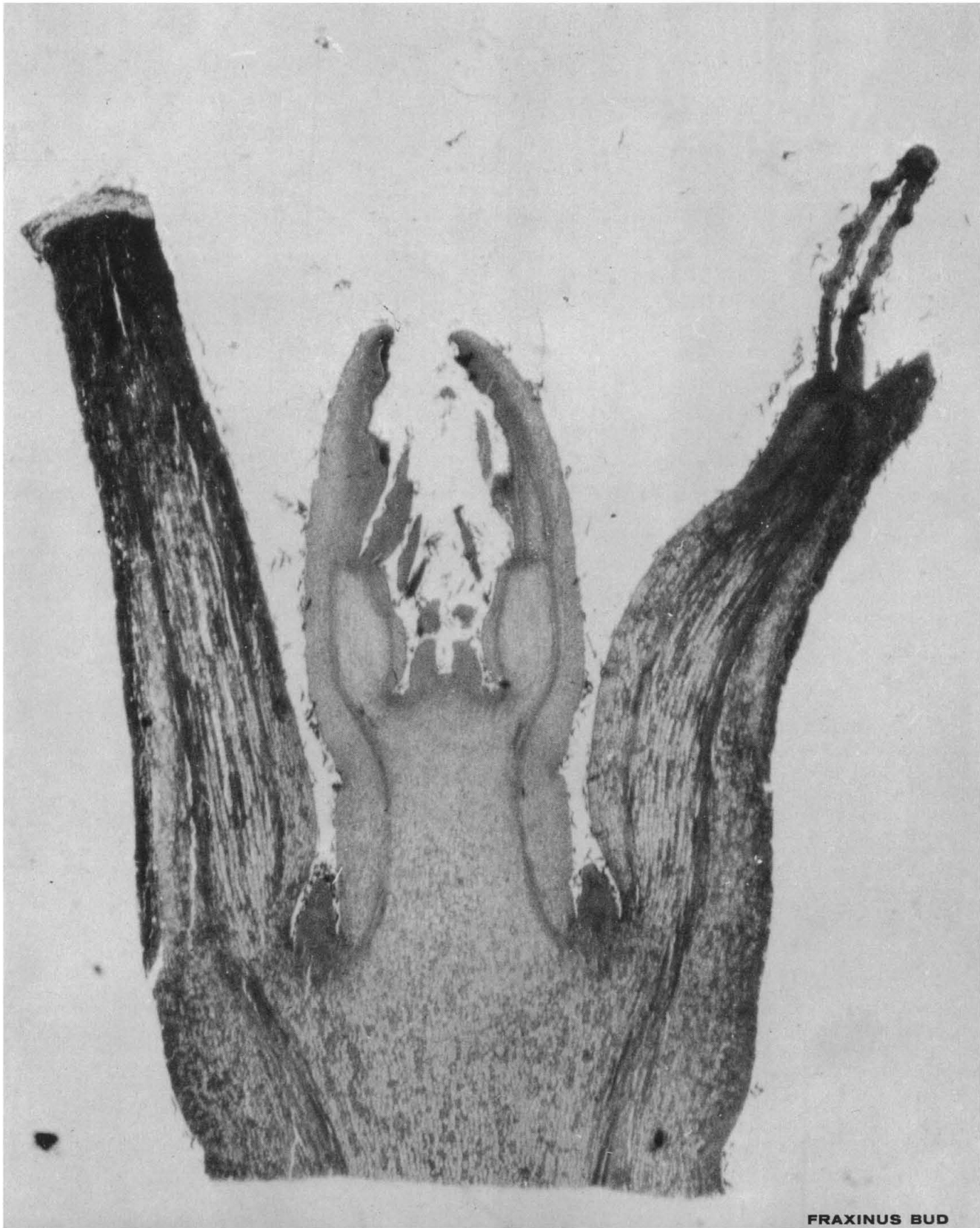


SCIENCE

23 June 1967

Vol. 156, No. 3782

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE



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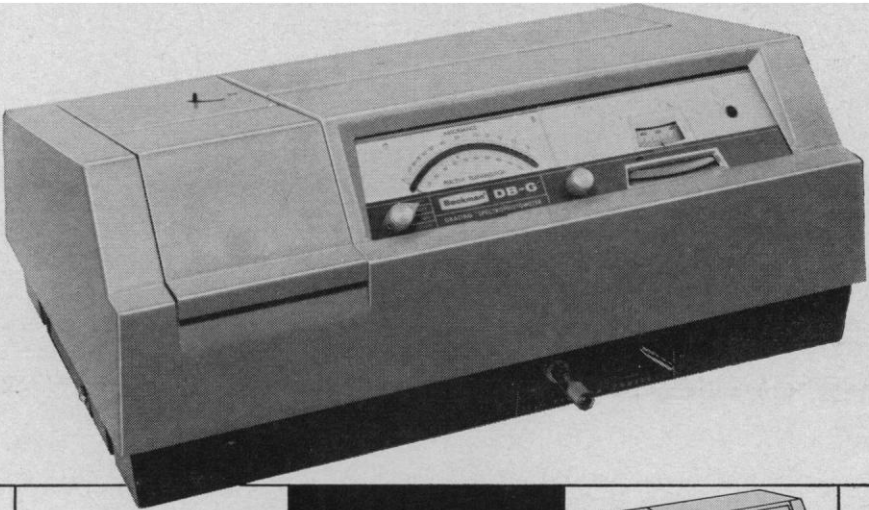
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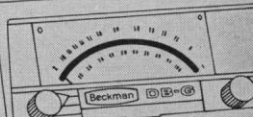
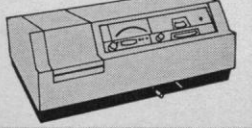
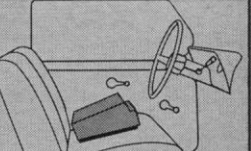
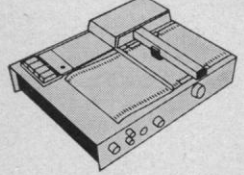
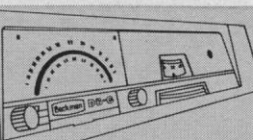



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COVER

Sectional view of a newly expanding bud of white ash (*Fraxinus americana* L.). Two bud scales (modified petioles) enclose several pairs of opposite leaf primordia. See page 1635. [Herbert B. Pepper, State University College of Forestry at Syracuse University]

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.

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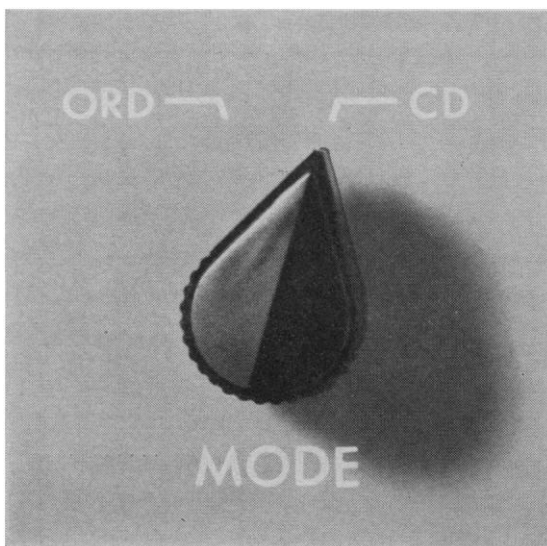
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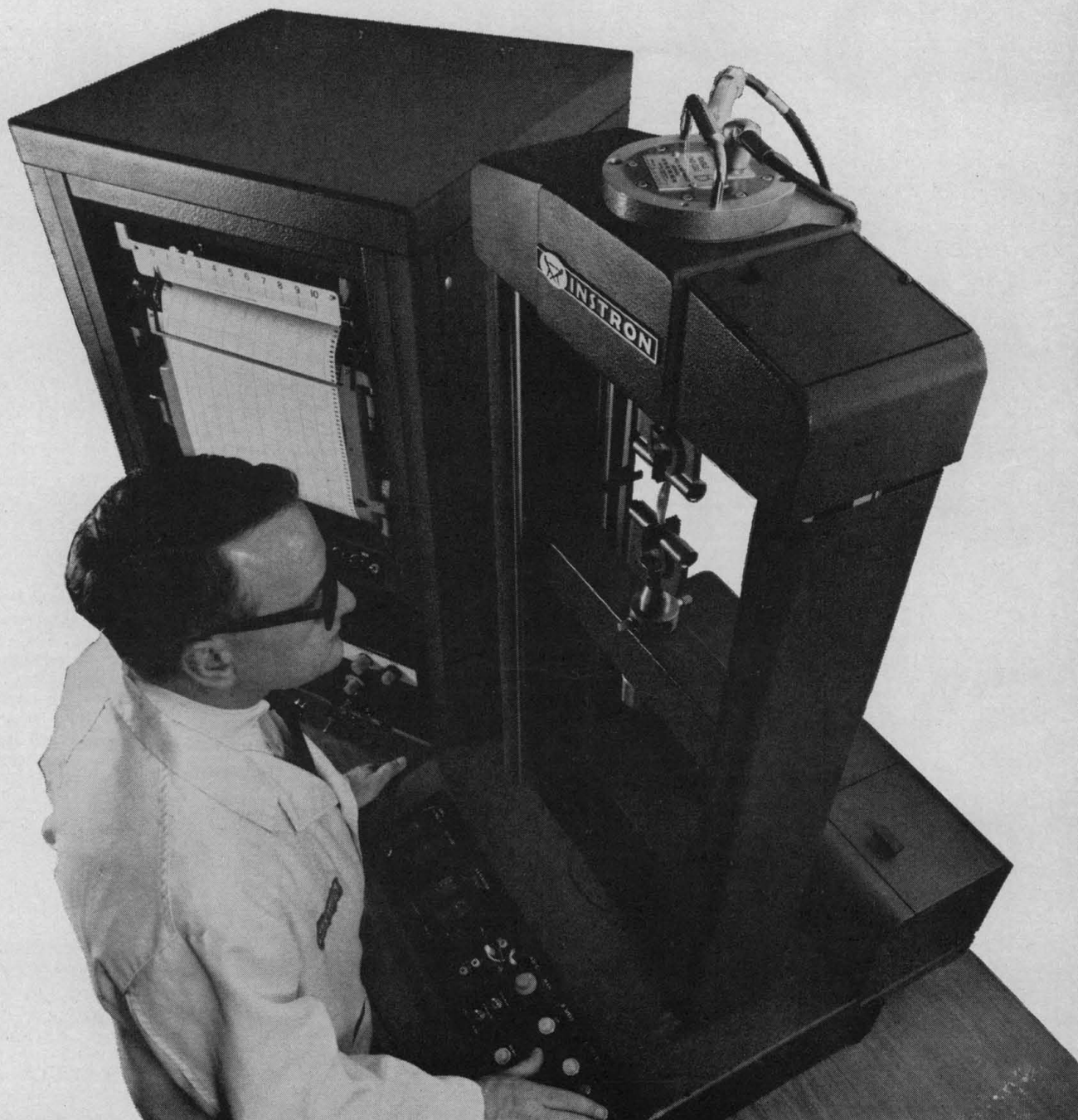
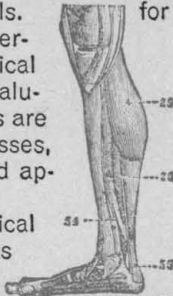
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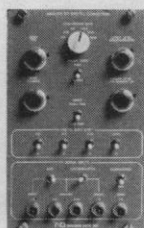
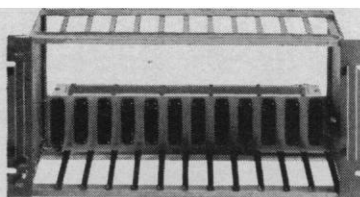
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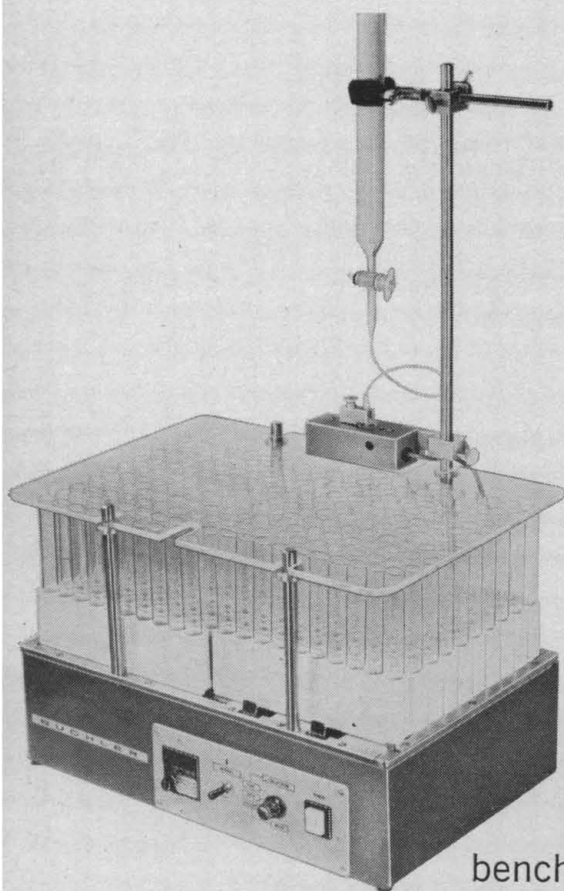
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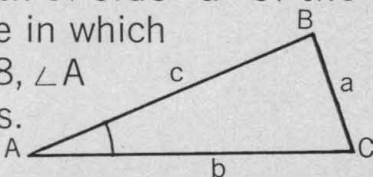
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Someone gave him the following problem:

