SCIENCE

18 January 1974

Vol. 183, No. 4121

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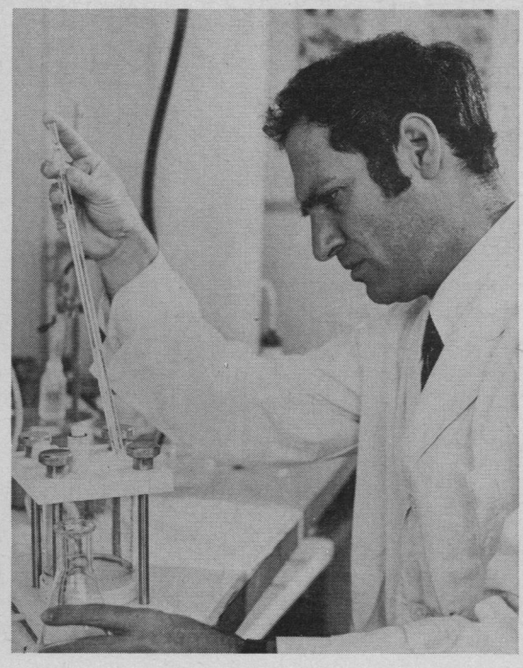

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18 January 1974

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SCIENCE

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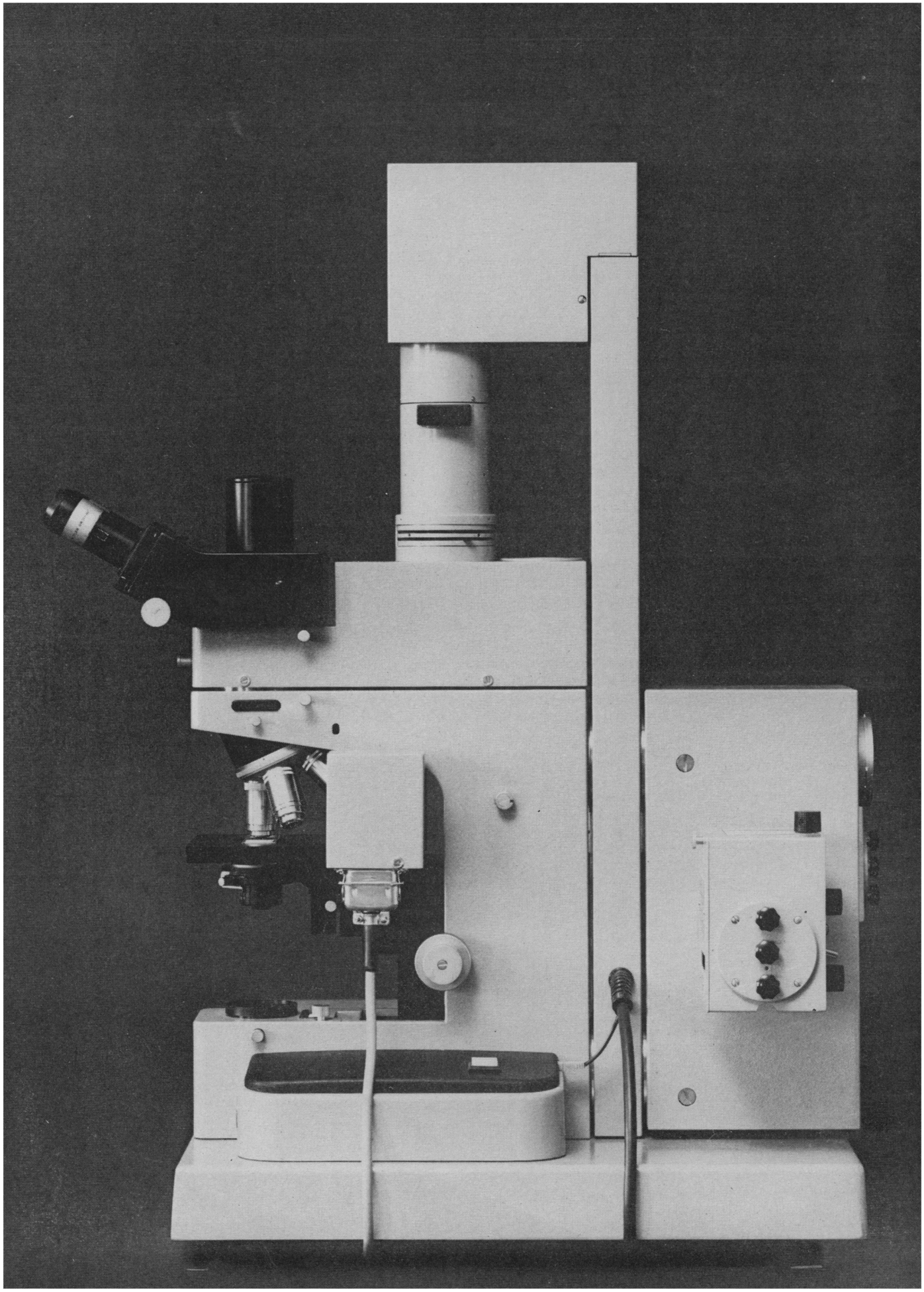
The American Association for the Advancement of Science was founded in 1848 and incorporated in 1874. Its objects are to further the work of scientists, to facilitate cooperation among them, to improve the effectiveness of science in the promotion of human welfare, and to increase public understanding and appreciation of the importance and promise of the methods of science in human progress.

COVER

Crevasse in area where Ross Ice Barrier meets Rockefeller Plateau, Antarctica. See page 198. U.S. Navy]



How to turn a square microscope into a photometer system.

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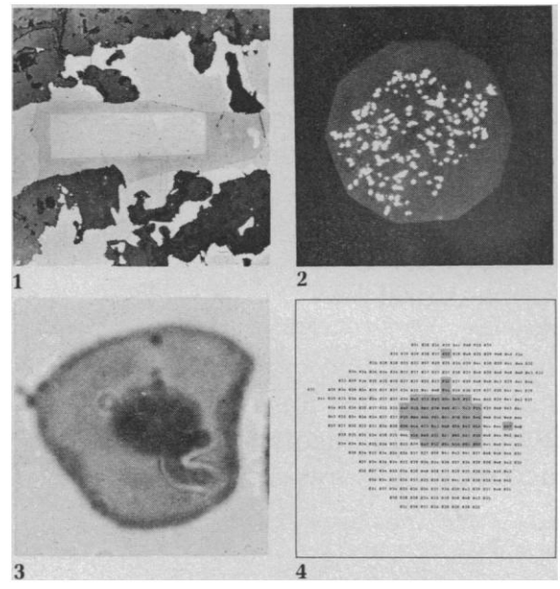

The area being measured is displayed superimposed on the object being observed.

1. An ore section with adjustable rectangular diaphragm. **2.** Auto-radiograph with measuring diaphragm superimposed. **3.** Shows a scanned cell. **4.** Is the print-out of this same cell for computer-assisted pattern analysis.

In short, applications are limited largely by the user's imagination.

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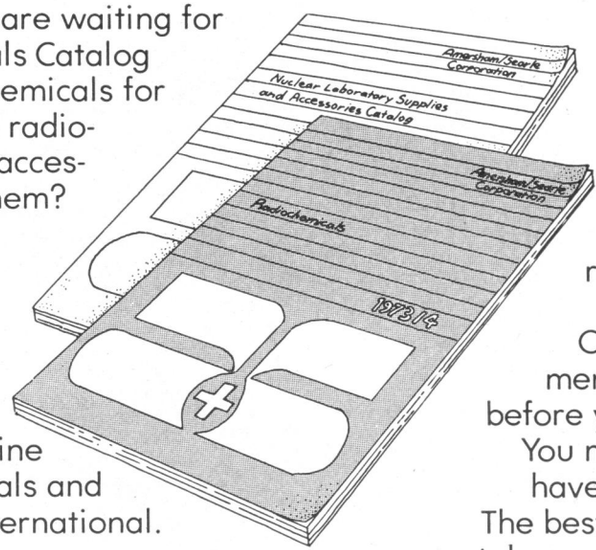

