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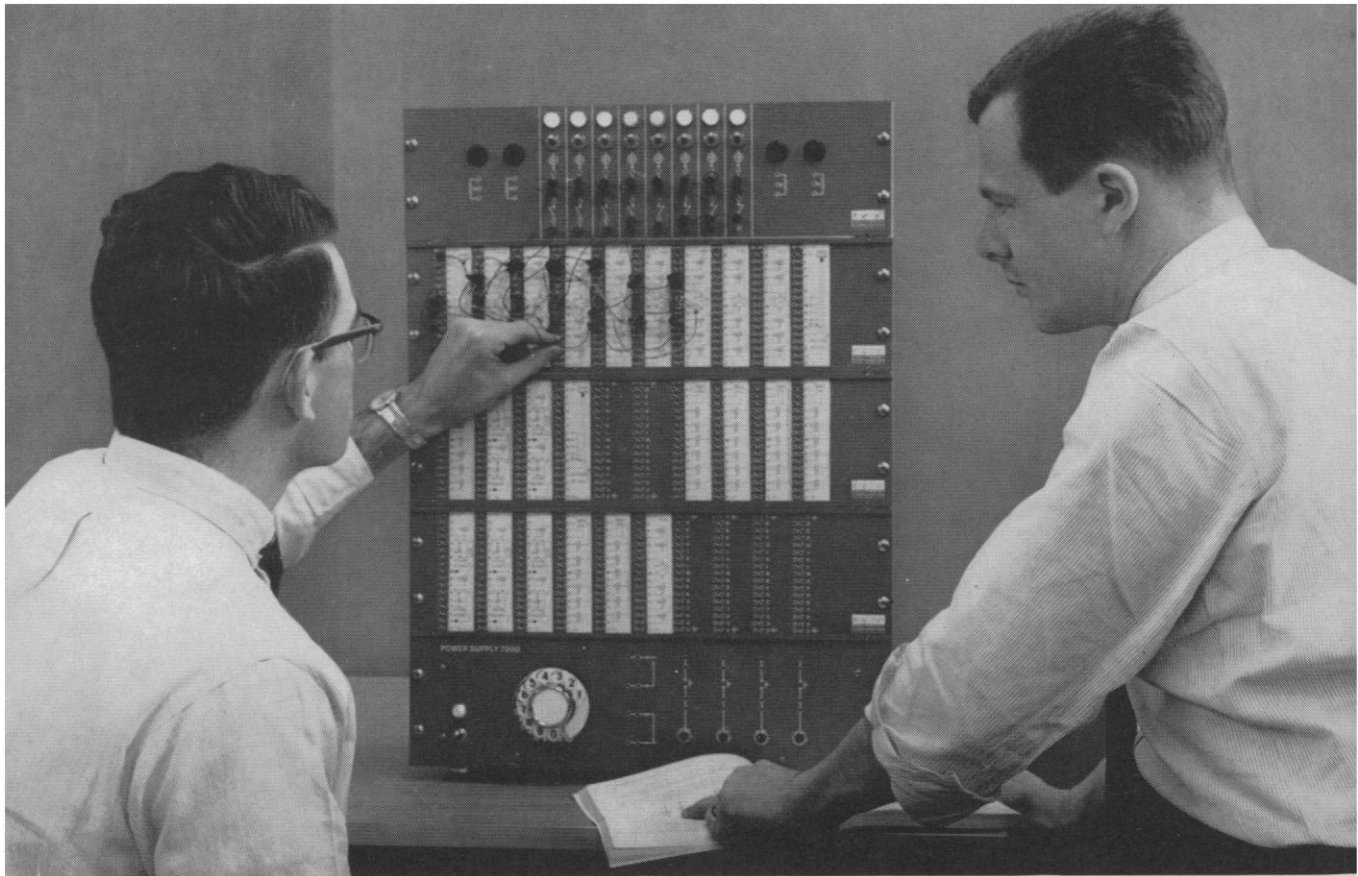
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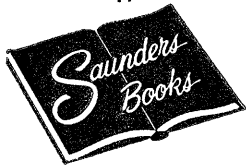
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Proceedings of the International Astronomical Union Symposium No. 22 at Rottach-Egern, September, 1963.

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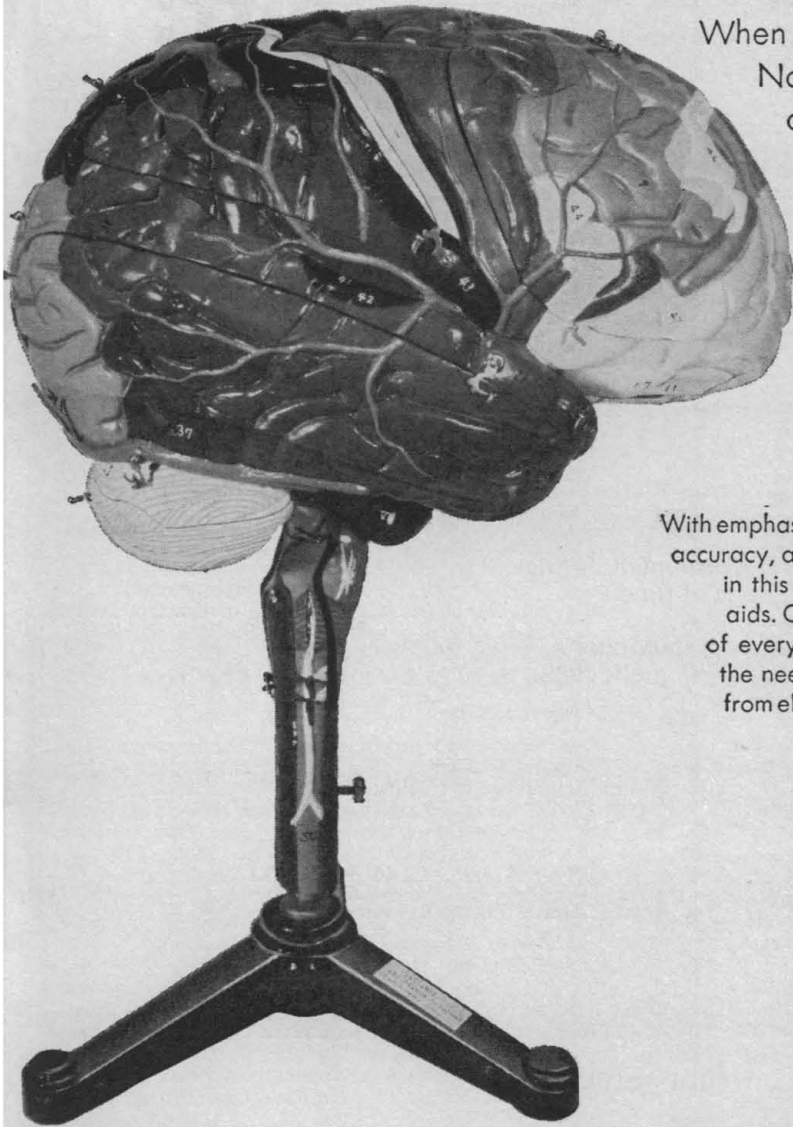
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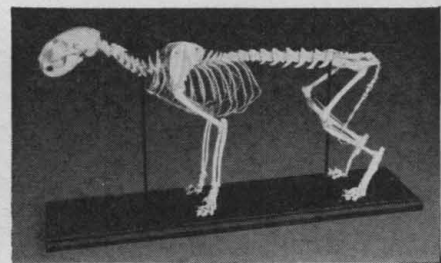
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 Edited by: George W. Irving, Jr., and Sam R. Hoover.

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Edited by: Reidar F. Sognaes.

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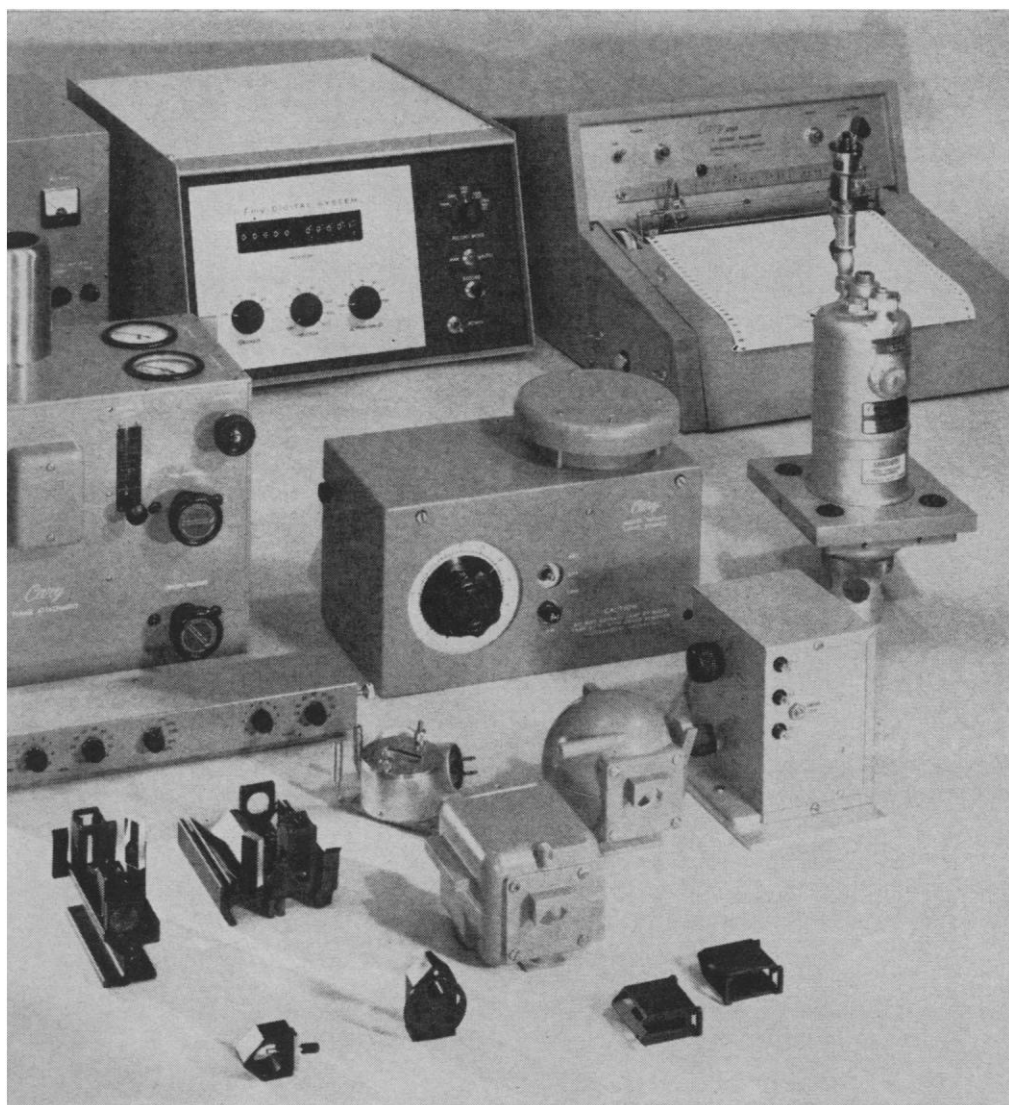
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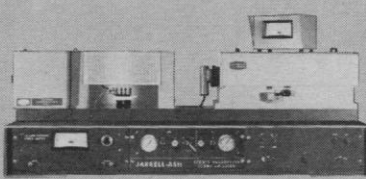


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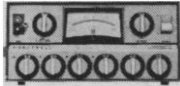
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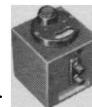


