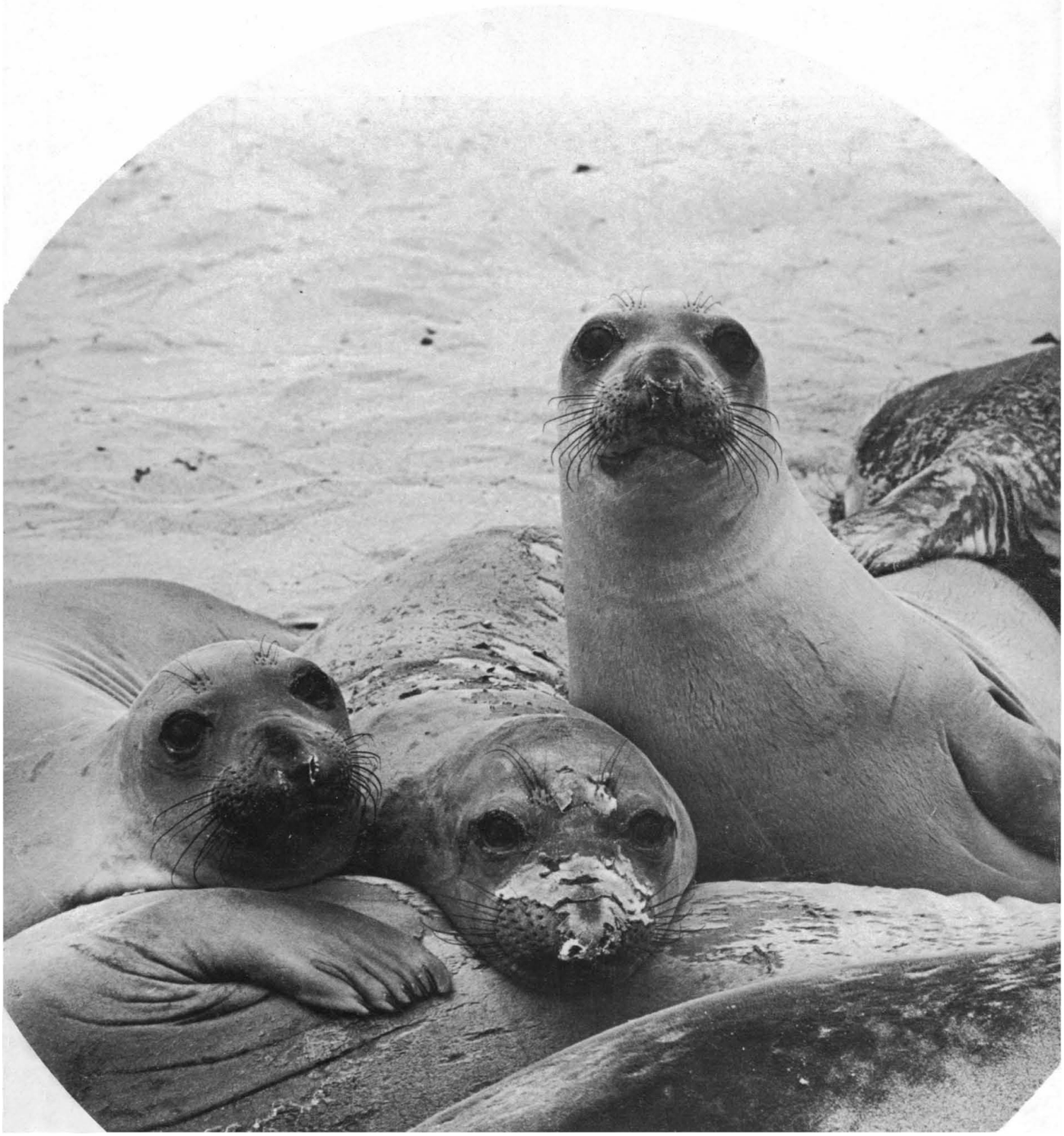
SCIENCE

3 January 1969
Vol. 163, No. 3862

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE



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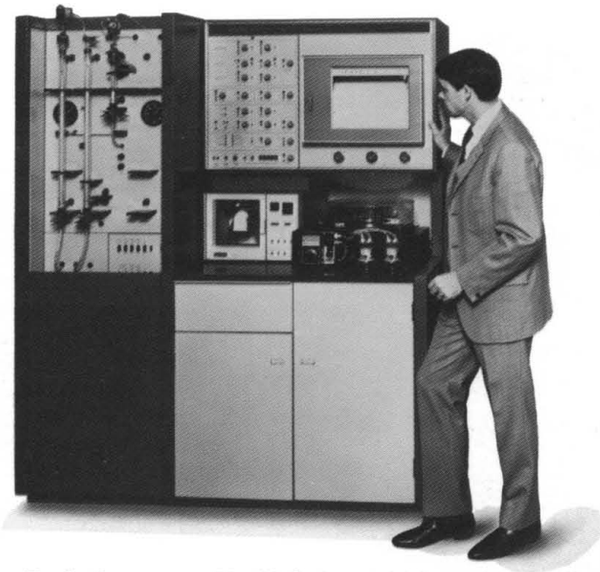

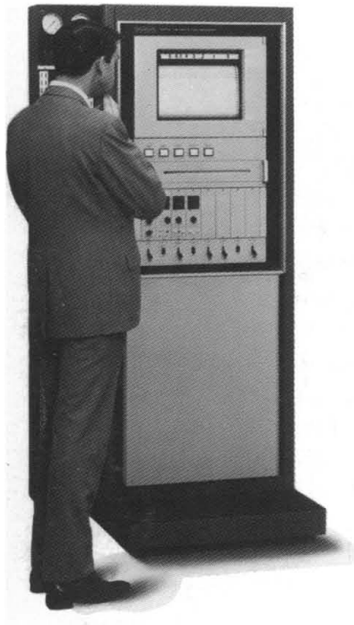

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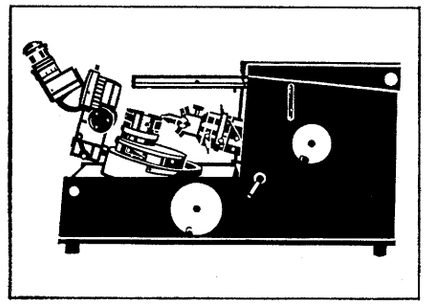

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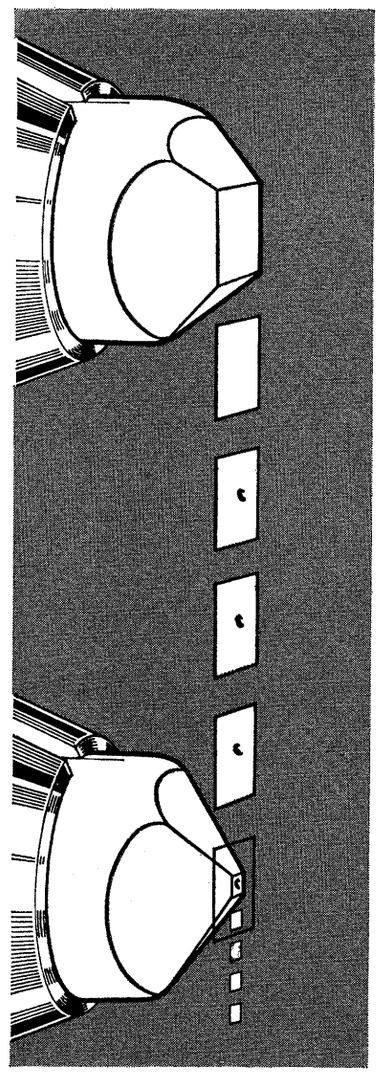

◀ Diagramatic representation of large survey sections for light microscopy and small ultrathin sections of area of interest for examination in the electron microscope.