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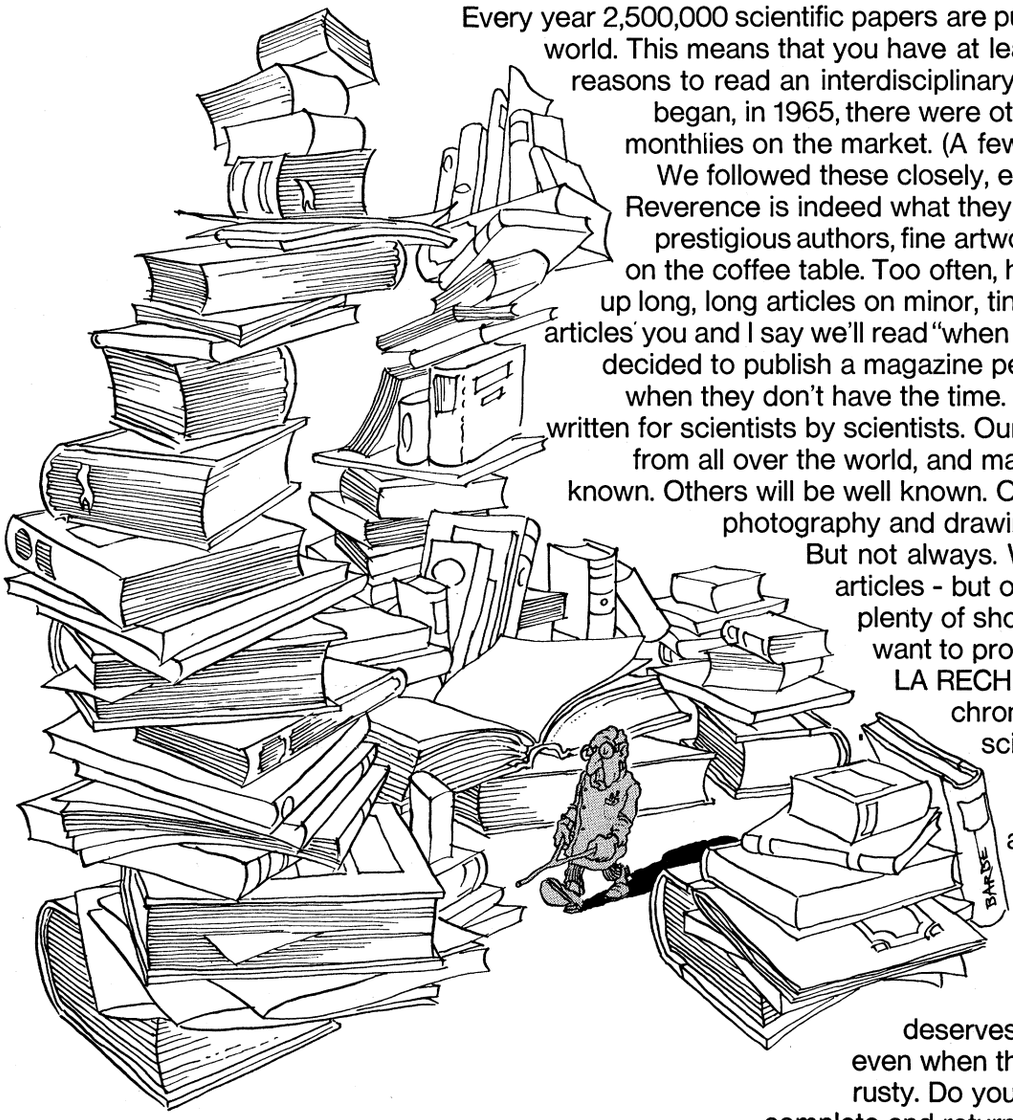

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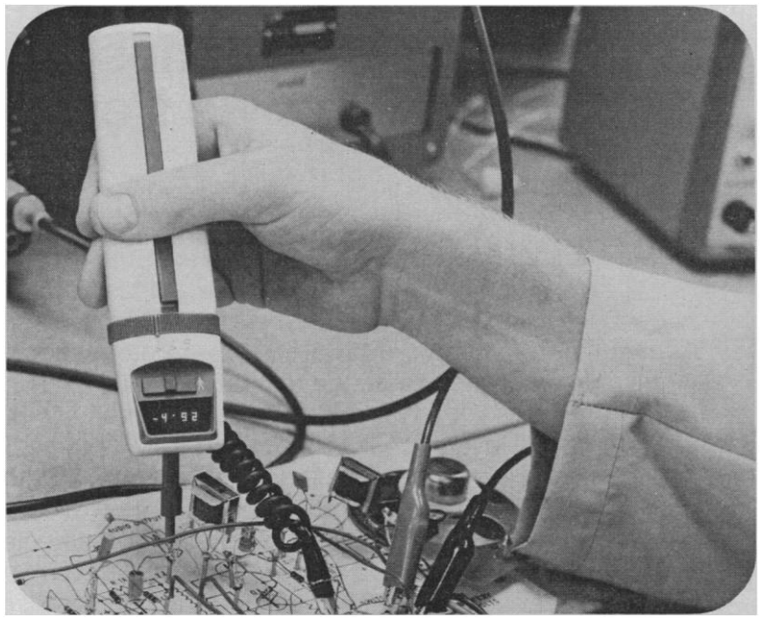
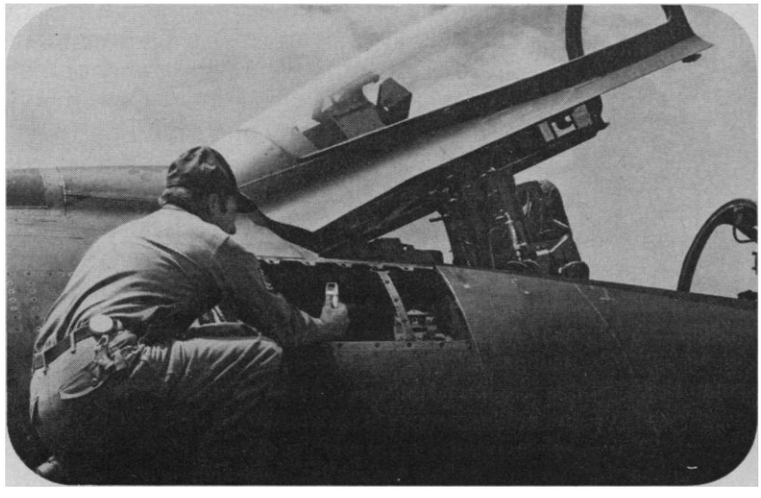
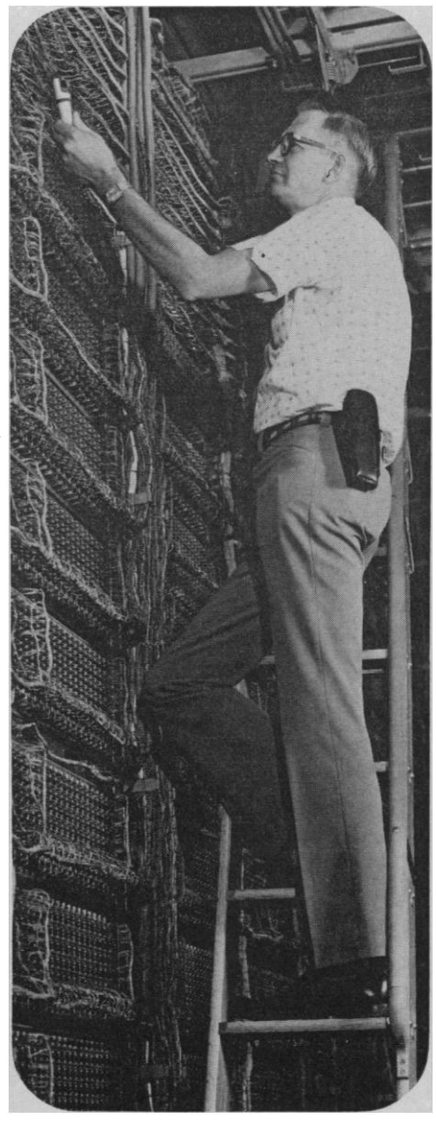






A small tool with a big impact on field service

To designers and technology buffs, the fascinating aspect of the new HP 970A Digital Multimeter is how we managed to squeeze a complete $3\frac{1}{2}$-digit autoranging DMM into a package that fits the palm of your hand. (The secret, briefly, is a unique thin-film IC that incorporates the equivalent of 3,000 transistors, and combines digital and analog circuitry, on the same hybrid substrate.)

To service technicians and engineers, those harried souls who keep electronic wizardry in good repair, the important news is how the 970A radically improves the measurement of volts and ohms. The battery-powered DMM goes wherever the work is to perform fast and accurate troubleshooting in hard-to-get-at places, and it does this so simply and easily that it's tough to make a measurement error.

To managers responsible for field service, and the customers they serve, the key benefit is the time that can be saved. Since half the cost of field service is labor, and the 970A speeds and simplifies a laborious task, its true value is often realized on invoices for service calls.