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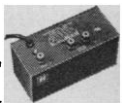
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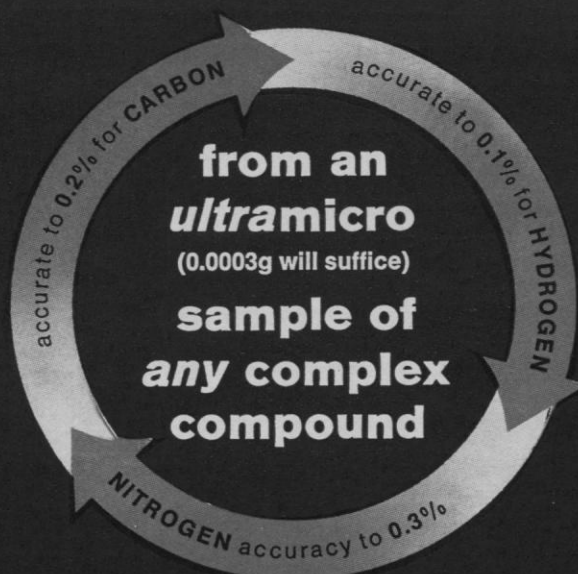
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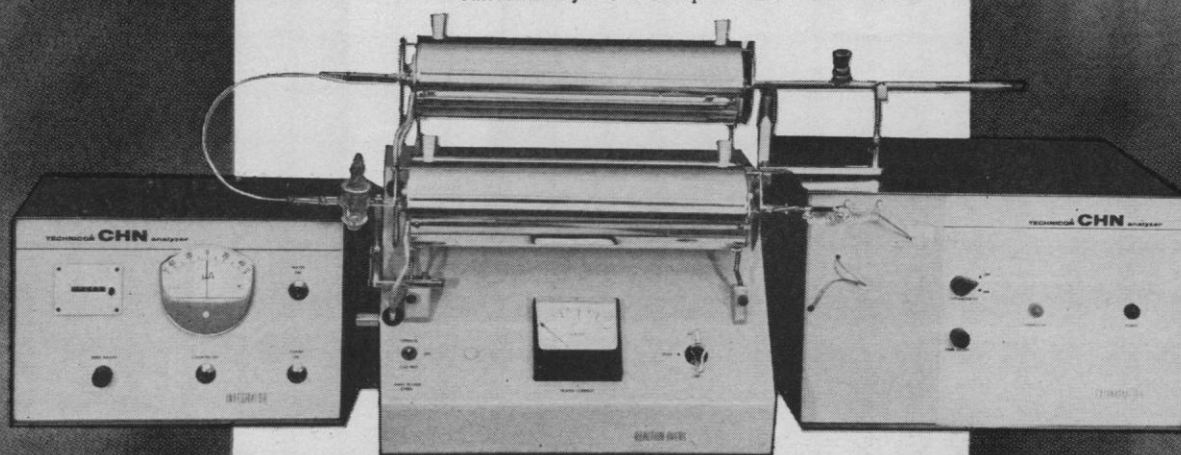
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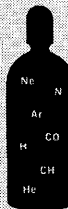
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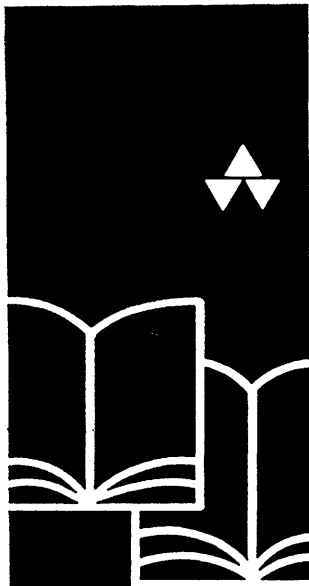
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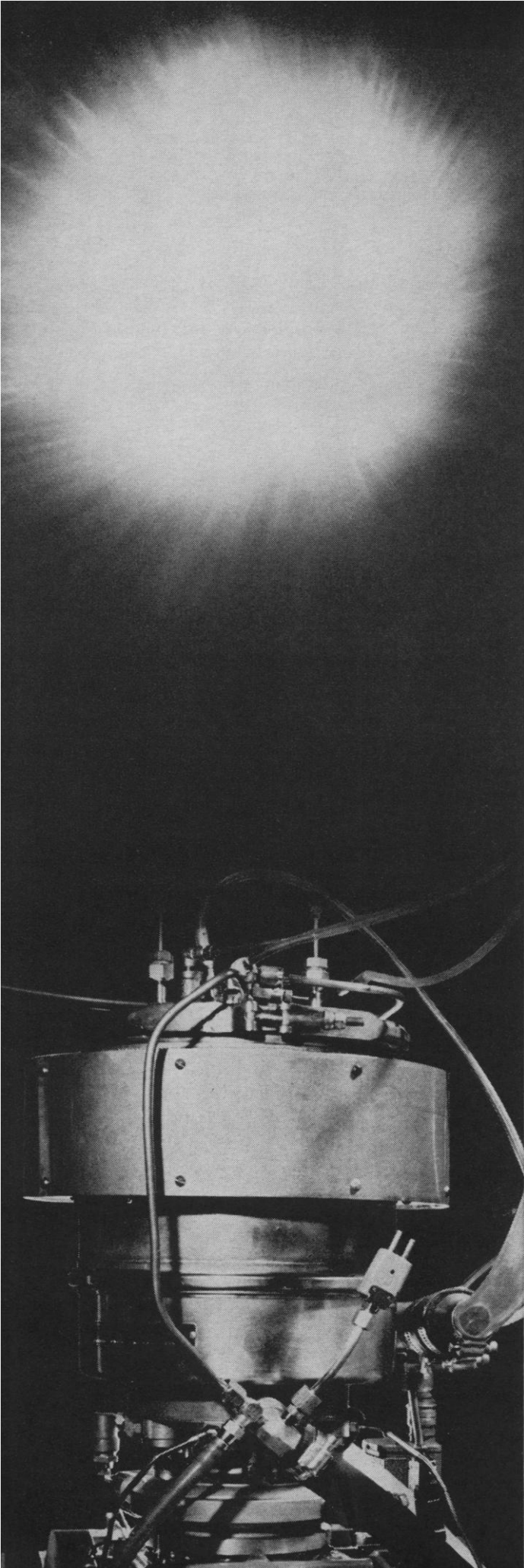
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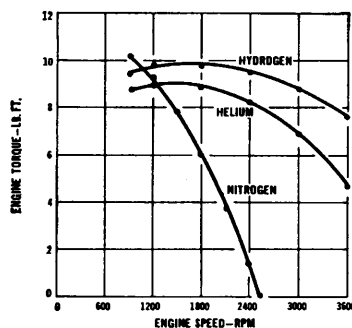
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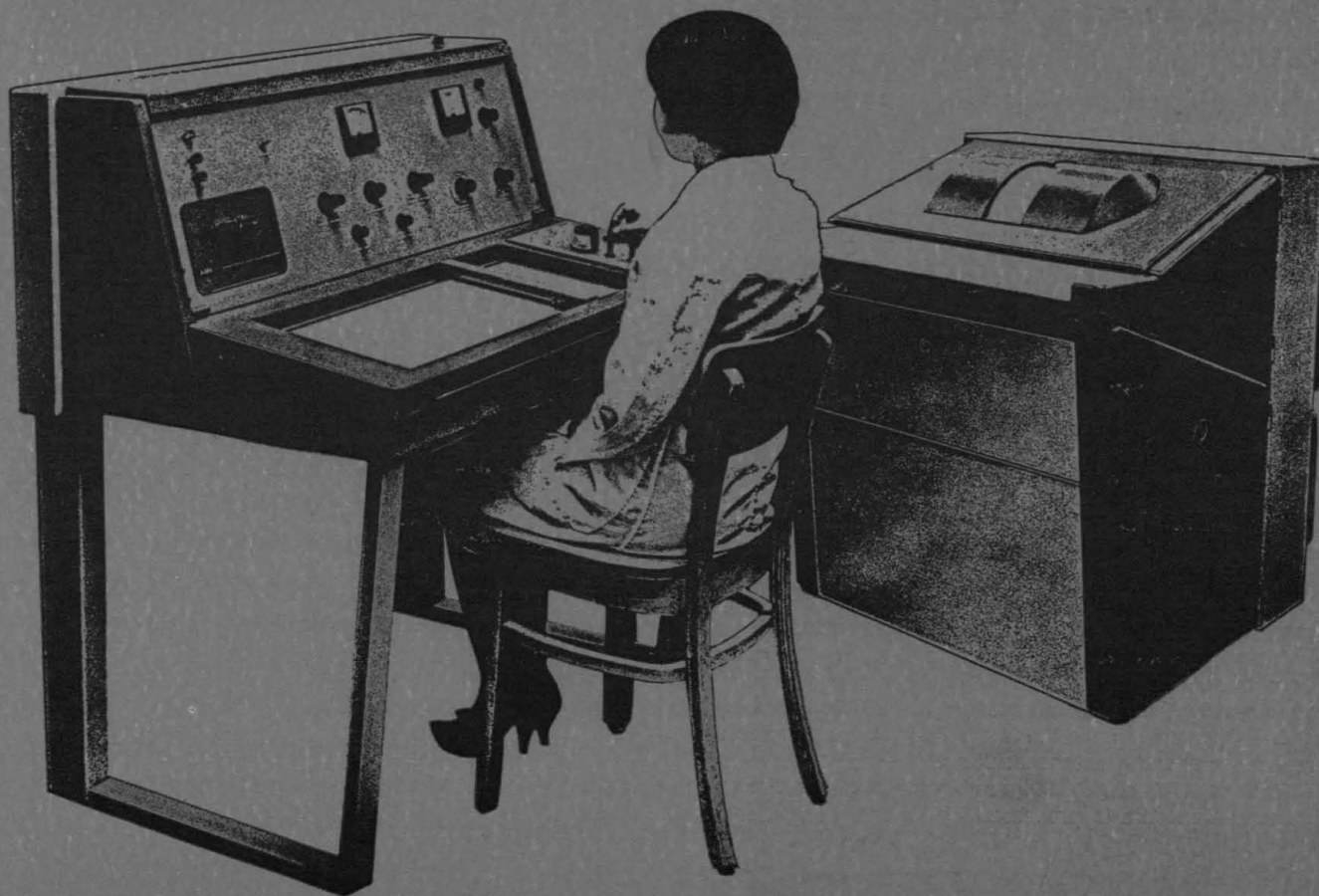
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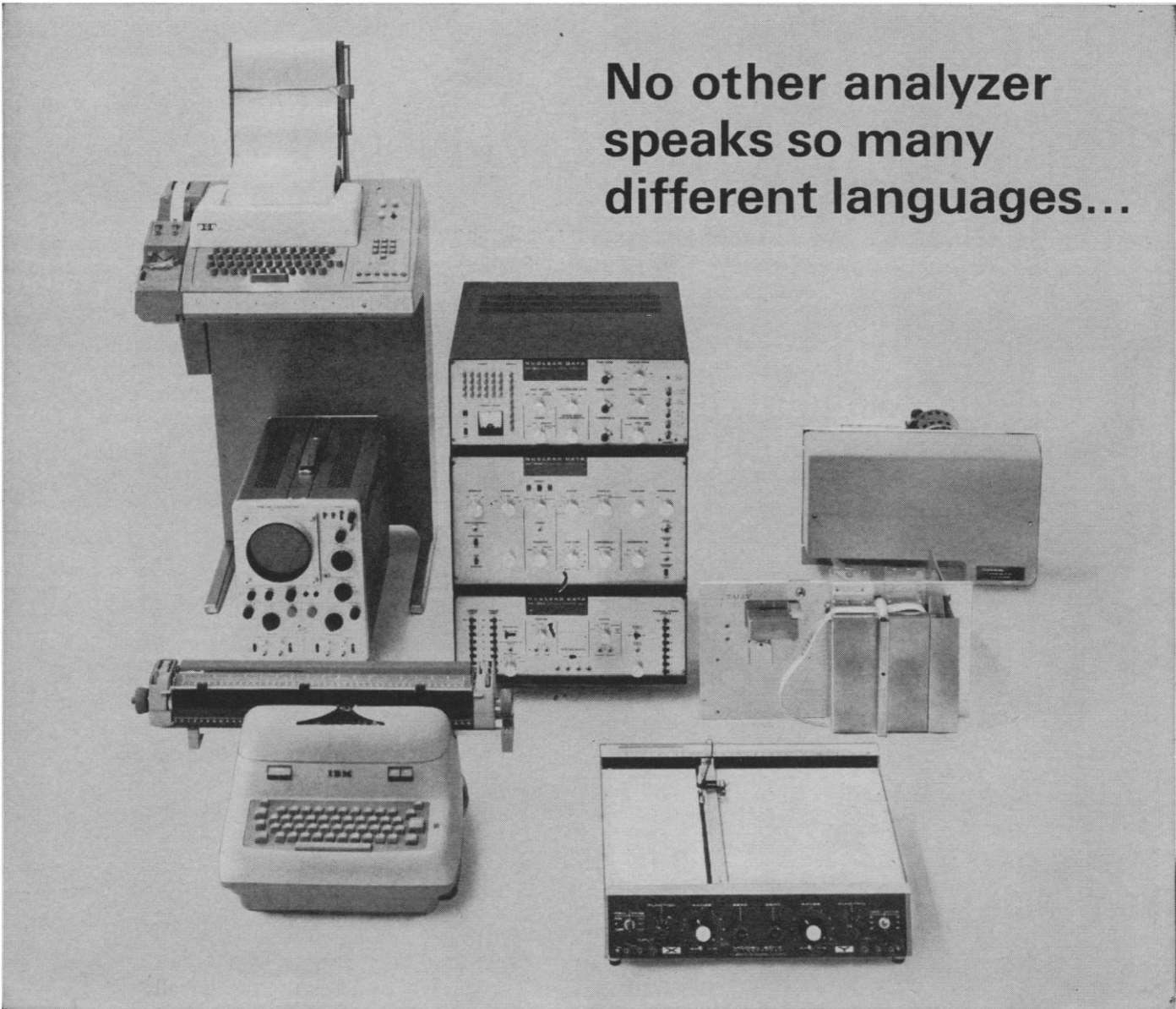
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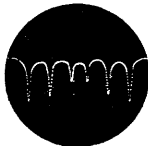
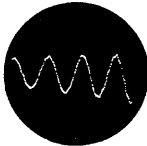
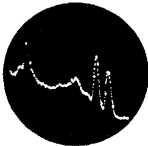
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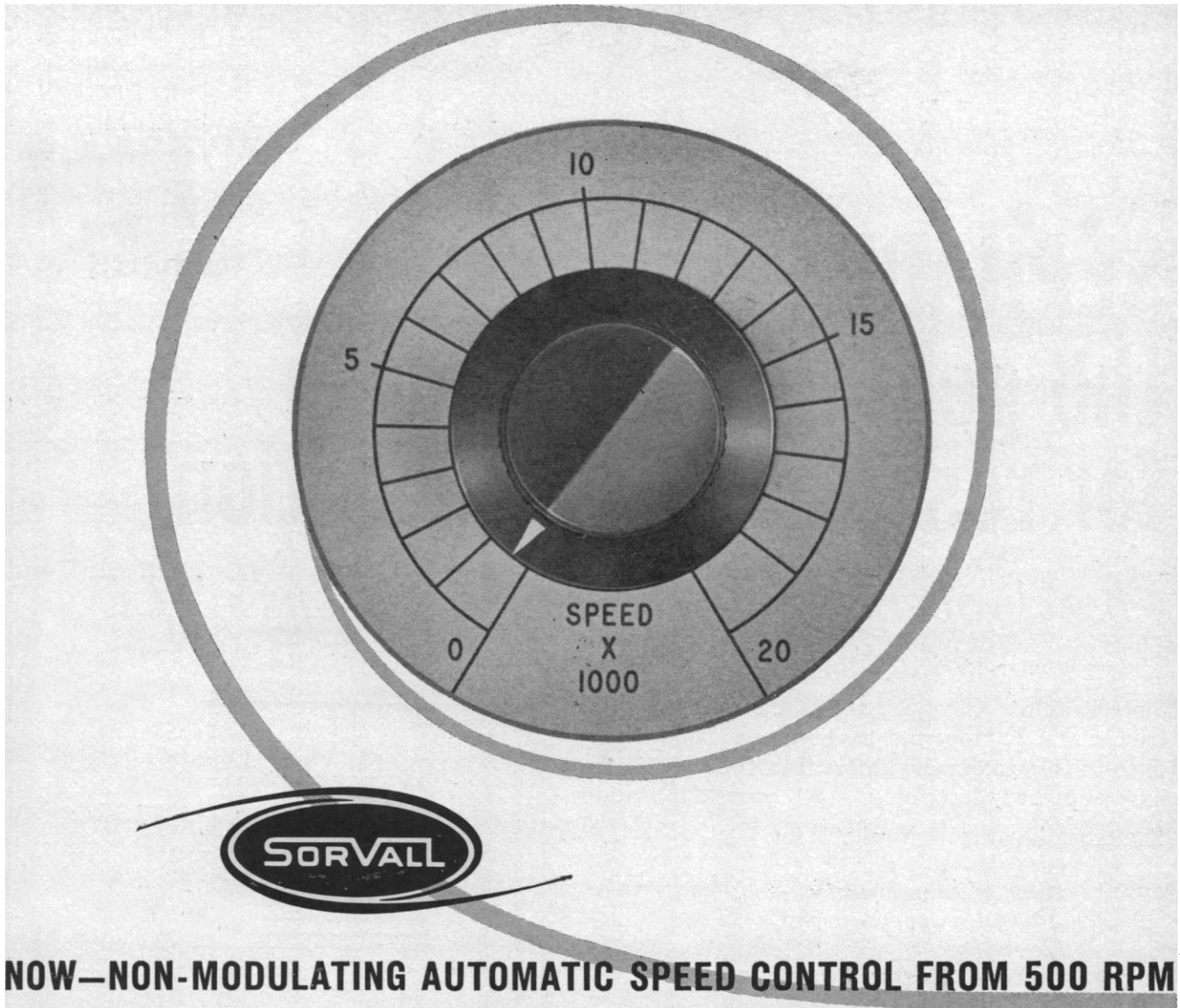
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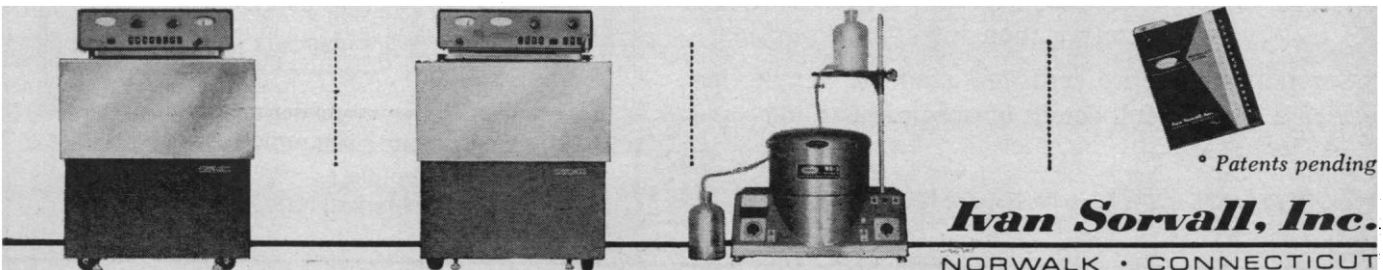
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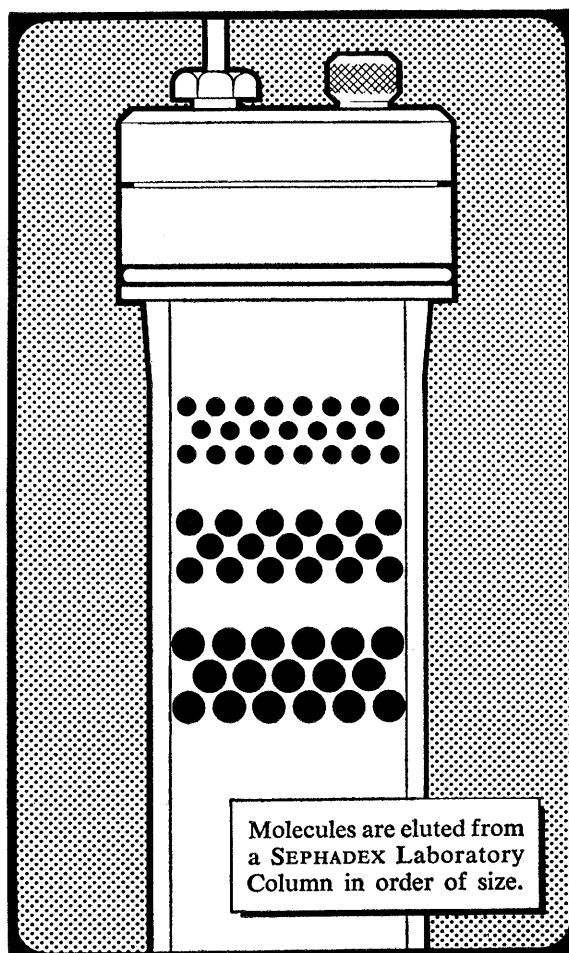
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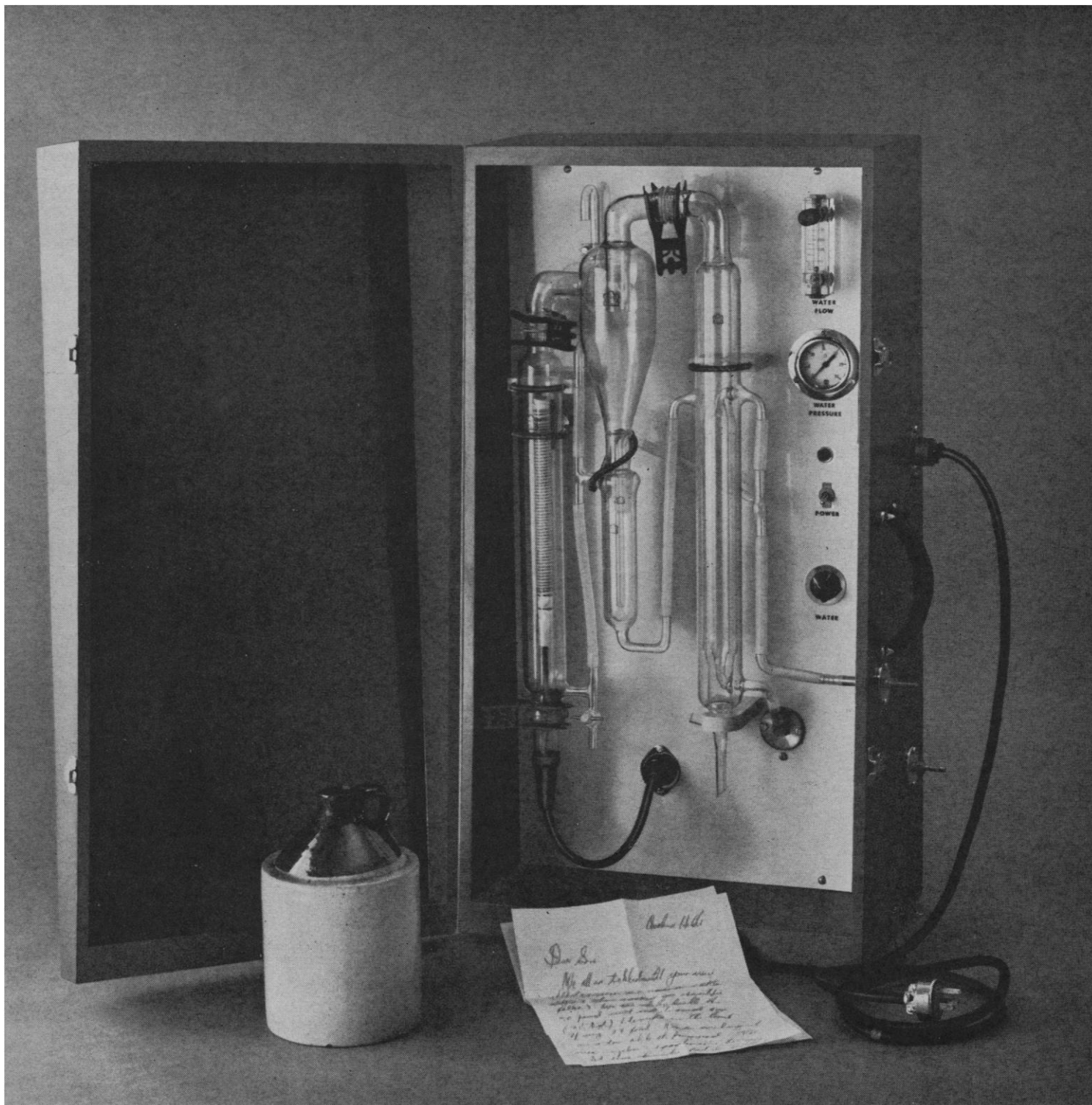