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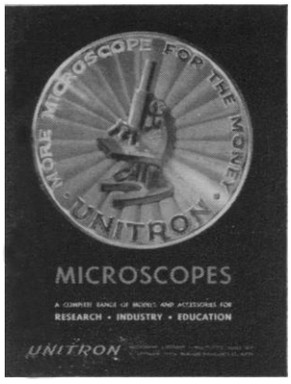
COVER

Juvenile northern elephant seals, 1 to 2 years old, in a gregarious group. These animals haul out to molt for a month or two. During this period they slough the entire epidermis in sheets, as can be seen on the nose of the center seal. See page 91. [B. J. Le Boeuf, University of California, Santa Cruz]



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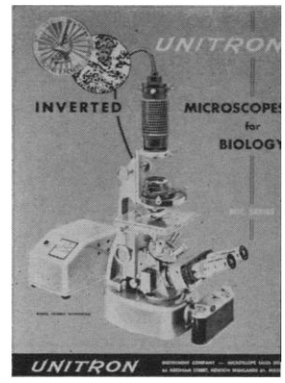

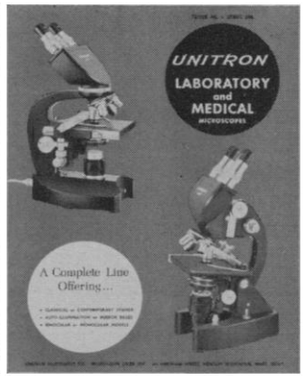

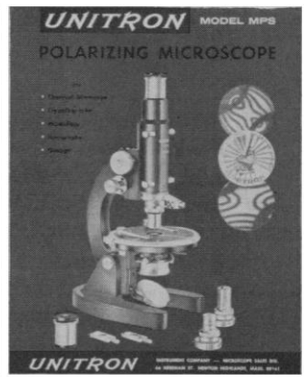

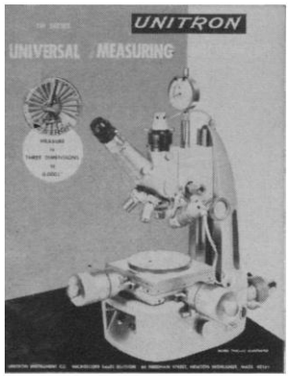

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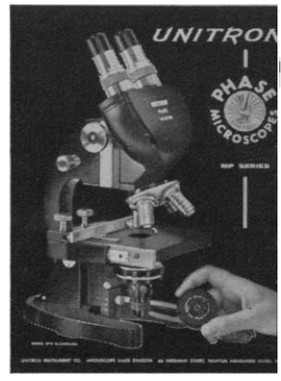

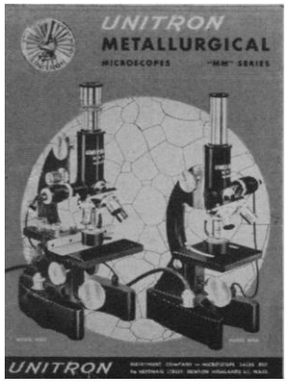

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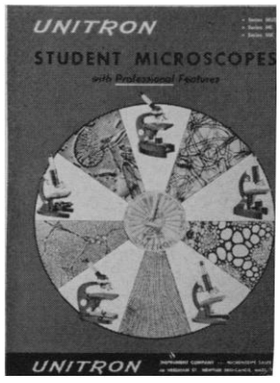

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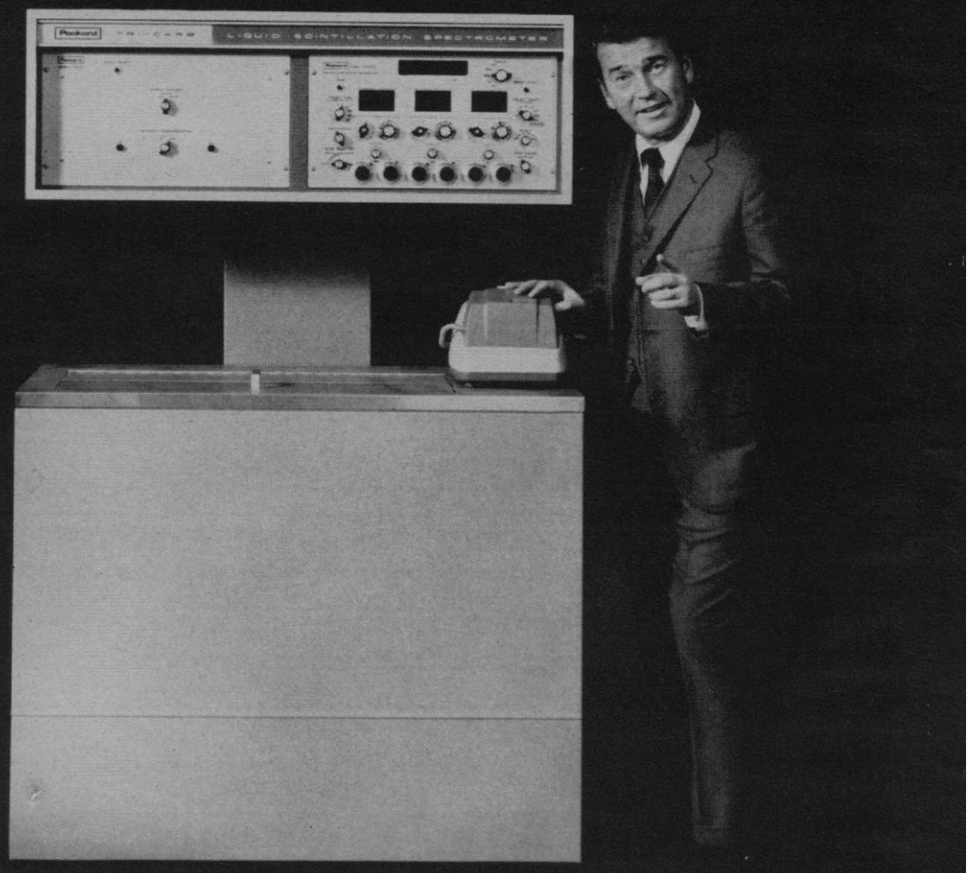