Whether a technician is toiling over a dishwasher, a television set, telephone switchgear or the most advanced computer, the 970A works the same way: he selects the desired function, attaches a clip lead to circuit common and touches the test point with the probe tip. A touch of the thumb on the DMM's bar switch,

and the measurement appears on the digital display. That's all. The rest is automatic. There's no need to select the proper knob, look for the right scale, figure out where the decimal point goes, or decide what the polarity is: the 970A does it all automatically.

Reading time is faster because the display is always in the line-of-sight, right next to the test point. Even if the 970A must be held upside down to reach a test point, the display can be electronically inverted so there's no chance of reading 6's for 9's.

Price is $275* including three interchangeable probe tips, built-in battery pack good for 2,000 measurements on a single overnight charge, charger, belt case, travel case and sun hood.

New portable spectrum analyzer "fingerprints" low-frequency signals

As its esoteric name implies, a spectrum analyzer is an instrument which separates and measures the individual frequencies that make up a complex electrical signal.

This ability to take apart and examine a waveform by spectrum analysis — to display, at one time, the frequencies and amplitudes of its individual spectral components — has been traditionally limited to the higher frequencies.

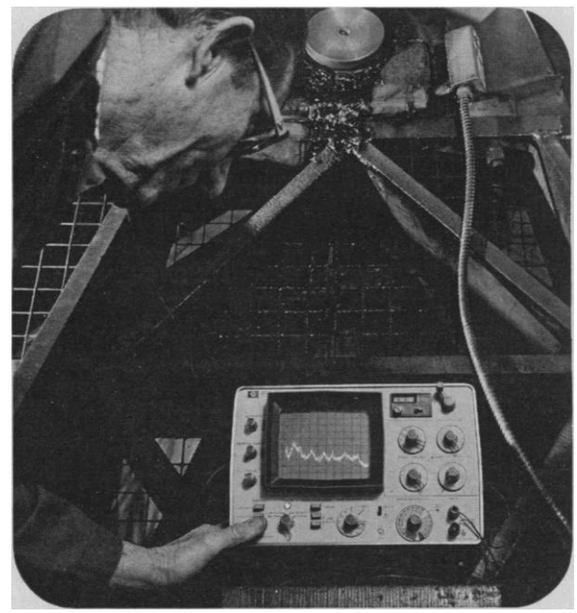
Now there's a low-cost way to do the same thing in the low-frequency range — the spectral deep where lurk such phenomena as mechanical vibrations, underwater sounds, communications signals and power line-related electrical interference. The new HP 3580A Spectrum Analyzer can look at a low-frequency event such as the signals produced by a jet engine or power plant generator and provide a signature analysis, or "fingerprint", containing important clues to how well it's working. The potential of using the 3580A for preventive maintenance — to help predict a failure before it occurs — exists in the instrument's use of digital storage.

Because necessarily slow sweeps of the frequency of interest are repetitively refreshed from the 3580A's digital memory, the CRT display is sharp and flickerless. This also allows a user to store a spectrum indefinitely, recall it whenever convenient, and even superimpose it on a new spectrum for comparison to see if there have been any tell-tale changes in the fingerprint.

Total analysis time is reduced by a factor of 10 or so through a technique called adaptive sweep. Akin to a "volume control" this sets a variable baseline high enough to exclude all noise and low-level signals that do not interest him and still obtain a full-resolution scan.

Fundamentally a precision instrument, the 3580A has a minimum bandwidth of 1 Hz (rather than the usual 10 Hz) over its entire range of 5 Hz to 50 kHz. It is thus capable of detecting spurious responses which can't be seen in the time domain or with older instruments.

The 3580A can be operated on line power or on internal rechargeable batteries. It weighs only 35 pounds and costs $3800*, plus $255* for the optional battery pack.



For more information on all of the above write to us. Hewlett-Packard, 1507 Page Mill Road Palo Alto, Calif. 94304

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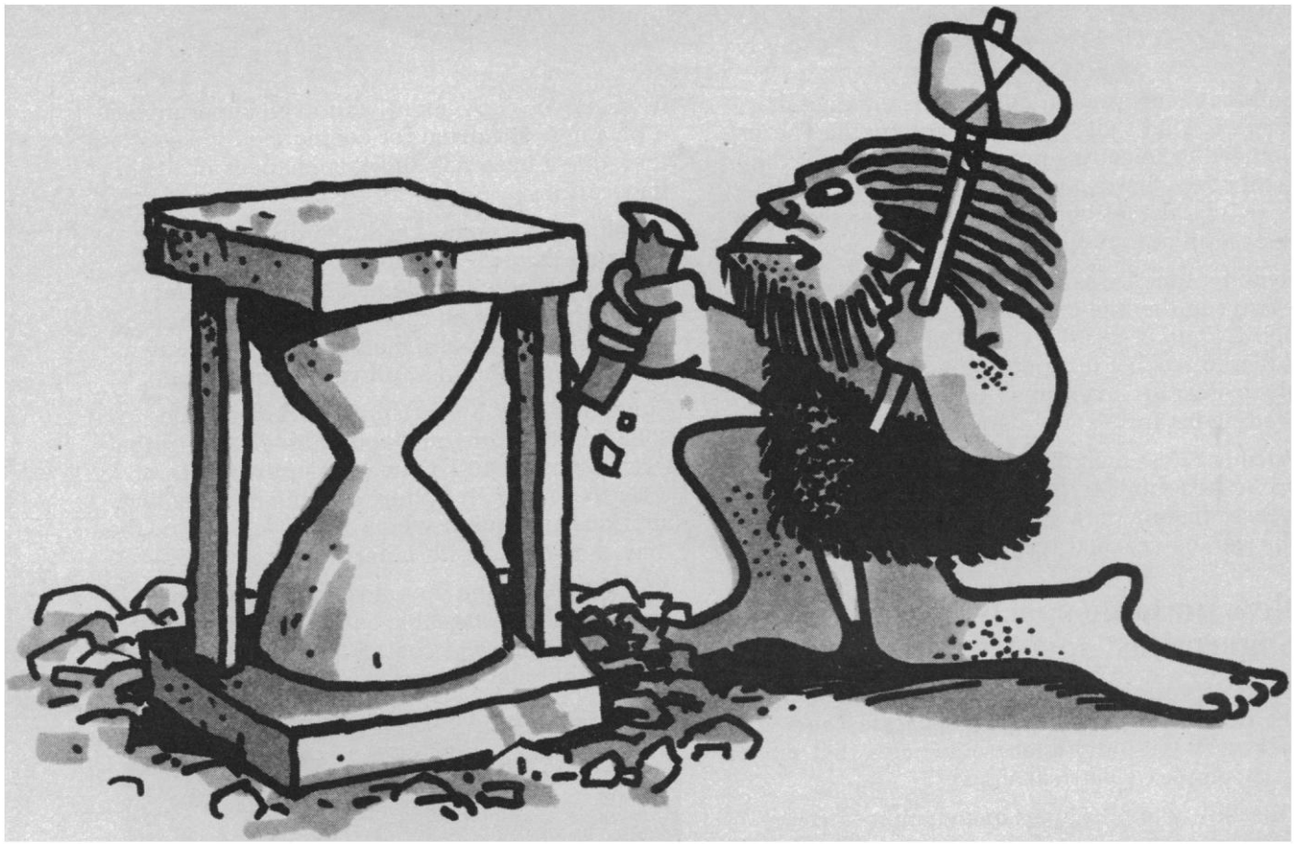