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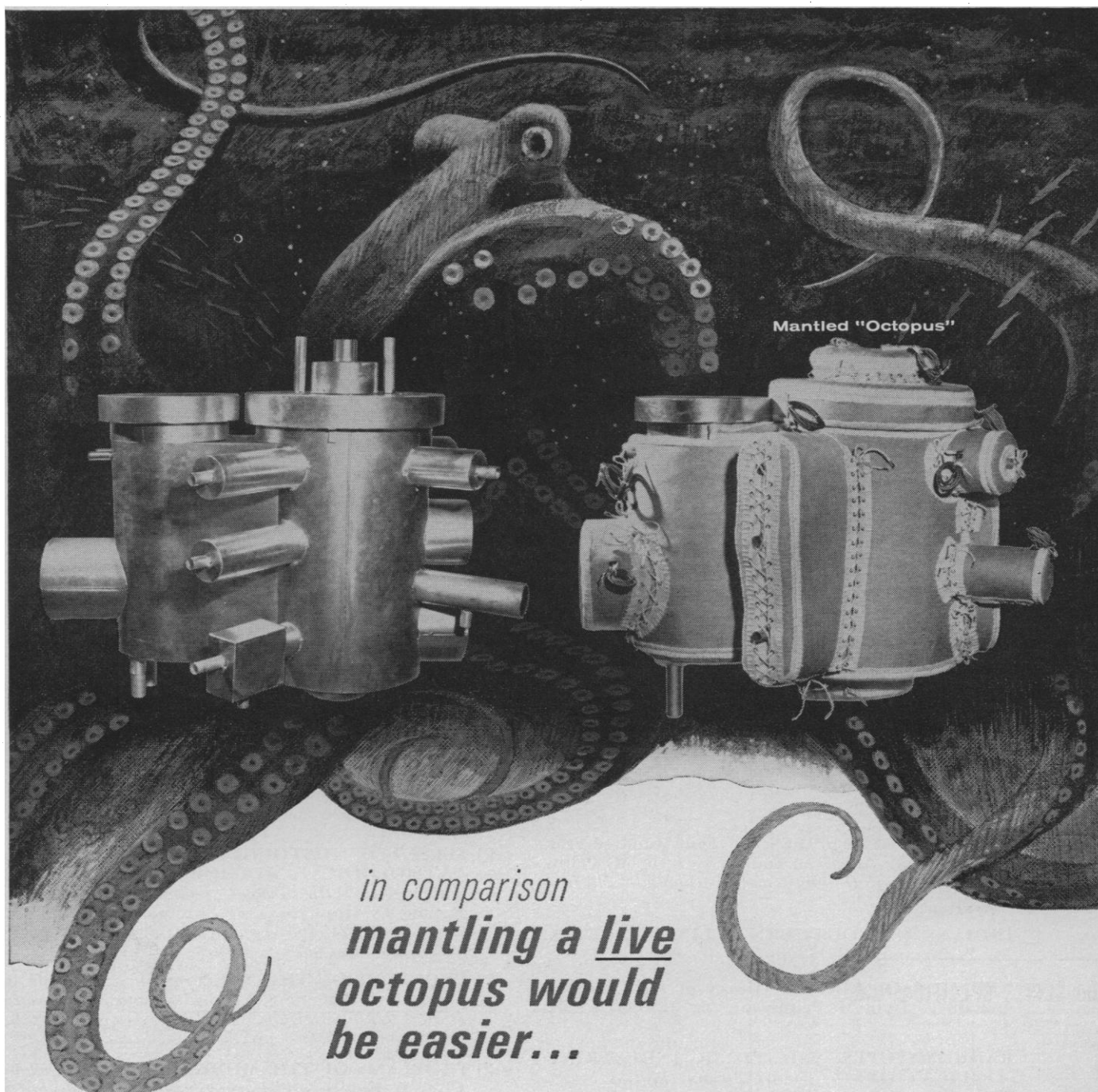
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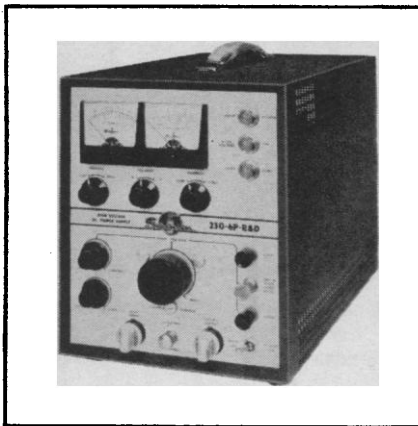
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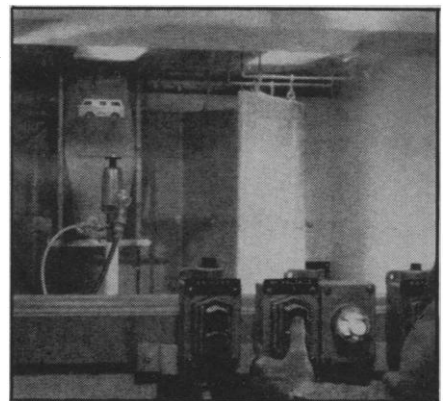
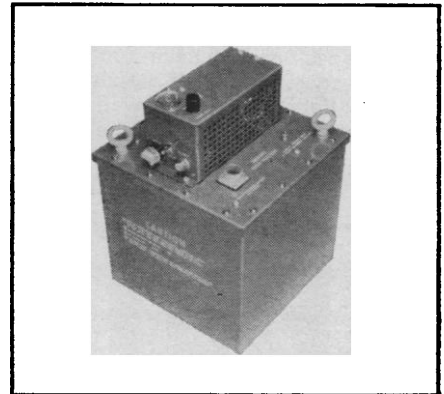
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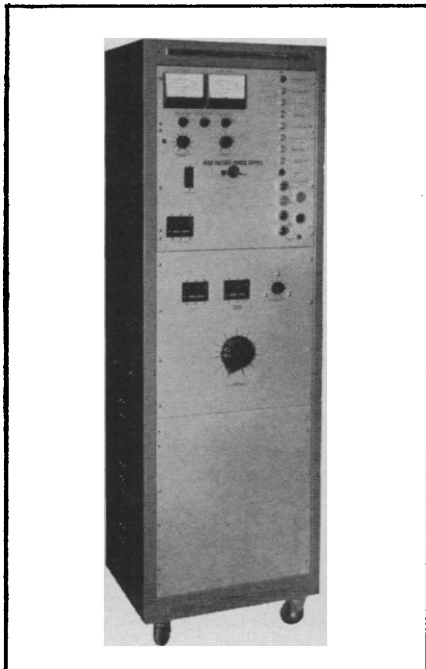
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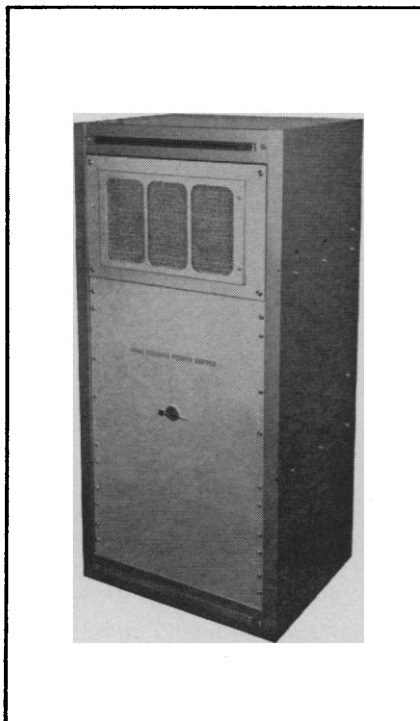
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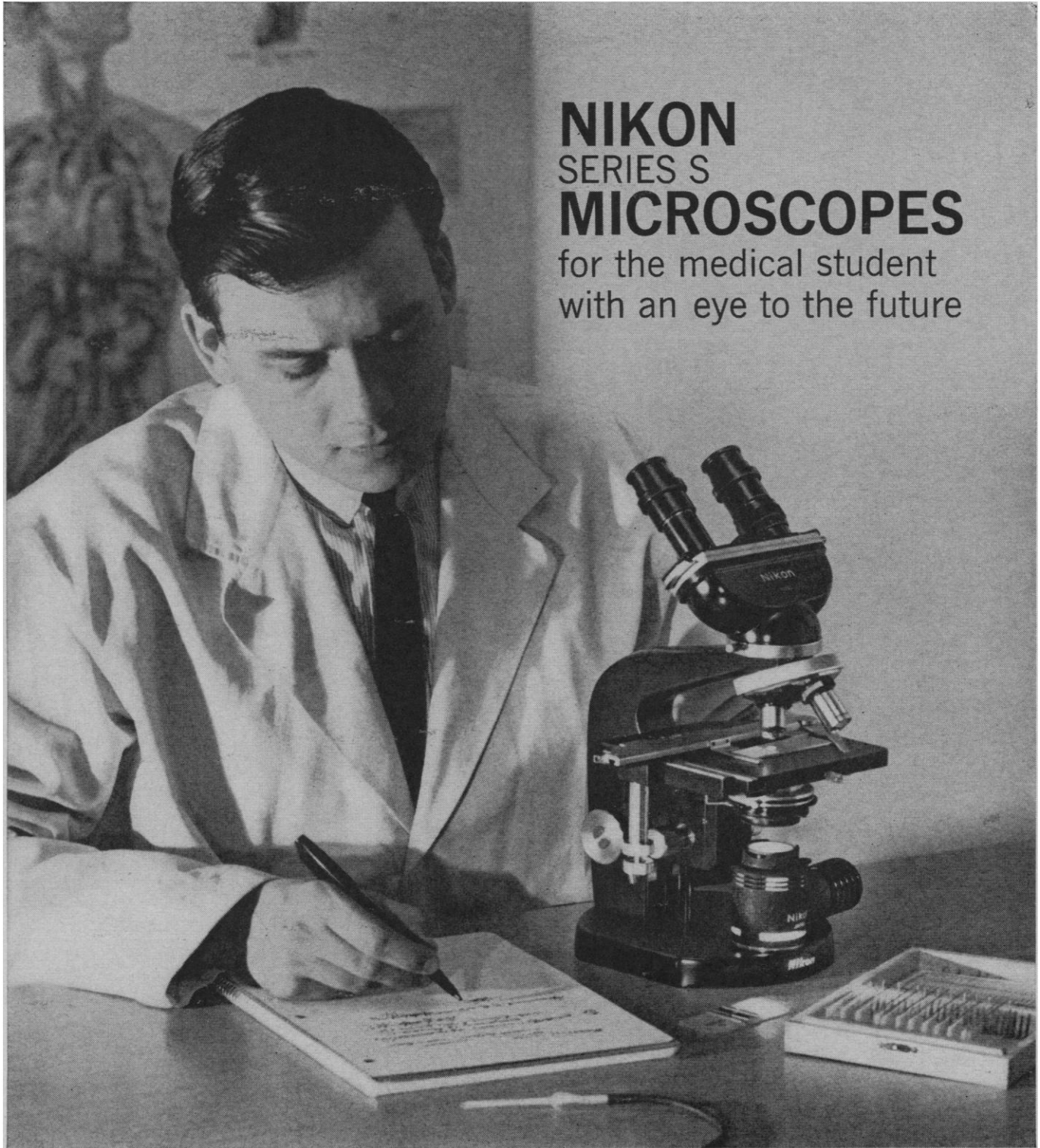
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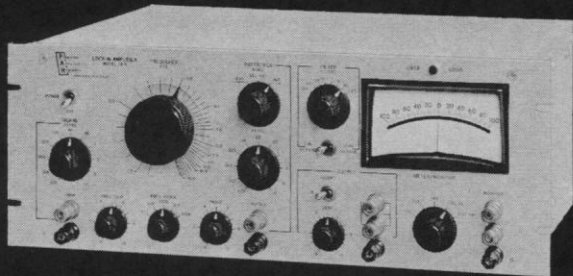
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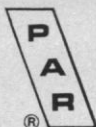
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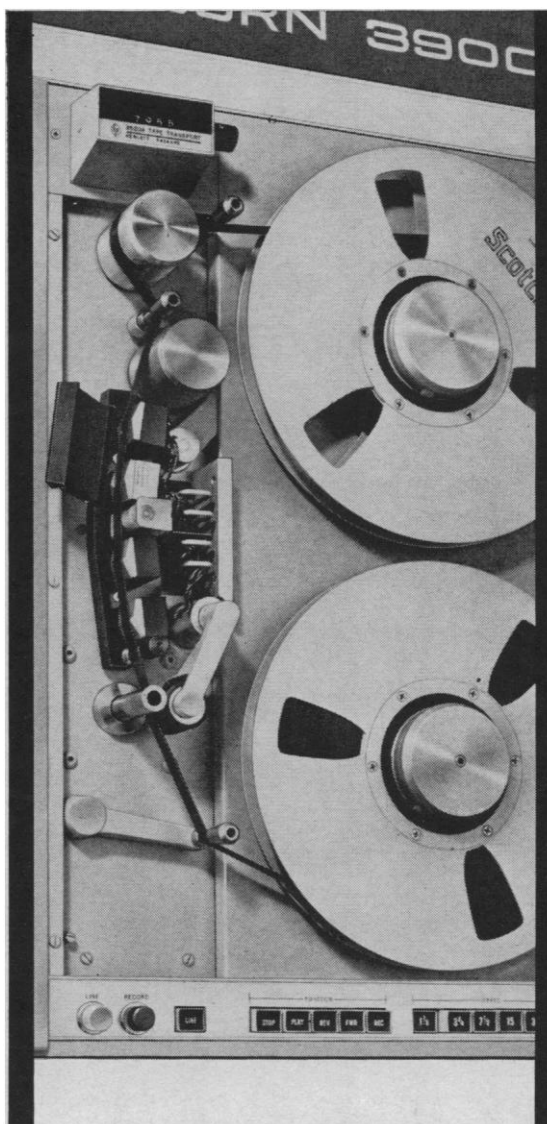
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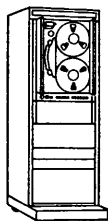
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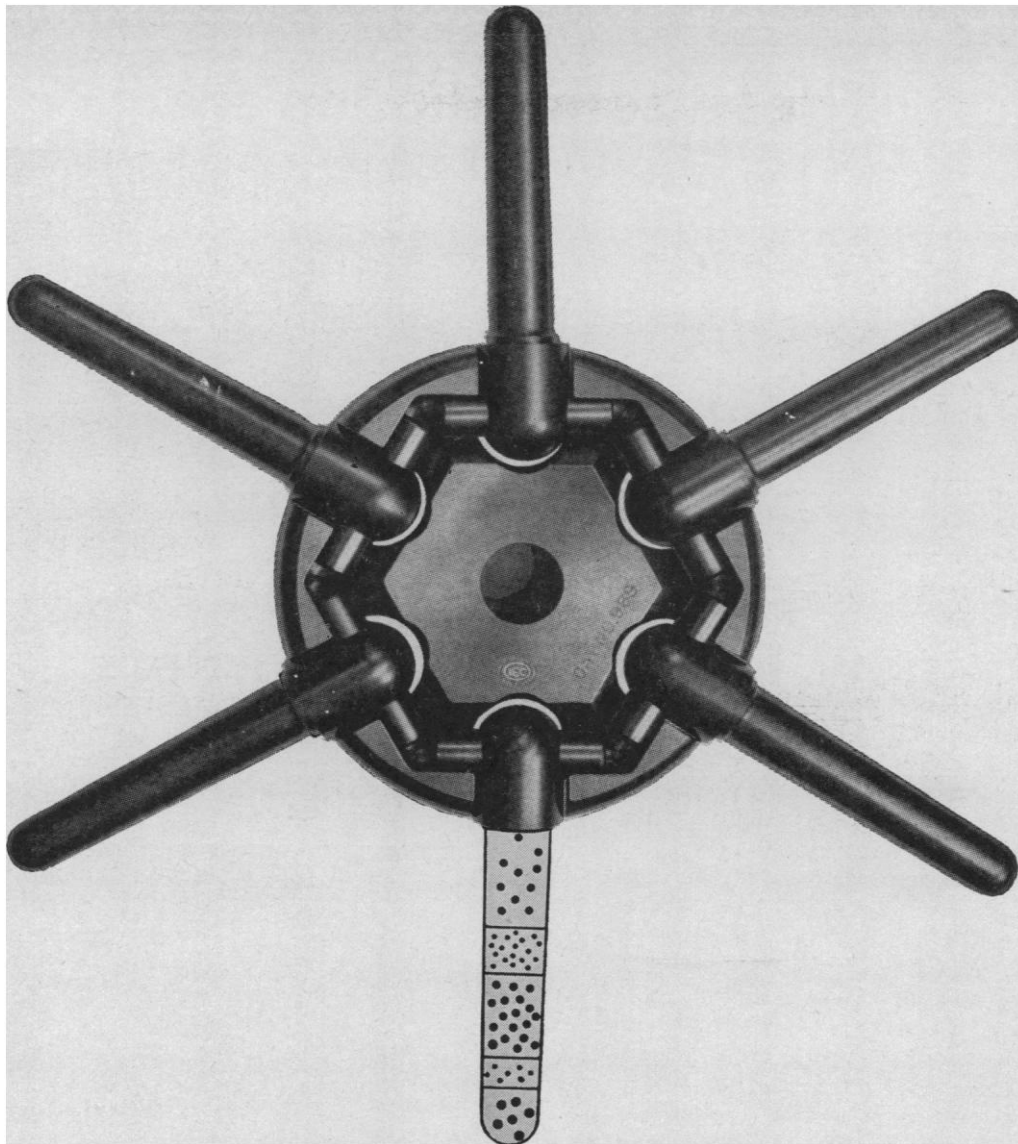
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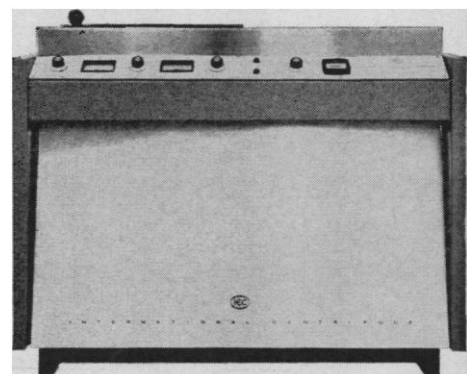
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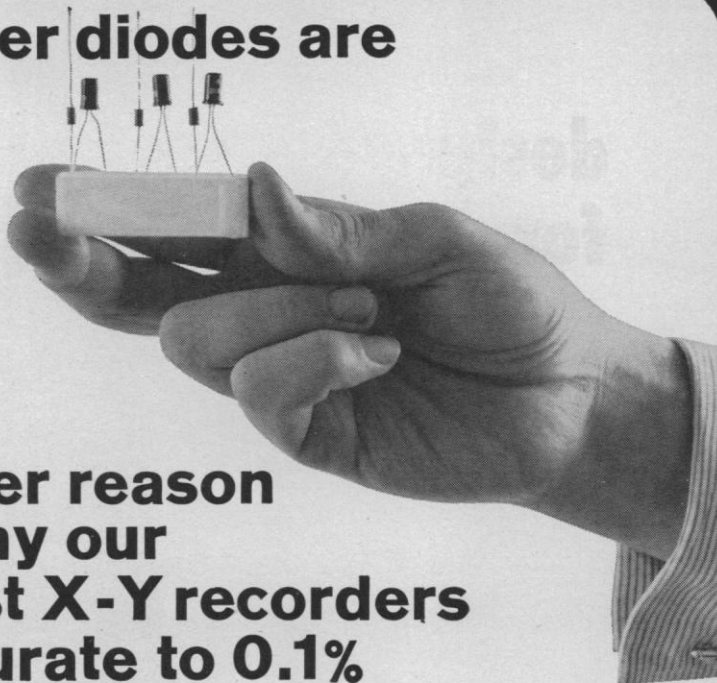
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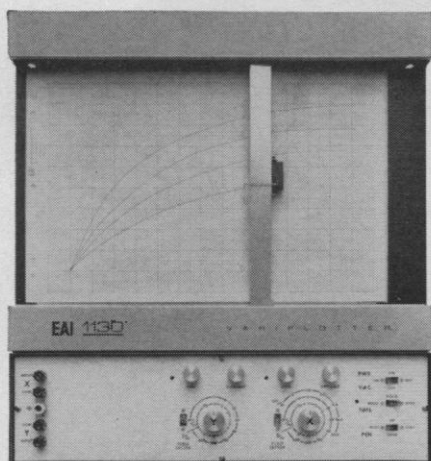
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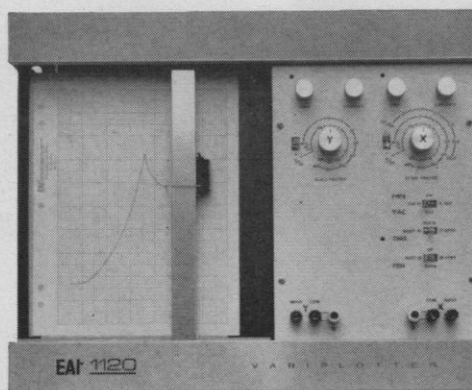
