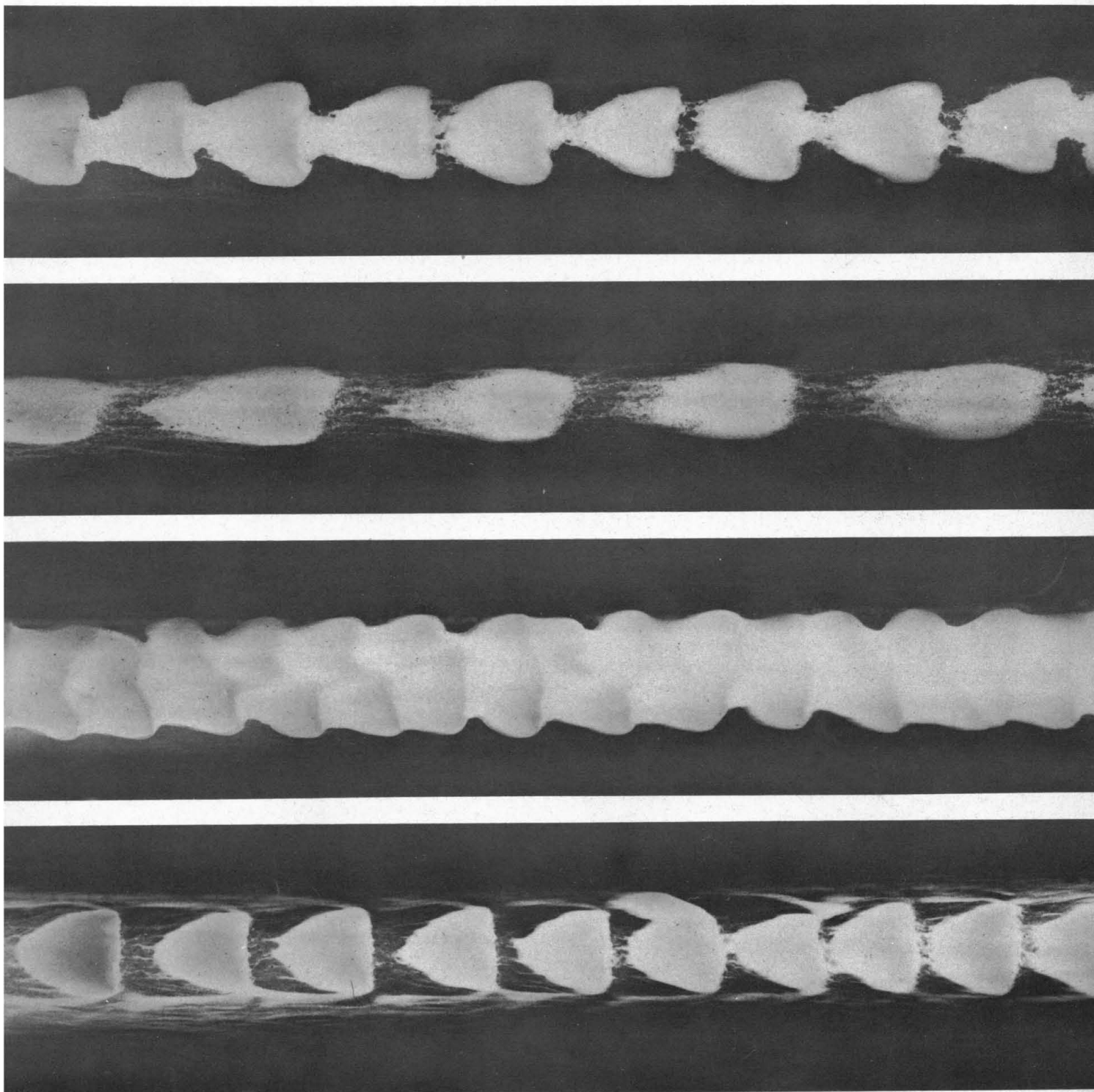


SCIENCE

1 May 1964
Vol. 144, No. 3618

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

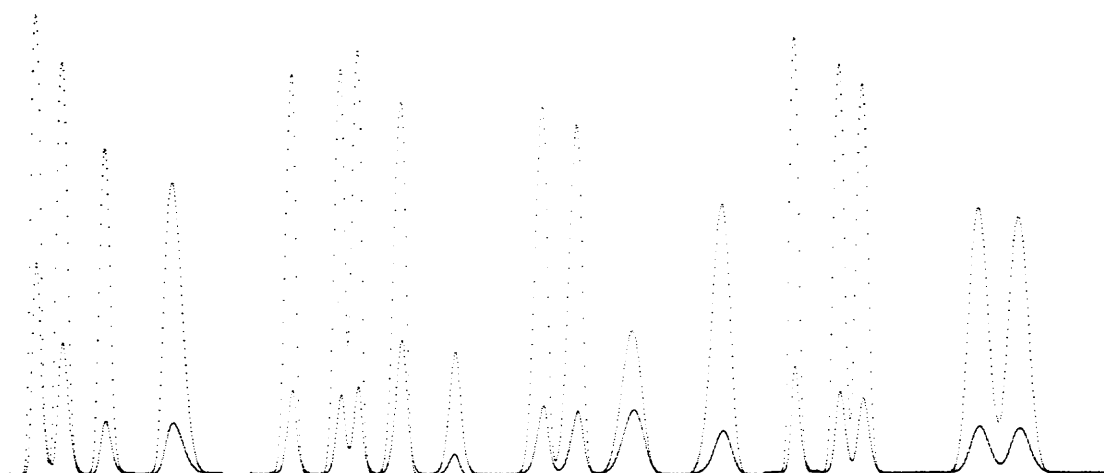


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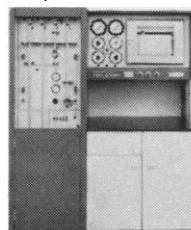