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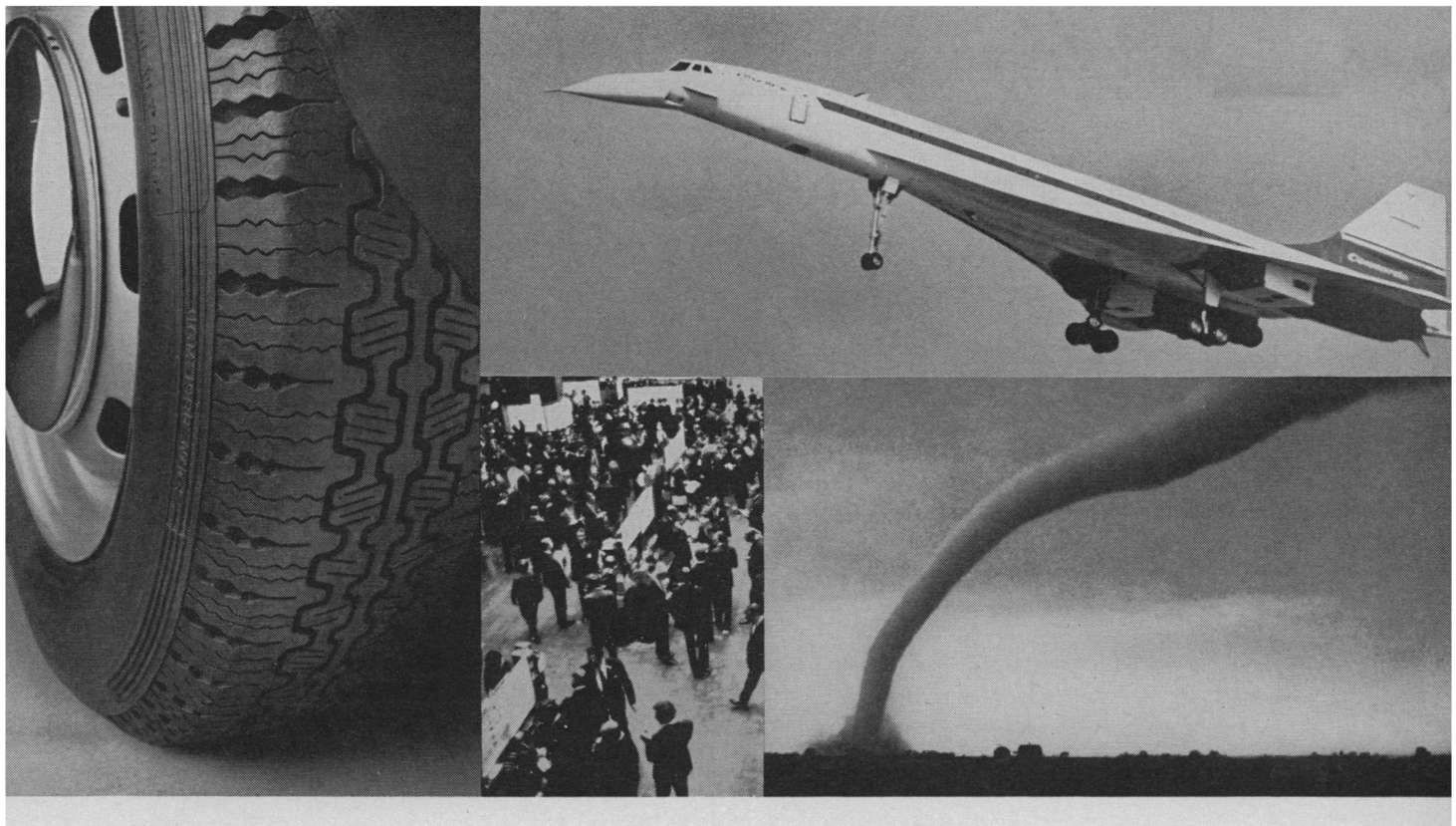

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These authoritative journals contain papers prepared by China's leading scholars and present original research from prestigious Chinese institutes and universities.

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The first issue of each of the translation journals will be published in early 1974, and, as with our Russian periodicals under the Consultants Bureau imprint, the translations of the Chinese journals will be available within six months following the appearance of the original Chinese edition.

Subscriptions are now being accepted. Examination copies will be available in early 1974.

available in 1974

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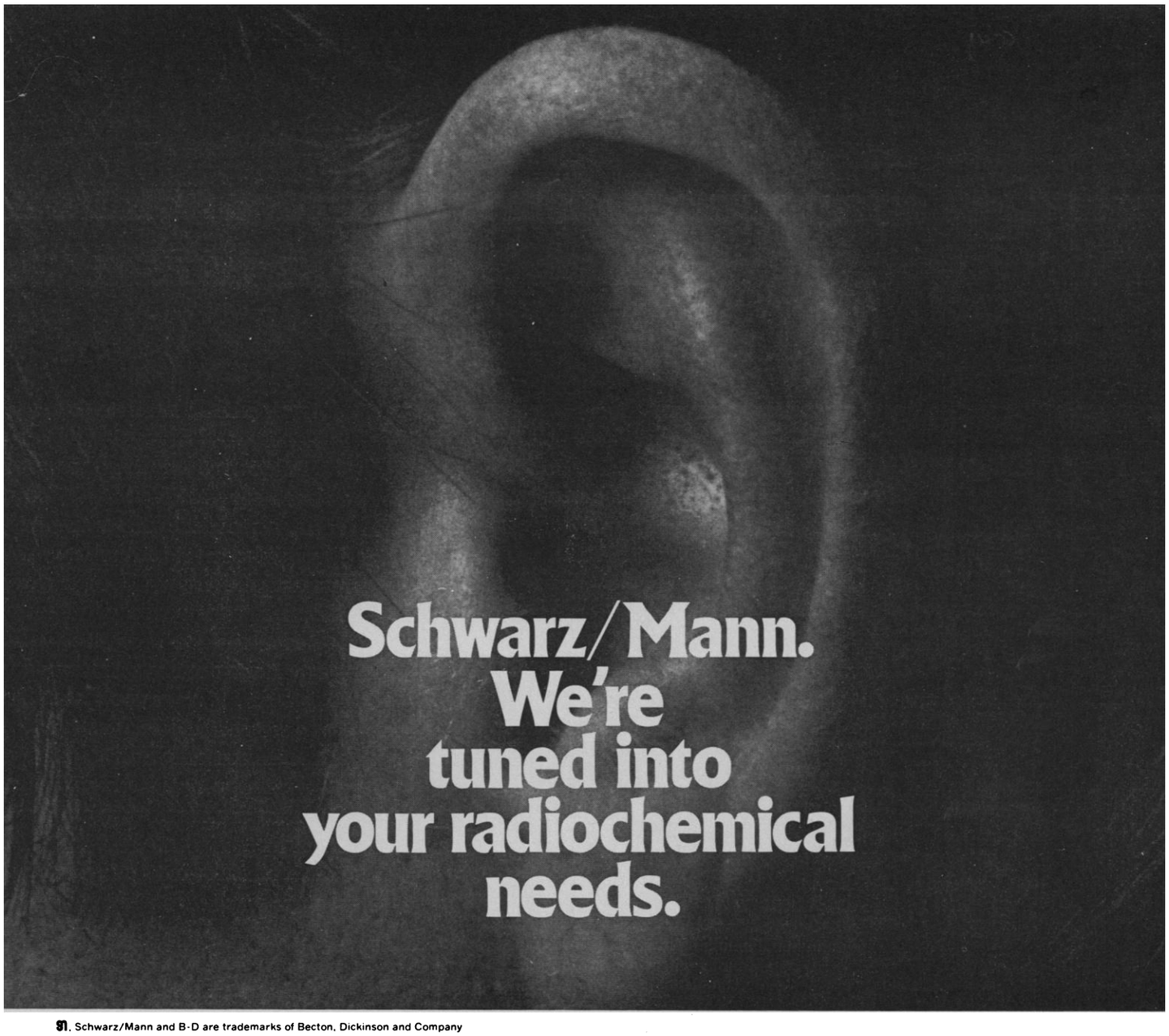

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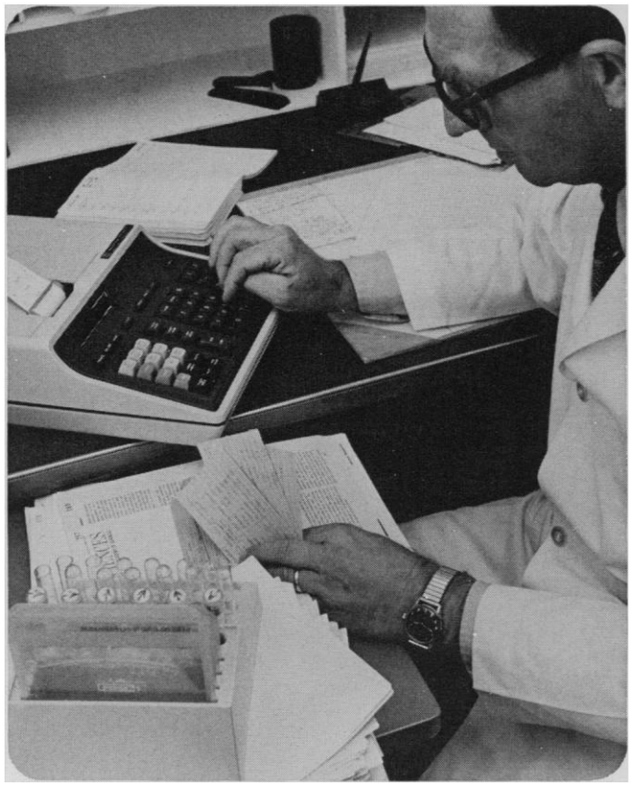