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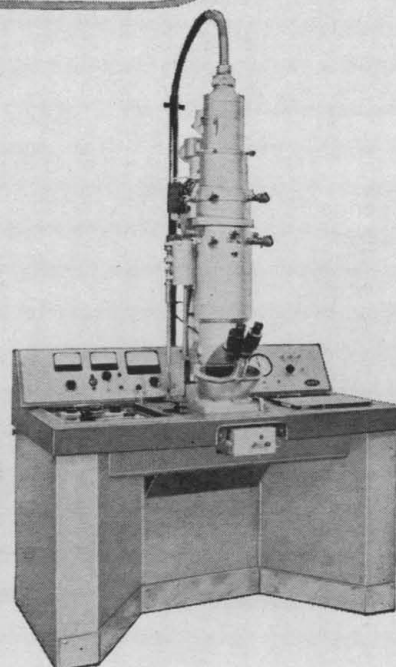
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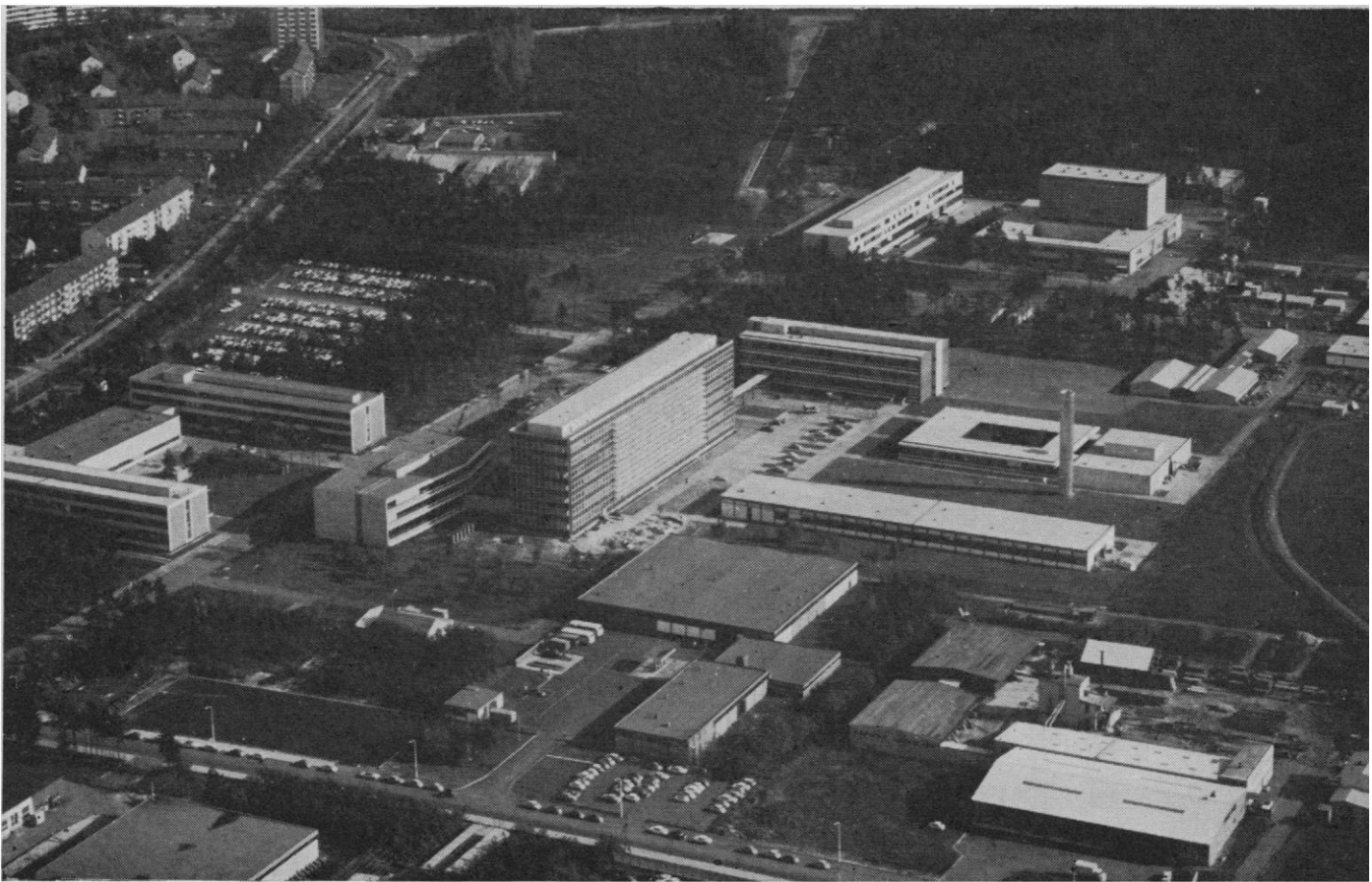
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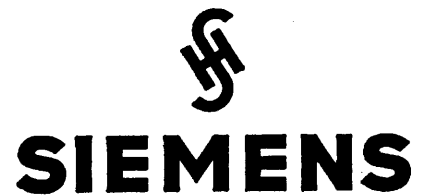
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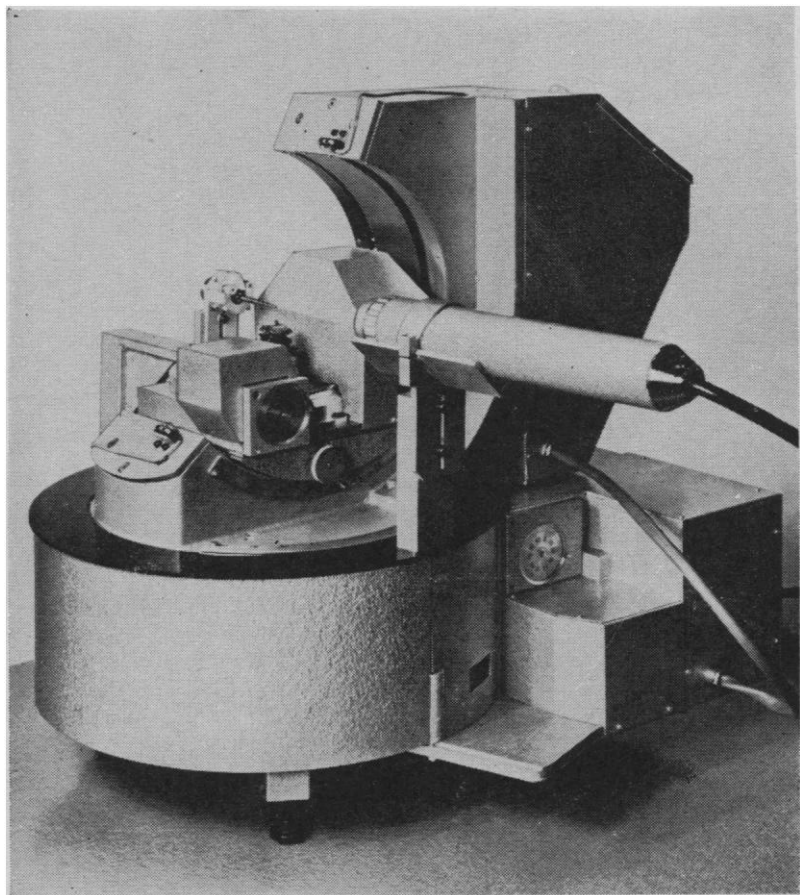
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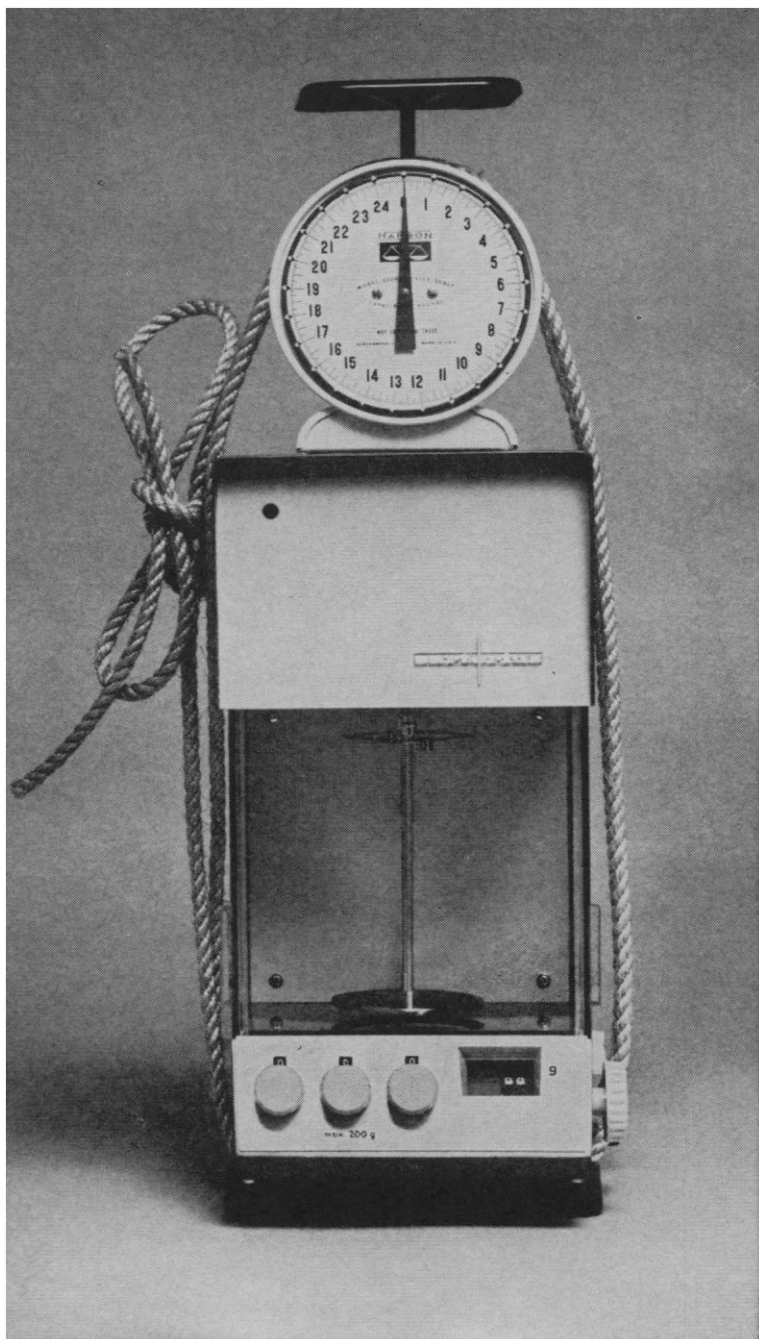
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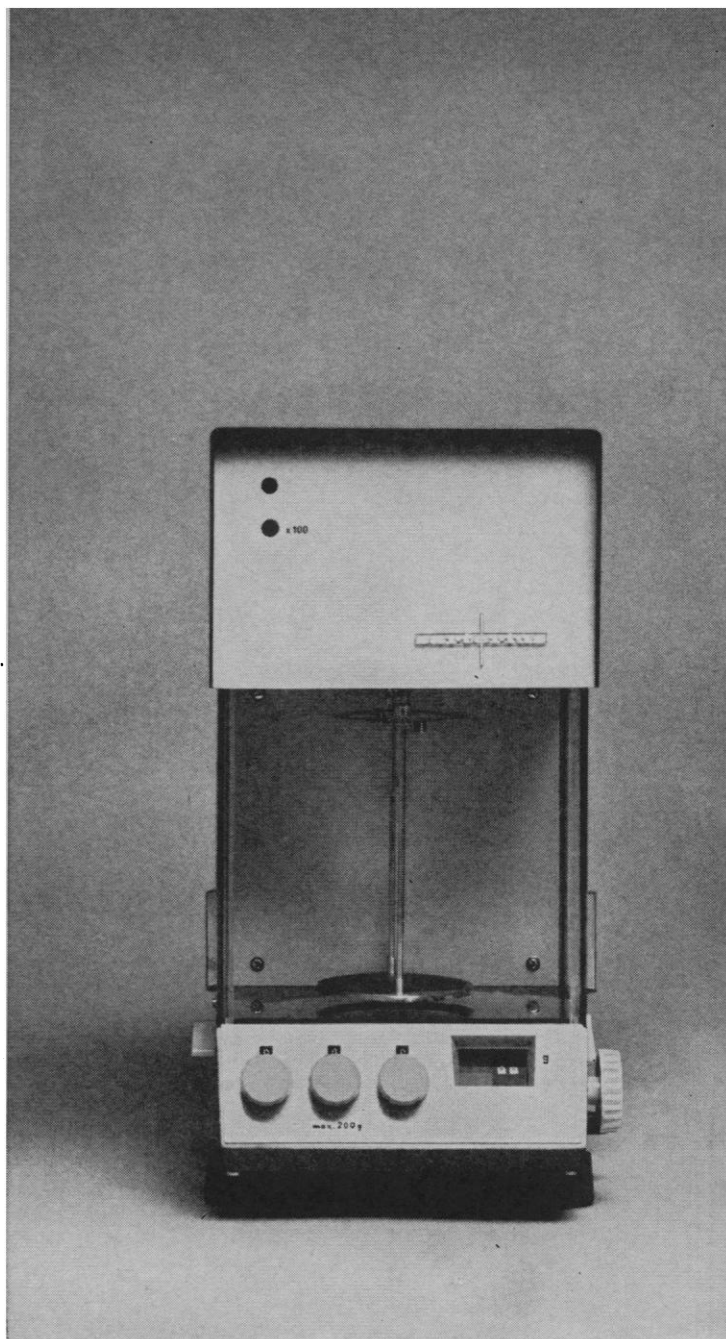
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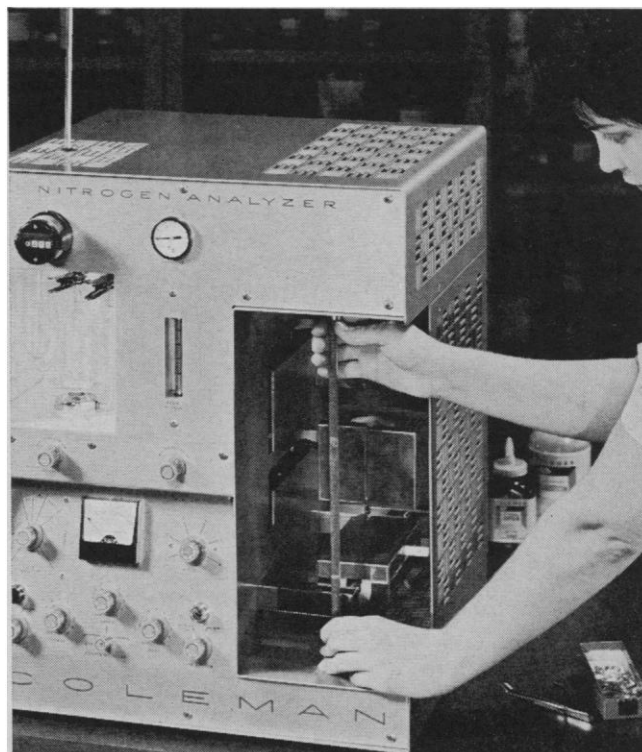
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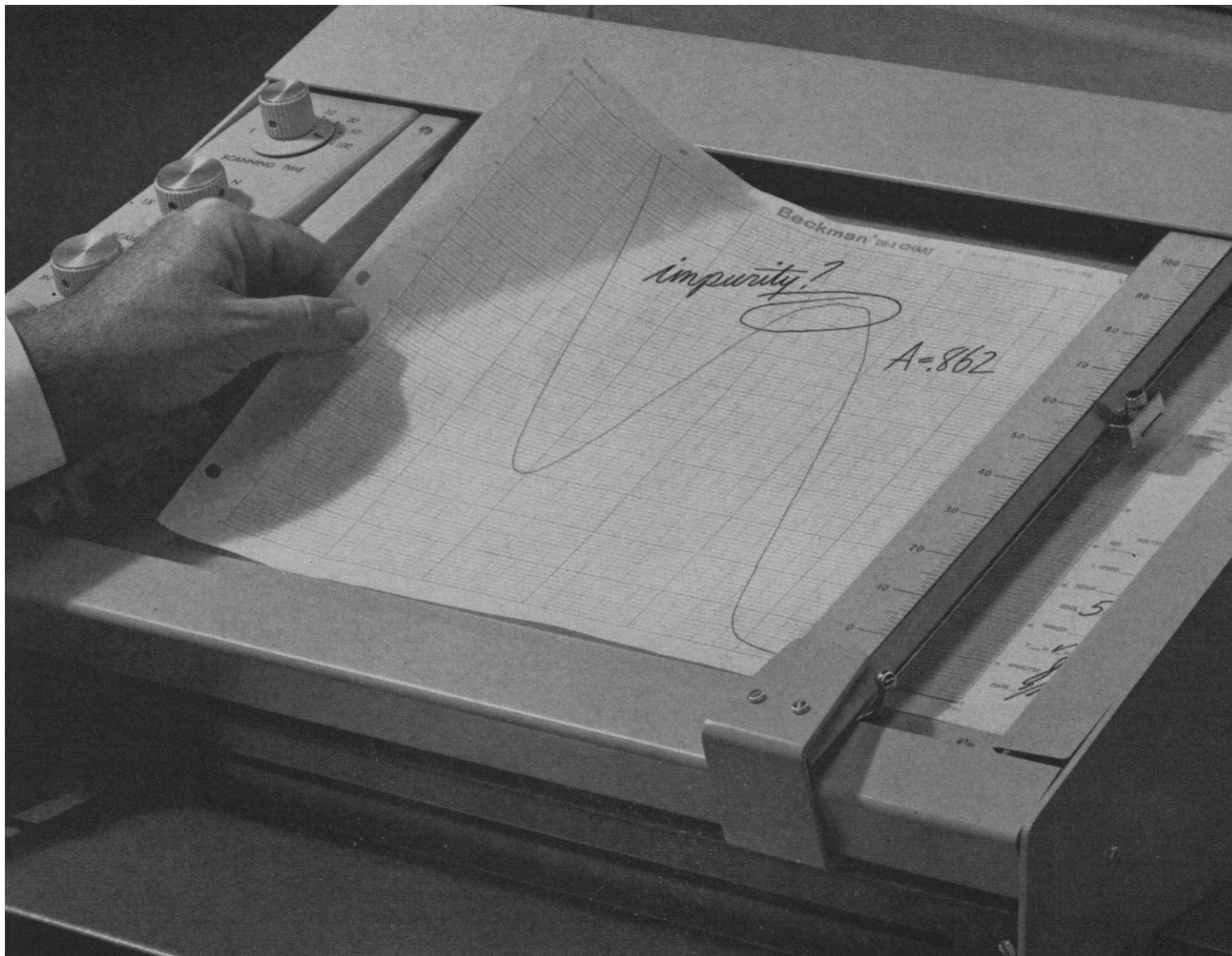
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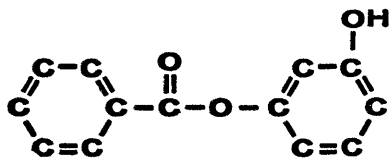
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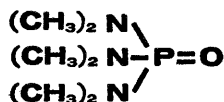
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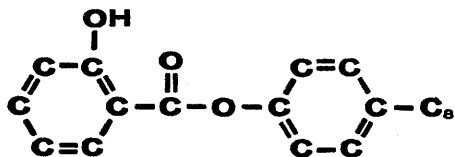
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Form.....clear liquid
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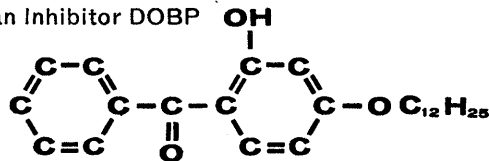
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Form.....white crystalline solid
 Melting point.....72-74°C.
 Solubility.....polar and non-polar organic solvents