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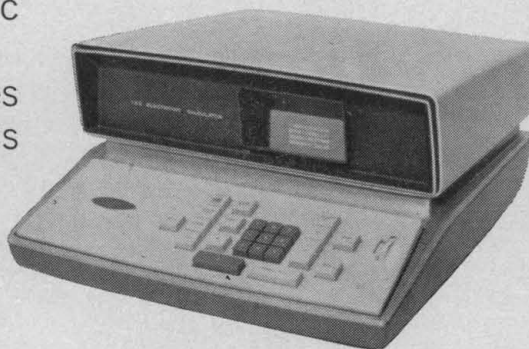
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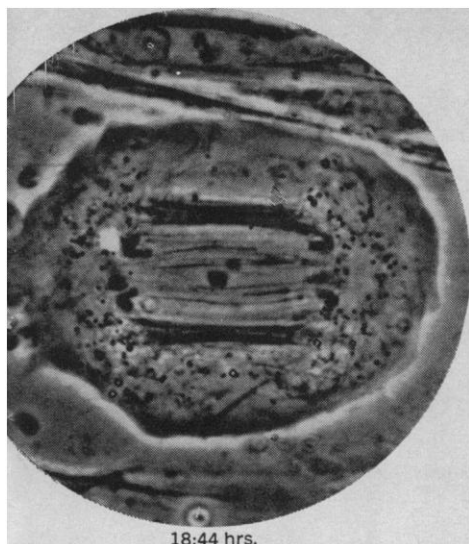
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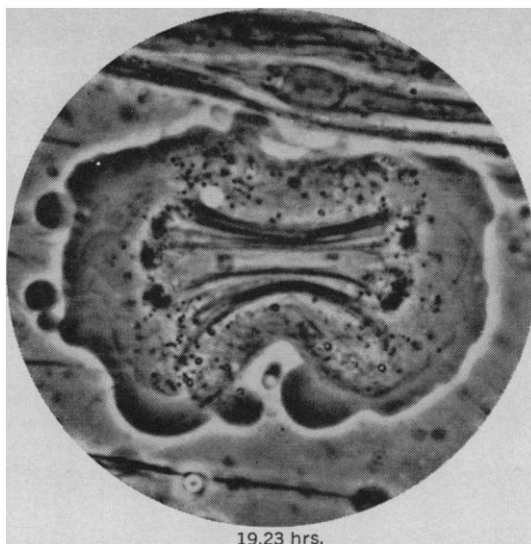
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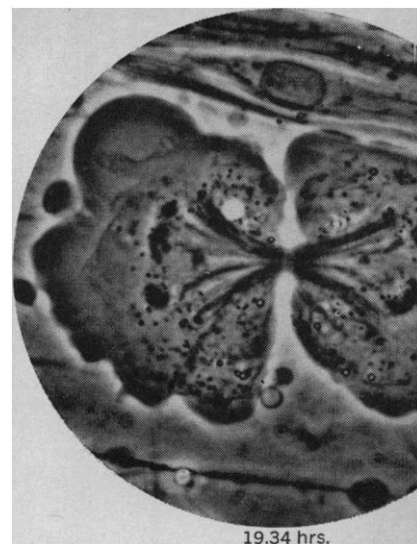
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18:44 hrs.



19:23 hrs.



19:34 hrs.

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A faultless sequence



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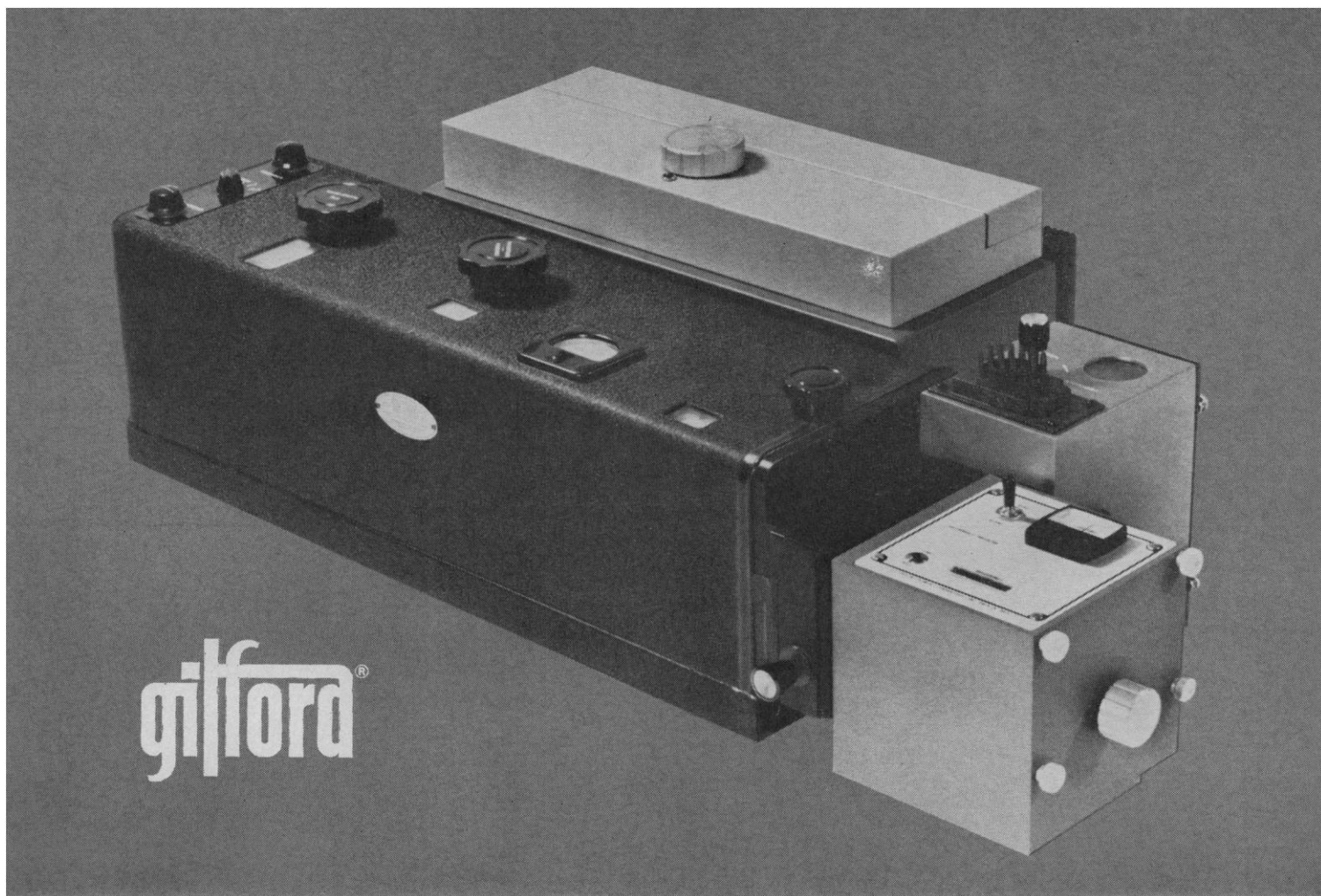
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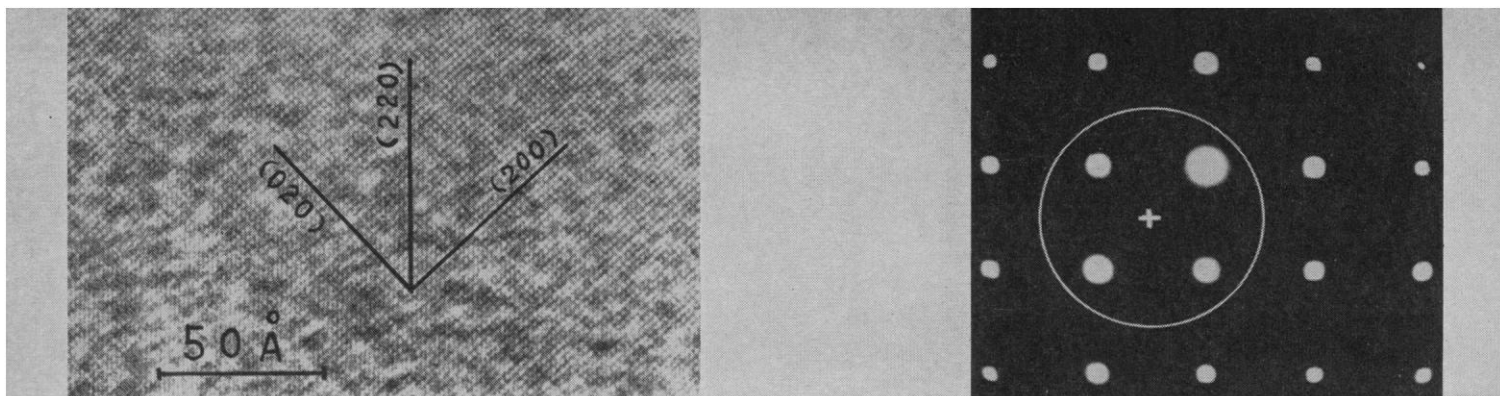
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Electron micrograph and diffraction pattern taken on the HU-11C showing the crossed lattice images of the (200) planes of gold. The (020) and (200) planes = 2.04 Angstroms. The (220) plane = 1.44 Angstroms. All important factors such as contamination, stage drift, astigmatism and aberrations must be negligible to achieve this ultra-high resolution. The HU-11C was operated at an accelerating voltage of 100 KV and an electron optical magnification of 270,000 X. The illumination was tilted until the three reflections showed nearly equal intensity in the diffraction pattern; then the micrograph was taken.