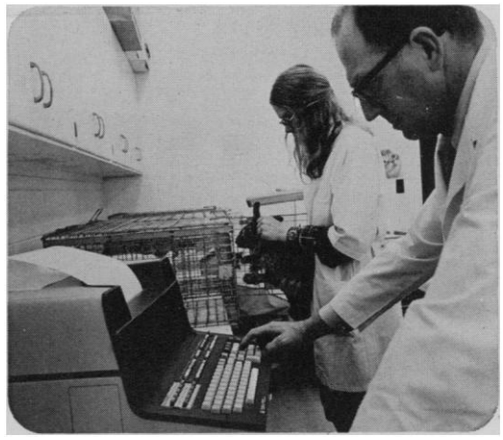

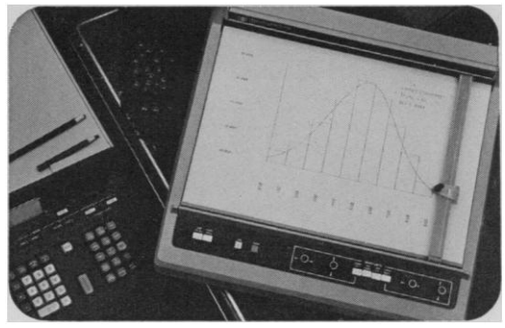

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1850), noting that the atomic weights of various elements were almost exactly integer multiples of the atomic weight of hydrogen, inferred that atoms of various elements consisted of common constituents. He correctly recognized that the relationship, although not exactly true, pointed toward a basic scientific law. At the other extreme, all four presidents of the United States who have been assassinated in office have been elected in years ending in zero. In spite of the low a priori probability of this occurring, no one would seriously suggest that this points to a physical or sociological law.

Since 1971, two more World Series have lasted seven games. The probability of a single series of evenly matched teams lasting seven games is

$$p = C_3^6 \left(\frac{1}{2}\right)^6 = \frac{5}{16}$$

where C is the binomial coefficient.

The probability of two successive series lasting seven games is therefore 25/256, or approximately 0.1. While not quite as improbable as the reputed loss of two vital magnetic tapes, this is nevertheless somewhat surprising.

Now that 17 of the 29 World Series played since the end of World War II have lasted seven games, one finds that the probability of this occurring as a random event (between evenly matched teams) would be

$$\sum_{n=17}^{29} C_n^{29} p^n (1-p)^{29-n} = 0.0021$$

And, of the 21 World Series that have gone to the sixth game since the end of World War II, the team that was ahead, going into the sixth game, has still won only four times. If the teams are evenly matched, the probability of winning less than five times is now

$$\sum_{17}^{21} C_m^{21} \left(\frac{1}{2}\right)^{21} = 0.0036$$

This "back-to-the-wall" effect, which tends to favor the trailing team in the sixth game, has occurred only since the end of World War II. Once again, one is forced to ask whether this unusual occurrence of seven-game World Series is a statistical freak or whether, like Prout's hypothesis, it suggests the existence of some hitherto undetected phenomenon.

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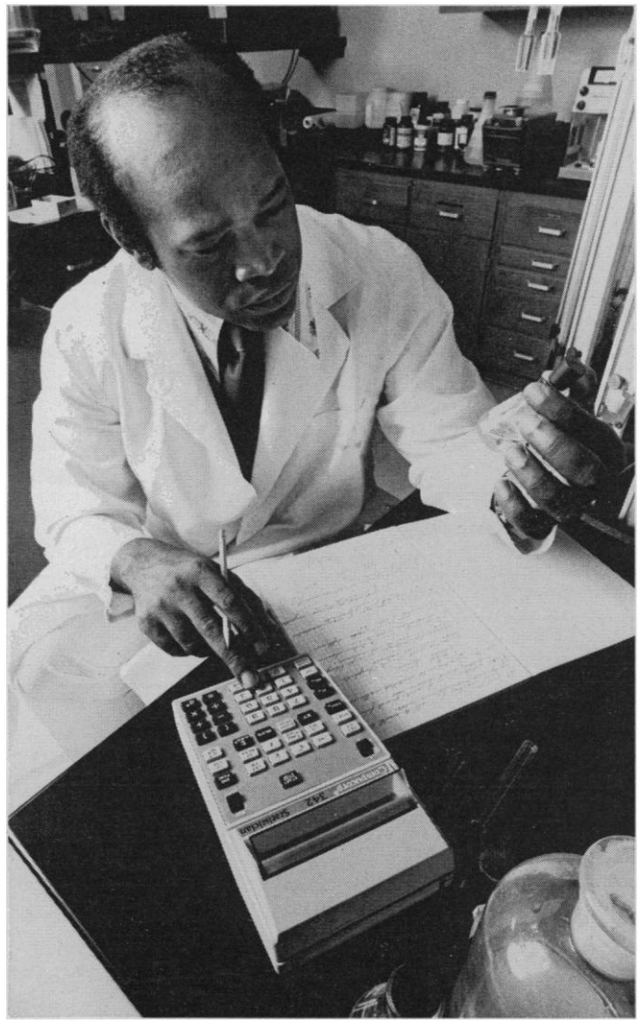

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18 January 1974, Volume 183, Number 4121 **SCIENCE**

Overmanagement of Medicine

The medical profession, which once was the most honored of all, now is under attack from many quarters and exists in what many sense to be an overmanaged condition. In part, this is the fault of the profession itself, which in its preoccupation with patients failed to keep its own house in order. Beyond that, the profession, peculiarly isolated from the political process, failed to apprehend what was going on about it. The consumer of medical services demanded his rights to know a little more. Peer review became a regulatory compulsion, and the presence of nonphysicians on review committees became the order of the day. And now the logical extension of peer review, the professional standards review organization, has come to reality through legislation.

There have been other intrusions. Where once the efficacy of medicines could be established by careful clinical observation, there is a consensus today that this cannot be obtained, or must be suspect. In its place have been substituted placebo-controlled, double-blind, randomized crossover studies. However, in the overweening worship of data that lead to computer printouts for statistical evaluation, there is likely to be loss of the humane aspects of clinical investigation and clinical medicine.

On the other hand, there go unchallenged reports of iatrogenic disorders produced by improper professional use of potent medications. Such reports are neither double-blind nor placebo-controlled; they are not exposed to critical scrutiny. They suffer from fatal defects: lack of standard criteria, lack of careful evaluation, and the curse of extrapolation. Yet they lead to recriminations against the medical profession or indictments of the medicines. Following upon recriminations come regulatory responses.

So restrictive are laws becoming that we see the specter of public reporting of prescriptions and public identification of patients. The result can only be fearful physicians and undermedicated patients. We have begun to see reports of undermedication. For instance, a study by the National Institute of Mental Health in 1971 reported that "if the question is whether physicians are contributing to drug abuse by creating physical dependence among their patients. . .[then our] data indicate that most private practitioners, if anything, err in the conservative direction . . . in terms of the incidence of high levels of psychic distress one could make a good case for the point that population needs for drug treatment are not being met." More recently, there appeared in the *Annals of Internal Medicine* (February 1973) an article entitled "Under-treatment of medical inpatients with narcotic analgesics." The summary of that article indicated that some physicians were likely to exaggerate the dangers of addiction, particularly that of therapeutic origin, and to prescribe lower, sometimes ineffective, doses of drugs, even for patients with terminal malignancy. Beyond that, the National Disease and Therapeutic Index shows that the overall use of sedatives declined by 30 percent in the 7 years ending in 1972, an indication of overrestraint in the use of these types of medication that have a broad usefulness. Production quotas have been established for several scheduled medicines already, and more are being contemplated. Controls, often in conflict with one another, are proposed at state, at national, and at international levels.