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LETTERS	Overhead and Accounting Methods: <i>L. Ehrman</i> and <i>R. J. Woodrow</i> ; Experimental Cancer-Cell Implants in Patients: <i>E. E. Mandel</i> ; Science as News: <i>S. Lambert</i> ; Priority Questioned: <i>J. C. Sheppard</i> , <i>W. E. Keder</i> , <i>A. S. Wilson</i> ; Insect Control by Nontoxic Means: <i>R. H. Wright</i> ; Noise, Annoyance, and Progress: <i>C. E. Goshen</i>	485
EDITORIAL	Distribution of Federal Research Funds	491
ARTICLES	Pharmacology of Individual Neurons: <i>G. C. Salmoiraghi</i> and <i>F. E. Bloom</i>	493
	Microelectrophoresis provides closer observation of the interactions between nerve cells and drugs.	
	Prehistory of the West Indies: <i>I. Rouse</i>	499
	The Indians Columbus encountered when he discovered the New World were moving up from South America.	
NEWS AND COMMENT	Population—Latin American Interest; Alaska—After the Earthquake Science and Society: White House Tea	513
	<i>Report from Europe</i> : Jodrell Bank Observatory	520
BOOK REVIEWS	Congressional Control of the Executive Branch: <i>R. G. Tugwell</i>	524
	<i>Radio Astronomy Today</i> , reviewed by <i>R. N. Bracewell</i> ; other reviews by <i>I. L. Eisner</i> , <i>C. V. Morton</i> , <i>M. Krantzberg</i> , <i>A. D. Wallace</i> , <i>M. Minsky</i>	525
REPORTS	Beta-Carotene: Thermal Degradation: <i>I. Mader</i>	533
	Periodic Phenomena Observed with Spherical Particles in Horizontal Pipes: <i>D. G. Thomas</i>	534
	Radioactive Particle in Sediment from the Columbia River: <i>N. Cutshall</i> and <i>C. Osterberg</i>	536
	Xenon Hexafluoride Complexes: <i>H. Selig</i>	537

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Variation of Cesium in the Ocean: <i>T. R. Folsom, C. Feldman, T. C. Rains</i>	538
Nicotinic Acid Analogs: Effects on Response of Chick Embryos and Hens to Organophosphate Toxicants: <i>J.-C. Roger, H. Chambers, J. E. Casida</i>	539
<i>trans</i> -2-Dodecenal and 2-Methyl-1,4-Quinone Produced by a Millipede: <i>J. W. Wheeler et al.</i>	540
Dictyotene Stage of Meiosis in Mosses: <i>F. J. Dill</i>	541
Inhibition of Bacterial Growth by Drugs of the Morphine Series: <i>E. J. Simon</i>	543
Bilirubin: Acute Effects in Newborn Rhesus Monkeys: <i>R. E. Behrman and E. Hibbard</i>	545
Transpiration: Its Effects on Plant Leaf Temperature: <i>G. D. Cook, J. R. Dixon, A. C. Leopold</i>	546
House Sparrows: Rapid Evolution of Races in North America: <i>R. F. Johnston and R. K. Selander</i>	548
Labeled Oxygen: Transport through Growing Corn Roots: <i>C. R. Jensen, J. Letey, L. H. Stolzy</i>	550
Hemoglobins A and F: Formation in Thalassemia and Other Hemolytic Anemias: <i>P. A. Marks and E. R. Burka</i>	552
Mechanisms of Receptor Adaptation: <i>M. Mendelson and W. R. Loewenstein</i>	554
Speech Sound Discrimination by Cats: <i>J. H. Dewson, III</i>	555
Comment on Reports: The Plankton Community: <i>R. W. Bachmann and B. C. Patten</i>	556
National Academy of Sciences: Abstracts of papers presented at the annual meeting, Washington, D.C., 27-29 April 1964	559
MEETINGS Analytical Chemistry in Nuclear Technology: <i>M. T. Kelley et al.</i> ; Forthcoming Events	570