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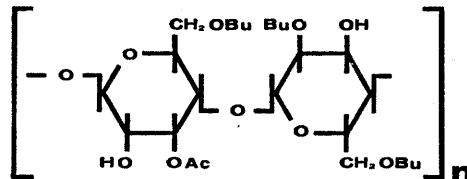


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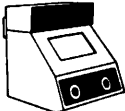



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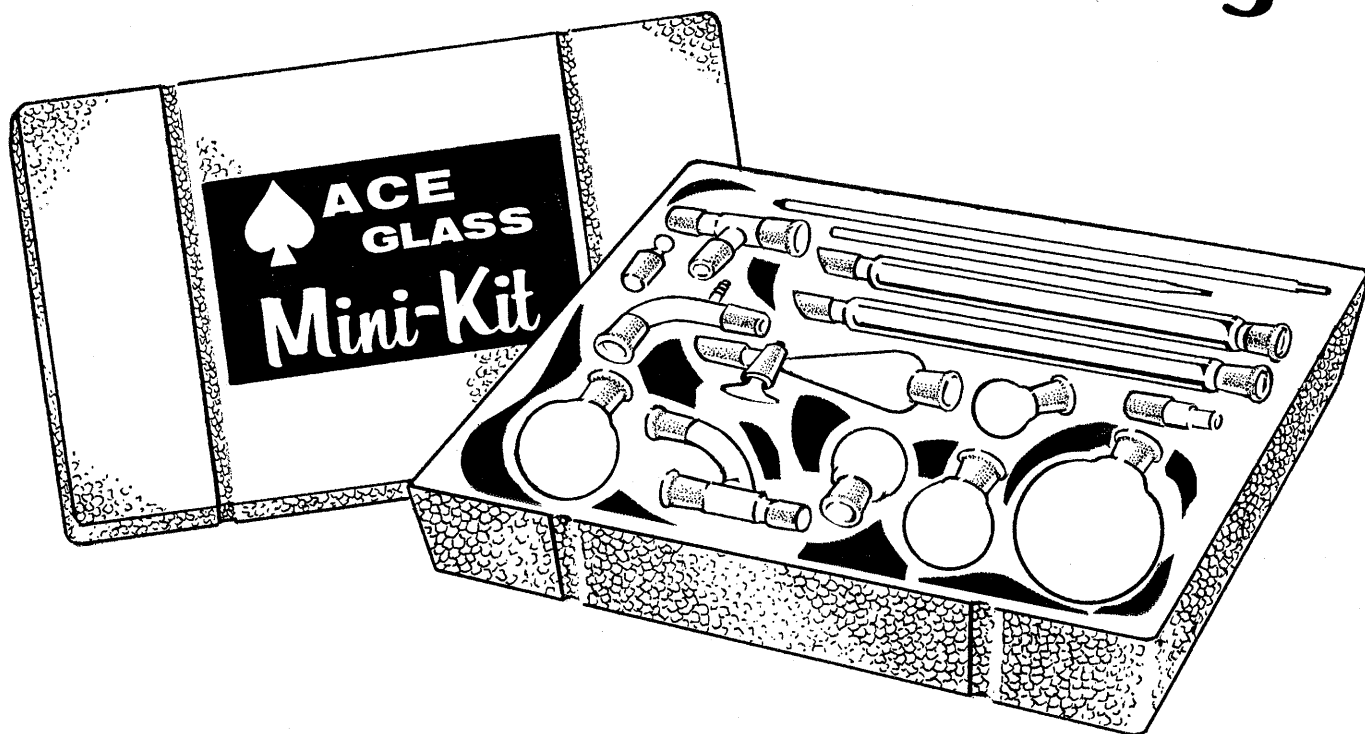
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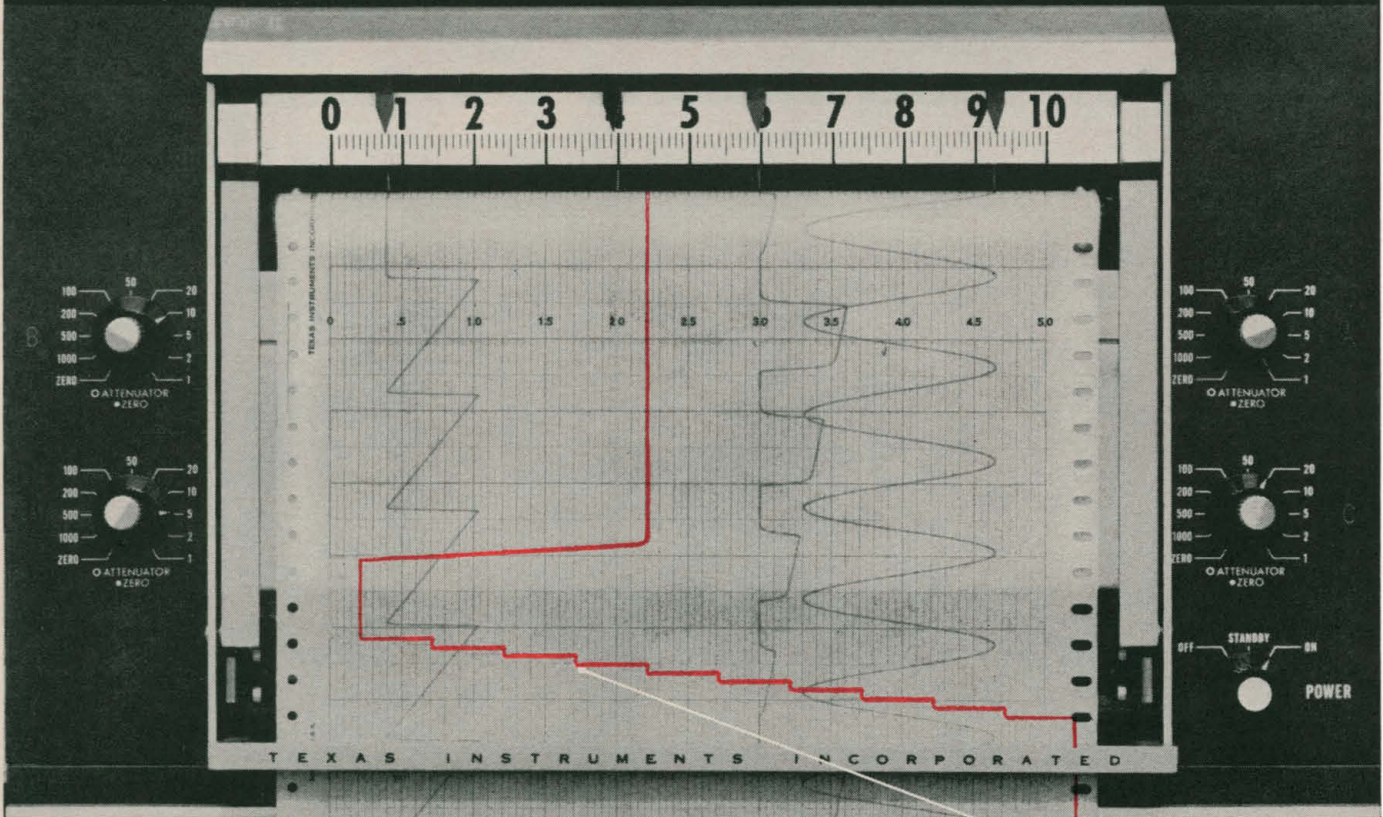
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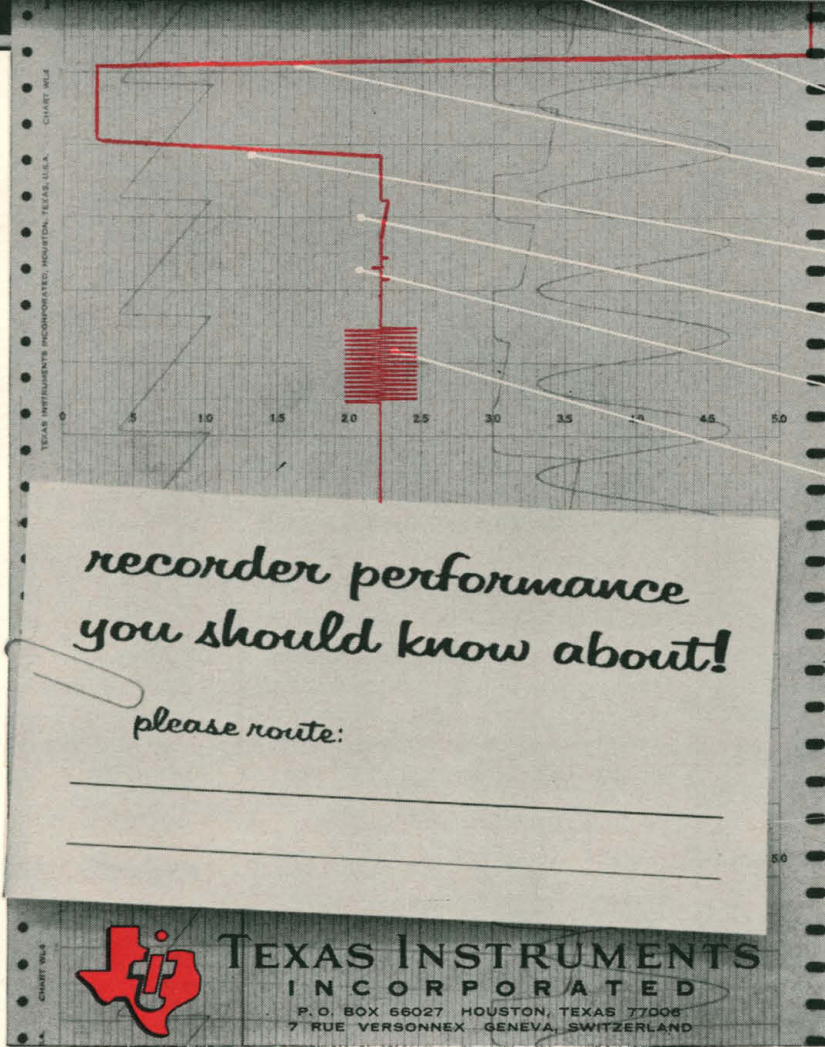
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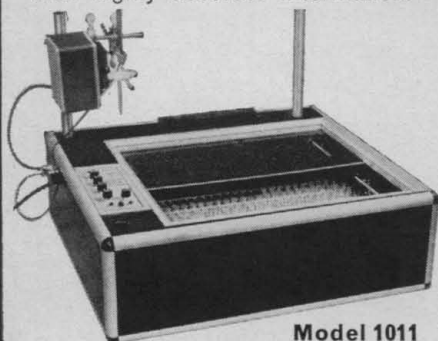
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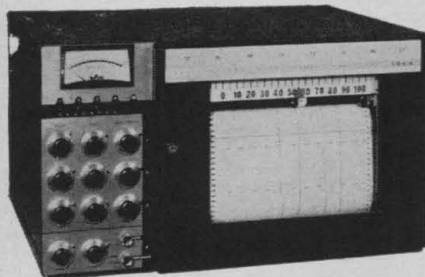
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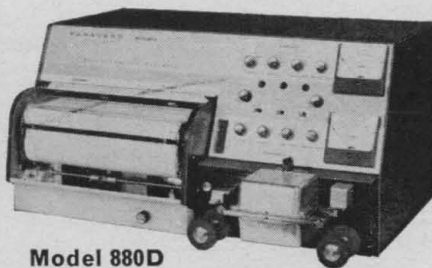
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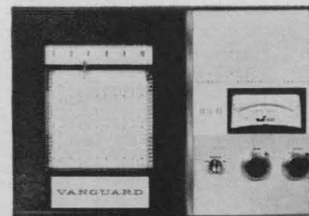
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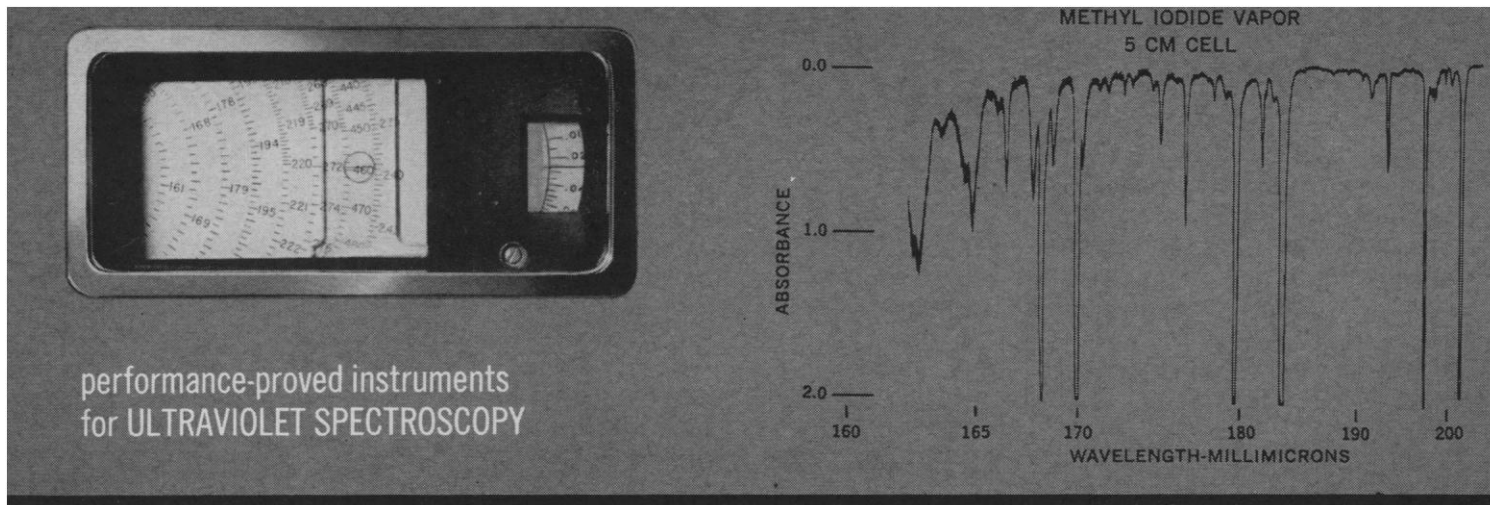
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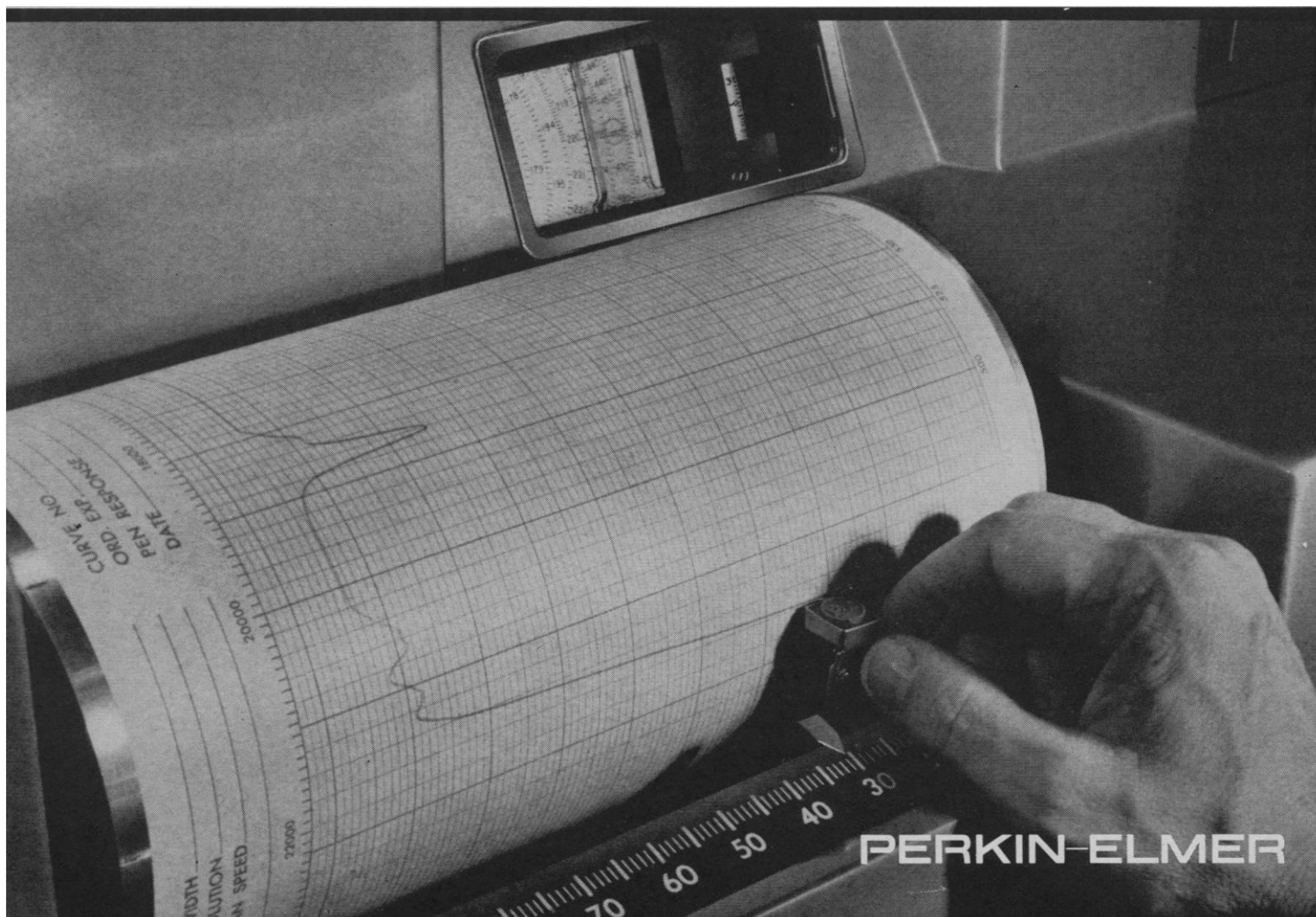
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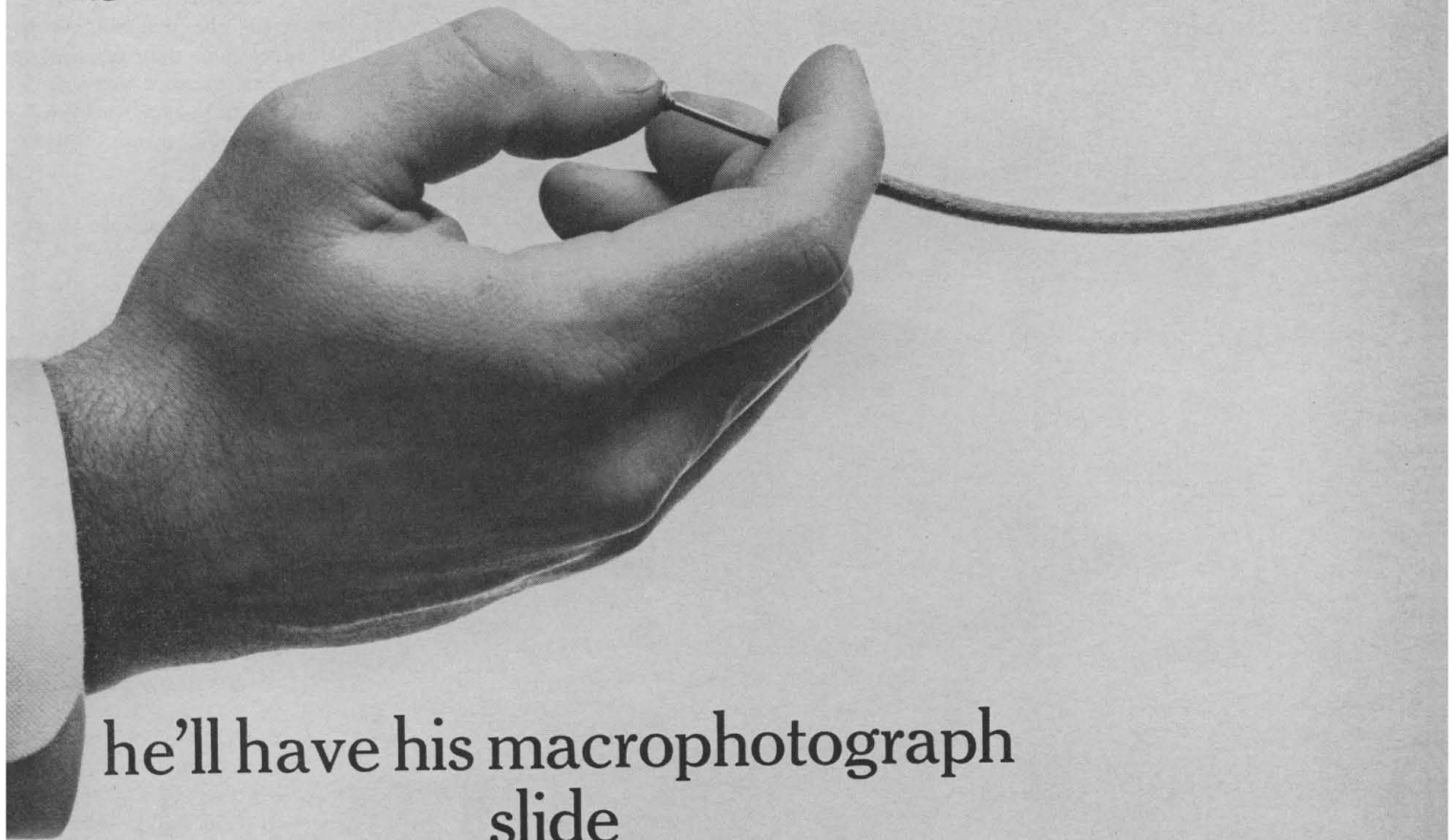
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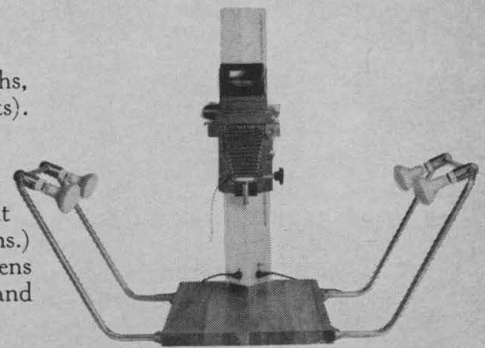
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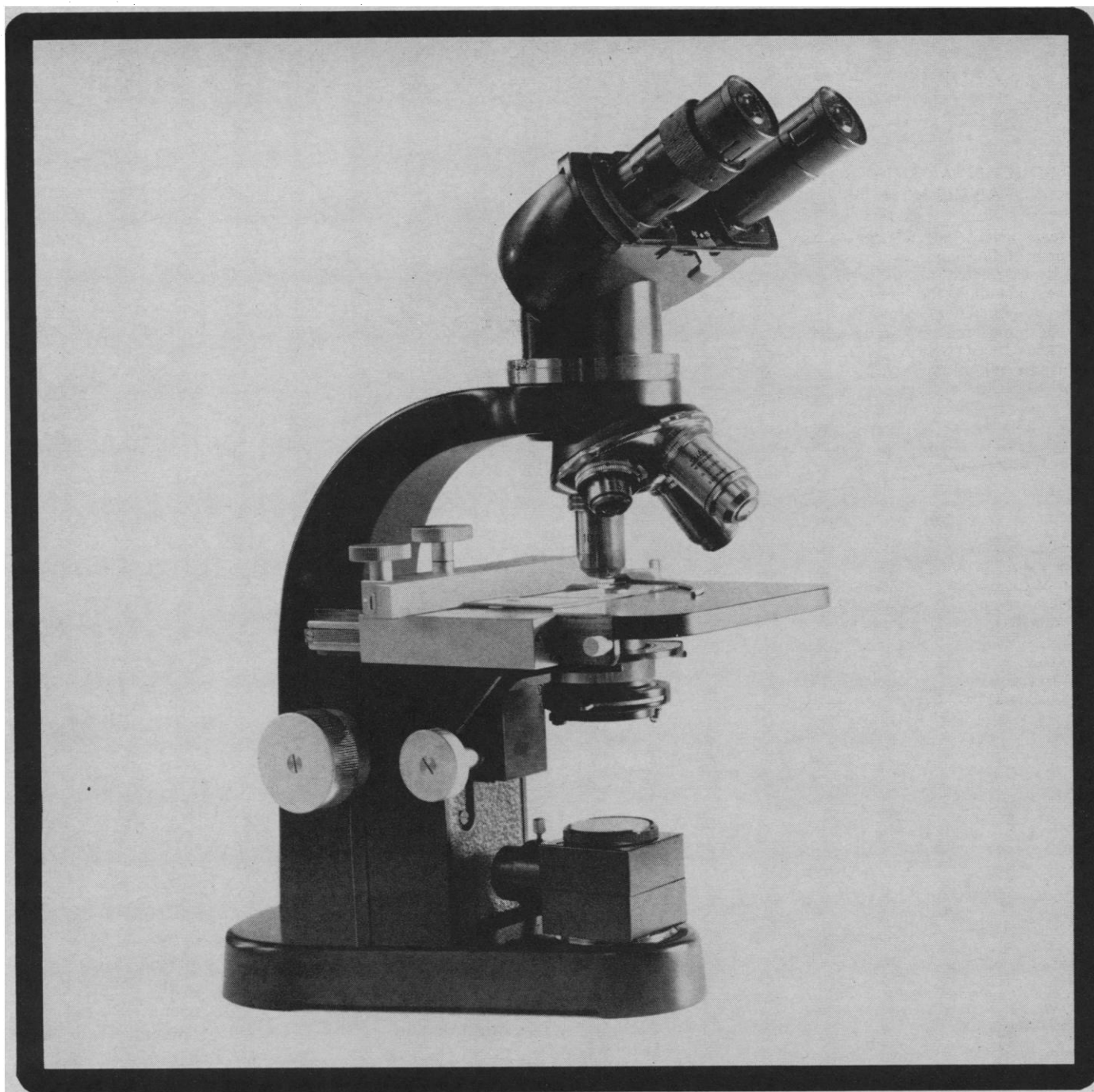
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The Evolution of Science

When scientific scholarship is compared with scholarship in other fields, or with the arts, it sometimes appears to be distinguished by an important difference of kind. It seems to be additive in nature, to grow as the sum of facts accumulated by a multitude of workers and piled up from generation to generation like the fabrication, brick by brick, of some massive wall. Other kinds of scholarship, and the arts, do not seem to be cumulative in precisely the same sense. This distinction, indeed, has an element of validity. As discoverer, collector, and arranger of new facts about the world, science is indeed an activity of accumulation—sometimes even of simple summation. And when one looks at the explosive rate at which that activity has accelerated in our own nation and over much of the globe since the second world war, it is tempting to regard accumulation as a pre-eminent characteristic of scientific endeavor.

But if this additive and cumulative aspect of scientific scholarship were a true measure of its inner structure, the concepts of our universe would have changed in no such dynamic way as they have even over the last two decades. In a profound sense, the structure of science is no more that of an assemblage of facts, brought together in simple additive arrays, than is the living body a simple assemblage of cells, coexisting without interaction or integration. Rather, like a living body, the body of scientific scholarship is a highly organized entity. Its multifarious parts, to be sure, are sometimes so diverse and so separated in their various specializations that it is often difficult to recognize them even as components of any organized whole. Yet so long as the parts are developing dynamically, the essence of an integrated relationship is maintained through the whole vast structure of science. The intensity or the importance of the reaction of one part of the body on another seemingly far distant can never be foreseen, from one year to the next or even, sometimes, literally from day to day. But it is a permanent potential of health and vigor.

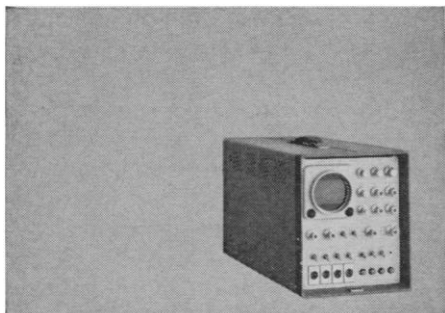
Furthermore, this interlocked character of scientific scholarship, across fields and over generations of workers, makes it far more than simply a static organic whole. In a very real sense it is a living and evolving organism. Its growth over three centuries has been marked, as in so much of actual organic evolution, by movement from the simple to the vastly more complex and at the same time by a correlated knitting and integration, transforming initially loose assemblages of hypothesis and theory and fact into more tightly woven, more inclusive, more efficient—and often superficially more simple—tools to achieve new orders of understanding.

As in organic evolution, moreover, the evolution of science is irreversible. In any literal sense, scientific scholarship can never go back. One thing must follow another: it cannot precede it. Without the work of Newton, the work of Einstein would have been impossible; even if it had been accomplished, it would have been irrelevant to the stream of our understanding. Science will continue to evolve and a deeper unity will be found among its parts. There will be many instances not only where specific information gained in one area will prove directly relevant in very different ones, but where major conceptual structures too will be found to underlie fields apparently very disparate.

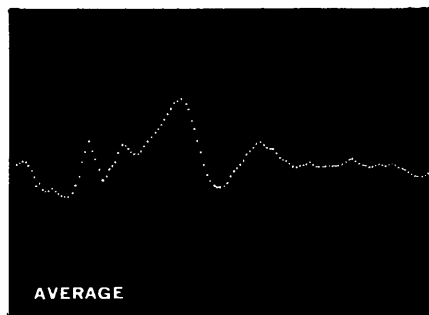
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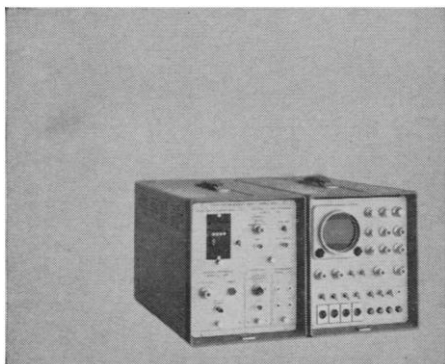
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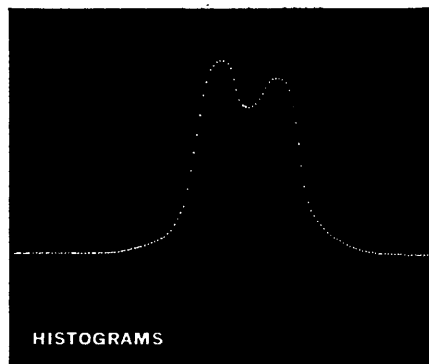
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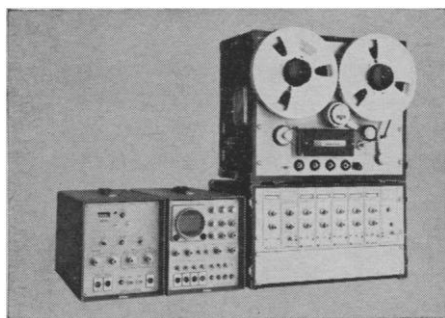
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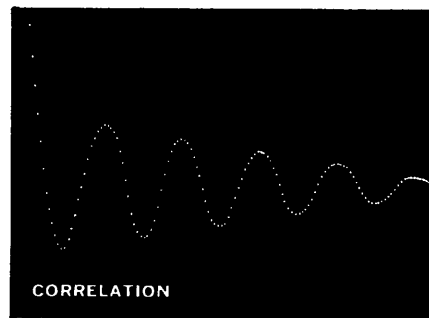
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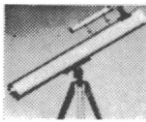
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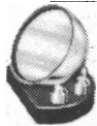


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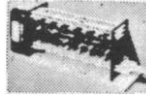
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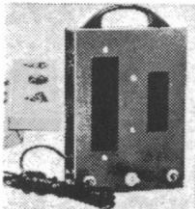
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The History of Surgical Anesthesia. Thomas E. Keys. Dover, New York, 1963. 223 pp. Illus. Paper, \$2. Revised and enlarged version, 1945 edition; contains an introductory essay by Chauncey D. Leake, a chapter by Noel A. Gillespie, and an appendix by John F. Fulton.

The Hopi Child. Wayne Dennis. Wiley, New York, 1965. 212 pp. Illus. Paper, \$1.45. Reprint, 1940 edition.

Introduction to Higher Algebra. Maxine Bôcher. Dover, New York, 1964. 333 pp. Illus. Paper, \$2. Reprint, 1907 edition.

Medical Psychology. Paul Schilder. David Rapoport, Translator and Editor. Wiley, New York, 1965. 428 pp. Illus. Paper, \$2.45. Reprint, 1953 edition.

