 21202)

5–7. National **Wildlife** Federation, 29th annual, Washington, D.C. (T. L. Kimball, 1412 16th St., NW, Washington, D.C.)

7–10. International Acad. of **Pathology**, 54th annual, Philadelphia, Pa. (F. K. Mostofi, Armed Forces Inst. of Pathology, Washington, D.C.)

7–10. **Mineralogical** Assoc. of Canada, 10th annual, Toronto, Ontario. (J. A. Mandarino, Dept. of Mineralogy, Rolay Ontario Museum, 100 Queen's Park, Toronto 5).

8–9. **High Speed Testing**, intern. symp., Boston, Mass. (R. H. Supnik, Plas-Tech Equipment Corp., 4 Mercer Rd., Natick, Mass.)

8–10. **Calibration**, intern. conf., Leipzig, Germany. (Kammer der Technik, Ebertstr. 27, Berlin W.8)

8–10. **Marine Systems**, conf., American Inst .of Aeronautics and Astronautics/U.S. Navy, San Diego, Calif. (AIAA, 1290 Sixth Ave., New York, N.Y. 10019)

8–10. Society of **Toxicology**, annual, Williamsburg, Va. (C. S. Weil, Mellon Inst., 4400 Fifth Ave., Pittsburgh, Pa. 15213)

8–11. American College of **Surgeons**, clinical congr., Seattle, Washington. (S. P. Harbison, 55 E. Erie St., Chicago, Ill.)

8–12. American Soc. of **Civil Engineers**, Mobile, Ala. (W. H. Wisely, ASCE, 345 E. 47 St., New York, N.Y. 10017)

8–12. **Personnel Dosimetry** for Accidental High Level Exposure to External and Internal Radiation, symp., Vienna, Austria. (J. H. Kane, International Conferences Branch, Div. of Special Projects, U.S. Atomic Energy Commission, Washington, D.C. 20545)

9–10. **Arms Control**, first West Coast conf., Los Angeles, Calif. (R. D. DeLauer, TRW Space Technology Laboratories, Redondo Beach, Calif.)

9–11. **Wildlife Management** Inst., Las Vegas, Nev. (C. R. Gutermuth, 709 Wire Bldg., Washington, D.C.)

10–12. **Particle Accelerator**, conf., Washington, D.C. (R. S. Livingston, Oak Ridge Natl. Laboratory, P.O. Box X, Oak Ridge, Tenn.)

13. Experimental Basis for the Current Management of **Portal Hypertension**, Philadelphia, Pa. (B. Sigel, Woman's Medical College of Pennsylvania, 3300 Henry Ave., Philadelphia 19129)

13–18. **Proctology**, 17th annual teaching seminar, New Orleans, La. (A. J. Cantor, 147-41 Stanford Ave., Flushing, L.I., N.Y. 11355)

14–16. Society for the Study of **Development and Growth**, southeastern regional, Univ. of Georgia, Athens. (D. T. Lindsay, Dept. of Zoology, Univ. of Georgia, Athens 30601)

15–17. **Plant Protection**, 2nd intern. conf., Naples, Italy. (Intern. Anti-Parasitic Centre, Via Barberini, 86, Rome, Italy)

15–17. **Solar Energy** Soc., intern. symp., Phoenix, Ariz. (SES, Arizona State Univ., Tempe 85281)

17–19. **Instrumentation** in the Iron and Steel Industry, 15th natl. conf., Pittsburgh, Pa. (R. P. Trauterman, Allegheny-Ludlum Steel Corp. Research Center, Alabama Ave., Backenridge, Pa.)

17–20. **Medical Schools and Teaching Hospitals**: Curriculum, Programming and Planning, New York Academy of Sciences, New York, N.Y. (NYAS, 2 E. 63 St., New York 10021)

17–20. American **Orthopsychiatric** Assoc., New York, N.Y. (E. Harrison, 477 FDR Drive, New York, N.Y.)

18. American **Vacuum** Soc., midwestern section, Houston, Tex. (J. H. Kimzey, Manned Spacecraft Center, 2101 Webster-Seabrook Rd., Houston 77058)

18–19. **Zinc Metabolism**, symp., Detroit, Mich. (A. S. Prasad, School of Medicine, Wayne State Univ., Detroit 48207)

18–20. **Michigan Acad.** of Science, Arts, and Letters, Univ. of Michigan, Ann Arbor. (I. J. Cantrall, Museum of Zoology, Univ. of Michigan, Ann Arbor)

19–20. New York **Microscopical** Soc., biennial symp., New York, N.Y. (T. G. Rochow, American Cyanamid Co., Room 467A, Stamford, Conn. 06904)

19–20. British Assoc. of **Physical Medicine**, annual, London, England. (J. P. Mitchell, 21 St. John St., Manchester 3, England)

19–21. American Soc. of **Internal Medicine**, Chicago, Ill. (A. V. Whitehall, 3410 Geary Blvd., San Francisco, Calif.)

20. **Identification of Drugs and Poisons**, symp., Pharmaceutical Soc. of Great Britain, London. (PSGB, 17 Bloomsbury Sq., London, W.C.1)

22–25. **Thermophysical Properties**, 3rd symp., Purdue Univ., Lafayette, Ind. (S. Gratch, Ford Motor Co., P.O. Box 2053, Dearborn, Mich. 48121)