NA REES ALTER ORR ROBERTS	ATHELSTAN F. SPILHAUS H. BURR STEINBACH	PAUL E. KLOPSTEG Treasurer	DAEL WOLFLE Executive Officer
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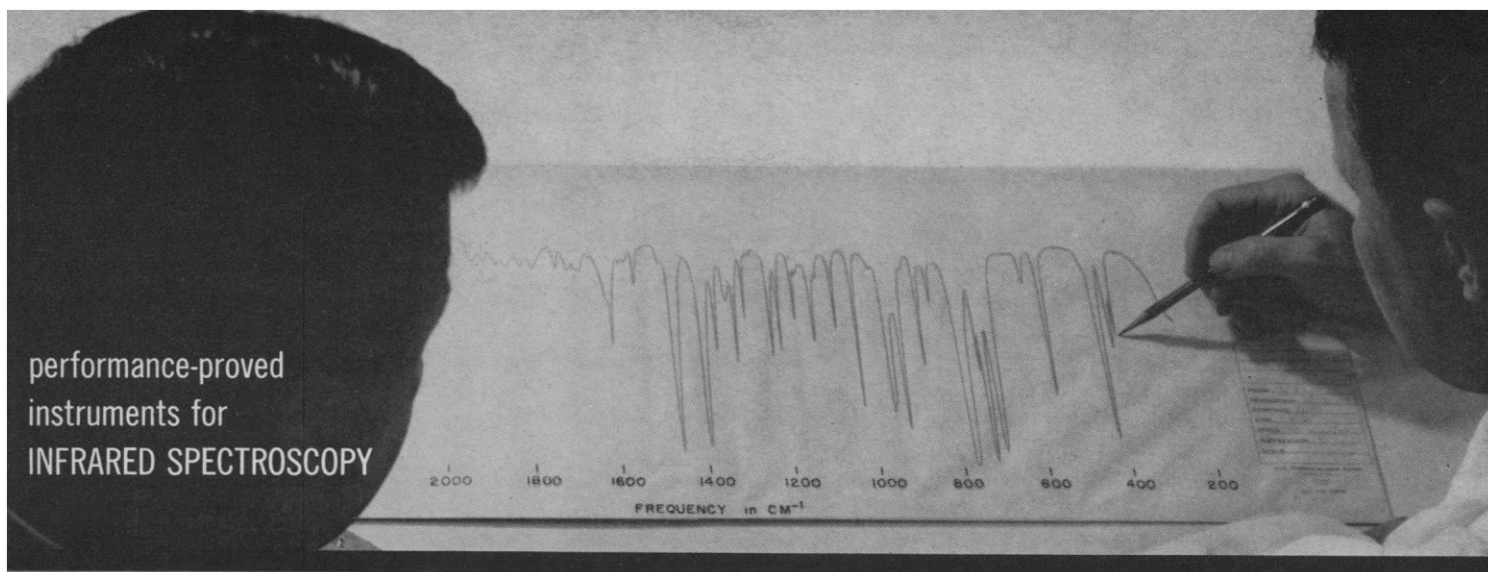
The development of electronic computers and related equipment to aid in the "life sciences" is examined by thirty-four experts in bio-medical electronics in a new book entitled **ELECTRONIC AND COMPUTER-ASSISTED STUDIES OF BIO-MEDICAL PROBLEMS**. Edited by **Otto H. Schmitt** of the *University of Minnesota*, and **Cesar A. Caceres** of the *U. S. Public Health Service*, this book is the first to stress the application of computers as eventual diagnostic aids to practicing physicians. *Publication date March, 344 pp., \$12.50*