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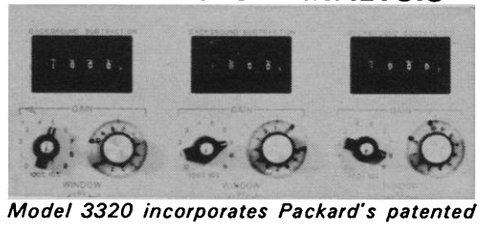

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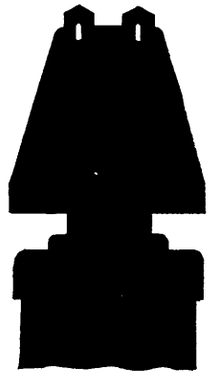

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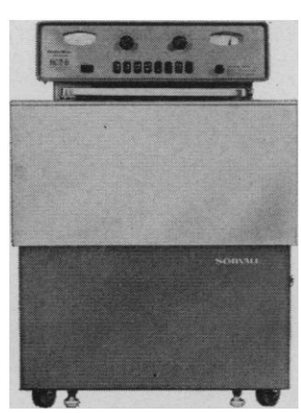

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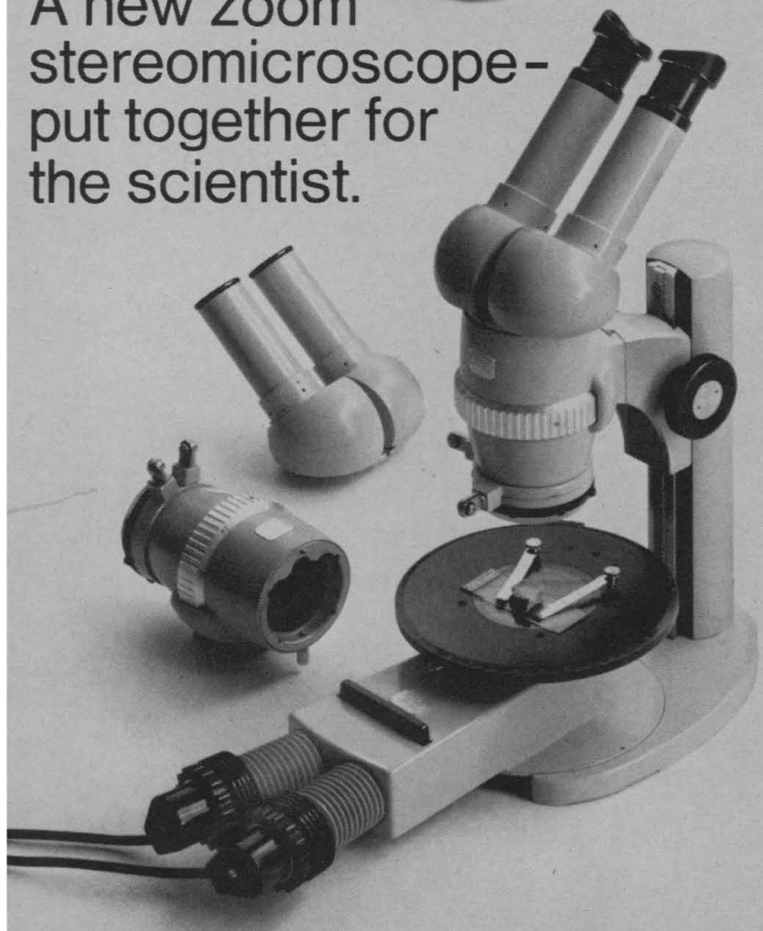

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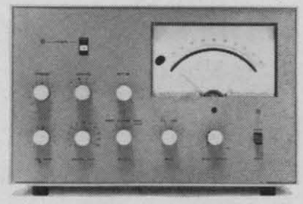

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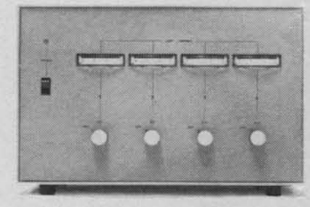

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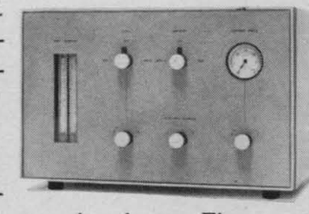

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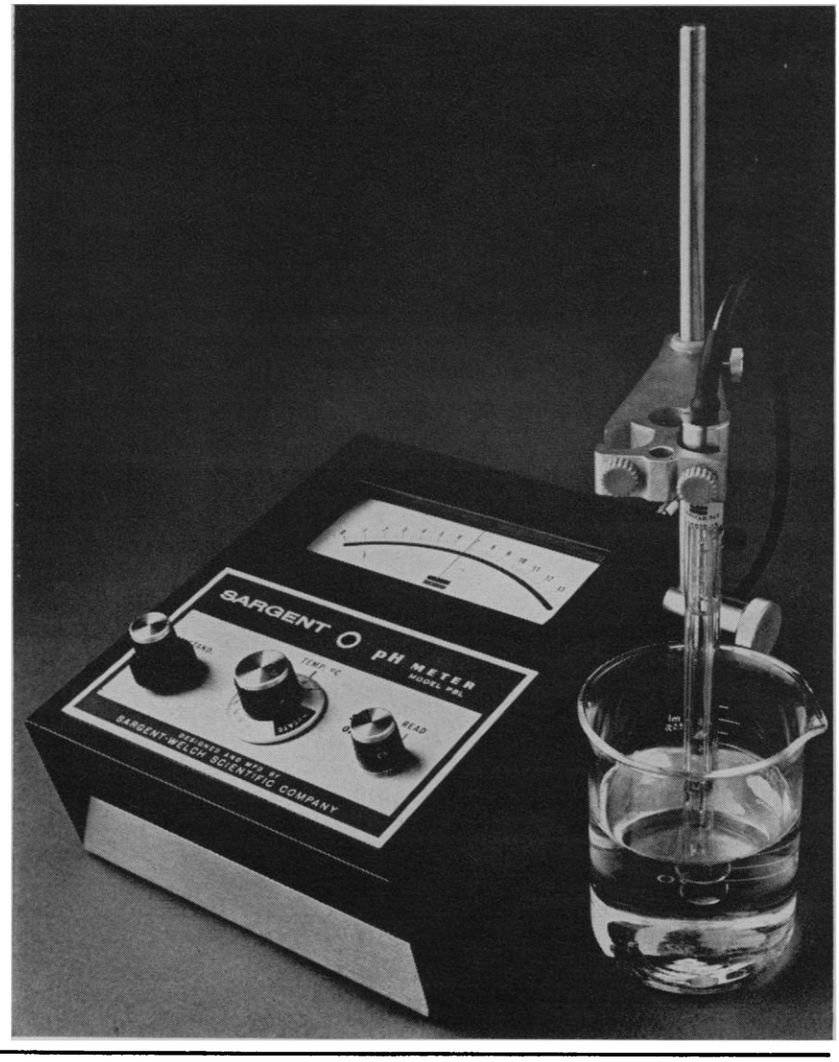

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Learning Environment

As Atkinson and Wilson point out in their article "Computer-assisted instruction" (4 Oct., p. 73), it is premature to evaluate the general effectiveness of many computer-assisted instructional (CAI) systems. The same argument might be advanced for a parent of this 10-year-old offspring—programmed instruction.