If the people are to be well served, physicians must not be shackled and dispassionate discussion must prevail in the promulgation of public policy for medicine. I hope for the day when a great profession, cognizant that the responsibility belongs to it, makes itself heard.—W. CLARKE WESCOE, M.D., *Vice Chairman, Sterling Drug Inc., 90 Park Avenue, New York 10016*

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CONTRIBUTORS:
MORRIS A. ADELMAN, MIT
JOSEPH BARNEA, United Nations
MANSON BENEDICT, MIT
DUANE CHAPMAN, Cornell University
DONALD COOK, American Electric Power Company
S. DAVID FREEMAN, Energy Policy Project
ROBERT L. HIRSCH, Atomic Energy Commission
JOHN HOLDREN, California Institute of Technology
JACK HOWARD, MIT
HENRY W. KENDALL, MIT
JAMES BRESE, Atomic Energy Commission
LAWRENCE LIDSKY, MIT
MICHAEL MCCLOSKEY, Sierra Club
WALTER J. MEAD, Energy Policy Project
ADEN MEINEL, University of Arizona
BRUCE C. NETSCHERT, National Economic Research Associates, Inc.
JOHN F. O'LEARY, Atomic Energy Commission
HERMAN POSTMA, Oak Ridge National Laboratory
DAVID ROSE, MIT
MILTON SHAW, Atomic Energy Commission
RICHARD G. STEIN, Richard G. Stein Associates
ARTHUR M. SQUIRES, City University of New York
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Microcalorimetry Techniques: Applications to Cellular Systems

Techniques and results of microcalorimetric investigations of cellular systems were discussed at a meeting held 9 through 11 July 1973, at the Chemical Center, Lund University, Sweden. Special emphasis was given to clinical applications. It was attended by 40 scientists with widely varying backgrounds and specialties. Chemists, microbiologists, cell biologists, biochemists, clinical chemists, physicians, and makers of calorimeters were present.

The application of thermal measurements to the study of cellular systems and to clinical applications is a relatively new and expanding field whose development has been made possible by the availability of simply constructed, sensitive, and reliable microcalorimeters.

Of the most immediate clinical application was the report of a calorimetric method for the diagnosis of systemic lupus erythematosus. By means of a test based on increased heat production during leukocyte phagocytosis accompanying this disease, 14 out of 15 positive cases and the majority of subjects in the probable and possible diagnostic categories were identified.

A calorimetric procedure for the rapid identification and typing of bacteria in urine was described. This fall the procedure will become part of a hospital's routine testing program.

The greatest number of investigators are working with human erythrocytes. The rate of heat production during the resting state of the red cell has been determined in three different laboratories with good agreement among them. The possibility of using microcalorimetry for the diagnosis of various forms of anemia, including sickle cell disease, is being explored. There was considerable discussion about the effects of the methods of storage and handling of blood cells upon thermal measurements of those cells. It appears that significant studies on the aging of cells might be made calorimetrically.

The calorimetric technique is very well suited for the study of reactions occurring at cell surfaces. Investigations of the binding of lectins to lymphocytes and the action of thrombin on human blood platelets were described. The thermal phenomena accompanying the release of histamine from sensitized mast cells has been utilized to quantitatively determine the inhibitory effect of various drugs.

The very general nature of the measurement of heat makes calorimetry applicable to a wide variety of experimental situations. Thus, work on samples of skin, biopsy material, muscle, and cells grown in tissue culture was reported. An interesting reference was made to an in vivo study of the rate of heat production accompanying human muscle contraction in which significant differences were found between normal and hypothyroid subjects.

As indicated by this brief report, the range of subjects suitable for microcalorimetric measurements is vast. The technique is definitely in its early stages of development, but already appears to be capable of producing significant results, both in fundamental science and in useful practical applications for clinical medicine.

PHILIP D. ROSS
Laboratory of Molecular Biology, National Institute of Arthritis, Metabolism, and Digestive Diseases, National Institutes of Health, Bethesda, Maryland 20014

Forthcoming Events

February

13–14. **Industrial Solvents** Symp., Industrial Health Foundation, Pittsburgh, Pa. (IHF, 5231 Centre Ave., Pittsburgh 15232)

13–15. Conference on **Biological Effects of Electromagnetic Radiation**, New York Acad. of Sciences, New York, N.Y. (G. R. Gruber, NYAS, 2 E. 63 St., New York 10021)

13–15. Society of **Photographic Scientists and Engineers**, Houston, Tex. (R. H. Wood, SPSE, 1330 Massachusetts Ave., NW, Washington, D.C. 20005)

13–15. International **Solid State Circuits** Conf., Inst. of Electrical and Electronic Engineers, Philadelphia, Pa. (Office of Technical Activities Board, IEEE, 345 E. 47 St., New York 10017)

13–16. American Acad. of **Forensic Sciences**, Dallas, Tex. (H. L. Kimball, P.O. Box 302, New Hartford, Conn. 06057)

13–16. National Assoc. of **Medical Examiners**, Dallas, Tex. (W. G. Ecker, Laboratory, St. Francis Hospital, Wichita, Kan. 67214)

14–16. Society of **University Surgeons**, St. Louis, Mo. (E. W. Fonkalsrud, Dept. of Surgery, Univ. of California Medical Center, Los Angeles 90024)

14–18. American **Group Psychotherapy** Assoc., New York, N.Y. (M. Keefe, AGPA, 1865 Broadway, New York 10023)

15–20. **Biofeedback Research** Soc., 5th annual mtg., Colorado Springs, Colo. (F. Butler, Dept. of Psychiatry, #202, Univ.

of Colorado Medical Center, 4200 E. Ninth Ave., Denver 80220)

19–23. American College of **Surgeons**, San Juan, P.R. (S. H. Fromm, 117 San Pedro, Urb. Horizon, Rio Piedras, P.R. 00926)

20–23. Society of **Professors of Education**, Chicago, Ill. (R. E. Bayles, School of Education, Atlanta Univ., Atlanta, Ga. 30314)

21–23. Texas **Junior College Teachers** Assoc., San Antonio. (G. Burrier, TJCTA, South Plains College, Levelland, Tex. 79336)

23–28. American Inst. of **Mining, Metallurgical and Petroleum Engineers**, Dallas, Tex. (J. B. Alford, AIMMPE, 345 E. 47 St., New York 10017)

24–26. Canadian **Ceramic** Soc., Montreal, P.Q. (H. L. Taylor, Suite 110, 2175 Sheppard Ave., Willowdale, Ont., Canada)

24–27. American Assoc. of **Community and Junior Colleges**, Washington, D.C. (AACJC Housing Bureau, 1129 20th St., NW, Washington, D.C. 20036)

24–28. **Medical** Soc. of the State of New York, New York. (H. I. Fineberg, 420 Lakeville Rd., Lake Success, N.Y. 11040)

24–1. American Association for the **Advancement of Science**, annual mtg., San Francisco, Calif. (E. Zeutschel, AAAS Meetings Office, 1515 Massachusetts Ave., NW, Washington, D.C. 20005)

25–26. National Conf. on **New Systems in Health and Welfare Management**, New York, N.Y. (R. E. Gitelman, Dept. W-37, Div. of Business and Management, New York Univ., 600 Third Ave., New York 10016)

25–27. **Physical Electronics** Conf., 34th annual, American Physical Soc., Murray Hill, N.J. (H. D. Hagstrum, Bell Labs., 600 Mountain Ave., Murray Hill 07974)

25–2. American **Nature Study** Soc., San Francisco, Calif. (B. McKnight, Faculty of Education, State University College, New Paltz, N.Y. 12561)

26–28. **Flow Measurements as Related to National Needs** Conf., Mechanics Div., Inst. for Basic Standards, and Natl. Bureau of Standards, Gaithersburg, Md. (L. K. Irwin, Mechanics Div., Physics Bldg. B214, Natl. Bureau of Standards, Washington, D.C. 20234)

26–28. **Industrial Pharmacy**, 13th intern. conf., Univ. of Texas College of Pharmacy, Univ. of Texas Pharmacy Extension Service, and Federal Food and Drug Administration, Lake Travis, near Austin. (J. A. Bardin, Pharmacy Extension Service, Pharmacy Bldg. 101, Univ. of Texas, Austin 78712)

26–1. **Climatic Impact Assessment** Program, 3rd conf., U.S. Dept. of Transportation, Cambridge, Mass. (E. F. Rice, Code AMR, Transportation Systems Center, Kendall Sq., Cambridge 02142)

26–1. Symposium on **Fundamental Cancer Research**, 27th, Houston, Tex. (J. Brandenberg, M. D. Anderson Hospital and Tumor Inst., Houston 77025)

27–2. Association for **Children with Learning Disabilities**, 11th annual intern. conf., Houston, Tex. (L. I. Lock, ACLD, 2200 Brownsville Rd., Pittsburgh, Pa. 15210)

27–2. **Pediatric Neurology and Neurosurgery**, intern. mtg., Mexico City, Mexi-

co (F. Rueda-Franco, Neurology and Neurosurgery Service, Hospital de Niño IMAN, Ave., Insurgentes Sur 3700-C, Mexico, 22, D.F.)