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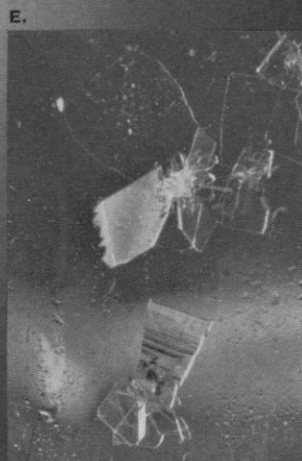
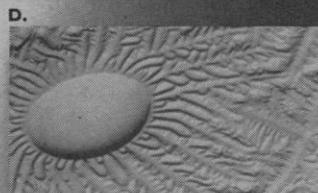
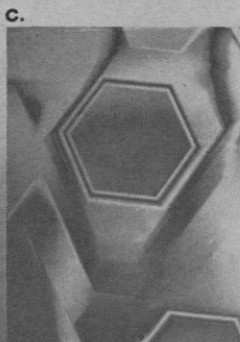
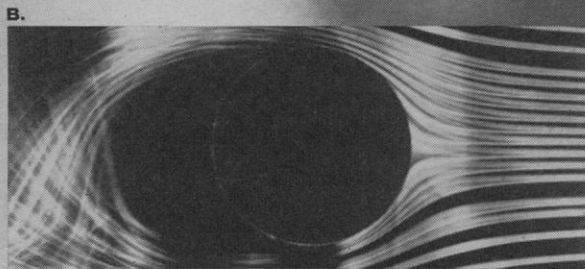
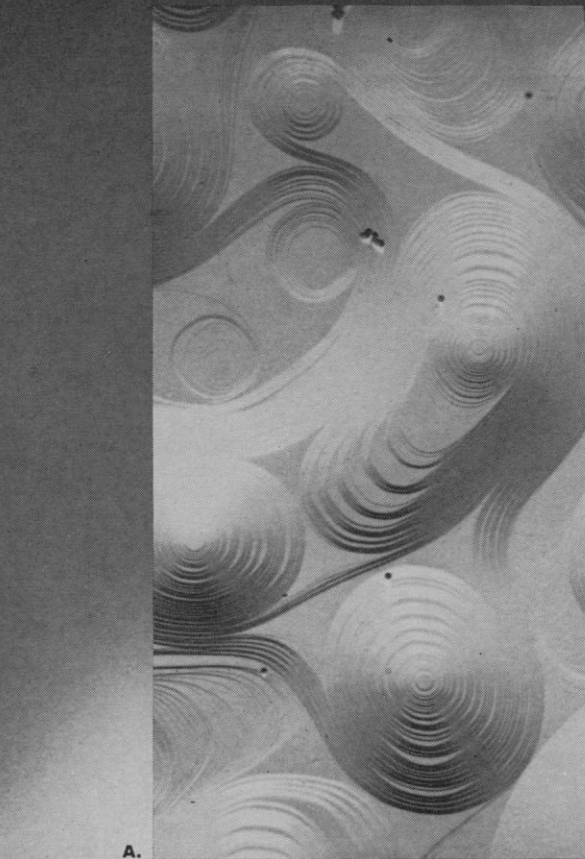
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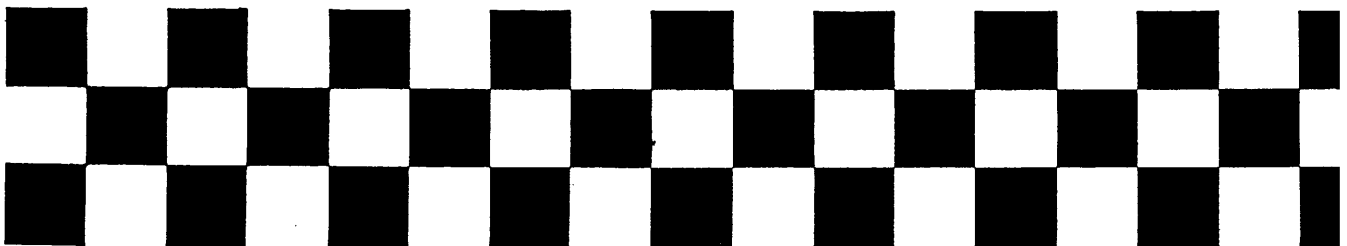
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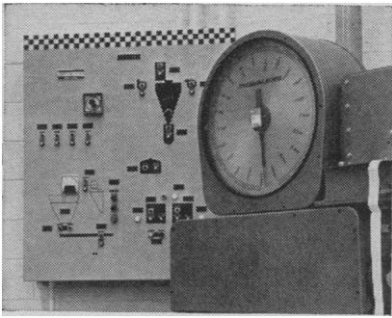
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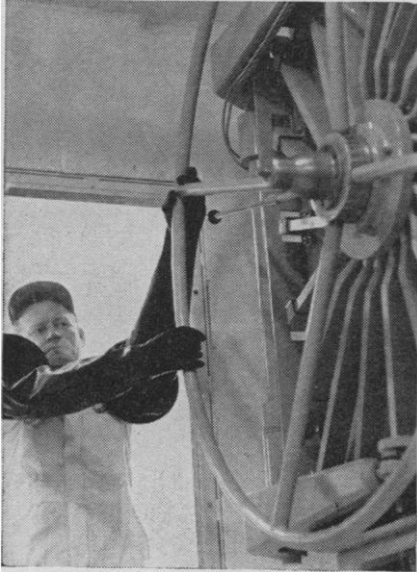
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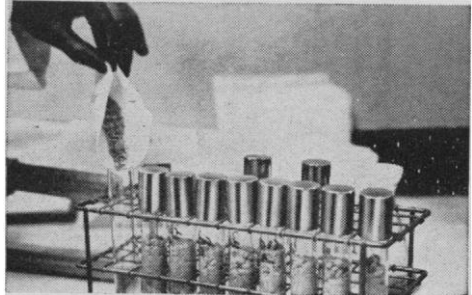
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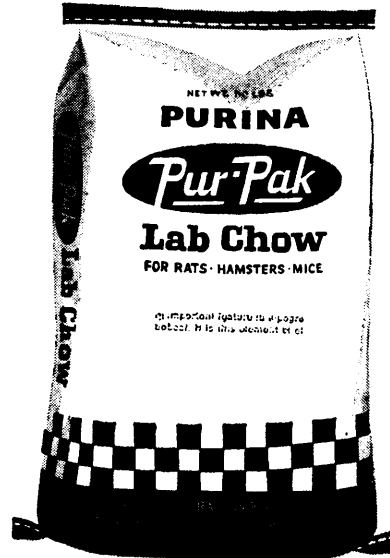
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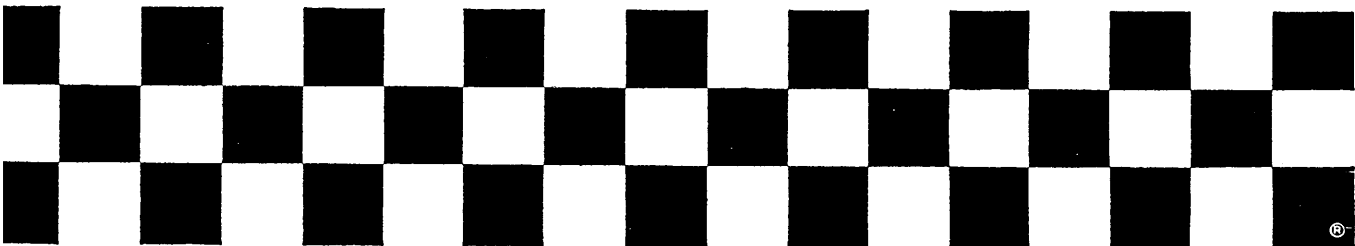
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Distribution of Federal Research Funds

The allocation of federal research funds is likely to be a continuing source of controversy. In 1962 ten institutions received 38 percent of the total, while 25 received 59 percent. At least two factors contributed to this concentration. First, a number of universities managed large research establishments for the Defense Department, the Atomic Energy Commission, or the National Aeronautics and Space Administration. A second factor is the known excellence of the institutions receiving funds. A few universities have obtained many of the best men, who in turn generate first-rate research proposals.

Policies of government agencies differ with respect to distribution of funds. The Defense Department awards research contracts to those most capable of getting results. Since the principal business of the organization is defense of the nation, such a policy seems in order.