Memory: A Contribution to Experimental Psychology. Hermann Ebbinghaus. Translated from the German (Leipzig, 1885) by Henry A. Ruger and Clara E. Bussenius. With a new introduction by Ernest R. Hilgard. Dover, New York, 1964. 141 pp. Illus. Paper, \$1.50. Reprint, 1913 edition.

Mirrors, Prisms, and Lenses. A textbook of geometrical optics. James P. C. Southall. Dover, New York, 1964. 842 pp. Illus. Paper, \$3.50. Reprint, third edition, 1933.

Nine Soviet Portraits. Raymond A. Bauer and Edward Wasiolek. M.I.T. Press, Cambridge, Mass., 1965. 206 pp. Illus. Paper, \$2.45. Reprint, 1955 edition.

Operational Philosophy: Integrating Knowledge and Action. Anatol Rapoport. Wiley, New York, 1965. 270 pp. Paper, \$1.65. Reprint, 1953 edition.

Optical Rotatory Power. T. Martin Lowry. Dover, New York, 1964. 497 pp. Illus. Paper, \$2.75. Reprint, 1935 edition.

Philosophic Foundations of Quantum Mechanics. Hans Reichenbach. Univ. of California Press, Berkeley, 1965. 192 pp. Illus. Paper, \$1.50. Reprint, 1944 edition.

The Servants of Power. A history of the use of social science in American industry. Loren Baritz. Wiley, New York, 1965. 285 pp. Paper, \$1.65. Reprint, 1960 edition.

A Sophisticate's Primer of Relativity. P. W. Bridgman. Harper and Row, New York, 1965. 170 pp. Illus. Paper, \$1.35. Reprint, 1962 edition.

Statistical Adjustment of Data. W. Edwards Deming. Dover, New York, 1964. 271 pp. Illus. Paper, \$1.75. Reprint, 1943 edition.

Studies in the Life History of the Song Sparrow. vols. 1 and 2. vol. 1, *A Population Study of the Song Sparrow* (254 pp.); vol. 2, *The Behavior of the Song Sparrow and Other Passerines* (342 pp.). Margaret Morse Nice. Dover, New York, 1964. Illus. Paper, \$1.75 each. Volume 1 is a reprint of volume 4 (1937) and volume 2 is a reprint of volume 6 (1943) of the *Transactions of the Linnaean Society of New York*.

Superfluids, vol. 2, *Macroscopic Theory of Superfluid Helium*. Fritz London; Dover, New York, 1964. 233 pp. Illus. Paper, \$1.75. Reprint, 1954 edition.

Theory and Application of Mathieu Functions. N. W. McLachlan. Dover, New York, 1964. 415 pp. Illus. Paper, \$2.35. Reprint, 1947 edition.

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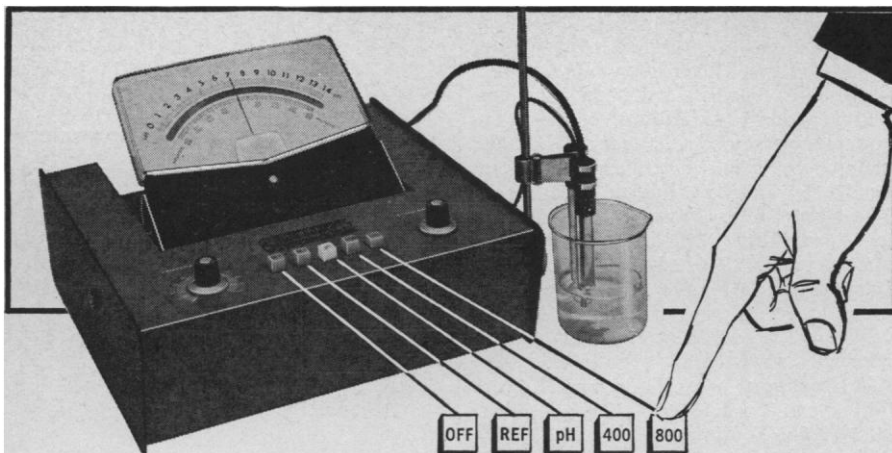
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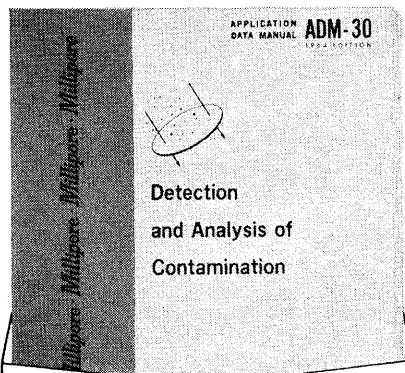
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Thought and Language. L. S. Vygotsky. Translated from the Russian edition (Moscow, 1934) and edited by Eugenia Hanfmann and Gertrude Vakar. M.I.T. Press, Cambridge, Mass., 1965. 190 pp. Paper, \$2.45. Reprint, 1962 English language edition; reviewed in *Science* 136, 37 (1962).

Training Research and Education. Robert Glaser, Ed. Wiley, New York, 1965. 608 pp. Illus. Paper, \$2.65. Reprint, 1962 edition. The contributors are Glenn L. Bryan, John B. Carroll, Launor F. Carter, Meredith P. Crawford, James Deese, Philip H. DuBois, Paul M. Fitts, Edwin A. Fleishman, Norman Frederiksen, Robert M. Gagné, Thomas F. Gilbert, Murray Glanzer, Robert Glaser, Arthur A. Lumsdaine, Robert B. Miller, Alfred F. Smode, Robert M. W. Travers, Theodore R. Vallance, and Clark L. Wilson.

A Treatise on Advanced Calculus. Philip Franklin. Dover, New York, 1965. 607 pp. Illus. Paper, \$2.75. Reprint, 1940 edition.

Vibrations and Waves. Norman Feather. Penguin Books, Baltimore, Md., 1965. 338 pp. Illus. Paper, \$1.45. Reprint, 1961 edition.

Worlds in Collision. Immanuel Velikovsky. Dell, New York, 1965. 432 pp. Paper, \$1.95. Reprint, 1950 edition.

New Books

Biological and Medical Sciences

Advances in Carbohydrate Chemistry. vol. 19. Melville L. Wolfrom and R. Stuart Tipson, Eds. Academic Press, New York, 1964. 428 pp. Illus. \$15. Nine papers: "Crystal-structure analysis in carbohydrate chemistry" by G. A. Jeffrey and R. D. Rosenstein; "Infrared spectroscopy and carbohydrate chemistry" by H. Spedding; "Nuclear magnetic resonance" by L. D. Hall; "Gas-liquid chromatography of carbohydrate derivatives" by C. T. Bishop; "The action of hydrogen peroxide on carbohydrates and related compounds" by G. J. Moody; "3-deoxyglycosuloses (3-deoxyglycosones) and the degradation of carbohydrates" by E. F. L. J. Anet; "Structure and some reactions of cellulose" by David M. Jones; "Wood hemicelluloses," pt. 1 by T. E. Himell; and "The pneumococcal polysaccharides" by M. J. How, J. S. Brimacombe, and M. Stacey.

Biology. John W. Kimball. Addison-Wesley, Reading, Mass., 1965. 720 pp. Illus. \$8.75.

Botulism. Proceedings of a symposium (Cincinnati, Ohio), January 1964. Keith H. Lewis and Kenneth Cassel, Jr., Eds. U.S. Department of Health, Education, and Welfare, Cincinnati, Ohio, 1964. 333 pp. Illus. Free. Fifteen papers contributed by T. L. Bott, V. B. Brooks, M. A. Cardella, M. S. Cooper, G. M. Dack, J. S. Deffner, C. E. Dolman, E. M. Foster, J. H. Green, W. K. Harrell, L. L. Kempe, M. G. Koenig, L. S. McClung, E. McCoy, C. S. Petty, D. E. Rogers, W. E. Perkins, G. G. Sloucum, E. J. Schantz, C. F. Schmidt, A. Spickard, and J. F. Winn.

Contributions to Sensory Physiology. vol. 1. William D. Neff, Ed. Academic

Press, New York, 1965. 286 pp. Illus. \$7.50. Five papers: "Cellular pattern, nerve structures, and fluid spaces of the organ of Corti" by Hans Engström, Harlow W. Ades, and Joseph E. Hawkins, Jr.; "Functional anatomy of the vestibular and lateral line organs" by Jan Wersäll and Åke Flock; "Psychophysiological studies of vestibular function" by Fred E. Guedry, Jr.; "Behavioral and electrophysiological studies of primate vision" by Russell L. De Valois; and "Vision in intermittent light" by H. Piéron.

The Control of Human Heredity and Evolution. T. M. Sonneborn, Ed. Macmillan, New York, 1965. 141 pp. Illus. Paper, \$1.95; cloth, \$4.50. Five papers: "Directed genetic change: perspectives from molecular genetics" by S. E. Luria; "Perspectives from physiological genetics" by Edward L. Tatum; "Investigations in human genetics with cultivated human cells: A summary of present knowledge" by Robert DeMars; "Prospects for genetic analysis in man" by G. Pontecorvo; and "Means and aims in human genetic betterment" by Hermann J. Muller.

Laboratory Instructions in Microbiology. Louis P. Gerhardt and Dean A. Anderson. Mosby, St. Louis, ed. 3, 1965. 335 pp. Illus. Paper, \$4.25.

A Manual for Histologic Technicians. Ann Preece. Little, Brown, Boston, ed. 2, 1965. 301 pp. Illus. \$8.50.

Matter, Energy, and Life. Jeffrey J. W. Baker and Garland E. Allen. Addison-Wesley, Reading, Mass., 1965. 192 pp. Illus. Paper, \$2.95; cloth, \$3.95.

Metabolism of Lipids as Related to Atherosclerosis. A symposium (Urbana, Ill.), June 1963. Fred A. Kummerow, Ed. Thomas, Springfield, Ill., 1965. 334 pp. Illus. Seventeen papers contributed by Karl Folkers, N. K. Freeman, Jack C. Geer, Donald J. Hanahan, W. Stanley Hartroft, S. A. Hashim, Ralph T. Holman, T. H. Joh, Eugene P. Kennedy, Peter D. Klein, David Kritchevsky, F. A. Kummerow, Henry Lardy, F. T. Lindgren, George V. Mann, Henry C. McGill, Jr., James F. Mead, Frank C. Monkhouse, A. V. Nichols, Toshiro Nishida, E. G. Perkins, Herbert Pollack, Daniel Steinberg, Jack P. Strong, A. L. Tappel, Theodore B. Van Itallie, and Salih J. Wakil.

Molecular Pharmacology: The Mode of Action of Biologically Active Compounds. vol. 2. E. J. Ariens, Ed. Academic Press, New York, 1964. 292 pp. Illus. \$10. Three papers: "A molecular approach to olfaction" by M. G. J. Beets; "The molecular basis of cancer chemotherapy" by P. Emmelet; and "Receptor theory in enzymology" by J. M. van Rossum.

La nutrición mineral de algunas cosechas tropicales. E. Malavolta, H. P. Haag, F. A. F. Mello and M. O. C. Brasil Sobro. Instituto Internacional de la Potasa, Berne, Switzerland, 1965. 163 pp. Illus. Plates. \$4.

Organic Reactions. vol. 14. Arthur C. Cope, Ed. Wiley, New York, 1965. 506 pp. Illus. \$14. Three papers: "The Chapman rearrangement" by J. W. Schulenberg and S. Archer; " α -Amidoalkylations at carbon" by Harold E. Zaugg and William B. Martin; and "The Wittig reaction" by Adalbert Maercker.

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Applied Science

Advances in Hydrosceince, vol. 1, Ven Te Chow, Ed. (Academic Press), 19 Feb. 1965, 854

Automatic Data Processing, Frederick P. Brooks, Jr. and Kenneth E. Iverson (Wiley), 12 June 1964, 1328

Cosmic Science, 1962, A. W. Middleton, Ed. (Pergamon; Macmillan), 31 July 1964, 478

The Design of Electric Circuits in the Behavioral Sciences, Tom N. Cornsweet (Wiley), 19 June 1964, 1441

Disciplines and Techniques of Systems Control, John Peschon, Ed. [Blaisdell (Ginn)], 26 Mar. 1965, 1564

Effects of Radiation on Material and Components, John F. Kircher and Richard E. Bowman, Eds. (Reinhold; Chapman and Hall), 18 Sept. 1964, 1291

Light and Heat Sensing, Harrison J. Merrill, Ed. (Pergamon; Macmillan), 1 May 1964, 526

The Measurement of Colour, W. D. Wright (Van Nostrand), 28 Aug. 1964, 916

The Mechanics of Aerosols, N. A. Fuchs (Pergamon; Macmillan), 20 Nov. 1964, 1033

Microwave Scanning Antennas, vol. 1, Apertures, R. C. Hansen, Ed. (Academic Press), 25 Dec. 1964, 1670

Nuclear Power, U.S.A., Walter H. Zinn, Frank K. Pittman, and John F. Hogerton (McGraw-Hill), 12 Feb. 1965, 721

Radioactive Isotopes in Instrumentation and Control, N. N. Shumilovskii and L. V. Mel'tser (Pergamon; Macmillan), 25 Sept. 1964, 1425

Radioisotopes and Radiation: Recent Advances in Medicine, Agriculture, and Industry, John Lawrence, Bernard Manowski, and Benjamin S. Loeb (McGraw-Hill), 12 Feb. 1965, 721

Biological and Medical Sciences

Acoustic Behaviour of Animals, R.-G. Busnel, Ed. (Elsevier), 8 May 1964, 713

Advances in Acarology, vol. 1, John A. Naegele, Ed. (Cornell Univ. Press), 8 May 1964, 716

Advances in Drug Research, vol. 1, N. J. Harper and Alma B. Simmonds, Eds. (Academic Press), 4 Dec. 1964, 1286

Advances in Lipid Research, vol. 1, Rodolfo Paoletti and David Kritchevsky, Eds. (Academic Press), 20 Nov. 1964, 1031

Advances in Metabolic Disorders, vol. 1,

Rachmiel Levine and Rolf Luft, Eds. (Academic Press), 30 Oct. 1964, 631

Allgemeine Cytologie, Ekkehard Grundmann (Thieme), 13 Nov. 1964, 909

Animal Body Fluids and Their Regulation, A. P. M. Lockwood (Harvard Univ. Press), 18 Sept. 1964, 1292

Animal Communication, Hubert Frings and Mable Frings [Blaisdell (Ginn)], 29 Jan. 1965, 492

Annelids, R. Phillips Dales (Hutchinson; Hillary House), 14 Aug. 1964, 697

Annual Review of Pharmacology, vol. 4, Windsor C. Cutting, Ed. (Annual Reviews), 8 May 1964, 722

Atlas of Human Anatomy, vols. 1-3, Ferenc Kiss and János Szentágothai (Pergamon; Macmillan), 11 Dec. 1964, 1455

The Basis of Human Evolution, Bertram S. Kraus (Harper and Row), 22 Jan. 1965, 389

The Biochemical Approach to Life, F. R. Jevons (Basic Books), 12 Mar. 1965, 1275

The Biochemical Aspects of Hormone Action, Albert B. Eisenstein, Ed. (Little, Brown), 5 Feb. 1965, 601

Biochemical Disorders in Human Disease, R. H. S. Thompson and E. J. King, Eds. (Academic Press), 19 Feb. 1965, 853

Biochemistry and Behavior, Samuel Eiduson, Edward Geller, Arthur Yuwiler, and Bernice T. Eiduson (Van Nostrand), 19 Mar. 1965, 1432

The Biochemistry of Clinical Medicine, William S. Hoffman (Yearbook), 24 July 1964, 377

The Biochemistry of Semen and of the Male Reproductive Tract, Thaddeus Mann (Methuen; Wiley), 12 Feb. 1965, 727

Biogenesis of Natural Compounds, Peter Bernfeld, Ed. (Pergamon; Macmillan), 3 July 1964, 39

Biologie Antarctique, Robert Carrick, Martin Holdgate, and Jean Prévost, Eds. (Hermann), 18 Sept. 1964, 1292

Biologie de l'Amerique Australe, Études sur la Faune du Sol, vols. 1 and 2, Delamare Deboutteville and Eduardo Rapoport, Eds. (Editions du Centre National de la Recherche Scientifique), 16 Oct. 1964, 389

The Biology of Plant Parasitic Nematodes, H. R. Wallace (Arnold; St. Martin's Press), 29 May 1964, 1116

Biology of the Antarctic Seas, vol. 1, Milton O. Lee, Ed. (American Geophysical Union), 15 Jan. 1965, 284

The Biology of Trace Elements, Karl H. Schutte (Lippincott), 27 Nov. 1964, 1152

Biospéologie: La Biologie des Animaux Cavernicoles, A. Vandel (Gauthier-Villars), 26 June 1964, 1563

The Biosynthesis of Steroids, Terpenes, and Acetogenins, John H. Richards and James B. Hendrickson (Benjamin), 8 Jan. 1965, 142

The Biosynthesis of Vitamins and Related Compounds, T. W. Goodwin (Academic Press), 6 Nov. 1964, 760

Bones, Bodies, and Disease, Calvin Wells (Praeger), 7 Aug. 1964, 568

Chemical Background for the Biological Sciences, Emil H. White (Prentice-Hall), 4 Dec. 1964, 1287

Chemotaxonomie der Pflanzen, vol. 2, *Monocotyledoneae*, R. Hegnauer (Birkhäuser), 17 July 1964, 259

Comparative Biochemistry, Marcel Florin and Howard S. Mason, Eds. (Academic Press), vol. 5, pt. C, *Constituents of Life*, 3 Apr. 1964, 43; vol. 6, *Cells and Organisms*, 10 July 1964, 148

Desert Animals: Physiological Problems of Heat and Water, Knut Schmidt-Nielsen (Oxford Univ. Press), 8 May 1964, 715

Dynamic Clinical Studies with Radioisotopes, Ralph M. Knisely, W. Newlon Tauxe, and Elizabeth B. Anderson, Eds. (U.S. Atomic Energy Commission), 1 Jan. 1965, 39

Ecological Genetics, E. B. Ford (Methuen; Wiley), 17 July 1964, 258

The Ecology of North America, Victor E. Shelford (Univ. of Illinois Press), 24 Apr. 1964, 401

Electron Microscopic Anatomy, Stanley M. Kurtz, Ed. (Academic Press), 15 Jan. 1965, 288

Entomologie appliquée à l'agriculture, Traité, vol. 1, *Coléoptères* (Masson), 4 Sept. 1964, 1038

The Enzymes, vol. 7, pt. A, *Oxidation and Reduction*, Paul D. Boyer, Henry Lardy, and Karl Myrback, Eds. (Academic Press), 3 July 1964, 39

Ergebnisse der Limnologie, vol. 2, *Remains of Animals in Quaternary Lake and Bog Sediments and Their Interpretation*, David G. Frey (Schweizerbart'sche), 4 Dec. 1964, 1289

The Evolution of the Metazoa, Jovan Hadži (Pergamon; Macmillan), 8 May 1964, 716

Evolutionary and Genetic Biology of Primates, John Buettner-Janusch, Ed. (Academic Press), 17 July 1964, 256

Freshwater Ecology, T. T. Macan (Longmans, Green), 10 Apr. 1964, 168

Genetics and Man, C. D. Darlington (Macmillan), 12 Feb. 1965, 725

Genetics for the Clinician, C. A. Clarke (Davis), 5 Feb. 1965, 595

The Genetics of Bacteria and Their Viruses, William Hayes (Wiley), 16 Oct. 1964, 389

Handbuch der Binnenfischerei Mitteleuropas, vol. 2A, *Anatomie der Fische*, Wilhelm Harder (Schweizerbart'sche), 19 Feb. 1965, 852

The Human Embryo, E. Blechschmidt (Schattauer), 19 Feb. 1965, 857

The Insects, Uri N. Lanham (Columbia Univ. Press), 8 May 1964, 721

Introduction to Comparative Entomology, Richard M. Fox and Jean Walker Fox (Reinhold; Chapman and Hall), 3 Apr. 1964, 41

Introduction to Molecular Biology, G. H. Haggis, D. Michie, A. R. Muir, K. B. Roberts, and P. M. B. Walker (Wiley), 11 Dec. 1964, 1455

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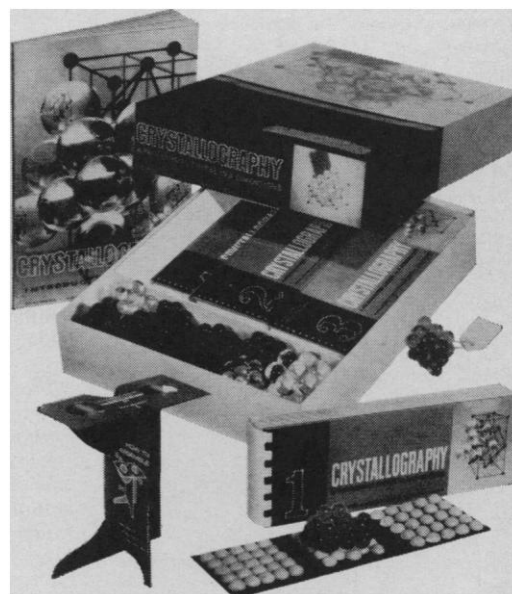
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Visual Principles of Elementary Human Anatomy. By CHARLES E. TOBIN and PETER NG. About 200 pages, illust. \$2.50.

Introduction to Physical Biochemistry. By HENRY B. BULL. 448 pages, 318 illust. \$8.50.