Nevertheless, few serious thinkers doubt that programmed instructional techniques can work as well as other techniques, or that they can be useful in the classroom as instructional aids to teachers. Moreover, there appears to be a tendency (at least among programming enthusiasts) to think that the use of more programs in the school, everything else being equal, will improve classroom instruction. And this improvement is expected to be due primarily to some inherent properties of the programs. For Atkinson and Wilson's CAI systems (response sensitive programs), these inherent properties appear in the form of optimal instructional strategies for the individual learner. For linear programmers (using response insensitive programs) these inherent properties appear in the form of the reinforcement schedule of the program. In either case it is assumed that the program is sufficiently motivating to maintain each student's responses to the program until the material is learned.

Nevertheless, forcing students to sit down at a teaching machine until they have completed some section of material would not appear to be much of an improvement over forcing them to learn that material through any other method. In other words, the program can only be as effective as the techniques we use in getting students to use the program.

Unfortunately, advocates of programmed instruction have not stressed total programmed environment as much as they have tried to sell programs as an approach to teaching. But any significant application of programming principles depends upon controlling the *total* environment—not small segments of it. (Is this, perhaps, why, in Atkinson and Wilson's words: ". . . the actual results of programmed learning fell somewhat short of the glowing predictions of its early prophets"?)

The main issues for programmers in applications to classrooms appear to me to be how programmed instruction, operant conditioning techniques, and optimal instructional strategies can contribute to a better total learning environment. This is not to say that the development of programs, CAI systems, and the like is not an important venture, but only to stress the often overlooked importance of the environment into which such programs and systems are to be placed. Unless programmed instruction is used as part of a programmed environment, its place in history will only be as another technological tool, not as a potential revolutionary way of analyzing (and hopefully improving) classroom instruction.

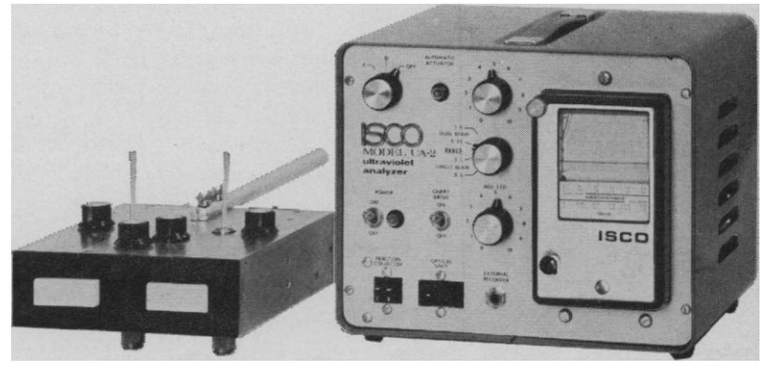
J. RONALD GENTILE
Department of Experimental Psychophysiology, Walter Reed Army Institute of Research, Washington, D.C. 20012

New Aims of Medical Practice

Sometimes, it seems, the bias of *Science* editors shows through. Abelson states casually—as if the proposition were quite axiomatic—that "the basic means of improving medical practice is through research" (meaning research in science) (Editorial, 30 Aug., p. 847). This doubtless was true at one time when medical knowledge was infinitely less developed than at present, and society considerably less complex; today the statement is, at best, a misleading oversimplification. Those specializing in diplomacy, economics, political science, public administration, and education might readily claim—respectively—that the "basic means" for improving medical practice include, more significantly: the maintenance of peace and fruitful international relations; increased national income and more even distribution of that income (particularly the portion of income after military expenditures); the more rational allocation of health functions among governments (federal, state, local), and between governments and private agencies; the more effective administration by governments of public health programs; and finally, probably the *sine qua non*, a more educated understanding by the public of *all* health requirements (including research), leading to fruitful public interest and steady financial support.

The primacy of increased medical knowledge holds only if one considers that knowledge is always more important than the use of knowledge. This seems to be common doctrine of the *Gelehrte* throughout the world. Certain-

Final Exam



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ly it would be dangerous folly to depreciate the crucial role of increased scientific knowledge and research. But the available knowledge on how to demolish the civilized world by hydrogen bombs, and how to destroy mankind by use of the "right" pathogens should at once bury the illusion that the benefits of increased scientific knowledge and research are automatic. Would that it were that simple! The means for the productive use of knowledge must also be on hand.

Actually, the very success of medical research, as compared with research in the relevant social disciplines, diminishes—though by no means eliminates—the *relative* need for further research in this area. At present, the "basic means" for further advances in medical practice lie at least as much in the sciences of society as in the sciences of medicine.

HERBERT S. CONRAD
4540 Lowell Street, NW,
Washington, D.C. 20016

Modifying the Ph.D. Program for Foreign Students

Most foreign predoctoral students in the United States come from developing countries. After earning a Ph.D. in science, each can be expected to return to his homeland wanting to contribute to its development and advance himself professionally. There he often encounters problems: the research he wants to do does not match local or national goals or resources; his research and teaching equipment is often damaged on arrival or soon needs repairs for which facilities are not readily available; and he lacks competence in the techniques of program justification, procurement, and survival in an environment where technical literature is relatively scarce.

The student himself, his homeland, and the host country clearly share the responsibility for training him and then using him wisely. In view of this, the Ph.D. program in the U.S. needs to be modified. The foreign predoctoral student must be trained so that he can cope with the problems and emergencies that await him in his homeland. Though the research training should be of no lower quality than that required of the American student, the program should be augmented to include training in certain skills which he will urgently need. I recommend the following

additions to the predoctoral program for foreign students:

1) Instruction in learning how to identify research areas which have local relevance and which can be pursued with the available resources, including a minimum of expensive equipment.

2) Acquisition of sufficient skill in laboratory maintenance and the correct use of hand tools so the predoctoral student can train technicians in these skills. He should be able to do simple glassblowing and make simple repairs on electronic equipment.