The National Institutes of Health and the National Science Foundation have succeeded in attaining a fairly widespread distribution of their funds. Lumping the two together for simplicity, one finds that, in fiscal 1962, four populous eastern states received \$7.0 per capita. Five middle western states obtained \$3.4, while eight southeastern states received \$2.1. However, considered on the more realistic basis of dollars per *scientist* in these regions, the distribution was roughly even. For the eastern group the figure was \$2000; for the middle western group, \$1590; and for the southeastern group, \$1600. These figures indicate that these two granting agencies have tried to distribute their funds broadly.

Despite such efforts, the fact remains that support is concentrated in a relatively few schools, and that some 700 institutions in this country which award baccalaureate or higher degrees in science receive no research grants from the National Science Foundation.

In considering policies with respect to distribution of funds for academic research we should ask ourselves: What should we be trying to do? What is the bottleneck today? Is it a need to acquire knowledge at a faster rate, or is it a need for more trained scientists? If the bottleneck were new findings, we would be justified in persisting in giving excellence overriding priority in the distribution of funds. The current flood of publications scarcely supports this view. Many believe that adequate training of students should have a priority in the academic world at least equal to that of research results. In the coming decade increasing numbers of students will enter universities, and an additional new group of professors must be prepared to teach them. Our future economic health depends on an adequate supply of first-class scientists for industrial organizations.

We have been told repeatedly, and we believe, that research lends excellence to teaching. The argument is that research keeps professors more alive and abreast of current developments. However, if the scientist at a university does not teach or if he directs only a few graduate students, he serves a limited academic function. With most of the grant money going to a few institutions, the remaining hundreds of schools having little or no funds for modern equipment are falling farther and farther behind in quality of staff and teaching.

Excellence in research productivity should continue to be a primary criterion in the choice of grantees, but agencies such as NSF should give weight to the training aspect in making allocations of funds.—PHILIP H. ABELSON



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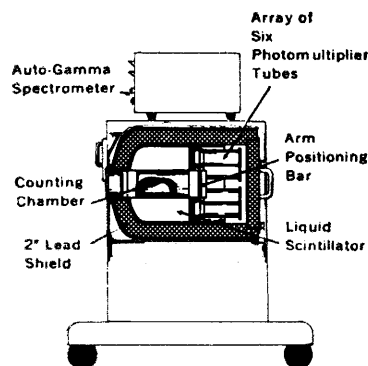
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The Federal Communications Commission has assigned three broad bands of frequencies for use by the common carriers, centered on 4000, 6000, and 11,000 megacycles. Because of atmospheric effects, transmission is more reliable in the lower two bands; thus the backbone long-haul routes of the Bell System operate in these bands. However, the 11,000 megacycle band is satisfactory most of the time, with transmission impairment occurring only during heavy rainstorms.

Engineers at our Merrimack Valley Laboratory (North Andover, Massachusetts) have developed a new microwave system which can operate alternatively in the 6000 and 11,000 megacycle bands. Should fading or equipment troubles occur while operating in one band, the system automatically switches to the other band—so rapidly that a television viewer, for example, cannot see or hear any difference. Thus reliable transmission is assured and available microwave bands are used efficiently.

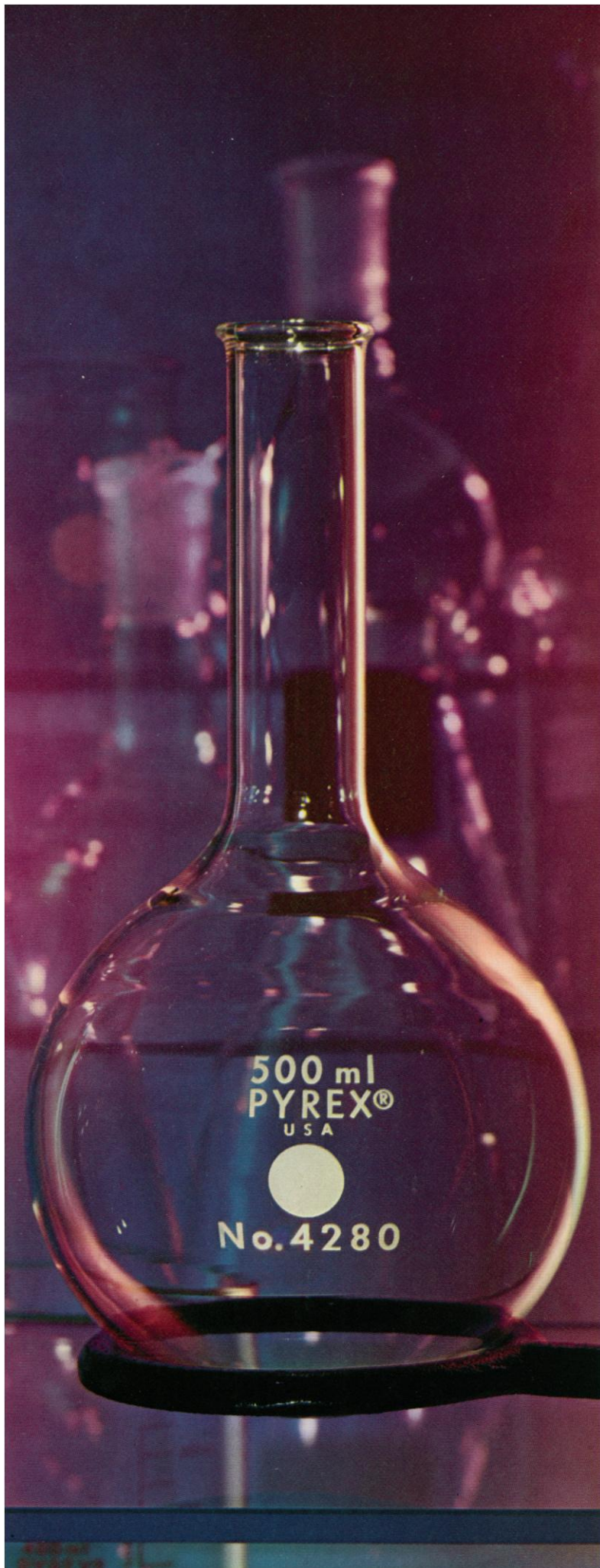
The new system is designed to be economical for short-haul service—i.e., for routes up to 250 miles in length.