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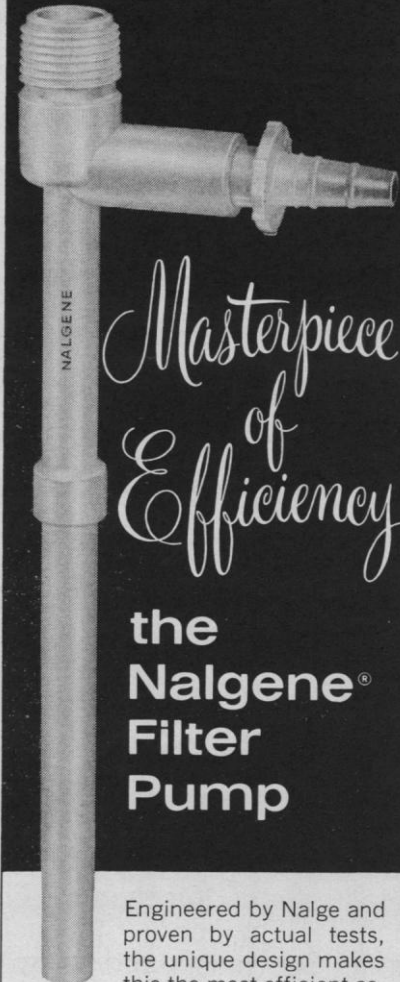
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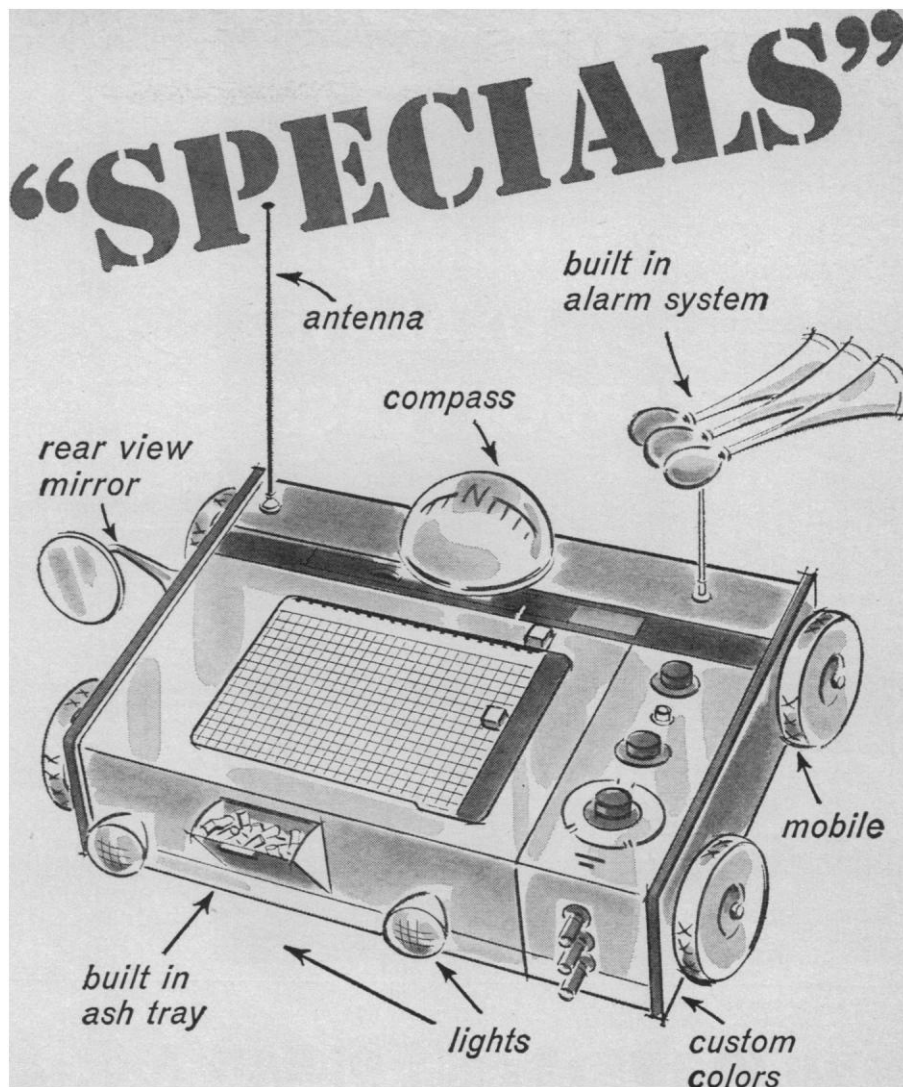
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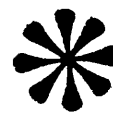
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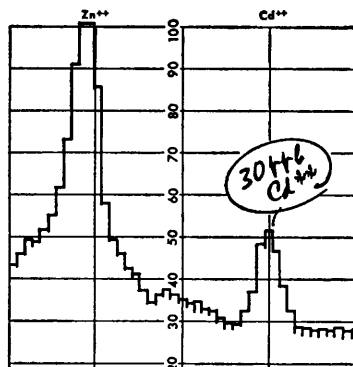
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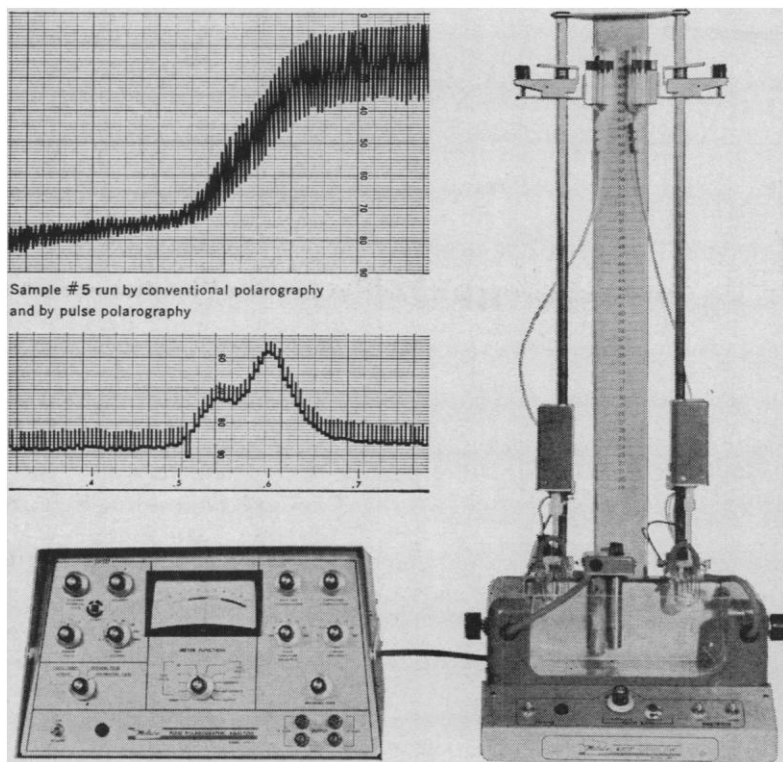
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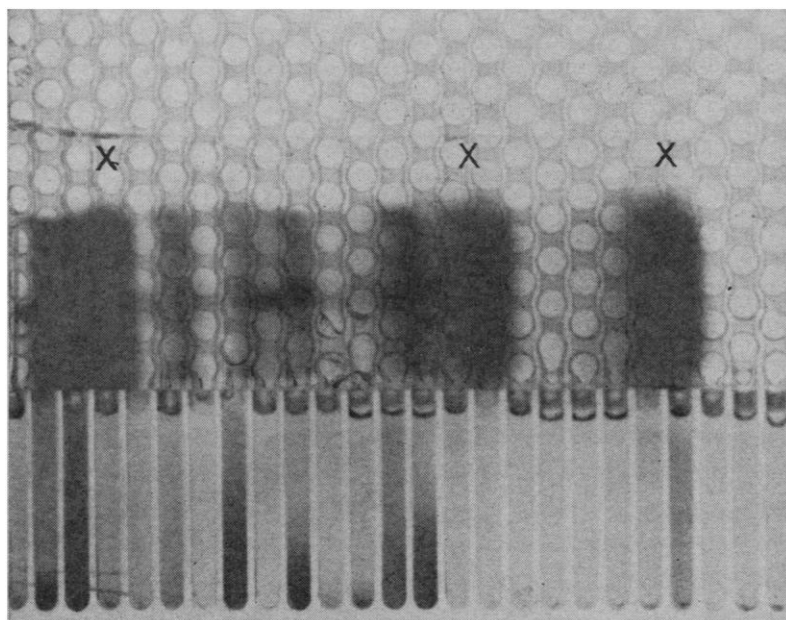
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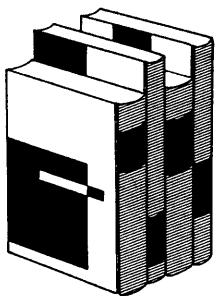
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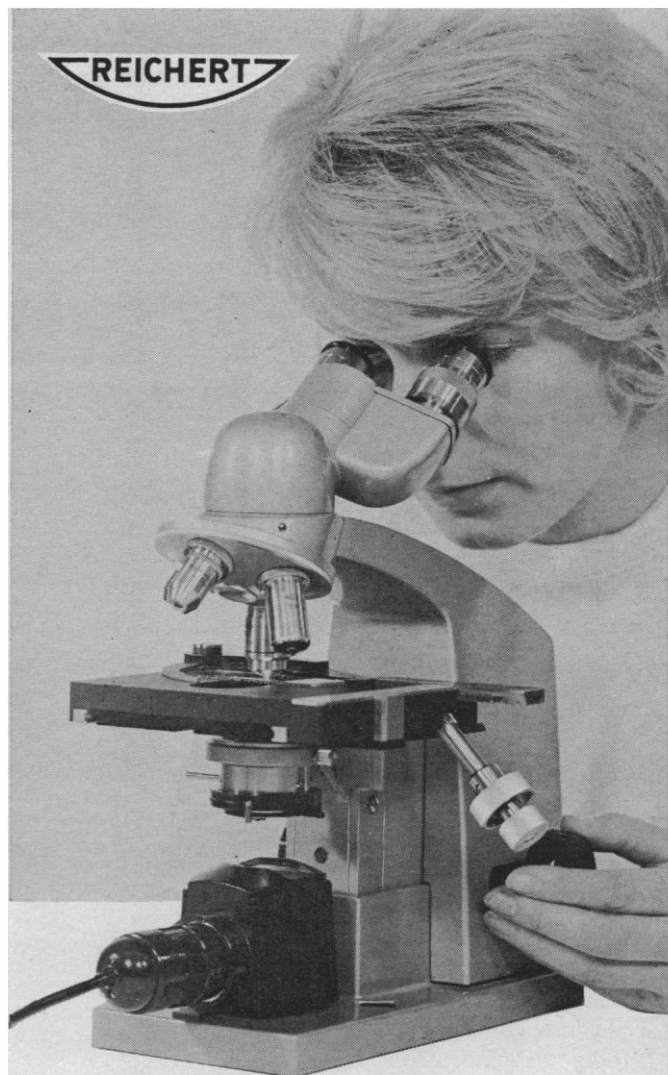
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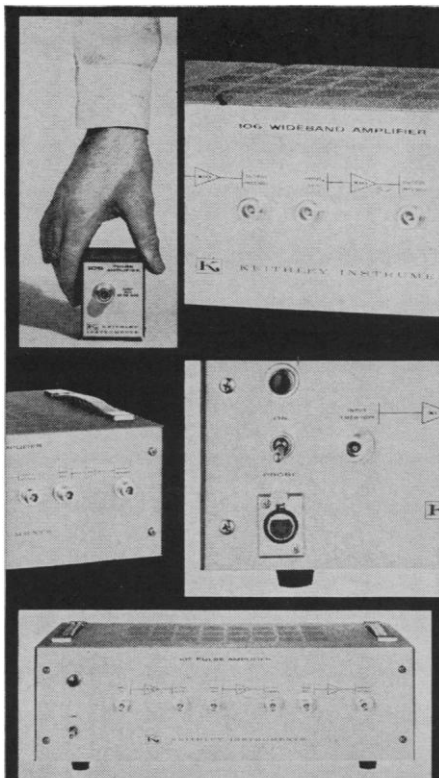
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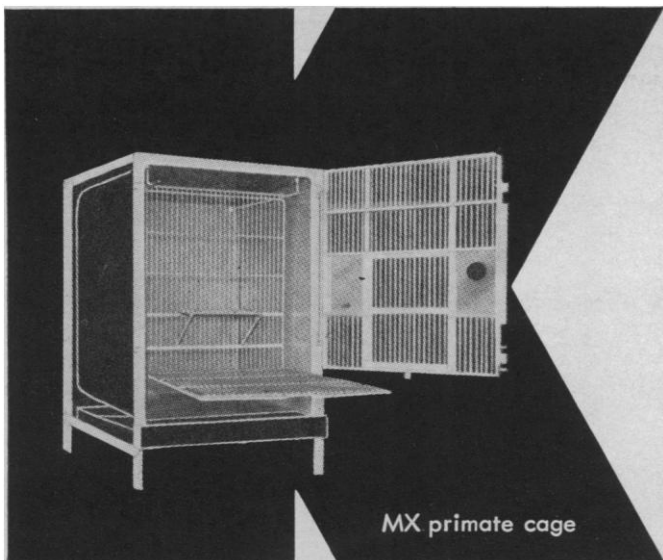
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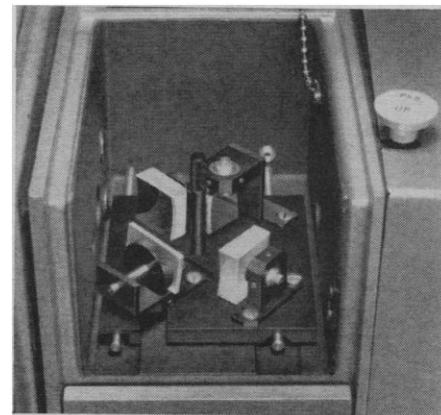
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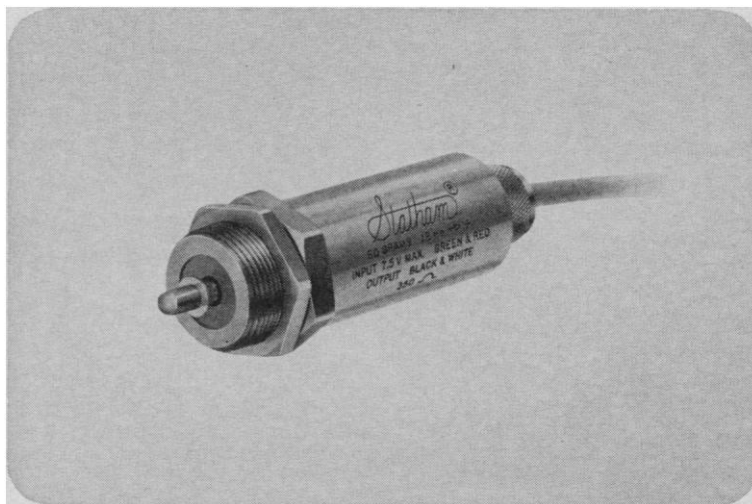
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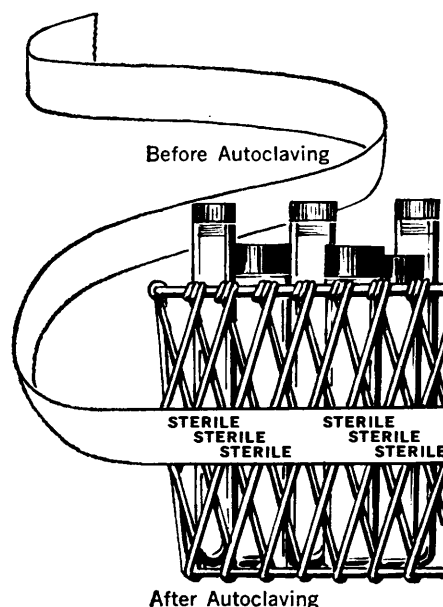
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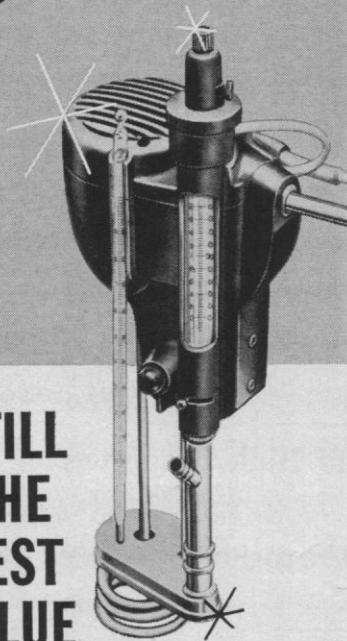
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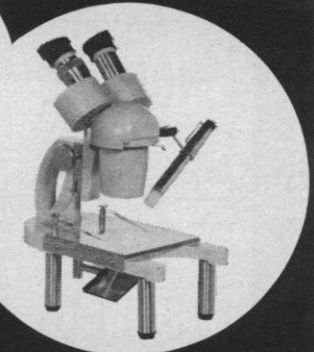
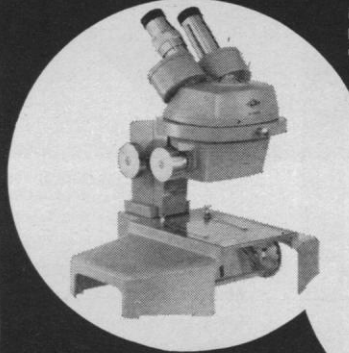
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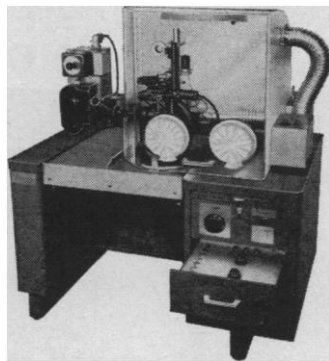
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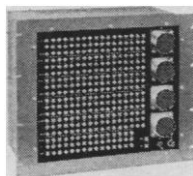
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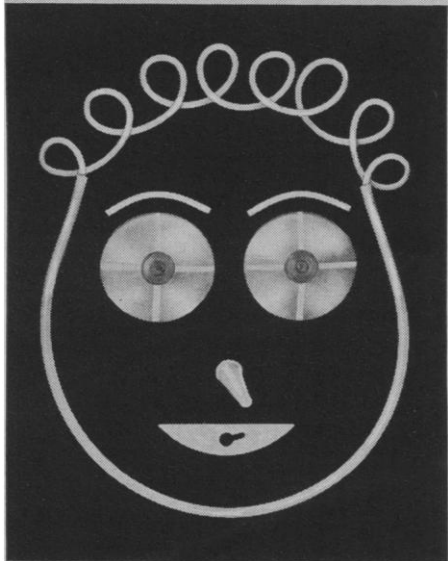
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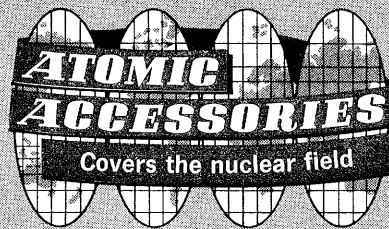
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phrine, norepinephrine, dopamine, and serotonin have been found to occur in tissues; either other phenylethylamines and indole derivatives do not form highly fluorescent derivatives, or their concentrations are not detectable. The method has proved useful for studies of uptake, storage, and metabolism of biogenic monoamines; it has also made it possible to map out monoaminergic systems in hypothalamus, cerebral cortex, and brain stem, as well as in the spinal cord. Owman submitted that this evidence strongly supports the view that these monoamines may serve as neurotransmitters in different parts of the nervous system.

D. Purpura (Columbia University) discussed the manner in which intracellular recording from cortical and thalamic neurons was employed to study the origin and nature of evoked potentials and the mechanism of thalamocortical synchronization and desynchronization. He then drew attention to the usefulness of microphysiological techniques in analyzing different varieties of synaptic organizations. The changing properties in immature cerebral and cerebellar cortex were presented as a method for investigating this neuronal organization. Purpura showed that during maturation of cortical neurons the excitability properties of neurons undergo various changes that are indicated by characteristics of intracellularly recorded activities at various stages of development. Emphasis was placed on ontogenetic studies that have revealed the existence of powerful inhibitory effects in immature cerebral cortex; x-irradiation also was used in attempts to modify normal maturational patterns in cellular cortex.

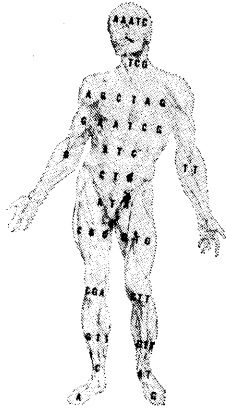
Rhythmic movements of the peripheral respiratory organs, whether lungs or gills, are a common feature of all vertebrates and of most invertebrates. R. von Baumgarten (University of Göttingen) began his lecture on the correlation of patterns of neuronal discharges in the respiratory system by showing that the appropriate innervation of the peripheral machinery of respiratory muscles requires a brain apparatus able to integrate incoming impulses into a rhythmic stream of outgoing discharges traveling down toward the periphery. The respiratory muscles are usually divided into inspiratory and expiratory muscles. Physiological studies show that the respiratory center is very often correspondingly divided into antagonistic groups of neurons, even if, as is usually the case, the inspiratory

phase of respiration is the only active phase, expiration being merely passive. In addition to originating a rhythmic form of breathing, the respiratory centers are known to perform what we call regulation of respiration with the help of intracentral and peripheral chemoreceptors. The respiratory center is not formed by a single pool of neurons as was assumed by Flourens; it is a complex of different neuronal pools connected by a self-inhibiting control system that regulates the activity of the different neurons. These neurons continue to discharge, even when all respiratory movements are blocked by curare-like substances; in this experimental condition, with all feedback impulses abolished, intracentral self-inhibiting mechanisms, similar to the Renshaw mechanisms, have been described. Von Baumgarten described other neuronal interactions whereby the respiratory center transforms a constant stream of incoming impulses into a rhythmic stream of outgoing impulses.

M. Mancina (University of Milan) discussed the neurophysiological mechanism during different stages of physiological sleep. A point was made in favor of the importance of measuring patterned activity. Sleep, which appears as inhibition of function, represents a pattern of interneuronal integration in which different structures actively function at different times; for instance, spinal post-tetanic potentiation, as well as mono- and polysynaptic spinal reflexes, is abolished during paradoxical sleep but not during physiological sleep. Mancina speculated that the spinal inhibition of paradoxical sleep may be presynaptic because it is not reversed by strychnine. However, paradoxical sleep is not characterized by a diffused inhibition because cortical responses to stimulation of the lateral geniculate body are enormously increased during paradoxical sleep. The study of interaction between a conditioning transcolossal stimulus and a test geniculate impulse revealed that during paradoxical sleep the facilitation is increased and its time-course is shortened. During light sleep, the testing response undergoes a long-lasting inhibition that is never observed in either wakefulness or paradoxical sleep.