3) Training in the rudiments of science administration, including program and budget development, procurement, and staffing. While he is still in the U.S., the student should establish the basis for continuing correspondence with appropriate scientific specialists, commercial suppliers, and information services.

To add this training to the existing predoctoral programs without lengthening them may require that research supervisors and students work harder or more efficiently. However, increased attention to the special problems of this group of graduate students should reduce their later frustrations and the brain drain problems of their homelands.

R. R. RONKIN
9 Ring Road, New Delhi-24, India

Grecian Winds

Hertzler's communication (15 Nov., p. 813) calls attention to an ancient Greek belief but in too limited a fashion. Fertilization of plants, animals, and people by wind is frequently mentioned in Greek myths. The Greeks proved the fertilizing power of air by noting that mares turned their backs to strong winds (ignoring the fact that stallions did also). In the *Iliad*, Achilles' horses were born to their mother Podarge, who was impregnated by the wind, Zephyros. Sudden gusts of wind were supposed to enter women's wombs and thereby produce children; babies born without known fathers were called "wind-children." [See my "The Pneuma Concept of the Soul," *J. Hist. Behav. Sci.* **1**, 314 (1965)].

Is it possible that the phrase "gone with the wind" has hidden meanings that our Victorian morals have kept us from recognizing?

MARK D. ALTSCHULE
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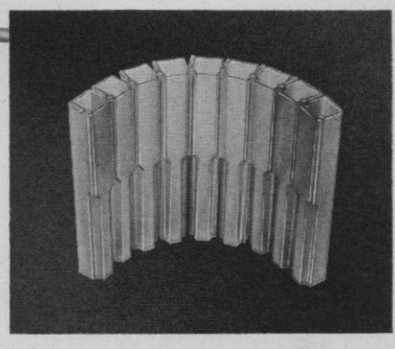

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3 January 1969, Volume 163, Number 3862

SCIENCE

The Need for Priorities

If public policies are to be durable and survive the rigors of changing times, they must grow out of the deeply-held beliefs and values of the society. So with public policy toward science. If it is to be strong, it must first be relevant and it must be *shown* to have relevance.

If R and D is necessary to acceptable national security, or to better health care, or to control crime and violence, or to enrich education and learning, and if these are the central concerns of our society, then science and its advocates must learn to shape R and D accordingly and give it relevance. I suggest that here we find the source of today's support gap.

The Federal Government is at the point where very tough policy choices must be made about R and D. Our opportunities are sadly out of phase with our pocketbook, and it would be hard to think of another area of public action where the problems of choice confronting the Government are more baffling. Is it right, in the sense of good social policy, to underfund programs in education, environmental health, and Model Cities so that we can seize our opportunities in science and technology? Should we require that public investments in R and D meet some reasonable test of social return commensurate with the cost of investment and equal to or higher than the return on different uses of the same money and creativity? I am one who thinks we should. It is not good enough in a rational but troubled age to run a country on the double standard of prudence in private investment and simple incrementalism in public investment. This is precisely why we have been working at top speed to change and upgrade the Government's decision-making process and to inject better methods into the way Government works out problems of choice and makes up its mind what to do next. And I see no reason why R and D should have immunity from all this.

For the short run, it is going to be very hard to persuade the country and the Congress that R and D is being maintained at a poverty level. The likelihood of a fiscal miracle to extricate R and D from its present plateau is remote.

But if more money is going to be scarce for R and D, there may be some things that we can do to correct some of the deficiencies in the way Government deals with these matters. I think first of the Government's administrative and policy structure for science and technology. If our policies and strategies for R and D are hard to fathom, perhaps it is because we are not well-organized. R and D is decentralized through the Federal Government. It is managed as a network which is held together loosely by the White House science office. It does not have a prime mover. Its decision-making patterns are pluralistic. As an institutional process it is not responsive to standards of balance, purpose, or priorities. Its component elements serve as mission-related conduits for funding research, development, training, and academic science; but it does not function as a system because it wasn't a system to begin with. It seems to me that we need something better, something capable of shaping science goals and strategies with depth and range and visibility. We need answers; we already know the questions.

—WILLIAM D. CAREY, *Assistant Director, Bureau of the Budget*

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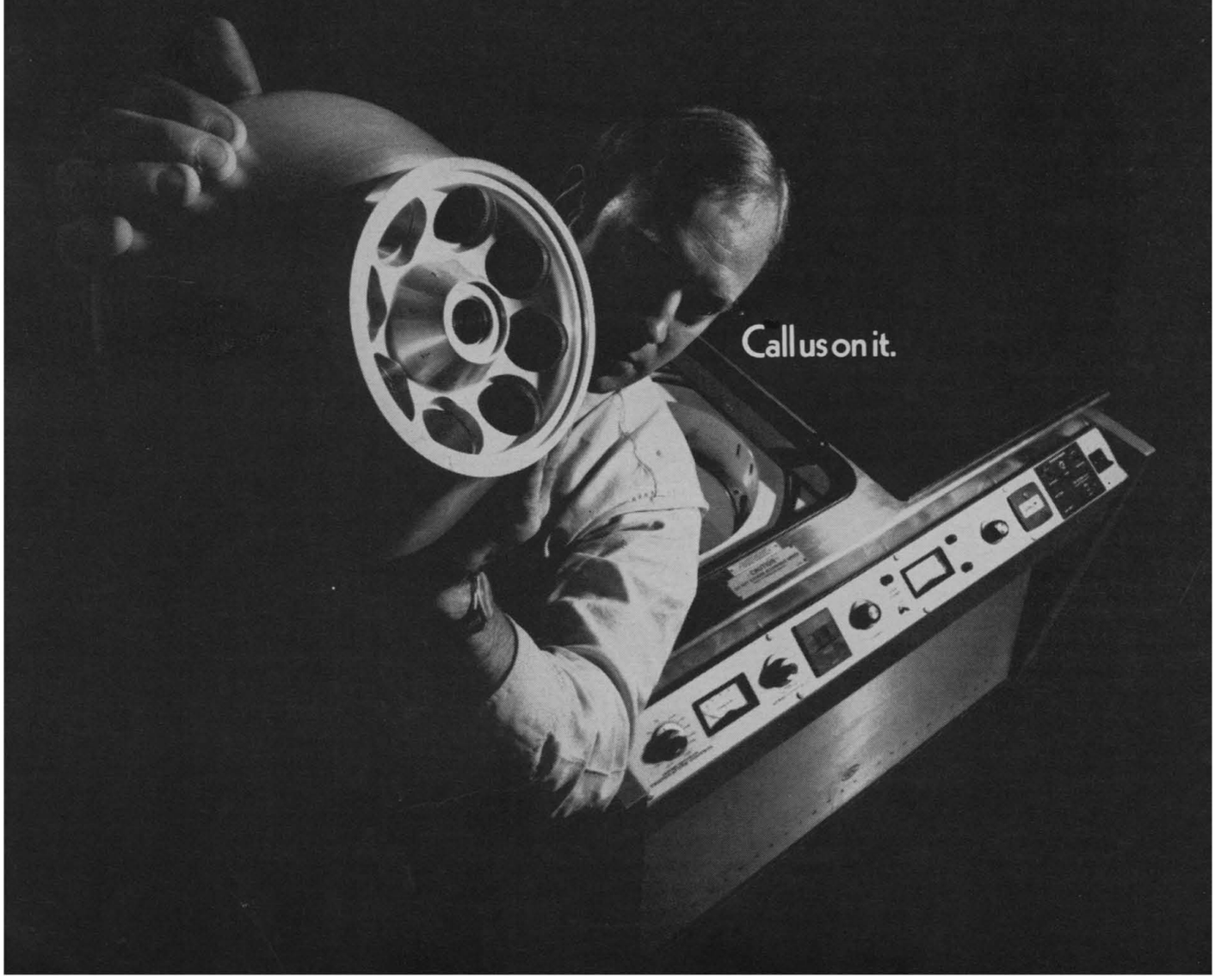