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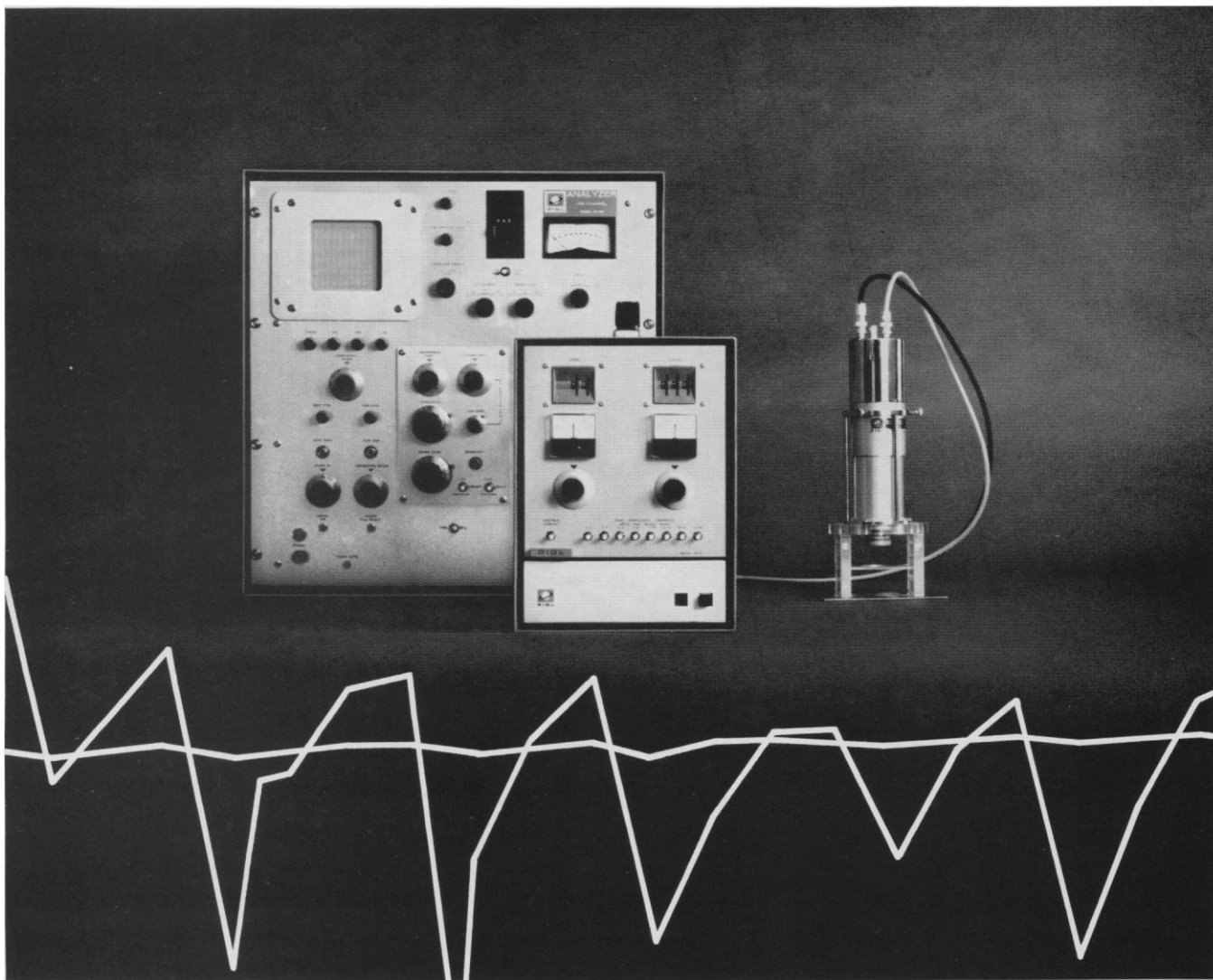
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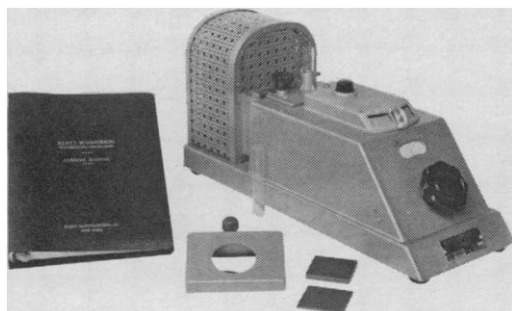
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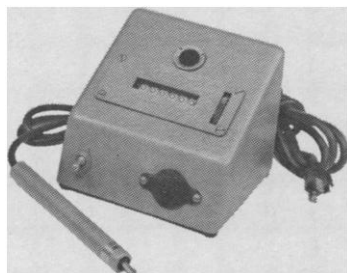