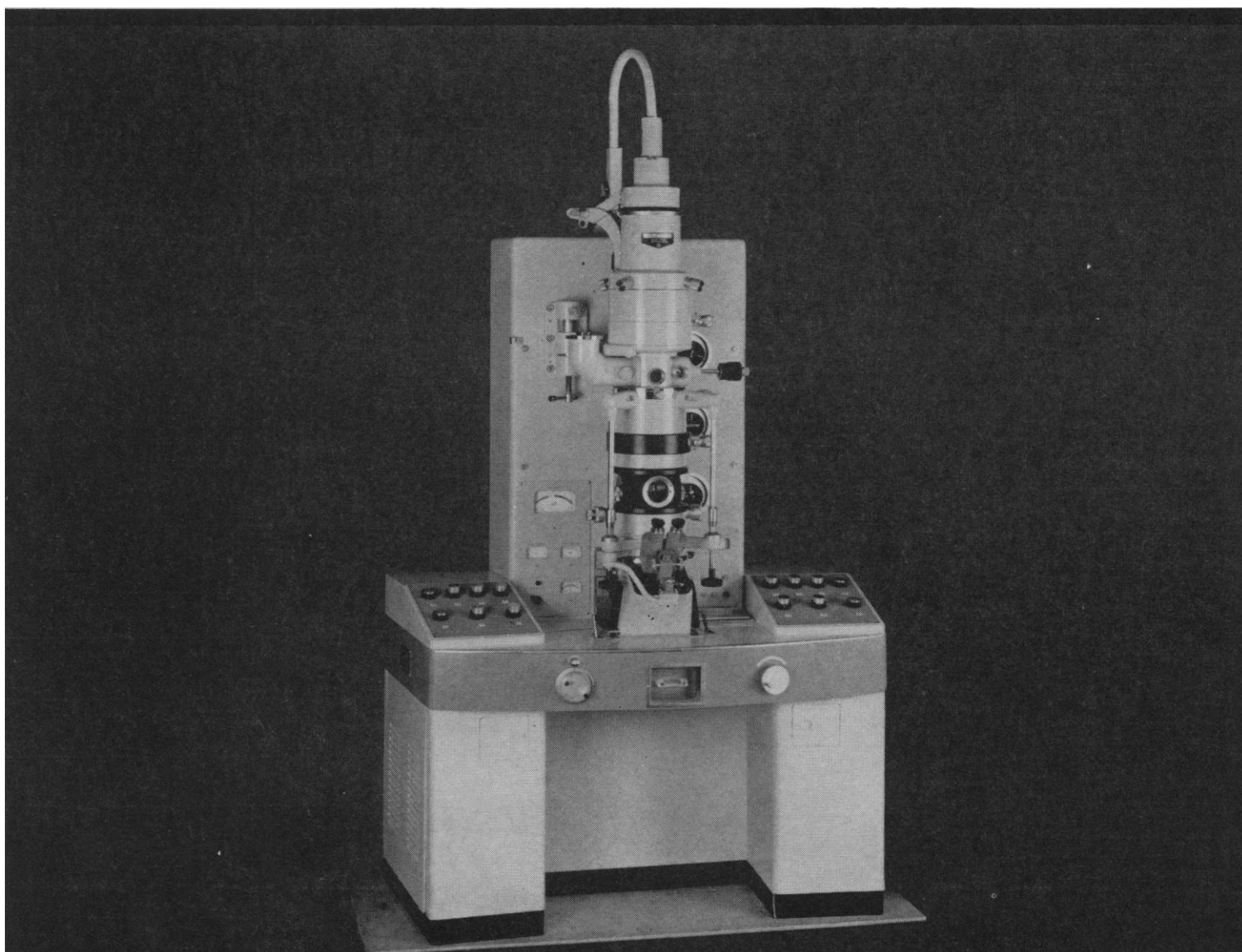
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either civil or military, or shall be skilled in aeronautical engineering or its allied sciences." The members elected their own chairman and exercised all the powers mentioned by Walker with regard to the original concept of the National Science Board. . . .

The NACA enjoyed great prestige and authority in all scientific and engineering matters concerning aeronautics. This prestige resulted from the character of its members and the excellence of its staff. There is every reason to suppose that the National Science Foundation would have enjoyed similar prestige in its wider field if Bush's plan had succeeded. It is interesting to note that the NACA also enjoyed excellent relations with the Congress, and generally with the White House under seven presidents. Wilson was originally hostile and the NACA was established only as a rider to a Naval appropriation which he could not very well veto. His attitude changed after entry into World War I. Hoover was also hostile throughout his entire connection with government. Truman was an active supporter of the NACA, which made his veto of the original National Science Foundation bill the more surprising.

Bush served as vice chairman of the NACA in 1938 and as chairman in 1939-40. His knowledge and admiration of this organization is apparent in his attempt to set up the National Science Foundation in the same pattern. It is unfortunate that this successful experiment in governmental organization of scientific research came to an end in 1958 with the National Space Act, and that it has been all but forgotten.

IRA H. ABBOTT

Post Office Box 156,
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Long-Term Drug Dangers

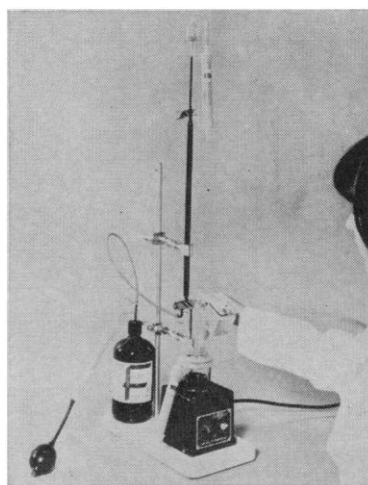
In addition to those drug catastrophes discussed by Modell ("Mass drug catastrophes and the roles of science and technology," 21 Apr., p. 346), I think we can consider another type of situation. Let us assume that a drug (such as a combination psychic energizer and diuretic) with no known side effects is aggressively promoted and very widely used throughout North America and Europe. Some 16 years after its adoption, the first hints of unexpected side effects begin to appear and several more years are required before they are con-



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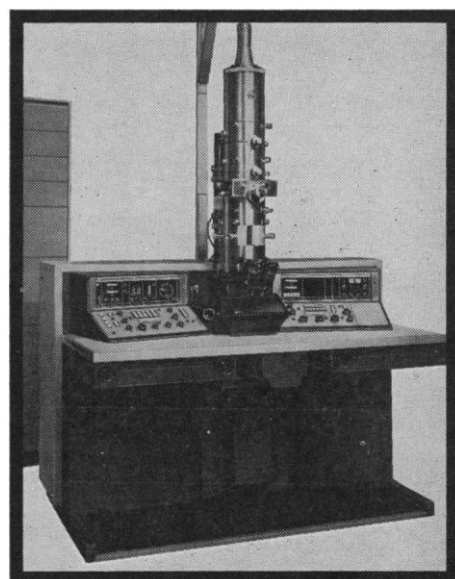
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firmed. All children born to mothers using this drug during the first 3 months of pregnancy (effective as it is for morning sickness) are found to be sterile. Use of the drug for 20 years has affected the larger portion of an entire generation so that populations of the countries affected drop sharply for several decades and require several additional decades to recover—if given the opportunity.

The effects of thalidomide were relatively easy to discover and limit, but how readily can we detect more subtle side effects in time to prevent the possibility of a history-changing catastrophe? In contrast to such a situation, the individual tragedies attributed to past and present drugs would seem rather tolerable.

HERBERT FRIEDMAN

*Department of Psychology,
College of William and Mary,
Williamsburg, Virginia 23185*

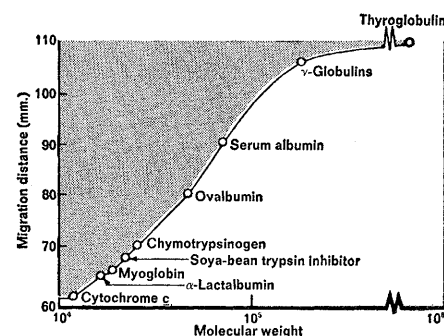
When the public is alarmed about the dangerous side effects of many of the products of our modern technology, their fears are not going to be allayed by articles such as Modell's. Instead the effect is to widen the credibility gap between scientists and the general public. Who will believe that "No drug catastrophes of modern times compare even remotely with those of the past. . ."? Who will be reassured by the assertion that in the case of thalidomide " . . . the horror might well have been greater but for modern methods of pharmacologic detection. . ."? These "modern methods" did not even detect trouble until well over 2000 cases of phocomelia had occurred (although the malformation is so bizarre that an adequate detection system should have detected and identified the trouble before more than 25 or 50 malformations had occurred).

In ordinary discourse (as well as in most technical discourse) a "drug catastrophe" refers to the side effects of an agent that is used as a medicine or in the making of a medicine. The term would not be applied to "gin, opium, coca, tobacco . . . [which] were used by ancient man for their pleasurable effects alone." Furthermore most of the above mentioned agents did not become major health hazards until technological "improvements" resulted in a more dangerous product. Tobacco did not become a major health hazard in the remote past; it became a hazard in this century (when the machine-made cigarette replaced pipes and cigars). Again,

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it is questionable whether "pesticides, herbicides, gasoline additives," and so on "... should count as drug hazards" but in any event they hardly support the contention that modern drug hazards are minor compared to those in the pretechnological era.

The only way to close the credibility gap is for the spokesmen for science to speak plainly, honestly, and bluntly—without minimizing mistakes, evading responsibility, rewriting history, or otherwise trying to cover up unpleasant facts. Language games in technical jargons have long been a favorite academic sport, but this is too dangerous a game to play when human lives and well-being are at stake.

IRWIN D. J. BROSS

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Research in Parasites

The U.S.-Japan Cooperative Medical Science Program was established so that these two nations could cooperate in improvement of health conditions in the underdeveloped countries in Southeast Asia. Two parasitic infections, schistosomiasis and filariasis, are of particular importance in these areas. The U.S. Panel on Parasitic Diseases is attempting to stimulate studies on the physiology and biochemistry of the parasites, the pharmacology of drugs effective against the parasites in their vertebrate hosts, the ecology and physiology of vectors, the mode of action of chemical agents against the vectors, and the immunological mechanisms operating in both invertebrate and vertebrate hosts.

The maintenance of parasite life cycles is a tedious and difficult undertaking, and such projects have received little attention in recent years. In order to make materials available to investigators who would be interested in schistosomes and filariids, the Panel has established sources of supply of three species of human schistosomes, *Schistosoma mansoni*, *S. japonicum*, and *S. haematobium*, either in their invertebrate or vertebrate hosts. At least five different filariid parasites can also be supplied. Individuals interested in work with these parasites may obtain information from the Office of International Research, NIH.