March

1–3. **Student American Medical** Assoc., Dallas, Tex. (C. C. Hewitt, 1400 Hicks Rd., Rolling Meadows, Ill. 60008)

1–8. American Soc. of **Clinical Pathologists**, Los Angeles, Calif. (J. Graves, Intersociety Committee on Pathology Information, Inc., 9650 Rockville Pike, Bethesda, Md. 20014)

2–6. California **Medical** Assoc., San Francisco. (R. L. Thomas, 693 Sutter St., San Francisco 94102)

3–9. Noah Worcester **Dermatological** Soc., Marco Island, Fla. (H. Poltnick, 1553 Woodward, Detroit, Mich. 48226)

4–6. **Electrostatic and Electromagnetic Confinement of Plasmas and the Phenomenology of Relativistic Electron Beams** Conf., New York Acad. of Sciences, Atomic Energy Commission, and Leonardo Acad. of Sciences, New York, N.Y. (G. R. Gruber, NYAS, 2 E. 63 St., New York 10021)

4–8. **Medical Data Processing** Symp., French Inst. for Research in Information and Automation, Toulouse. (E. E. Van Brunt, Project Chief, Medical Data System, Medical Methods Research, 3779 Piedmont Ave., Oakland, Calif. 94611)

5. **Computerized Laboratory Systems** Symp. American Soc. for Testing and Materials, Cleveland, Ohio. (J. B. Wheeler, ASTM, 1916 Race St., Philadelphia, Pa. 19103)

6–7. Conference on **Use of Wastewater in the Production of Food and Fiber**, Oklahoma City, Okla. (R. L.-R. Carpenter, Oklahoma State Dept. of Health, NE 10th and Stonewall, Oklahoma City 73105)

7–8. American **Psychopathological** Assoc., 64th annual, Boston, Mass. (J. Cole, Boston State Hospital, 591 Morton St., Boston 02124)

7–9. Central **Surgical** Assoc., Cincinnati, Ohio. (A. J. Walt, 540 E. Canfield Ave., Detroit, Mich. 48201)

8–11. **Acupuncture and Chinese Medicine**, 2nd world symp., San Francisco, Calif. (J. Kao, Managing Editor, *American Journal of Chinese Medicine*, P.O. Box 555, Garden City, N.Y. 11530)

9–12. American Assoc. of **Pathologists and Bacteriologists**, San Francisco, Calif. (A. J. French, 1335 E. Catherine St., Ann Arbor, Mich. 48104)

9–16. International Acad. of **Pathology**, San Francisco, Calif. (L. D. Stoddard, Medical College of Georgia, Augusta 30902)

10–14. International **Anesthesia Research** Soc., 48th congr., San Francisco, Calif. (B. B. Sankey, 3645 Warrensville Center Rd., Cleveland, Ohio 44122)

10–14. Society of **Toxicology**, Washington, D.C. (R. A. Scala, Medical Research Div., Esso Research and Engineering Co., Linden, N.J. 07036)

10–15. American Soc. of **Photogrammetry**, St. Louis, Mo. (L. P. Jacobs, 105 N. Virginia Ave., Falls Church, Va. 22046)

11–14. American Soc. of **Neurochemistry**, 5th annual, New Orleans, La. (S.

H. Appel, Duke Univ. Medical Center, Durham, N.C. 27706)

11–15. Symposium on **Isotope Techniques in Groundwater Hydrology**, Intern. Atomic Energy Agency, Vienna, Austria. (J. H. Kane, Office of Information Services, U.S. Atomic Energy Commission, Washington, D.C. 20545)

12–14. National Federation of **Abstracting and Indexing** Services, Chicago, Ill. (S. Keenan, NFAIS, 3401 Market St., Philadelphia, Pa. 19104)

13. Symposium on **Sickle Cell Anemia and Other Hemoglobinopathies**—Teaching Day in Hematology, Research Foundation of the State Univ. of New York, Brooklyn, N.Y. (B. Kearney, Box 20, Downstate Medical Center, 450 Clarkson Ave., Brooklyn 11203)

13–15. American Acad. of **Occupational Medicine**, San Francisco, Calif. (J. M. MacMillan, Reynolds Metals Co., P.O. Box 27003, Richmond, Va. 23261)

15–19. National **Science Teachers** Assoc., Chicago, Ill. (R. H. Carleton, NSTA, 1201 16th St., NW, Washington, D.C. 20036)

17–20. American Assoc. of **Dental Schools**, Atlanta, Ga. (B. F. Miller, AADS, 1625 Massachusetts Ave., NW, Washington, D.C. 20036)

18–22. **Lunar Science** Conf. 5th, NASA Johnson Space Center and Lunar Science Inst., Houston, Tex. (LSI, 3303 NASA Rd. 1, Houston 77058)

20–22. International Topical Conf. on **Tetrahedrally Bonded Amorphous Semiconductors**, Yorktown Heights, N.Y. (M. H. Brodsky, IBM Corp., T. J. Watson Research Center, Yorktown Heights, 10598)

21–22. Symposium on the **Preventability of Perinatal Injury**, Natl. Foundation–March of Dimes, New York, N.Y. (Coordinator, SPPI, NF–MD, 315 Park Ave., S., New York 10010)

21–23. Florida **Acad. of Sciences**, Orlando. (I. Foster, Eckert College, St. Petersburg, Fla.)

21–23. Mississippi **Acad. of Sciences**, Biloxi. (C. L. Dodgen, University Medical Center, Jackson, Miss. 39216)

21–24. International Assoc. for **Dental Research**, North American Div., Atlanta, Ga. (A. R. Frechette, IADR, 211 E. Chicago Ave., Chicago, Ill. 60611)

22–23. Michigan **Acad. of Science, Arts and Letters**, East Lansing. (D. Stokes, 1006 Rackham Bldg., Univ. of Michigan, Ann Arbor 48104)

25–26. State **Medical** Soc. of Wisconsin, Milwaukee. (E. R. Thayer, Box 1109, Madison, Wis. 53701)

25–28. American College of **Surgeons**, Houston, Tex. (E. W. Gerrish, ACS, 55 E. Erie St., Chicago, Ill. 60611)

25–28. Institute of **Electrical and Electronics Engineers**, New York, N.Y. (D. G. Fink, IEEE, 345 E. 47 St., New York 10017)

25–29. **Molecular Biology and Mechanisms of Virus Disease**, winter confs., Intern. Chemical and Nuclear Corp. and the Univ. of California at Los Angeles, Squaw Valley, Calif. (Conf. Office, Virus Research, c/o Dept. of Bacteriology, Univ. of California, Los Angeles 90024)

26–27. **Reducing Fuel Consumption and Emissions by Combustion Modifications**, Central States Section, Combustion Inst., Madison, Wis. (G. Borman, Univ. of Wisconsin, 1513 University Ave., Madison 53706)

26–29. American **Astronomical** Soc., Lincoln, Neb. (H. M. Gurin, AAS, 211 FitzRandolph Rd., Princeton, N.J. 08540)

26–29. National **Atomic and Molecular Physics** Conf., 6th, Inst. of Physics, Swansea, England. (Meetings Officer, IP, 47 Belgrave Sq., London, SW1X 8QX, England)

27. American Soc. of **Clinical Oncology**, Houston, Tex. (A. Evans, Children's Hospital of Philadelphia, 1740 Bainbridge St., Philadelphia 19146)

27–29. **Nuclear Structure and High Energy Physics** Conf., Inst. of Physics, Glasgow, Scotland. (IP, 47 Belgrave Sq., London, SW1X 8QX, England)

27–29. **Textile Research** Inst., 44th annual, New York, N.Y. (TRI, 601 Prospect Ave., P.O. Box 625, Princeton, N.J. 08540)

28–29. American Board of **Medical Specialties**, Chicago, Ill. (J. C. Nunemaker, Suite 1160, 1603 Orrington, Evanston 60201)

28–30. American Assoc. for **Cancer Research**, 65th annual, Houston, Tex. (H. J. Creech, AACR, Inst. for Cancer Research, Fox Chase, Philadelphia, Pa. 19111)

28–30. South Carolina **Acad. of Science**, Hartsville. (J. M. Barry, College of General Studies, Univ. of South Carolina, Columbia 29208)

29–30. New England **Bioengineering** Conf., 2nd annual, American Soc. of Engineering Education and the Inst. of Electrical and Electronics Engineers, Worcester, Mass. (R. A. Peura, Worcester Polytechnic Inst., Worcester 01609)

29–31. American **Psychosomatic** Soc., 31st, Philadelphia, Pa. (D. Oken, 265 Nassau Rd., Roosevelt, N.Y. 11575)