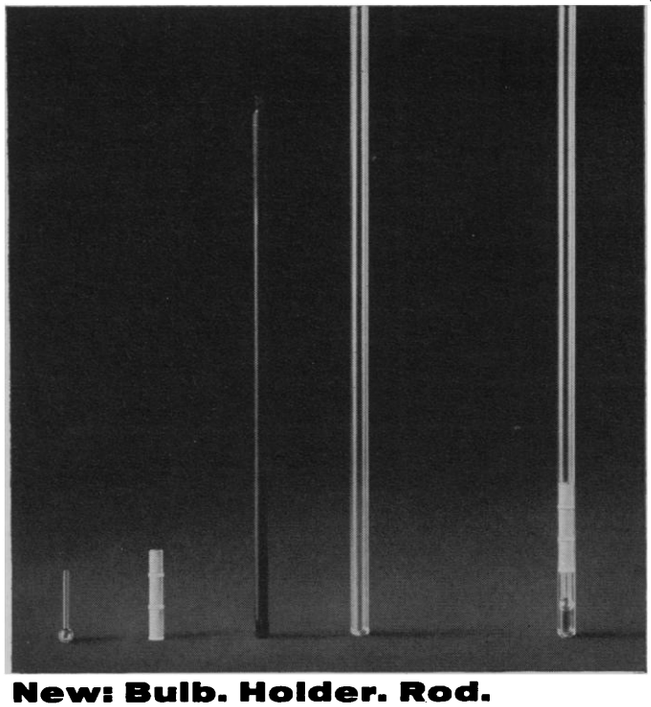

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*Applied Spectroscopy, May-June, 1967, Vol. 21 #2, "Microcell for Nuclear Magnetic Resonance Analysis," R. A. Flath, N. Henderson, R. E. Lundin, and R. Teranishi.

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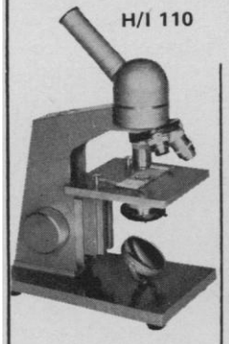

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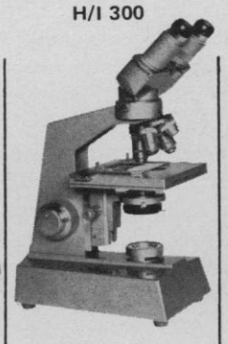

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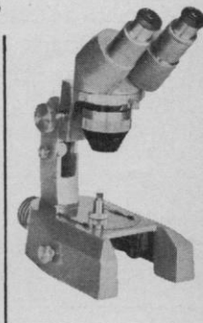

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14–15. American **Psychopathological** Assoc., 59th, New York, N.Y. (M. Fink, New York Medical College, 5 E. 102 St., New York 10029)

16–20. Soc. of **Economic Geologists**, Washington, D.C. (R. A. Laurence, P.O. Box 1549, Knoxville, Tenn. 37901)

16–20. American Inst. of **Mining, Metallurgical, and Petroleum Engineers**, 98th, Washington, D.C. (W. V. O'Connell, Public Relations, The Institute, 345 E. 47 St., New York 10017)

18–20. **Biophysical** Soc., Toronto, Ont., Canada. (W. A. Brodsky, Univ. of Louisville, Reynolds Bldg., Louisville, Ky. 40208)

18–22. American College of **Radiology**, Atlanta, Ga. (W. C. Stronach, 20 N. Wacker Dr., Chicago, Ill. 60606)

19–21. **Solid State Circuits** Conf., Philadelphia, Pa. (Office of Technical Activities, Inst. of Electrical and Electronics Engineers, 345 E. 47 St., New York 10017)

20–22. **Catalysis** Soc., 1st North American mtg., Atlantic City, N.J. (J. H. Sinfelt, Central Basic Research Lab., Esso Research and Engineering Co., P.O. Box 45, Linden, N.J. 07036)

20–22. Central **Surgical** Assoc., Chicago, Ill. (V. L. Williams, 1325 S. Grand Blvd., St. Louis, Mo. 63104)

23–28. Intersociety Committee on **Pathology**, Los Angeles, Calif. (O. Neibel, CAP, 230 N. Michigan Ave., Chicago, Ill. 60601)

26–2. American College of **Cardiology**, New York, N.Y. (W.D. Nelligan, 9650 Rockville Pike, Bethesda, Md. 20014)

27–1. **Experimental Nuclear Magnetic Resonance** Conf., 10th, Pittsburgh, Pa. (J. M. Anderson, Dept. of Chemistry and Chemical Engineering, Univ. of Illinois, Urbana 61801)

27–1. American **Physical** Soc., St. Louis, Mo. (W. W. Havens, Jr., The Society, 335 E. 45 St., New York 10017)

March

1–7. American **Concrete** Inst., 65th, Chicago, Ill. (The Institute, 22400 W. Seven Mile Rd., Detroit, Mich. 48219)

2–7. Pittsburgh Conf. on **Analytical Chemistry and Applied Spectroscopy**, Inc., 20th, Cleveland, Ohio. (W. M. Hickam, 1969 Pittsburgh Conf., Westinghouse Research Labs., Pittsburgh, Pa. 15235)

3–5. National Conf. on **Underwater Technology**, 3rd, San Diego, Calif. (J. T. Quirk, Ocean Engineering Div., U.S. Naval Civil Engineering Lab., Port Hueneme, Calif. 93041)

3–6. American Assoc. of **Junior Colleges**, Education Material and Equipment Exposition, Atlanta, Ga. (American Junior College Exposition, P.O. Box 1016, Alexandria, Va. 22313)