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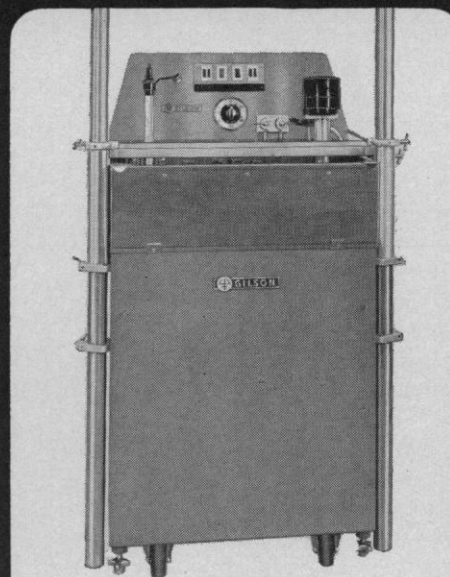
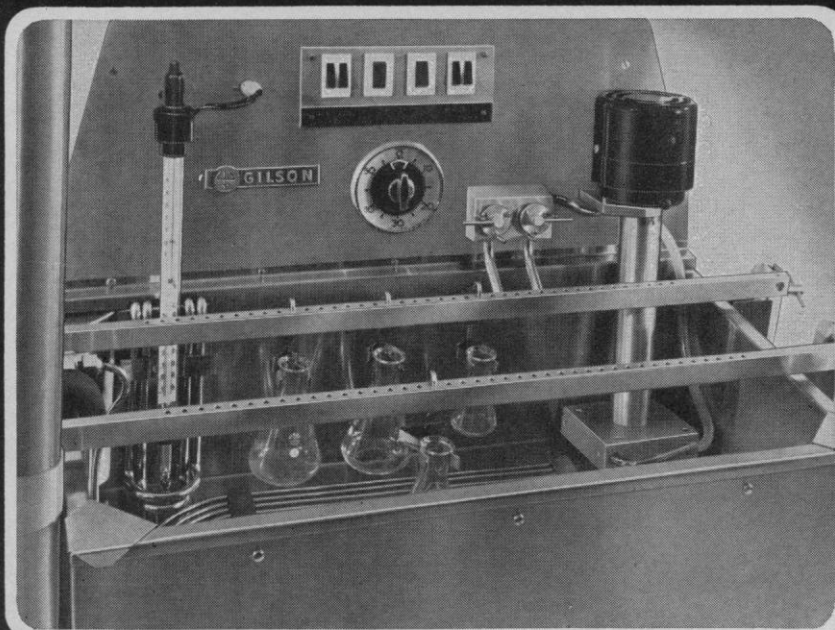
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Applied Science

One of the most significant trends of this century is an increasingly close relation among science, technology, and society. Central to this interaction are the big mission-oriented industrial or governmental laboratories. Many of these laboratories conduct excellent basic research while pursuing goals highly relevant to the needs of society. They are able to tackle problems involving physical, biological, and social sciences and complex engineering considerations.

In the mission-oriented laboratories it is feasible to bring together all the needed expertise and to achieve fruitful interaction. This is accomplished through both formal and informal channels, and the latter are often very effective. For example, in the Bell Telephone Laboratories, intercommunication among physicists, who participate widely in interdisciplinary activities, serves to supplement the formal modes of information transfer.

When basic research in the physical sciences is accomplished at the universities, the path to application is a difficult one, with many inherent delays. The communication of ideas by way of the scientific literature to those who might apply them is slow and inefficient. In the mission-oriented laboratories such barriers to application need not exist.

Many scientists are at their best when working with a sense of urgency. A combination of the desire to know and the need to know can provide a double motivating force. Thus, in some laboratories the scientist enjoys the traditional stimulus that the basic researcher feels, including the approval of his peers, while also having the satisfying knowledge that his contribution has been relevant to a great social need.

Recently, the National Academy of Sciences has prepared a report on applied science and technological progress.* An important aspect of the effort is a discussion of the mission-oriented laboratories. The report lists a number of the characteristics of the research environment that facilitate transfer of new scientific results to useful applications.

1) The key individuals in the research organizations are fully aware of and sympathetic to the principal goals of the organization, but at the same time the research mission is defined in broad enough terms so that it retains its validity as circumstances and the state of technology change.

2) People within the organization are willing to move between fundamental research and work more closely concerned with applications, and also are willing to change specialties or scientific disciplines. The artificial barriers that sometimes exist between disciplines and between fundamental work and applications are at a minimum.

3) The organization is quick to recognize new ideas and to fund work based on them, at least up to the point where the feasibility and desirability of a larger commitment can be assessed.

4) At each organizational level the individual has some freedom in redeploying the resources at his disposal without extensive review by higher authority.

5) There is full communication through all stages of the research and development process, from original research to ultimate application.

Because of their great achievements the mission-oriented laboratories are likely to fill expanding roles. Some existing laboratories may be asked to change their emphasis from physical technology to work on social and environmental problems. New establishments may be created to deal with aspects of the many social problems that are facing the nation. Mission-oriented laboratories have made great contributions to the well-being of this country. They represent a successful means of bringing to bear on difficult problems the best of our intellectual resources.—PHILIP H. ABELSON

* *Applied Science and Technological Progress*, a report to the Committee on Science and Astronautics, U.S. House of Representatives, by the National Academy of Sciences.

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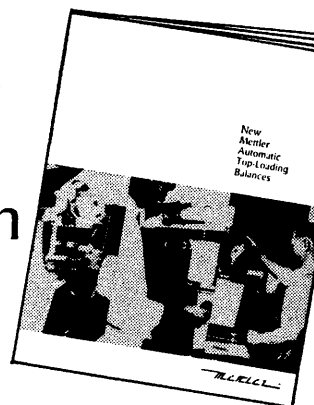
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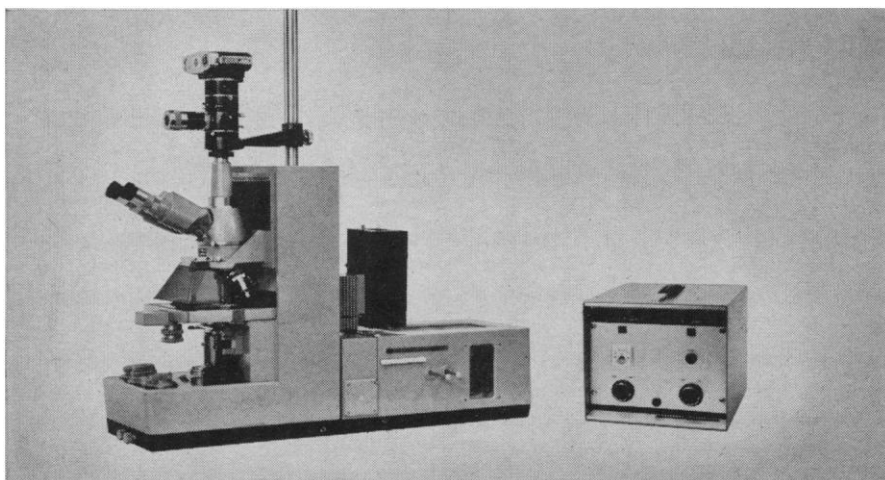
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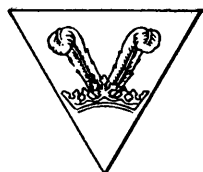


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man (Chicago), the lack of criteria for the pathologic differentiation of a primarily degenerative process from a primarily inflammatory process constitutes one of the greatest obstacles to progress. A disease which at its inception is purely degenerative may, in a matter of a few days, assume the appearance of an inflammatory disease due to the occurrence of natural reparative processes. Conversely, myocarditis (true inflammation) may eventually result in degeneration of muscle fibers. Many observations, concurring with the results of D. Reichenbach and E. P. Benditt (Seattle), show that in a number of cardiomyopathies there is a characteristic morphologic finding of myofibrillar degeneration, or myolysis. This distinct form of degeneration is usually, although not always, accompanied by interstitial mononuclear-cell proliferation, but by little if any polymorphonuclear-cell invasion. Even such a primarily degenerative lesion was repeatedly designated as myocarditis during the conference, as it is customarily done by pathologists elsewhere. It is, of course, very misleading to diagnose an inflammation secondary to myocardial degeneration as myocarditis; this term implies an infectious process to the clinician.

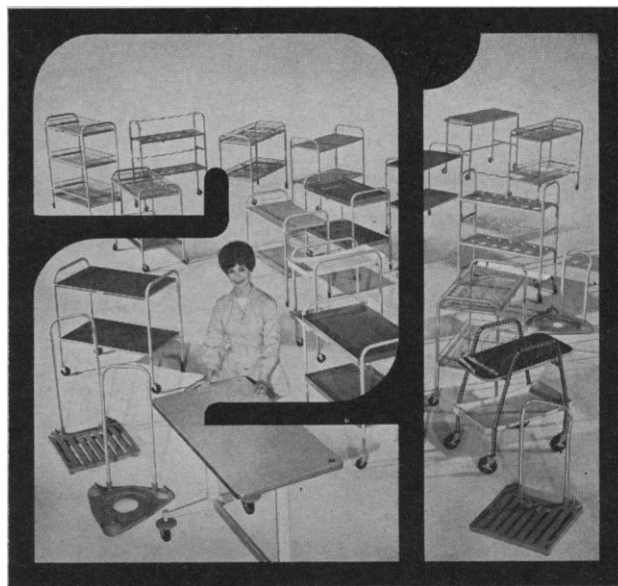
The use of the term myocardial infarction, which is one of the commonest designations entered on death certificates today, also requires reevaluation in the light of recent developments. In accordance with generally accepted views, myocardial infarct applies to an ischemic necrosis of the heart muscle secondary to mechanical obstruction of a coronary artery (thrombosis, formation of atherosclerotic plaques, or stenosis). However, ischemic necroses may develop through a variety of other mechanisms, and the limitations of light and electron microscopy in the study of myocardial ischemia have long been apparent. Furthermore, thrombosis may be, at least theoretically, the consequence rather than the cause of myocardial degeneration. This possibility was emphasized by the observations of G. Baroldi (Milan) on 696 autopsy specimens. No correlation between coronary thrombosis and myocardial degeneration could be found in 90 percent of the cases clinically diagnosed as "acute myocardial infarct"; in 98 percent of the sudden unexpected "coronary death" cases; and in 100 percent of the sudden but not unexpected "coronary death" cases. The use of the term myocardial infarct was ob-

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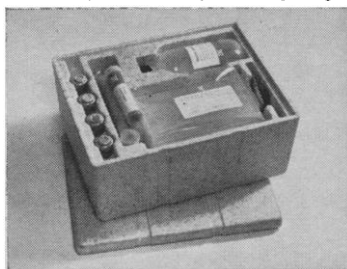
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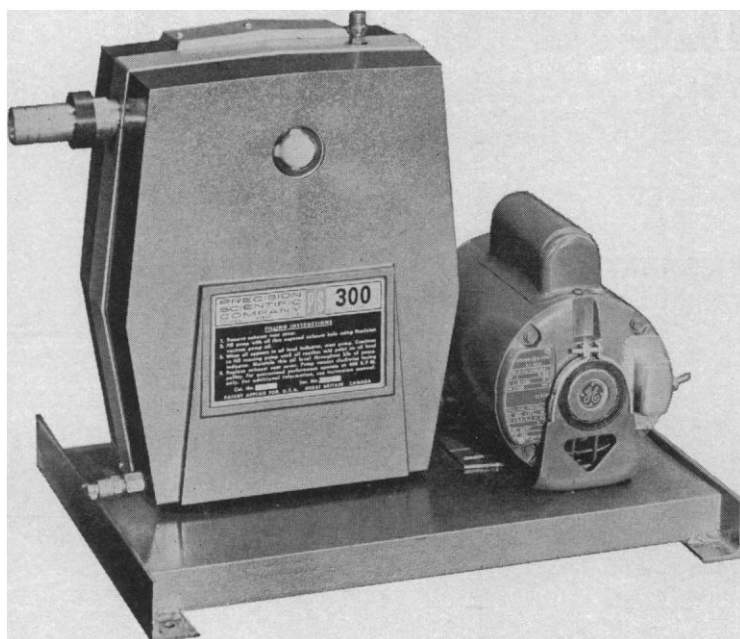
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viously incorrect in these cases. There are no currently available methods for determining, in the absence of a recent occlusion, whether coronary atherosclerosis and myocardial degeneration in a particular patient are cause-and-effect related. In fact, investigators are beginning to interpret the pathogenesis of all forms of cardiomyopathies as sequelae of metabolic derangements in the heart muscle influenced by electrolytes, hormones, hypoxia, and other sensitizing and desensitizing factors.