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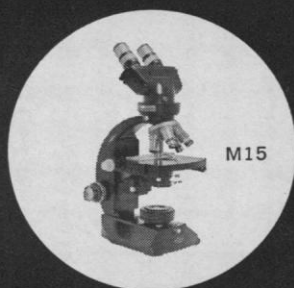
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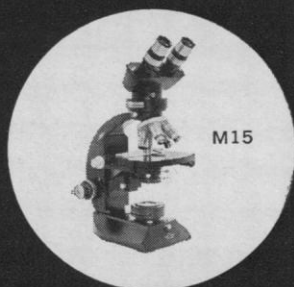
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Forthcoming Events

May

11-13. **Vectorcardiography**, intern. conf., New York, N.Y. (E. Meilman, Long Island Jewish Hospital, New Hyde Park, N.Y.)

11-14. **Society for Industrial and Applied Mathematics**, spring meeting, Washington, D.C. (SIAM, Box 7541, Philadelphia 1, Pa.)

11-14. **American Urological Assoc.**, annual, Pittsburgh, Pa. (AUA, 1120 North Charles St., Baltimore, Md.)

11-16. **Assessment of Radioactive Body Burdens in Man**, symp., IAEA, Heidelberg, Germany. (IAEA, Div. of Public Information, Kärrntnerring 11, Vienna, Austria)

11-14. **Aerospace Medical Assoc.**, 35th annual, Bal Harbour, Fla. (W. J. Kennard, c/o Washington Natl. Airport, Washington, D.C. 20001)

11-14. **Biological Editors**, conf., Ann Arbor, Mich. (R. L. Zwemer, Committee on European Editors, c/o American Physiological Soc., 9650 Wisconsin Ave., Bethesda, Md. 20014)

11-16. **International College of Surgeons**, 14th intern. congr., Vienna, Austria. (S. E. Henwood, 1516 Lake Shore Dr., Chicago, Ill. 60610)

12. **American Inst. of Chemical Engineers**, tri-sectional symp., Newark, N.J. (R. H. Dodds, Gibbs & Hill, Inc., 393 Seventh Ave., New York, N.Y.)

13-14. **Society of Plastics Engineers**, plastics in space, conf., Garden City, N.J. (D. Hassel, Grumman Aircraft Engineering Corp., Bethpage, L.I., N.Y.)

13-15. **Biomathematics and Computer Science in the Life Sciences**, 2nd annual symp., Houston, Tex. (Univ. of Texas Graduate School of Biomedical Sciences, 102 Jesse Jones Bldg., Texas Medical Center, Houston 77025)

13-15. **Society of Professional Well Log Analysts**, 5th intern. symp., Midland, Tex. (F. Wheeler, SPWLA, P.O. Box 4713, Tulsa 14, Okla.)

14-15. **Radiochemical Processing Symp.**, Buffalo, N.Y. (R. F. Lumb, Western New York Nuclear Research Center, Power Drive, Buffalo 14214)

14-15. **Scandinavian Biochemistry Meeting**, Stockholm, Sweden. (Sveriges Biokemiska Förenig, Karolinska Inst., Stockholm 60)

14-16. **American Inst. of Industrial Engineers**, 15th annual conf., Philadelphia, Pa. (W. J. Jaffe, Dept. of Management Engineering, Newark College of Engineering, Newark, N.J.)

14-16. **Central States Anthropological Soc.**, annual, Milwaukee, Wis. (N. O. Lurie, Dept. of Anthropology, Univ. of Wisconsin, Milwaukee 11)

14-16. **Society of Technical Writers and Publishers**, 11th annual convention, San Diego, Calif. (C. M. Johnson, U.S. Navy Electronics Laboratory, San Diego 92132)

16. **Southern California Acad. of Sciences**, annual, Northridge. (R. B. Loomis, Dept. of Biology, Long Beach State College, Long Beach, Calif.)

16-2. **European Energy Conf.**, Paris, France. (H. Perdon, Institut Français des Combustibles et de l'Energie, 3, rue Henri-Heine, Paris 16°)

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17-20. American Inst. of **Chemical Engineers**, natl. meeting, Pittsburgh, Pa. (F. J. Van Antwerpen, 345 E. 47 St., New York, N.Y. 10017)

18-20. **Radiation Research Soc.**, 12th annual, Miami Beach, Fla. (G. D. Adams, Radiological Laboratory, Univ. of California Medical Center, San Francisco 22)

18-20. **Water**, 2nd conf., Technical Assoc. of the Pulp and Paper Industry, Green Bay, Wis. (H. O. Teeple, TAPPI, 360 Lexington Ave., New York, N.Y.)

18-21. Society of **Economic Paleontologists and Mineralogists**, Toronto, Ont., Canada. (R. H. Dott, Box 979, Tulsa 1, Okla.)