3–7. Symposium on **Arthritis and Related Disorders**, New York, N.Y. (Office of the Recorder, New York Univ. Post-Graduate Medical School, 550 First Ave., New York 10016)

4–6. National **Space** Mtg. of the Inst. of Navigation, Houston, Tex. (R. H. Battin, M.I.T. Instrumentation Lab., 75

Cambridge Parkway, Cambridge, Mass. 02139)

4–7. **Offshore Exploration** Conf., 4th, San Diego, Calif. (OECON IV, P.O. Box 88, Palos Verdes Estates, Calif. 90274)

5–7. **Fundamental Cancer Research**, 23rd symp., Houston, Tex. (D. E. Anderson, Univ. of Texas, M. D. Anderson Hospital and Tumor Inst., Houston)

5–7. **Particle Accelerator** Conf., Washington, D.C. (E. H. Eisenhower, Center for Radiation Research, Natl. Bureau of Standards, Washington, D.C. 20234)

9–11. American Assoc. of **Pathologists and Bacteriologists**, San Francisco, Calif. (K. M. Brinkhous, Dept. of Pathology, Univ. of North Carolina, School of Medicine, Chapel Hill 27514)

9–14. American Soc. of **Photogrammetry**, Washington, D.C. (G. L. Loelkes, 8608 Cherry Valley Lane, Alexandria, Va. 22309)

10–12. **Flight Test, Simulation, and Support** Conf., 3rd., Houston, Tex. (J. C. McLane, Jr., Structures and Mechanics Div., Engineering and Development Directorate, NASA Manned Spacecraft Center, Houston 77058

10–12. Society of **Toxicology**, Williamsburg, Va. (J. F. Borzelleca, Dept. of Pharmacology, Medical College of Virginia, Richmond 23219)

10–13. Conference on **Electric Fields in the Magnetosphere**, Houston, Tex. (J. W. Freeman, Jr., Dept. of Space Science, Rice Univ., P.O. Box 1892, Houston 77001)

10–13. American **Nuclear** Soc., Idaho Falls, Idaho. (J. E. Kunze, General Electric Co., P.O. Box 2147, Idaho Falls 83401)

10–14. National Assoc. of **Corrosion Engineers**, 25th, Houston, Tex. (Publication Director, 980 M & M Bldg., No. 1, Main St., Houston)

11–14. **Optical Soc. of America**, San Diego, Calif. (M. E. Warga, The Society, 2100 Pennsylvania Ave., NW, Washington, D.C. 20037)

13–14. Symposium on **Automated, High-Resolution Analyses in the Clinical Lab.**, Oak Ridge, Tenn. (Oak Ridge Natl. Lab., P.O. Box X, Oak Ridge 37830)

13–15. Conference on **Nuclear Isospin**, 2nd, Asilomar, Calif. (S. D. Bloom, Lawrence Radiation Lab., P.O. Box 808, Livermore, Calif. 94550)

14–15. American **Burn** Assoc., Atlanta, Ga. (J. A. Boswick, Cook County Hospital, 1835 W. Harrison, Chicago, Ill. 60612)

15–19. American Acad. of **Allergy**, Bal Harbour, Fla. (J. O. Kelly, 756 N. Milwaukee St., Milwaukee, Wis. 53202)

16–20. American Inst. of **Chemical Engineers**, 64th, New Orleans, La. (R. M. Persell, U.S. Dept. of Agriculture, Southern Utilization R&D Div., Box 19687, New Orleans 70119)

16–20. American Soc. of **Mechanical Engineers**, Cleveland, Ohio. (The Society, 345 E. 47 St., New York 10017)

18–19. Central States Section of the **Combustion** Inst., Minneapolis, Minn. (B. Schukraft, Inst. of Gas Technology, 3424 S. State St., Chicago, Ill. 60616)

20–22. American Acad. of **Facial Plastic and Reconstructive Surgery**, New Orleans, La. (J. R. Anderson, 111 Tulane Ave., New Orleans 70112)

23–29. American **Crystallographic**

Assoc., Seattle, Wash. (W. L. Kehl, Gulf Research and Development Co., P.O. Box 2038, Pittsburgh, Pa. 15230)

24–25. **Laser Safety** Conf. and Workshops, 2nd, Cincinnati, Ohio. (L. Goldman, Laser Lab., Children's Hospital Research Foundation of the Medical Center of the Univ. of Cincinnati, Cincinnati 45229)

24–27. American **Physical** Soc., Philadelphia, Pa. (W. W. Havens, Jr., The Society, 335 E. 45 St., New York 10017)

24–28. **Desalination**: Methods and Applications, Berkeley, Calif. (Continuing Education in Engineering, Univ. Extension, Univ. of California, 2223 Fulton St., Berkeley 94720)

25–27. American **Laryngological, Rhinological and Otological** Soc., Inc., New Orleans, La. (V. R. Alfaro, 917 20th St., NW, Washington, D.C. 20006)

26–28. National **Business Aircraft** Mfg. and Engineering Display, Wichita, Kan. (A. J. Favata, SAE Headquarters, 2 Pennsylvania Plaza, New York 10001)

26–28. Symposium on the **Engineering Aspects of Magnetohydrodynamics**, 10th, Cambridge, Mass. (J. Klepeis, Arrangements Committee, Avco Everett Research Lab., 2385 Revere Beach Parkway, Everett, Mass. 02149)

26–28. **George H. Hudson** Symp., 4th, Plattsburgh, N.Y. (M. H. Tourin, State Univ. College of Arts and Sciences, Plattsburgh 12901)

27–28. **Technical Writing** Inst., Lubbock, Tex. (M. Miles, Technical Writing Inst., Dept. of English, Texas Technological College, Lubbock 79409)

28–29. American **Otological** Soc., Inc., New Orleans, La. (W. H. Bradley, 1100 E. Genesee St., Syracuse, N.Y.)