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Calendar of Events

Courses

Integrated Circuit Engineering, Univ. of Arizona, 17 July–18 Aug. A 200-hour program which combines theory with the practical considerations required to design a functional integrated circuit. Fee, \$500. (R. H. Mattson, Electrical Engineering Dept., Univ. of Arizona, Tucson 85721)

School Librarian Workshop, Drexel Inst. of Technology, 17–28 July (Miss M. Warrington, Graduate School of Library Science, Drexel Inst. of Technology, Philadelphia, Pa. 19104)

Analysis and Design for Automatic Control, Carnegie Inst. of Technology, 18–28 July. Includes 70 hours of classroom work, laboratory projects, and special lectures. Fee, \$375. (W. W. Ellis, Post-College Professional Education, Carnegie Univ., Pittsburgh, Pa. 15213)

Non-Equilibrium Processes in Astrophysics, Univ. of Manchester, 24–28 July. Lectures at postgraduate level. (J. Hazlehurst, Astronomy Dept., Univ. of Manchester, Manchester 13, England)

Engineering Summer Conferences, Univ. of Michigan, 31 July–4 Aug. Designed for engineers, scientists, and technical writers in order to increase the clarity of technical communication by intensive training in expression and organization. Registration 1 month before course begins is required. Fee, \$175. (Engineering Summer Conf., West Engineering Bldg., Univ. of Michigan, Ann Arbor)

Neutron Activation Analysis, State Univ. at Buffalo, 31 July–11 Aug. No previous experience with nuclear techniques required. The course is applicable to industry, law enforcement, and laboratories. (Office of Continuing Education, State Univ. at Buffalo, 3435 Main St., Buffalo, N.Y. 14214)

Workshop on Microscopy, Chicago, Ill., 11–14 Sept. Sponsored by Paper Physics Committee of Technical Assoc. of Pulp and Paper Industry. Registration limited to first 75 persons who apply. Fee, \$100. (T. S. McConnell, TAPPI, 360 Lexington Ave., New York 10017)

National Meetings

July

5-8. National Soc. of **Professional Engineers**, annual mtg., Hartford, Conn. (P. H. Robbins, 2029 K St., NW, Washington, D.C. 20006)

9-13. American **Veterinary Medical Assoc.**, 104th annual mtg., Dallas, Tex. (Executive Secretary, 600 S. Michigan Ave., Chicago, Ill. 60605)

10-11. American College of **Laboratory Animal Medicine**, annual mgt., Dallas, Tex. (R. H. Yager, Secretary, ILAR-NRC, 2101 Constitution Ave., NW, Washington, D.C. 20418)

10-12. **Aviation and Space Transportation**, symp., New York, N.Y. (American Soc. of Mechanical Engineers, 345 E. 47 St., New York 10017)

10-14. Nuclear and Space **Radiation Effects**, Columbus, Ohio. (IEEE. Technical Activities Board, 345 E. 47 St., New York 10017)

14-15. Rocky Mountain **Cancer Conf.**, 21st, Denver, Colo. (N. P. Isbell, Colorado Medical Soc., 1809 E. 18 Ave., Denver 80218)

17-19. Sixth **Aerospace Reliability and Maintainability** Meeting, Cocoa Beach, Fla. (Meetings Manager, ASME, 345 E. 47 St., New York 10017)

17-21. **Neutron Thermalization and Reactor Spectra**, Ann Arbor, Mich. (J. H. Kane, Intern. Conf. Branch, Technical Information Div., Atomic Energy Commission, Washington, D.C.)

17-21. Third **Propulsion Joint Specialist Conf.**, Washington, D.C. (Meetings Dept., American Inst. of Aeronautics and Astronautics, 1290 Sixth Ave., New York 10019)

18-20. **Electromagnetic Compatibility**, 9th symp., Washington, D.C. (F. T. Mitchell, Atlantic Research Corp., Shirley Hwy. and Edsall Rd., Alexandria, Va.)

18-22. American **Medical Technologists**, 29th annual mtg., Washington, D.C. (C. B. Dziekonski, 710 Higgins Rd., Park Ridge, Ill. 60068)

19-21. **Marine Chemists Assoc.**, 9th annual mtg., San Francisco, Calif. (K. M. Savage, c/o National Fire Protection Assoc., 60 Batterymarch St., Boston, Mass.)

24-27. American Soc. for **Metals**, W. H. Eisenman Conf. on Metal Ceramics Composites, San Francisco, Calif. (The Society, Metals Park, Ohio 44073)

24-28. Solid **Waste Research and Development**; conf., Milwaukee, Wis. (United Engineering Center, 345 E. 47 St., New York 10017)

24-29. **Fluorine Chemistry**, 4th intern. symp., Estes Park, Colo. (P. Tarrant, Dept. of Chemistry, Univ. of Florida, Gainesville 32601)

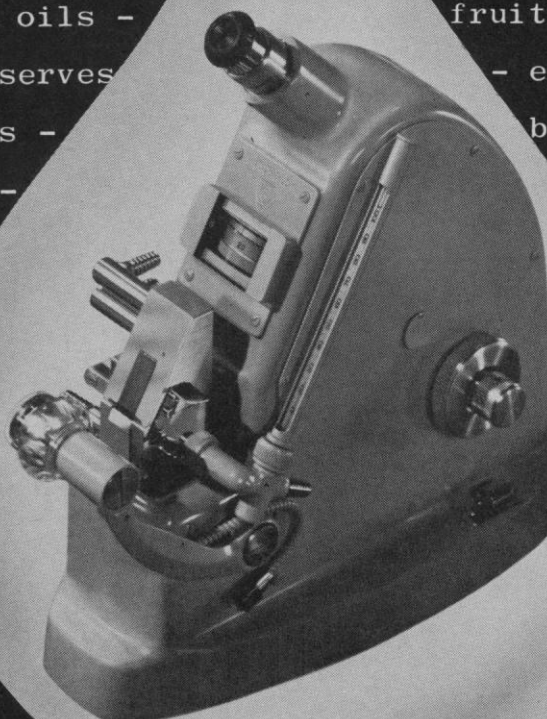
27-29. **Linguistic Soc. of America**, annual summer mtg., Ann Arbor, Mich. (A. A. Hill, Box 8120, University Station, Austin, Tex. 78712)

30-32. American Soc. of **Animal Science**, mtg., Reno, Nev. (A. M. Pearson, Dept. of Food Science, Michigan State Univ., East Lansing 48823)

31-32. International Soc. for Human and Animal **Mycology**, 4th conf., New Orleans, La. (R. Baker, Louisiana Univ. School of Medicine, New Orleans)

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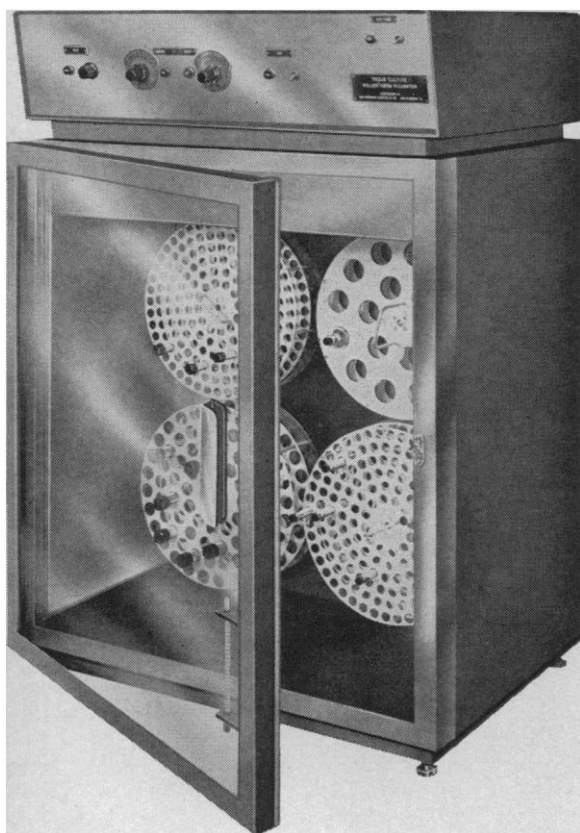
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31-4. **Mammalian Oviduct**, symp., Pullman, Wash. (E. S. E. Hafez, Reproduction Lab., Washington State Univ., Pullman 99163)

31-4. Association for the Advancement of **Medical Instrumentation**, annual mtg., San Francisco, Calif. (J. J. Post, Box 314, Harvard Sq., Cambridge, Mass. 02138)

31-4. **Particulate Matter Systems**, conf., Milwaukee, Wis. (United Engineering Center, 345 E. 47 St., New York 10017)

International and Foreign Meetings

July

1-5. European **Orthodontic Soc.**, 43rd annual congr., Bern, Switzerland. (P. Herren, Hirschenger, 6, Bern)

1-9. **Women Engineers and Scientists**, 2nd intern. conf., Cambridge, England. (Mrs. W. D. Gifford, Soc. of Women Engineers, 345 E. 47 St., New York 10017)

2-4. Canadian Soc. of **Clinical Chemists**, annual mtg., Montreal, P.Q. (M. Francoeur, Dept. of Biochemistry, Hotel-Dieu Hospital, 109 Pine Ave. W., Montreal)

2-6. **Forest Products Research Society**, annual mtg., Vancouver, B.C., Canada. (The Society, 417 N. Walnut St., Madison, Wis. 53705)

3-5. British **Orthoptic Soc.**, intern. mtg., London, England. (Conference Secretary, Tavistock House North, Tavistock Sq., London, W.C.1)

3-5. **Electron Diffraction**, anniversary mtg., London, England. (Meetings Officer, Inst. of Physics and the Physical Soc., 47 Belgrave Sq., London, S.W.1)

3-7. Instruments and Techniques for Assessment of **Airborne Radioactivity** in Nuclear Operations, Vienna, Austria. (International Atomic Energy Agency, Kartner Ring 11, Vienna 1)

4-7. Federation of **European Biochemical Societies**, 4th mtg., Oslo, Norway. (F. Gran, c/o Inst. for Nutrition Research, Univ. of Oslo, Blindern, Norway)

5-7. **Canadian Federation of Biological Societies** (Canadian Physiological Soc., Pharmacological Soc. of Canada, Canadian Assoc. of Anatomists, Canadian Biochemical Soc., Nutrition Soc. of Canada), 10th annual mtg., Montreal, P. Q. (Honorary Secretary, c/o Faculty of Medicine, University of Western Ontario, London, Ontario)

5-7. Congress of **Medicinal Chemistry**, 3rd intern. mtg., Paris, France. (Société de Chimie Thérapeutique, 2 rue d'Alesia, 75-Paris 14^e)

6-14. **British Medical Assoc.**, annual mtg., Bristol, England. (The Secretary, Tavistock Square, London W.C.1, England)

7-13. International **Dental Federation**, 55th annual mtg., and 14th congr., Paris, France. (Secretary General, 35 Devonshire Pl., London, W.1, England)