18-21. American Assoc. of **Petroleum Geologists**, 49th annual conv., Toronto, Ont., Canada. (R. E. King, American Overseas Petroleum, Ltd., 485 Lexington Ave., New York, N.Y. 10017)

19-20. Council on **Medical Television**, 6th annual, Atlanta, Ga. (S. A. Agnello, Duke Univ. Medical Center, Box 3163, Durham, N.C. 27706)

19-21. **Microwave Theory and Techniques**, intern. symp., New York, N.Y. (H. L. Browman, Airborne Instruments Laboratory, Deer Park, N.Y. 11729)

19-22. **German Metallurgical Soc.**, general assembly, Bremen. (Deutsche Gesellschaft für Metallkunde, An der Alteburger Mühle 12, Köln-Marienburg, Germany)

19-22. German Soc. for **Applied Optics**, 65th, Gmunden am Traunsee. (H. Volkmann, Deutsche Gesellschaft für Angewandte Optik, Zeppelinstr. 23, 7920 Heidenheim, Germany)

19-23. **Energy Metabolism**, 3rd symp., Ayr, Scotland. (European Assoc. for Animal Production, Corso Trieste, 67, Rome, Italy)

19-30. International **Electrotechnical Commission**, general meeting, Aix-les-Bains, France. (American Standard Assoc., 10 E. 40 St., New York 16)

20. Memorial Hospital of Long Beach, **medical staff symp.**, Long Beach, Calif. (G. X. Trimble, 2801 Atlantic Ave., Long Beach 6)

20-23. Canadian Assoc. of **Geographers**, 14th annual, London, Ont. (CAG, P.O. Box 421, Ottawa, Ont., Canada)

20-28. Modern Methods for **Analysis of Organic Compounds**, symp., Eindhoven, Netherlands. (Gesellschaft Deutscher Chemiker, Postfach 9075, Frankfurt-am-Main, Germany)

21-22. American **Geological Inst.**, Toronto, Ont., Canada. (D. M. Kinney, U.S. Geological Survey, Washington, D.C.)

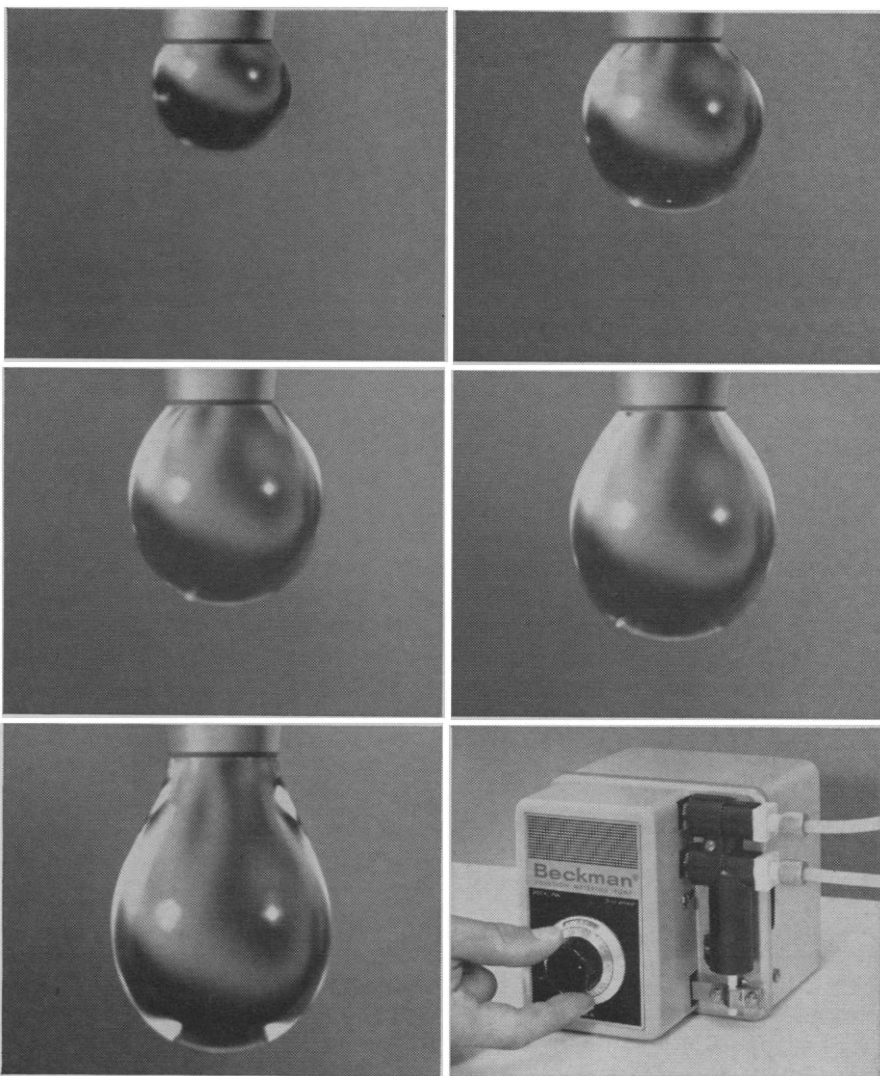
21-22. Southern **Textile Research Conf.**, Hilton Head Island, S.C. (American Assoc. of Textile Chemists and Colorists, P.O. Box 886, Durham, N.C.)

21-23. **Minerals**, 9th annual symp., Moab, Utah. (J. C. Fox, Soc. of Mining Engineers, 345 E. 47 St., New York, N.Y.)

21-23. California Soc. of **Professional Engineers**, annual, Palm Springs, Calif. (J. C. Huisking, 970 Hillcrest Dr., Pomona, Calif.)

23-24. **Radiosensitizers and Radioprotective Drugs**, 1st intern. symp., Milan, Italy. (R. Paoletti, Pharmacology Inst., Via A. del Sarto, 21, Milan)

24-28. Near and Middle East **Medical conf.**, Istanbul, Turkey. (P. Ponthus, Institut de Radiologie et de Lutte Contre le



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