29–31. **Seismological** Soc. of America, Las Vegas, Nev. (W. K. Cloud, SSA, P.O. Box 826, Berkeley, Calif. 94701)

29–31. National **Wildlife Federation**, Denver, Colo. (T. L. Kimball, NWF, 1412 16th St., NW, Washington, D.C. 20036)

29–3. American Soc. of **Abdominal Surgeons**, Las Vegas, Nev. (B. F. Alfano, 675 Main St., Melrose, Mass. 02176)

30–4. **Gas Turbine** Conf., American Soc. of Mechanical Engineers, Zurich, Switzerland. (M. Churchill, ASME, 345 E. 47 St., New York 10017)

31–3. International Soc. for **Experimental Hematology**, 3rd, Houston, Tex. (J. J. Trentin, Div. of Experimental Biology, College of Medicine, Texas Medical Center, Houston 77025)

31–5. American College of **Physicians**, New York, N.Y. (E. C. Rosenow, Jr., 4200 Pine St., Philadelphia, Pa. 19104)

April

1–2. **Synchrotron Radiation and Its Applications to the Analysis of Problems in Scientific Investigation** Conf., Inst. of Physics, Reading, England. (Meetings Officer, IP, 47 Belgrave Sq. London, SW1X 8QX, England)

1–3. American Assoc. of **Petroleum Geologists**, San Antonio, Tex. (T. L. Bear, Bear & Kistler, 1052 W. 6 St., Los Angeles, Calif. 90017)

1–3. Society of **Economic Paleontologists and Mineralogists**, San Antonio, Tex. (R. Tener, Box 979, Tulsa, Okla. 74101)

1–4. American Assoc. of **Anatomists**, Cleveland, Ohio. (J. E. Pauly, Univ. of Arkansas, School of Medicine, Little Rock 72201)

1–4. **Industrial Water and Pollution** Conf., Water and Wastewater Equipment Manufacturers Assoc., Detroit, Mich. (R. C. Hughes, WWEMA, 744 Broad St., Newark, N.J. 07102)

1–4. **Geochemical Exploration**, 5th intern. symp., Vancouver, B.C., Canada. (J. J. Barakso, Mineral Environment Labs. Ltd., 705 W. 15 St., North Vancouver)

1–5. International Symp. on **Advances in Polymer Friction and Wear**, American Chemical Soc., Los Angeles, Calif. (L.-H. Lee, Wilson Center of Technology, Xerox Corp., Webster, N.Y. 14580)

1–5. **Farm and Agricultural Industries**, 11th intern. conf., Intern. Commission of Agriculture and Food Industries and the Greek Chemists' Assoc., Athens. (L. de Saint Rat, ICAFI, 24, rue de Teheran, 75008 Paris, France)

1–5. American College of **Radiology**, New Orleans, La. (W. C. Stronach, ACR, 20 N. Wacker Dr., Chicago, Ill. 60606)

2–4. **Fast Reactor Safety** Conf., American Nuclear Soc., Beverly Hills, Calif. (J. B. Moore, Southern California Edison, P.O. Box 800, Rosemead, Calif. 91770)

2–4. **Mechanical Properties of Materials at High Rates of Strain**, Inst. of Physics, Oxford, England. (J. Harding, Dept. of Engineering Science, Parks Rd., Oxford, OX1 3PJ)

2–5. American **Astronomical** Soc., Palo Alto, Calif. (J. Veverka, Center for Radiophysics and Space Research, Space Sciences Bldg., Cornell Univ., Ithaca, N.Y. 14850)

2–5. American **College Health** Assoc., Dallas, Tex. (J. W. Dilley, 2807 Central St., Evanston, Ill. 60201)

3–4. National Conf. on **New Systems in Health and Welfare Management**, Chicago, Ill. (R. E. Gitelman, Dept. W-37, Div. of Business and Management, New York Univ., 600 Third Ave., New York 10016)

3–4. **Railroad** Conf., American Soc. of Mechanical Engineers and Inst. of Electrical & Electronics Engineers, Pittsburgh, Pa. (E. K. Farrelly, Port Authority of New York and New Jersey, World Trade Center, New York 10047)

3–4. **Metal Semiconductor Contacts** Conf., Inst. of Physics, Manchester, England. (Meetings Officer, IP, 47 Belgrave Sq., London, SW1X 8QX, England)

3–5. American Soc. for **Artificial Internal Organs**, Chicago, Ill. (K. K. Burke, ASA10, Box 777, Boca Raton, Fla. 33432)

3–7. International Union of **Angiology** Congr., 9th, Florence, Italy. (F. Pratesi, Via della Robbia 5, Florence 50132)

4–7. American **Fertility** Soc., Miami, Fla. (H. H. Thomas, 1801 Ninth Ave., S. Birmingham, Ala. 35205)

4–7. Missouri State **Medical** Assoc., Kansas City. (R. McIntyre, P.O. Box 1028, Jefferson City, Mo. 65101)

5–6. Alabama **Acad. of Science**, Birmingham. (D. Costes, Science Dept., Troy State Univ., Troy 36081)

5–6. American **Burn** Assoc., Cincinnati,

Ohio. (A. R. Dimick, Dept. of Surgery, Univ. of Alabama, University Station, Birmingham 35294)

7–10. Conference on **Environmental Acoustics**, American Soc. for Testing and Materials, Columbus, Ohio. (J. McFadden, ASTM, 1916 Race St., Philadelphia, Pa. 19103)

7–12. American Assoc. of **Immunologists**, Atlantic City, N.J. (H. Metzger, AAI, 9650 Rockville Pike, Bethesda, Md. 20014)

7–12. American **Physiological** Soc., Atlantic City, N.J. (R. G. Daggs, APS, 9650 Rockville Pike, Bethesda, Md. 20014)

8–10. **Engineering Aspects of Magnetohydrodynamics** Symp., Tullahoma, Tenn. (Y. C. L. Wu, Energy Conversion Research Div., Univ. of Tennessee Space Inst., Tullahoma 37388)

8–11. European **Sleep Research** Soc., 2nd congr., Rome, Italy. (W. P. Koella, Ciba-Geigy AG, K 125/1109, 4002 Basel, Switzerland)

8–12. American Soc. for **Experimental Pathology**, Atlantic City, N.J. (G. B. Mider, ASEP, 9650 Rockville Pike, Bethesda, Md. 20014)

8–12. International Symp. on **Wound Healing**, Rotterdam, Netherlands. (Secretary, Holland Organizing Centre, 16 Lange Voorhout, The Hague, Netherlands)

8–12. American **Orthopsychiatric** Assoc., San Francisco, Calif. (M. F. Langer, AOA, 1790 Broadway, New York 10019)

8–12. American Soc. for **Pharmacology and Experimental Therapeutics**, Atlantic City, N.J. (E. B. Cook, ASPET, 9650 Rockville Pike, Bethesda, Md. 20014)

9–11. **Thin Films**, 8th conf., Inst. of Physics, Sussex, England. (Meetings Officer, IP, 47 Belgrave Sq., London, SW1X 8QX, England)

9–13. **James Ewing** Soc., Honolulu, Hawaii. (A. S. Ketcham, Clinical Center 10N116, Natl. Cancer Inst., Bethesda, Md. 20014)

9–14. Conference on **Industrial Problems in Source Sampling and Monitoring**, Engineering Foundation, Pacific Grove, Calif. (EF, 345 E. 47 St., New York 10017)

10–13. Tennessee **Medical** Assoc., Gatlinburg. (J. E. Ballentine, TMA, 112 Louise Ave., Nashville, Tenn. 37203)

11–13. Southern Soc. for **Philosophy and Psychology**, Tampa, Fla. (M. Loeb, Psychology Dept., Univ. of Louisville, Louisville, Ky. 40208)

11–13. American Assoc. of **Physical Anthropologists**, Amherst, Mass. (G. J. Armelagos, Dept. of Anthropology, Univ. of Massachusetts, Amherst 01002)

12. Utah Acad. of **Sciences, Arts, and Letters**, Salt Lake City. (H. Buchanan, Dept of Botany, Weber State College, Ogden, Utah 84403)

12–13. Colorado-Wyoming **Acad. of Science**, Laramie, Wyo. (J. T. Windell, Dept. of Biology, Univ. of Colorado, Boulder 80302)

14. Conference on **Structure and Cognition: The Mutual Relevance of Structural Anthropology and Cognitive Anthropology**, Geneseo, N.Y. (G. Erchak, Dept. of Anthropology, State University of New York College at Geneseo, Geneseo 14454)

15–17. Rocky Mountain **Bioengineering**