7-13. Physics of **Electronic and Atomic Collisions**, 5th intern. conf., Leningrad, U.S.S.R. (R. N. Ilin, Ioffe Physico-Technical Inst., Leningrad K-21)

9-15. American So. for **Horticultural Science**, Tropical Region, 15th annual mtg., Panama. (E. H. Casseres, Calle Londres 40, Mexico 6, D.F., Mexico)

9-15. International Soc. of **Urology**, 14th congr., Munich, Germany. (Secretary

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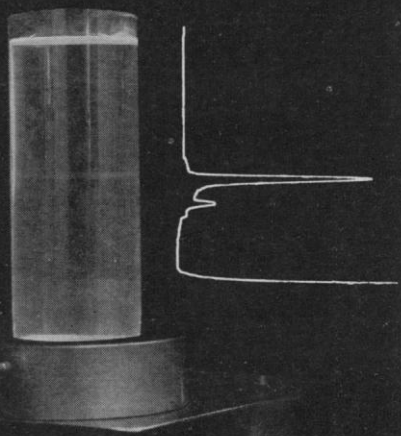
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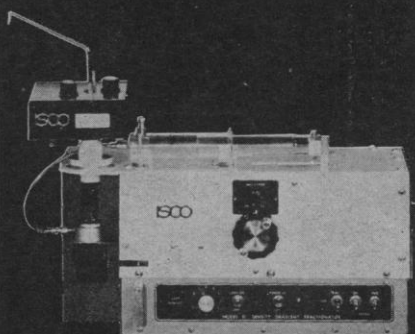
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10-15. Latin American Soil Biology, 2nd congr., Santa Maria, Brazil. (Science Dept., British Council, Albion House, 59 New Oxford St., London, W.C.1, Eng-land)

11-14. Magnet Technology, 2nd intern. conf., Oxford, England. (R. C. Pepperell, Rutherford High Energy Laboratory, Chilton, Didcot, Berkshire, England)

11-14. International Union of School and University Health Medicine, 5th congr., Prague, Czechoslovakia. (The Union, Centre International de l'Enfance, Château de Longchamp, Bois de Boulogne, Paris 16^e, France)

12-14. International Soc. for Clinical and Experimental Hypnosis, 5th congr., Kyoto, Japan. (Y. Ikemi, c/o Dept. of Psychosomatic Medicine, Kyushu Univ., School of Medicine, Fukuoka City, Japan)

14-28. Plant Pathology, 1st intern. congr., London, England. (R. K. S. Wood, Imperial College, London, S.W.1)

15-18. Electrical Contact Phenomena, intern. research symp., Swansea, Wales. (Meetings Officer, Inst. of Physics and the Physical Soc., 47 Belgrave Sq., Lon-don, S.W.1, England)

16-22. Organic Photochemistry, intern. symp. (IUPAC), Enschede, Netherlands. (W. G. Dauben, c/o Dept. of Chemistry, Univ. of California, Berkeley 94720)

17-19. Organic Chemistry, symp., (IUPAC), Nottingham, England. (A. W. Johnson, Dept. of Chemistry, Univ. of Nottingham, Nottingham)

17-21. Solar-Terrestrial Relationships during Solar Minimum Conditions, symp., London, England. (G. de Q. Robin, c/o Scott Polar Research Inst., Univ. of Cam-bridge, Cambridge, England)

17-22. World Veterinary Assoc., 18th intern. congr., Paris, France. (R. Vuil-laume, 27, rue des Petits-Hôtels, Paris 10^e)

18-23. Laser Applications, 1st intern. congr., Paris, France. (The Congress, 14, rue de Buffon, Paris 5^e)

19-22. Ibero-Latin American Congr. of Dermatology, Barcelona, Spain. (J. Pinol-Aguade, c/o Facultad de Medicina, Univ. de Barcelona, Spain)

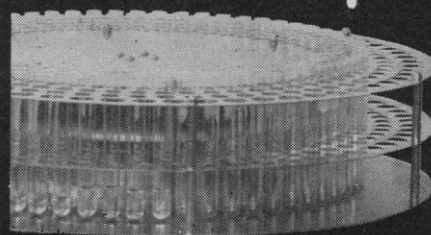
21-31. Space Science, 8th intern. symp., London, England. (M. J. Gazin, Commit-tee on Space Research, 55, Boul. Males-herbes, Paris 8^e, France)

23-26. Society of Naval Architects and Marine Engineers, spring mtg., Montreal, Canada. (M. H. Gluntz, The Society, 74 Trinity Pl., New York 10006)

23-28. International Soc. for Neuro-chemistry, 1st intern. mtg., Strasbourg, France. (J. Folch-Pi, McLean Hospital, Belmont, Mass.)

23-28. International Psychoanalytical Assoc., 25th congr., Copenhagen, Den-mark. (M. M. Montessori, Psycho-Analyt-ical, 63 New Cavendish St., London, W.1, England)

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BOOKS RECEIVED

(Continued from page 1589)

Behavior: An Introduction to Comparative Psychology. John B. Watson. Holt, Rinehart and Winston, New York, 1967. 477 pp. Illus. \$7.95. Reprint, 1914 edition. Henry Holt Editions in Psychology Series.

The Biochemistry of Animal Development. vol 2, *Biochemical Control Mechanisms and Adaptations in Development.* Rudolf Weber, Ed. Academic Press, New York, 1967. 495 pp. Illus. \$21. Nine papers.

Biochimie et Biologie Moléculaire. Marcel Florkin and Ernest Schoffeniels. De-soer, Liege, Belgium, 1966. 588 pp. Illus.

Book of ASTM Standards: With Related Material. Pt. 7, *Nonferrous Metals and Alloys (Including Corrosion Tests); Electrodeposited Metallic Coatings; Metal Powders; Nonferrous Filler Metal; Nonferrous Surgical Implant Materials* (956 pp. \$16); pt. 11, *Bituminous Materials for Highway Construction, Waterproofing, and Roofing; Soils; Skid Resistance* (908 pp. \$14); pt. 12, *Chemical-Resistant Non-metallic Materials; Clay and Concrete Pipe and Tile; Masonry Mortars and Units; Asbestos-Cement Products; Natural Building Stones* (498 pp. \$8); pt. 13, *Refractories, Glass, and Other Ceramic Materials; Manufactured Carbon and Graphite Products* (672 pp. \$10); pt. 17, *Petroleum Products—Fuels; Solvents; Burner Fuel Oils; Lubricating Oils; Cutting Oils; Lubricating Greases; Hydraulic Fluids* (1152 pp. \$20); pt. 18, *Petroleum Products—Measurement and Sampling; Liquefied Petroleum Gases; Light Hydrocarbons; Plant Spray Oils; Aerospace Materials; Sulfonates; Crude Petroleum; Petrolatum; Wax; Graphite* (914 pp. \$16); pt. 19, *Gaseous Fuels; Coal and Coke* (500 pp. \$8); pt. 20, *Paint, Varnish, Lacquer, and Related Products—Materials Specifications and Tests; Naval Stores; Industrial Aromatic Hydrocarbons* (1232 pp. \$20); pt. 21, *Paint, Varnish, Lacquer, and Related Products—Tests for Formulated Products and Applied Coatings* (658 pp. \$10); pt. 22, *Sorptive Mineral Materials; Soap; Engine Antifreeze; Wax Polishes; Halogenated Organic Solvents; Activated Carbon; Industrial Chemicals* (670 pp. \$10); pt. 29, *Electrical Insulating Materials* (1256 pp. \$22). American Soc. for Testing and Materials, Philadelphia, 1967. Illus.

The Cell and Environmental Temperature. Proceedings of the international symposium on cytoecology (Leningrad), May-June 1963. A. S. Troshin, Ed. Translated from the Russian (1964). C. L. Prosser, Ed. Pergamon, New York, 1967. 472 pp. Illus. \$21.50. Fifty-nine papers. International Series of Monographs in Pure and Applied Biology.

The Chemistry of the Ether Linkage. Saul Patai, Ed. Interscience (Wiley), New York, 1967. 795 pp. Illus. \$29.50. Sixteen papers.

Chromatography. Erich Heftmann. Reinhold, New York, ed. 2, 1967. 893 pp. Illus. \$27.50.

The City. Robert E. Park, Ernest W. Burgess, and Roderick D. McKenzie. Univ. of Chicago Press, Chicago, 1967. 249 pp. \$5. Reprint, 1925 edition.

Clinical Judgment. Alvan R. Feinstein. Williams and Wilkins, Baltimore, 1967. 422 pp. Illus. \$9.50.

Codes for Periodical Titles. vols. 1 and 2. Prepared by Wyandotte-ASTM Punched Card Project. L. E. Kuentzel, Ed. American Soc. for Testing and Materials, Philadelphia, ed. 2, 1966. vol. 1, 523 pp.; vol. 2, 591 pp. \$85 per set.

Cold Spring Harbor Symposia on Quantitative Biology. vol. 31, *The Genetic Code.* Cold Spring Harbor Laboratory of Quantitative Biology, Cold Spring Harbor, N.Y., 1966. 784 pp. Illus. \$15. Eighty-eight papers.

College Physics. Franklin Miller, Jr. Harcourt, Brace, and World, New York, ed. 2, 1967. 735 pp. Illus. \$10.50.

The Comparative Anatomy and Histology of the Cerebellum from Myxinoidea through Birds. Olof Larsell. Univ. of Minnesota Press, Minneapolis, 1967. 301 pp. Illus. \$14.

Composite Materials. Lectures delivered at the Institution's refresher course, November 1965. A. Kelly, G. C. Smith, P. J. E. Forsyth, and A. J. Kennedy. Published for The Institution of Metallurgists. Iliffe, London; Elsevier, New York, 1967. 154 pp. Illus. \$7.50. Four papers.

The Control of Nuclear Activity. A symposium (Woods Hole, Mass.), August-September 1966. Sponsored by The Society of General Physiologists. Lester Goldstein, Ed. Prentice-Hall, Englewood Cliffs, N.J., 1967. 508 pp. Illus. \$7.50.

Cross Electrophoresis: Its Principle and Applications. Shojiro Nakamura. Shoin, Tokyo, 1966; Elsevier, New York, 1967. 204 pp. Illus. \$17.

Cytogenetics. Carl P. Swanson, Timothy Merz, and William J. Young. Prentice-Hall, Englewood Cliffs, N.J., 1967. 206 pp. Illus. Paper, \$3.75; cloth, \$5.95. Foundations of Modern Genetics Series.

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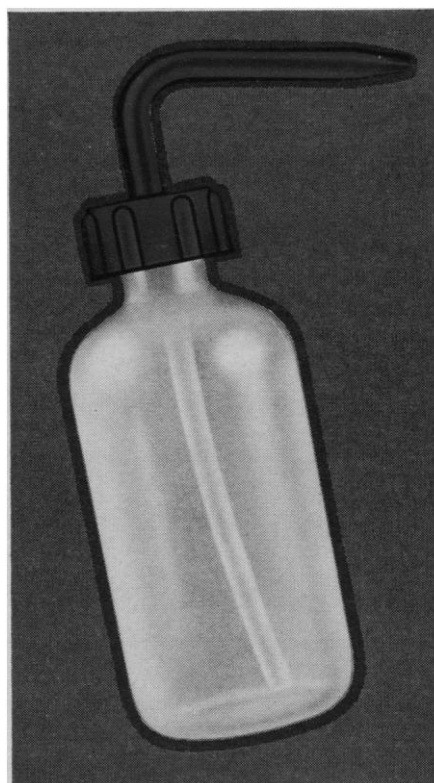
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Economic Organizations and Social Systems. Robert A. Solo. Bobbs-Merrill, New York, 1967. 519 pp. Illus. \$8.75.