28–30. American **Psychosomatic** Soc., Inc., 26th, Cincinnati, Ohio. (H. Weiner, 265 Nassau Rd., Roosevelt, N.Y. 11575)

30–2. American **Orthopsychiatric** Assoc., New York, N.Y. (M. F. Langer, Room 1313, 1790 Broadway, New York 10019)

31–2. **Advances in Water Quality Improvement**–Physical and Chemical Processes, Austin, Tex. (Center for Research in Water Resources, Univ. of Texas, Rt. 4, Box 189, Austin 78757)

31–2. **Metals Engineering** Conf., Washington, D.C. (R. J. Cepluch, Hartford Steam Boiler Inspection and Insurance Co., 56 Prospect St., Hartford, Conn. 06102)

31–2. American Assoc. of **Thoracic Surgery**, San Francisco, Calif. (T. B. Ferguson, Suite 311, 7730 Carondelet Ave., St. Louis, Mo. 63110)

International and Foreign Meetings

February

18–21. International **Oceanological Equipment and Services** Exhibition, Brighton, England. (BPS Exhibitions Ltd., Oceanology International 69, 6 London Street, London, W.2)

19–21. International **Solid-State Circuits** Conf., Philadelphia, Pa. (J. H. Wuorinen, Bell Telephone Labs., Murray Hill, N.J. 07971)

23–27. Pan American Congr. for **Psychoanalysis**, 4th, New York, N.Y. (H. Montessori, Intern. Psychoanalytical As-

soc., 2B Prins Hendriklaan, Amsterdam Z, Netherlands)

27–28. Congress of Intern. Inst. for **Sugar Beet Research**, 32nd, Brussels, Belgium. (The Institute, 150 rue Beauduin, Tirlemont, Belgium)

March

2–6. International Soc. of **Anesthesia Research**, 43rd, Bal Harbour, Fla. (B. B. Sankey, 3645 Warrensville Center Rd., Cleveland, Ohio 44122)

3–6. Symposium on **Protein Structure and Function**, St. Marguerite, P.Q., Canada. (T. H. G. Michael, Chemistry Inst. of Canada, 151 Slater St., Ottawa 4, Ont.)

7–12. International Acad. of **Pathology**, 58th, San Francisco, Calif. (P. K. Mostofi, % Armed Forces Inst. of Pathology, Washington, D.C. 20305)

9–11. International Conf. and Exposition on **Urban Transportation**, Pittsburgh Pa. (Pittsburgh Urban Transit Council, 945 Union Trust Bldg., Pittsburgh 15219)

9–22. International Postgraduate Congr. for **Practical Medicine**, Daves, Switzerland. (W. Brune, Kongressburo der Bundesarztekammer, Haedenkampstr. 1 5000 Koln-Lindenthal, Germany)

10–12. International Conf. on **Urban Transportation**, 4th, Pittsburgh, Pa. (G. R. Schaefer, WABCO Mass Transit Center, Westinghouse Air Brake Co., Pittsburgh)

12–13. Conference on **Safety on Construction Site**, London, England. (Institution of Civil Engineers, Great George St., London, S.W.1)

17–18. International Symp. of **High-speed Testing: The Rheology of Solids**, Boston, Mass. (R. H. Supnik, % Plas-Tech Equipment Corp., 4 Mercer Rd., Natick, Mass. 01760)

20–23. International Assoc. for **Dental Research**, 47th, Houston, Tex. (A. D. Frechette, 211 E. Chicago Ave., Chicago, Ill. 60611)

24–27. International Convention of Inst. of **Electrical and Electronics Engineers**, New York, N.Y. (The Convention, 345 E. 47 St., New York 10017)

25–28. **Autoclaved Building Products**, 2nd intern. symp., Hanover, Germany. (Secretary, Second Intern. Symp. 1969, "Haus der Kalksandstein-industrie," Postfach 66, 3 Hanover-Herrenhausen)

25–28. **Liquefied Natural Gas**, London, England. (Conference Dept., Inst. of Mechanical Engineers, 1 Birdcage Walk, Westminster, London, S.W.1)

27–28. International Congr. for **Heating, Ventilating, Air Conditioning**, 19th, Frankfurt am Main, Germany. (S. Ausschuss, Kongress fur Heizung, Luftung, Klimatechnik, Kongressburo, Konigstr. 5, 4 Dusseldorf 1, Germany)

31–4. International Symp. on **Concrete Bridge Design**, 2nd, Chicago, Ill. (American Concrete Inst., P.O. Box 4754, Redford Sta., 22400 W. Seven Mile Rd., Detroit, Mich. 48219)

April

7–11. Federation of European **Biochemical** Societies, 6th, Madrid, Spain. (Secretariat, Centro de Investigaciones Biologicas, Velazquez, 144, Madrid 6)

8–11. International Symp. on **Laboratory Animals**, Washington, D.C. (B. F. Hill, Charles River Breeding Labs., Inc., Wilmington, Mass.)

9–12. **British Medical** Assoc., clinical mtg., Valletta, Malta. (British Medical Assoc. House, Tavistock Sq., London, W.C.1, England)

14–17. **Cleft Palate**, intern. congr., Houston, Tex. (B. J. McWilliams, Cleft Palate Research Center, Univ. of Pittsburgh, 313 Salk Hall, Pittsburgh, Pa. 15213)

15–17. **Civil Engineering Problems of the South Wales Valleys**, Cardiff, England. (Institution of Civil Engineers, Great George St., London, S.W.1, England)

15–18. International **Magnetics** Conf., Amsterdam, Netherlands. (T. Holtwijk, Philips Research Labs., Eindhoven, Netherlands)

17–18. British Inst. of **Radiology**, London, England. (British Inst. of Radiology, 32 Welbeck St., London, W.1)

19–27. Yugoslav Seminar and Exhibition of **Regulation, Measuring and Automation-Jurema** 1969, 14th, Zagreb. (Jurema, Unska U1, P.O.B. 123, Zagreb)

21–23. Canadian Inst. of **Mining and Metallurgy**, 71st, Montreal, Canada. (Executive Director, The Institute, Suite 906, 1117 St. Catherine St. W., Montreal 2, P.Q.)

21–25. **Switching Techniques for Telecommunication Networks**, London, England. (Conference Dept., Institution of Electrical Engineers, London, W.C.2)

21–26. Canadian **Pulp and Paper** Assoc., 10th, Vancouver, B.C. (W. K. Voss, Ontario Paper Co. Ltd., Thorold, Ont.)

22–25. **Cotton Textile Research**, 1st intern. symp., Paris, France. (Institut Textile de France, 23 rue des Abondances, 92, Boulogne, France)

22–29. **Hydrology of Deltas**, intern. symp., Bucharest, Rumania. (A. I. Johnson, Water Resources Div., U.S. Geological Survey, Federal Center, Denver, Colo. 80225)

28–2. Symposium on **Radiation-Induced Carcinogenesis**, Athens, Greece. (R. N. Mukherjee, Unit of Radiation Biology, Intern. Atomic Energy Agency, Karntner Ring 11–13, A-1010 Vienna, Austria)

May

5–8. **Instrumentation in Aerospace Simulation Facilities**, 3rd intern. congr., Farmingdale, N.Y. (C. R. Spitzer, MS-236, NASA Langley Research Center, Hampton, Va. 23365)

5–8. International **Microwave** Symp., Dallas, Tex. (J. B. Horton, MS 905, Texas Instrument Co., Box 5012, Dallas 75222)

5–9. Commonwealth **Mining and Metallurgical** Congr., 9th, London, England. (Congress Secretary, Commonwealth Council of Mining and Metallurgical Institutions, 44 Portland Pl., London, W.1, England)

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