Eden Was No Garden: An Inquiry into the Environment of Man. Nigel Calder. Holt, Rinehart, and Winston, New York, 1967. 240 pp. \$4.95.

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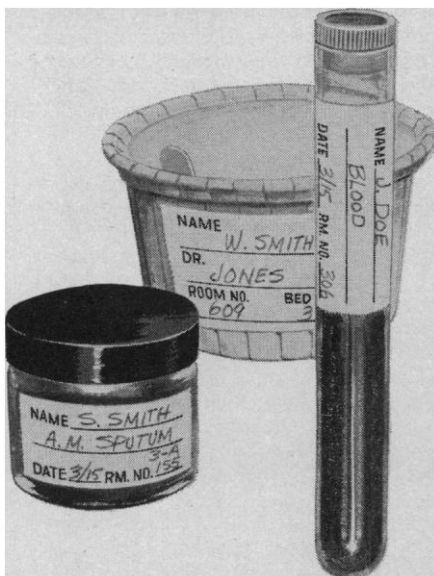
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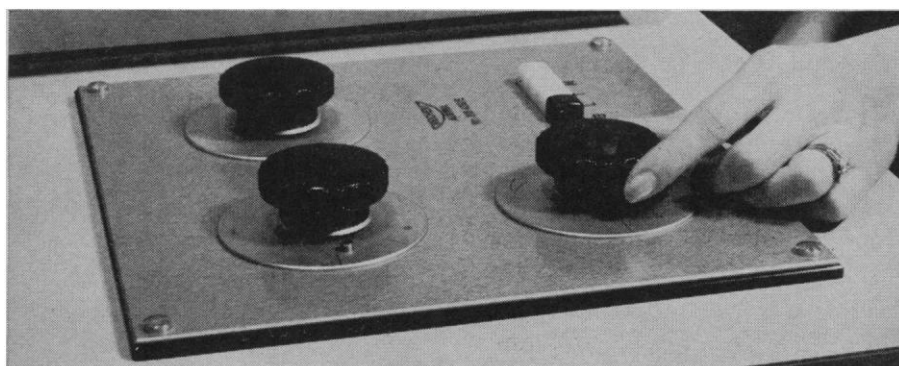
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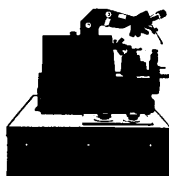


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Parkhomenko. Translated from the Russian edition by George V. Keller. Plenum Press, New York, 1967. 328 pp. Illus. \$19.50. Monographs in Geoscience.

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Elements of Real Analysis. Sze-Tsen Hu. Holden-Day, San Francisco, 1967. 379 pp. Illus. \$10.95.

Essentials of Healthier Living. Justus J. Schifferes. Wiley, New York, ed. 3, 1967. 468 pp. Illus. \$7.50.

Estuaries. A symposium (Jekyll Island, Ga.), March-April 1964. AAAS Publication No. 83. George H. Lauff, Ed. AAAS, Washington, D.C., 1967. 773 pp. Illus. \$27. There are 71 papers.

Experimental Methods of Materials Research. Herbert Herman, Ed. Interscience (Wiley), New York, 1967. 328 pp. Illus. \$14.95. Ten papers. Advances in Materials Research, vol. 1.

Families of Flowering Plants in Ethiopia. An introduction with keys for the identification of the families of flowering plants and gymnosperms found in Ethiopia and adjacent areas of eastern Africa. William C. Burger. Oklahoma State Univ. Press, Stillwater, 1967. 240 pp. Illus. \$7.

Foundations of Mechanics. Ralph Abraham. Benjamin, New York, 1967. 334 pp. Illus. \$14.75.

From Frege to Gödel: A Source Book in Mathematical Logic, 1879-1931. Jean van Heijenoort. Harvard Univ. Press, Cambridge, Mass., 1967. 672 pp. Illus. \$18.50.

Fundamental Aspects of Electrocrystallization. J. O'M. Bockris and G. A. Razumney. Plenum Press, New York, 1967. 167 pp. Illus. \$7.50.

Handbook of the Engineering Sciences. vol. 1, *The Basic Sciences*. James H. Potter, Ed. Van Nostrand, Princeton, N.J., 1967. 1365 pp. Illus. \$37.50.

Handbook of the Poisson Distribution. Frank A. Haight. Wiley, New York, 1967. 182 pp. \$9.50.

Heat Transfer. Alan J. Chapman. Macmillan, New York, ed. 2, 1967. 637 pp. Illus. \$12.95.

Hemes and Hemoproteins. A colloquium (Philadelphia), April 1966. Britton Chance, Ronald W. Estabrook, and Takashi Yonetani, Eds. Academic Press, New York, 1966. 640 pp. Illus. \$13.75.

Heredity and Evolution in Human Populations. L. C. Dunn. Harvard Univ. Press, Cambridge, Mass., ed. 2, 1967. 165 pp. Illus. \$3.50.

Intermediate Algebra for College Students. Thurman S. Peterson. Harper and Row, New York, ed. 3, 1967. 393 pp. Illus. \$7.50.

Intracellular Transport. Katherine Brehme Warren, Ed. Academic Press, New York, 1966. 343 pp. Illus. \$15. Fourteen papers. Symposia of the International Society for Cell Biology, vol. 5.

An Introduction to Analysis. Wilson M. Zaring. Macmillan, New York, 1967. 378 pp. Illus. \$9.95.

An Introduction to Astronomy. Charles M. Huffer, Frederick E. Trinklein, and Mark Bunge. Holt, Rinehart and Winston, New York, 1967. 391 pp. Illus. \$8.95.

An Introduction to Fourier Analysis. R. D. Stuart. Methuen, London; Barnes and Noble, New York, 1967. 128 pp. Illus.

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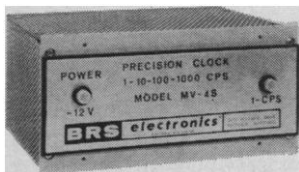
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The Iron Age in Northern Britain. Based on papers delivered to the Conference on Problems of the Iron Age in Northern Britain (Edinburgh), October 1961. A. L. F. Rivet, Ed. Edinburgh Univ. Press; Aldine, Chicago, 1966. 163 pp. Illus. \$8.50. Six papers.

The Ixodid Ticks of Tanzania. G. H. Yeoman and Jane B. Walker. Commonwealth Institute of Entomology, London, 1967. 227 pp. Illus.

Lectures on Algebraic Topology. Marvin J. Greenberg. Benjamin, New York, 1967. 245 pp. Illus. Paper, \$5.95; cloth, \$10.

Lehrbuch der Theoretischen Physik. vol. 5, *Statistische Physik*. L. D. Landau and E. M. Lifschitz. Akademie-Verlag, Berlin, 1966. 543 pp. Illus.

Let Us Start Here. An introduction to basic readings in the life sciences. Paul Gibbons Roope. World, Cleveland, 1967. 112 pp. \$3.50.

The Levittowners: Ways of Life and Politics in a New Suburban Community. Herbert J. Gans. Pantheon Books, New York, 1967. 504 pp. \$7.95.

Life, Atoms, Chance: Three Essays in the Philosophy of Science. F. F. Centore. Pageant Press, New York, 1966. 118 pp. \$3.

Local Atomic Arrangements Studied by X-Ray Diffraction. Proceedings of a symposium (Chicago, Ill.), February 1965. Sponsored by the Metallurgical Society, American Institute of Mining, Metallurgical, and Petroleum Engineers. J. B. Cohen and J. E. Hilliard, Eds. Gordon and Breach, New York, 1966. 393 pp. Illus. Paper, \$22. Metallurgical Society Conferences, vol. 36. Eleven papers.

Luminescence Dosimetry. Proceedings of an international conference (Stanford, Calif.), June 1965. Sponsored by U.S. Atomic Energy Commission, Office of Naval Research, and Stanford University. Frank H. Attix, Ed. U.S. Atomic Energy Commission, Oak Ridge, Tenn., 1967 (available from Clearinghouse for Federal Scientific and Technical Information, Springfield, Va.). 526 pp. Illus. Paper, \$3. Forty-five papers.

Magnetism in Solids. D. H. Martin. M.I.T. Press, Cambridge, Mass., 1967. 462 pp. Illus. \$19.95.

Man and the Earth. Joseph Bixby Hoyt. Prentice-Hall, Englewood Cliffs, N.J., ed. 2, 1967. 480 pp. Illus. \$9.95.

The Mathematical Approach to Biology and Medicine. Norman T. J. Bailey. Wiley, New York, 1967. 310 pp. Illus. \$8.75.

Mathematics—An Integrated Series: Book Four, Analysis. H. Vernon Price, Philip Peak, and Phillip S. Jones. Harcourt, Brace, and World, New York, 1967. 491 pp. Illus. \$6.

Maxima and Minima. Morris E. Levenson. Macmillan, New York, 1967. 160 pp. Illus. Paper, \$2.95.

Medicine at the Paris Hospital, 1794–1848. Erwin H. Ackerknecht. Johns Hopkins Press, Baltimore, 1967. 256 pp. Illus. \$8.95.

Medical Cytogenetics. Mihály Bartalos and Theodore A. Baramki. Williams and Wilkins, Baltimore, 1967. 443 pp. Illus. \$12.50.

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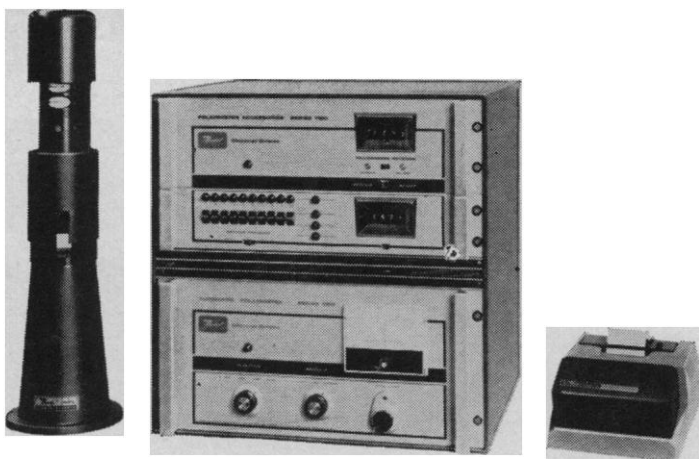
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The Method of Coordinates. I. M. Gel'fand, E. G. Glagoleva, and A. A. Kirillov. Translated and adapted from the Russian by Leslie Cohn and David Sookne. M.I.T. Press, Cambridge, Mass., 1967. 79 pp. Illus. Paper, \$1.50. Library of School Mathematics Series, vol. 1.

Methods of Wood Chemistry. vol. 1. B. L. Browning. Interscience (Wiley), New York, 1967. 406 pp. Illus. \$15.

Metis of the Mackenzie District. Richard Slobodin. Canadian Research Centre for Anthropology, Ottawa, 1966. 189 pp. Paper, \$4.

Mineral Recognition. Iris Vanders and Paul F. Kerr. Wiley, New York, 1967. 330 pp. Illus. \$11.95.

A Model of Simple Competition. Joel E. Cohen. Harvard Univ. Press, Cambridge, Mass., 1966. 150 pp. Illus. \$5.95. Annals of the Computation Laboratory, vol. 41.

Modern Developments in the Mechanics of Continua. Proceedings of an international conference (Pinebrook, N.Y.), August 1965. Salamon Eskinazi, Ed. Academic Press, New York, 1966. 215 pp. Illus. \$10. Sixteen papers.

Modern Plane Geometry for College Students. Herman R. Hyatt and Charles C. Carico. Macmillan, New York, 1967. 464 pp. Illus. \$7.95.

Molecular Flow in Vessels. Yurii Naumovich Lyubotov. Translated from the Russian edition (Moscow, 1964) by Wendell H. Furry and James S. Wood. Consultants Bureau, New York, ed. 2, 1967. 172 pp. Illus. Paper, \$22.50.

Molecules and Cells. D. A. Coult. Houghton Mifflin, Boston, 1967. 176 pp. Illus. Paper, \$2.75. Principles of Modern Biology Series.

National Document-Handling Systems for Science and Technology. L. F. Carter *et al.* Wiley, New York, 1967. 356 pp. Illus. \$9.95.

The New College Physics: A Spiral Approach. Albert V. Baez. Freeman, San Francisco, 1967. 757 pp. Illus. \$11.75.

New Geography, 1966-67. John Laffin. Abelard-Schuman, New York, 1967. 237 pp. Illus. Paper, \$2.95; cloth, \$5.95.

Oil Property Valuation. Richard V. Hughes. Wiley, New York, 1967. 325 pp. Illus. \$11.50.

On Education—Sociological Perspectives. Donald A. Hansen and Joel E. Gerstl, Eds. Wiley, New York, 1967. 314 pp. \$7.50. Nine papers.

Organic Reactions. vol. 15. Arthur C. Cope, Ed. Wiley, New York, 1967. 615 pp. Illus. \$18. Two papers.

Perspectives in Powder Metallurgy: Fundamentals, Methods, and Applications. vol. 2. *Vibratory Compacting: Principles and Methods.* Henry H. Hausner, Kempton H. Roll, and Peter K. Johnson, Eds. Plenum Press, New York, 1967. 312 pp. Illus. \$17.50. Twenty-seven papers.

Planning Human Resource Development: Educational Models and Schemata. Russell G. Davis. Rand McNally, Chicago, 1967. 352 pp. Illus. \$8.

Practical Physical Chemistry. Arthur M. James. Churchill, London, ed. 2, 1967. 383 pp. Illus. Paper, 40s.

Principles of Biology. Neal D. Buffaloe and J. B. Throneberry. Prentice-Hall, Englewood Cliffs, N.J., ed. 2, 1967. 416 pp. Illus. \$7.50.



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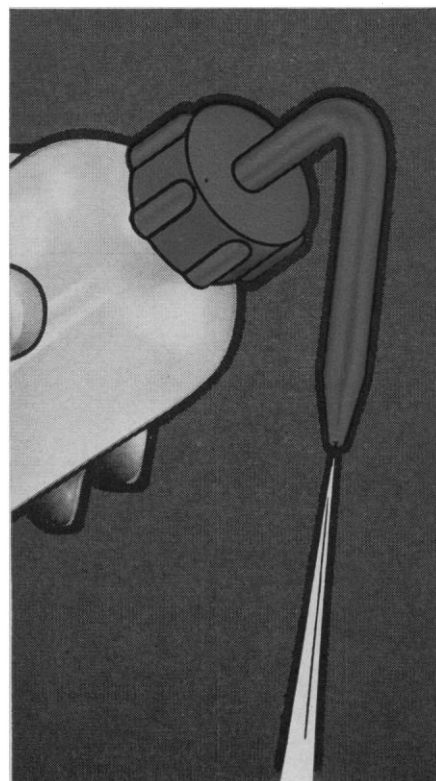
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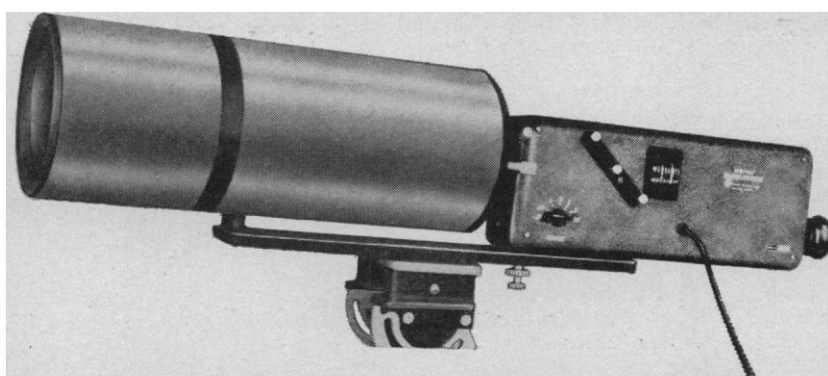


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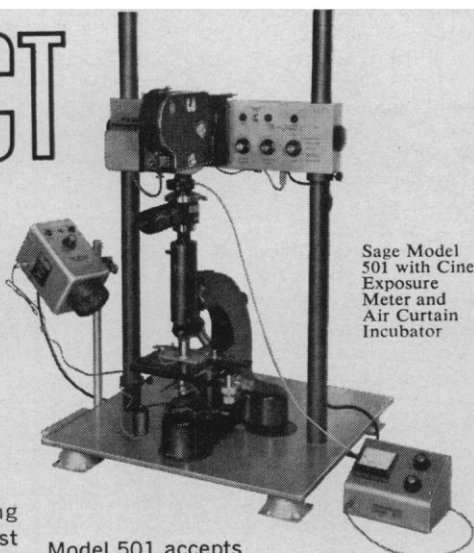
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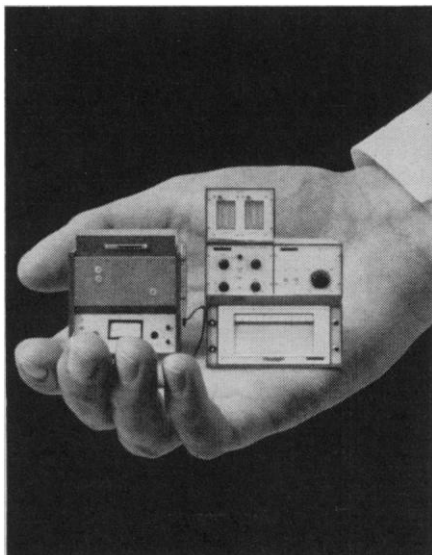
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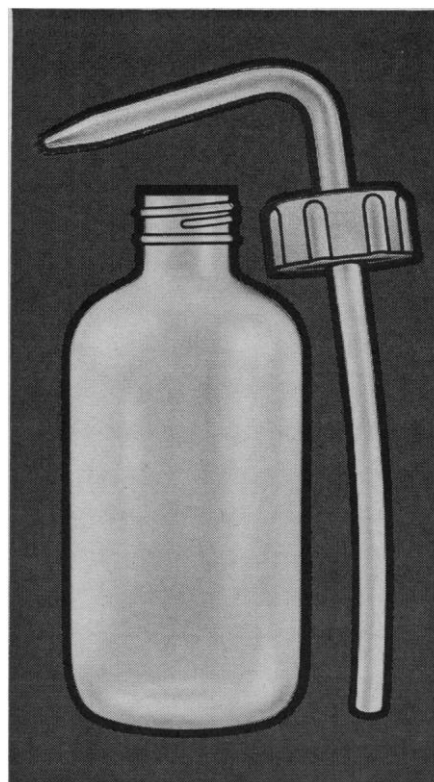
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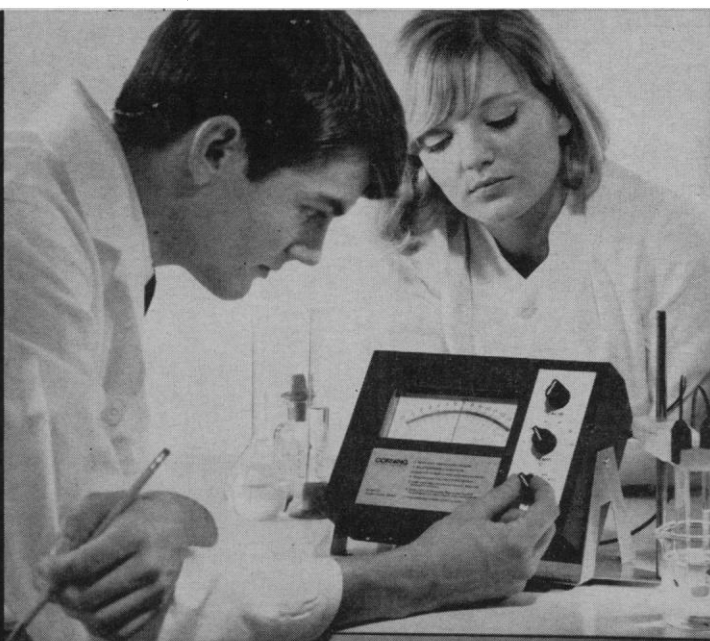
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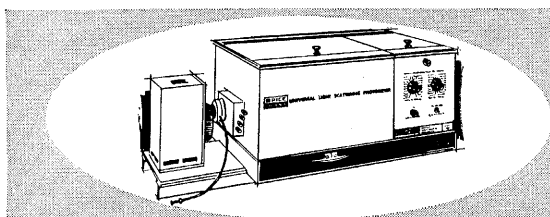
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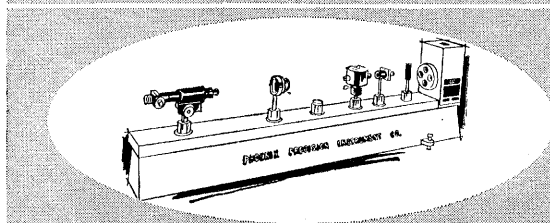
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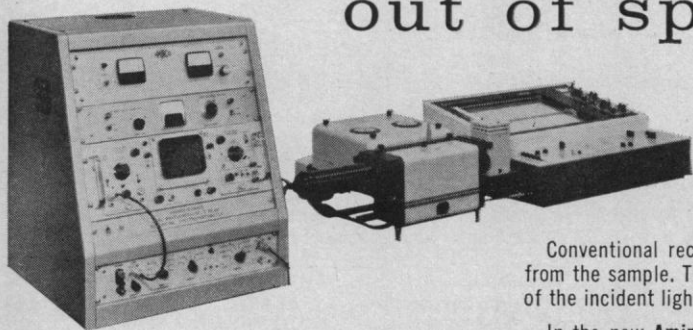


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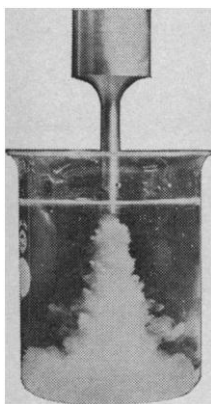
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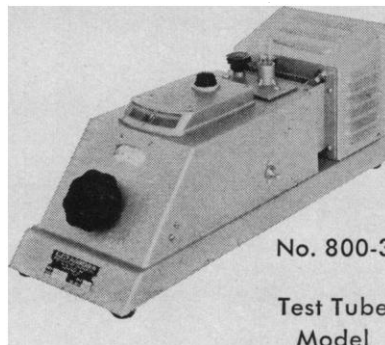
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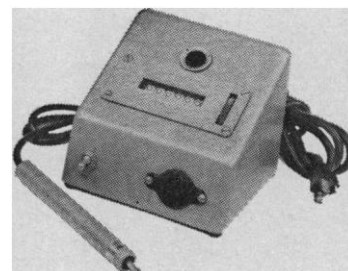


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