A clear-cut example of integration between glucose concentrations in blood and patterns of neuronal discharge rates was presented by B. K. Anand (All-India Institute of Medical Sciences) in discussing integration patterns of the central nervous system with

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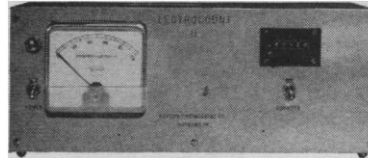
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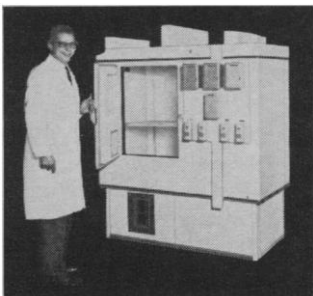
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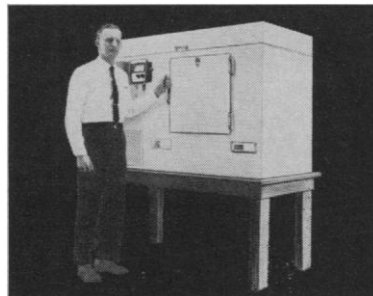
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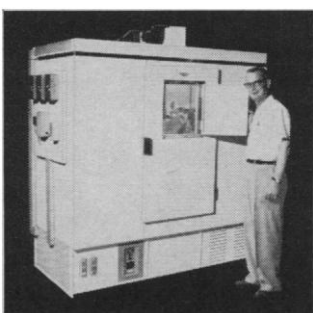
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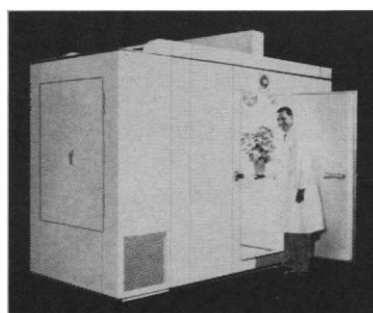
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G013	Cyclohexaneethanol, 'Baker' $\text{CH}_2(\text{CH}_2)_4\text{CHCH}_2\text{CH}_2\text{OH}$ FW 128.22	25 g.	5.00
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G076	2-(Cyclohexylamino)-1-ethanol, 'Baker' $\text{CH}_2(\text{CH}_2)_4\text{CHNHCH}_2\text{CH}_2\text{OH}$ FW 143.23	25 g.	1.75
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G077	3-(Cyclohexylamino)propionitrile, Practical $\text{CH}_2(\text{CH}_2)_4\text{CHNHCH}_2\text{CH}_2\text{CN}$ FW 152.24	25 g.	1.50
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G082	N-Cyclohexyl-1,3-propanediamine, Practical $\text{CH}_2(\text{CH}_2)_4\text{CHNHCH}_2\text{CH}_2\text{CH}_2\text{NH}_2$ FW 156.27	25 g.	3.00
		100 g.	9.00
G096	Cyclooctane, 'Baker' $\text{CH}_2(\text{CH}_2)_6\text{CH}_2$ FW 112.22	100 g.	1.75
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J686	1,4-Dimethylcyclohexane (cis-trans Mixture), Practical $\text{CH}_3\text{CH}(\text{CH}_2)_2\text{CH}(\text{CH}_3)\text{CH}_2\text{CH}_2$ FW 112.22	25 g.	10.00
	B.P. 120-124°C.	100 g.	30.00
J694	2, 6-Dimethylcyclohexanol, 'Baker' $\text{CH}_3\text{CH}(\text{CH}_2)_3\text{CH}(\text{CH}_3)\text{CHOH}$ FW 128.22	25 g.	6.50
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J705	N,N-Dimethylcyclohexylamine, Practical $\text{CH}_2(\text{CH}_2)_4\text{CHN}(\text{CH}_3)_2$ FW 127.23	500 g.	3.20
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L581	1-Ethylcyclohexanol, 'Baker' $\text{CH}_2(\text{CH}_2)_4\text{C}(\text{C}_2\text{H}_5)\text{OH}$ FW 128.22	25 g.	7.00
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Q415	1-Methylcyclopentanol, 'Baker' $\text{CH}_2(\text{CH}_2)_3\text{C}(\text{CH}_3)\text{OH}$ FW 100.16	25 g.	9.00
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Q419	α-Methylcyclopentanemethanol, 'Baker' $\text{CH}_2(\text{CH}_2)_3\text{CHCHOHCH}_3$ FW 114.19	25 g.	8.50
	B.P. 165-168°C.	100 g.	25.00
U486	N-iso-Propylcyclohexylamine, Practical $\text{CH}_2(\text{CH}_2)_4\text{CHNHCH}(\text{CH}_3)_2$ FW 141.26	25 g.	1.75
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reference to the functional importance of the limbic system. Anand opened a discussion on the relation between discharge rates of hypothalamic units and changes of some homeostatic conditions with a series of experiments, thus attempting to classify nervous regulation of food intake in the same category as the control mechanisms that regulate various other visceral activities which maintain the constancy of the *milieu intérieur*. G. S. Chhina (All-India Institute of Medical Sciences) dealt with the control of sexual behavior in monkeys by the central nervous system.

P. B. Dews (Harvard Medical School) stressed the importance of studying the regularities of the patterns of activity of the central nervous system which are revealed by measures of the behavioral output. He defined conditioned behavior and characterized it by examples in contrast with reflex behavior. Development of the scope of conditioning was outlined from the limited situation of Pavlov, which could deal only with behavioral responses induced by stimuli presented to the test object, to that of operant conditioning in which any response the animal makes can be followed by reinforcing stimuli and usually conditioned. Dews also described the process of shaping; with this term, he described the possibility of evoking in an animal unusual responses that can be conditioned with appropriate techniques. The concept of neighboring stimuli as a way to effect responses, even when the responses occur some time before the reinforcing stimuli, was also introduced; its value in making possible the conditioning of indefinitely long sequences of behavior was emphasized. The effects of conditioning were summarized as dynamic modulations of on-going behavior. Dews then described some actual patterns of conditioned behavior and related them to specific schedules of reinforcement. The differential effect of drugs on these behavioral patterns was finally discussed.

Lecturing on fluorometry and spectrofluorometry, W. Hammer (U.S. National Heart Institute) presented the theoretical background of the fluorescence phenomenon and also led a discussion of the theories and technical problems connected with the assay of biogenic amines in brain tissue.

Basic problems of drug metabolism, of interest in therapy, were discussed by J. R. Fouts (University of Iowa). Inhibition and stimulation of drug metabolism were presented to the audience

in their biochemical and clinical implications; stimulation of drug metabolism was shown by Fouts to depend on the synthesis of new enzymes in liver.

Malhotra (Lady Hardinge Medical College, New Delhi) introduced a discussion of the mechanism of drug action by describing original experiments on the role of cholinergic mechanisms in brain function as revealed by the action of various depressants of the central nervous system. This discussion was continued by E. Costa (National Heart Institute) who presented a provisional model of the integrated biophysical unit, which, in nerve endings, controls synthesis, storage, release, and metabolism of norepinephrine. Costa emphasized that synthesis, storage, release, and metabolism of norepinephrine are not unrelated phenomena and must be considered together in interpreting drug action. The action of various drugs that act on sympathetic tone was discussed in relation to the neurochemical transducer. The validity of this model was also investigated in adrenergic mechanisms present in the olfactory bulb of rabbits; data obtained in this structure were not at variance with the model prepared to explain the function of peripheral sympathetic nerve endings. In discussing the mechanism of action of reserpine, Costa pointed out that the effect of the alkaloid on brain concentrations of amine indicates that a new dynamic equilibrium has been obtained as a result of the drug action; therefore the rate of serotonin biosynthesis, higher than that of norepinephrine, becomes of paramount importance in explaining reserpine action. The fast turnover of serotonin, when only a portion of the storage process is blocked, assures that enough serotonin occupies receptors to produce a sedative response.

Both the liveliness of the discussions and Indian hospitality were admirable.

E. COSTA

Laboratory of Chemical Pharmacology,
National Heart Institute,
Bethesda, Maryland

Forthcoming Events

May

12-13. Control of Water Quality, natl. forum, American Soc. for Testing and Materials, Philadelphia, Pa. (ASTM, Committee D-19 on Industrial Water, 1916 Race St., Philadelphia 19103)

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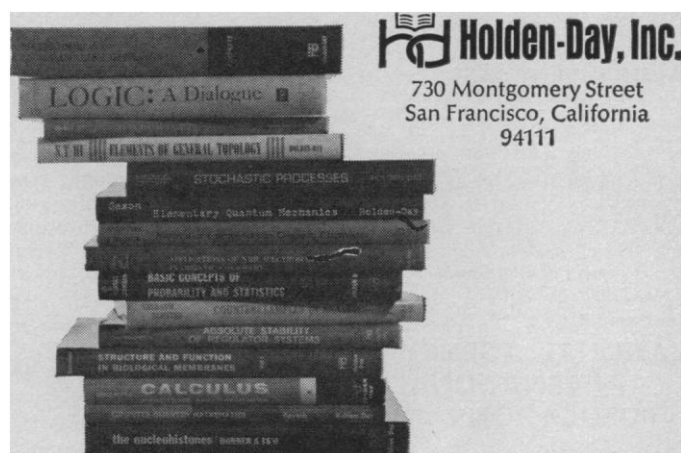
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(Vol. II) Choice of isotopes and labelled compounds; Clinical applications: brain; stomach, bone marrow, lymph nodes, kidneys; pancreas, lungs, spleen; liver.

(1964) Vol. I: 560 pp., Vol. II: 470 pp. Price: In US and Canada Vol. I: US \$11.50, Vol. II: US \$9.50. Elsewhere: Vol. I: £3.90, Vol. II: £2.17.0.

BIOLOGICAL EFFECTS OF NEUTRON AND PROTON IRRADIATIONS

Proceedings of a symposium organized by IAEA and held in Upton, New York at the invitation of the Brookhaven National Laboratory from October 7-11, 1963. Subjects: dosimetry, estimation of absorbed dose of neutrons in biological material; biological effects of high-energy protons; cellular and genetic effects; pathology of neutron irradiation, including acute and chronic radiation syndromes (mortality, anatomical and histological changes, biological and metabolic disturbances) and delayed consequences; relative biological effectiveness of neutrons evaluated by different biological tests.

(1964) Vols. I and II: 433 pp. each. Price per volume: In US and Canada \$9.00. Elsewhere: 54s.stg.

OPERATING EXPERIENCE WITH POWER REACTORS

Proceedings of an IAEA conference held in Vienna, June 4-8, 1963, on operating experience with 20 power stations having a combined output of 1700 megawatts. Representatives of all of the nuclear power producing countries spoke, and their papers covered the five principal types of power reactors: pressurized water, heavy water, boiling water, gas-cooled, fast.

(1963) Vol. I: 526 pp., Vol. II: 412 pp. Price: In US and Canada: Vol. I: US \$10.00, Vol. II: US \$8.50. Elsewhere: Vol. I: 60s.stg., Vol. II: 51s.stg.

EXPONENTIAL AND CRITICAL EXPERIMENTS

Proceedings of an IAEA symposium held in Amsterdam, September 2-6, 1963. Contents: (Vol. I) The general role of critical and exponential experiments; Fast assemblies; Subcritical H₂O assemblies. (Vol. II) Subcritical water assemblies—H₂O or D₂O; Water assemblies—H₂O and/or D₂O; D₂O assemblies. (Vol. III) Assemblies with graphite; Special theoretical and experimental techniques; Organic-moderated or cooled assemblies.

(1964) Vol. I: 480 pp., Vol. II: 610 pp., Vol. III: 482 pp. Price: In US and Canada: Vols. I, III: US \$10.00 each; Vol. II: \$12.00. Elsewhere: Vols. I, III: 60s.stg. each; Vol. II: 72s.stg.

TREATMENT AND STORAGE OF HIGH-LEVEL RADIOACTIVE WASTES

Proceedings of a symposium held in Vienna, October 1962. Subjects: problems and practices; calcination and storage; solidification and fixation of liquids; treatment of solid wastes; shipment of large quantities of radioactive materials.

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13. Society for **Personnel Administration**, 4th annual conf., Catholic Univ., Washington, D.C. (H. G. Vavra, SPA, 1221 Connecticut Ave., NW, Washington, D.C.)

13-14. American Inst. of **Mining, Metallurgical, and Petroleum Engineers**, New England regional conf., Hartford, Conn. (AIMMPE, 345 E. 47 St., New York 10007)

13-14. Canadian Council of **Professional Engineers**, annual, Charlottetown, Prince Edward Island. (CCPE, 116 Albert St., Ottawa 4, Ontario)

13-14. **Signal Transmission and Processing**, symp., New York, N.Y. (L. E. Franks, Bell Telephone Laboratories, 1600 Osgood St., North Andover, Mass. 01845)

13-15. American Inst. of **Industrial Engineers**, 16th annual, Chicago, Ill. (W. J. Jaffe, Dept. of Industrial Engineering, Newark College of Engineering, Newark, N.J. 07102)

13-15. **Powder Metallurgy**, 3rd intern., Eisenach, East Germany. (Gesellschaft Deutscher Berg- und Hüttenleute, Wallstr. 68, Berlin C.2, East Germany)

13-19. **Space Science**, 6th intern. symp., Buenos Aires, Argentina. (COSPAR Secretariat, 55, Boulevard Maiesherbes, Paris 8^e, France)

14-15. Association of **University Radiologists**, annual, Seattle, Wash. (A. R. Margulis, AUR, Dept. of Radiology, Univ. of California Medical Center, San Francisco)

16-19. American Inst. of **Chemical Engineers**, 56th natl., San Francisco, Calif. (A. E. Aronson, A. B. Dick Co., 5700 W. Touhy Ave., Chicago 48)

16-20. Institute of **Food Technologists**, annual, Kansas City, Mo. (C. L. Wiley, Suite 1350, 170 W. Adams St., Chicago, Ill. 60603)

16-21. **Mass Spectrometry**, 13th annual conf., St. Louis, Mo. (H. M. Rosenstock, Natl. Bureau of Standards, Washington, D.C. 20234)

17-18. Canadian **Aeronautics and Space Inst.**, annual, Vancouver, B.C. (H. C. Luttman, 77 Metcalfe St., Ottawa 4, Ont.)

17-19. **Application of Computing Methods to Reactor Problems**, conf., Argonne, Ill. (B. J. Toppel, Reactor Physics Div., Argonne Natl. Laboratory, 9700 S. Cass Ave., Argonne)

17-19. American College of **Physicians**, Far East session, Tokyo, Japan. (Session Coordinator ACP, USAF Hospital Tachikawa, APO 323, San Francisco, Calif.)

17-21. American Soc. of **Civil Engineers**, Minneapolis, Minn. (W. H. Wisely, ASCE, 345 E. 47 St., New York 10017)

17-21. **Nondestructive Testing in Nuclear Technology**, symp., Bucharest, Rumania. (P. Ghelardoni, Div. of Scientific and Technical Information, Intern. Atomic Energy Agency, Kärntner Ring 11, Vienna 1, Austria)

17-21. Society of **Photographic Scientists and Engineers**, annual conf., Cleveland, Ohio. (W. E. Granshaw, Eastman Kodak Co., 4605 Mackall Rd., South Euclid 21, Ohio)

17-21. Technical Literature Abstracting and Indexing, American Univ., Washington, D.C. (P. W. Howerton, 2000 G St., NW, Washington 20006)

18-20. **Aerospace Fluid Power Systems and Equipment**, conf., Los Angeles, Calif. (Soc. of Automotive Engineers, 485 Lexington Ave., New York 10017)

18-20. **Power Sources**, 20th conf., U.S. Army Electronics Research and Development Laboratories, Atlantic City, N.J. (H. W. Schwarz, PSD, Fort Monmouth, N.J. 07703)

18-20. **Telemetry**, intern. conf., Washington, D.C. (J. D. Cates, ITC/USA/65, White Sands Missile Range, N.M.)

19. **Memorial Hospital of Long Beach**, symp., Long Beach, Calif. (G. X. Trimble, Memorial Hospital, 2801 Atlantic Ave., Long Beach 90801)

19-21. **Atherosclerosis**, Czechoslovak-Italian symp., Prague, Czechoslovakia. (T. Zemplyni, Thomayerova nemocnice, Prague-Krc, Czechoslovakia)

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19-21. **Gamete Transport, Fertilization, and Preimplantation Mechanisms**, conf., Vanderbilt Univ., Nashville, Tenn. (Dept. of Obstetrics and Gynecology, Vanderbilt Univ. School of Medicine, Nashville 37203)

19-21. **Mathematical and Quantitative Linguistics**, intern. conf., New York, N.Y. (Y. Gentilhomme, 11, rue Linne, Paris 5^e, France)

19-22. Society of **Technical Writers and Publishers**, 12th annual conv., New York, N.Y. (H. Adler, Data Communication, Inc., 404 Park Ave. South, New York 10016)

19-22. Southern **Textile Research** conf., 5th annual, Hildon Head Island, S.C. (W. H. Martin, Inst. of Textile Technology, Charlottesville, Va.)

20. Institution of **Mining and Metallurgy**, annual, London, England. (The Institution, 44 Portland Pl., London, W.1)

20-21. **Chemical Engineering**, conf., Sydney, Australia. (Secretary, Inst. of Engineers, Australia, Science House, Gloucester and Essex St., Sydney)

20-21. **Electrical Conduction at Low Temperatures**, European symp., London, England. (Administration Assistant, Inst. of Physics and the Physical Soc., 47 Belgrave Sq., London, S.W.1)

20-21. **Fiber Soc.**, Atlanta, Ga. (L. Rebenfeld, Box 625, Princeton, N.J.)

20-21. Medical Diagnostic Applications of **Ultrasound**, conf., Pittsburgh, Pa. (C. Moses, Univ. of Pittsburgh School of Medicine, Pittsburgh 15213)

20-22. American **Cleft Palate Assoc.**, annual, New York, N.Y. (C. O. Wells, Parker Hall, Columbia, Mo.)

20-22. **Diabetology**, Paris, France. (M. Rathery, Hôtel-Dieu, 1, Pl. du Parvis Notre-Dame, Paris 4^e)

20-22. American **Gynecological Soc.**, New York, N.Y. (C. J. Lund, 260 Crittenden Blvd., Rochester 20, N.Y.)

20-25. **Intersexuality in Fishes**, Sarasota, Fla. (E. Clark, Cape Haze Marine Laboratory, 9501 Blind Pass Rd., Sarasota)

21-22. **Surface Physics**, 3rd annual symp., Pullman, Wash. (E. E. Donaldson, Dept. of Physics, Washington State Univ., Pullman)

21-22. **Women of Science**, symp., Ben-

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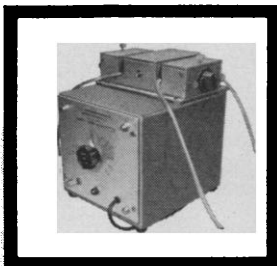
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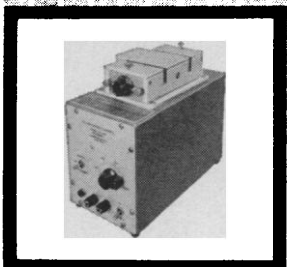
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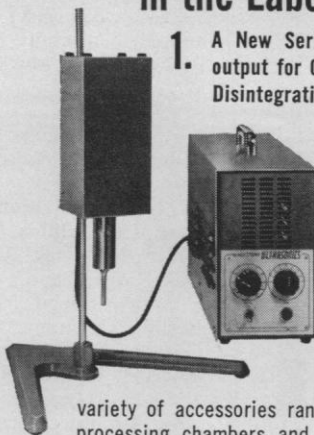
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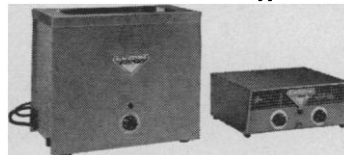
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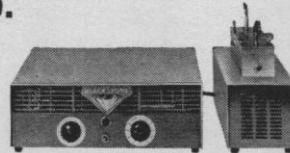
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21-23. **Exfoliative Cytology**, 2nd intern. congr., Paris, France. (Intern. Acad. of Cytology, 5841 Maryland Ave., Chicago, Ill. 60637)

23-24. American **Laryngological Assoc.**, annual, Colorado Springs, Colo. (L. G. Richards, 12 Clovelly Rd., Wellesley Hills 82, Mass.)

23-26. **Administrative Management Soc.**, 46th intern. conf., Minneapolis, Minn. (R. C. Walter, 32 W. 40 St., New York 10018)

23-26. **Radiation Research**, 13th annual, Philadelphia, Pa. (A. C. Upton, Biology Div., Oak Ridge Natl. Laboratory, Oak Ridge, Tenn.)

23-26. **Social Medicine**, intern. conf., Berlin, Germany. (Secretariat, Deutsche Gesellschaft für Sozialmedizin, Alsterglaci 3, Hamburg 13, Germany)

24-26. **Hygiene and Preventive Medicine**, 4th intern. congr., Vienna, Austria. (Vienna Acad. of Medicine, Alserstr. 4, Vienna 9)

24-26. **Standardization of Pharmaceutical Preparations**, 2nd intern. congr., Leipzig, East Germany. (J. Richter, Deutsches Inst. für Arzneimittelwesen, Grosse Seestr. 4, Berlin-Weissensee, East Germany)

24-27. **Thyroid**, 5th intern. conf., Rome, Italy. (T. Winship, American Thyroid Assoc., 110 Irving St., NW, Washington, D.C. 20010)

24-28. Australian Inst. of **Metals**, annual conf., Brisbane. (Secretary, AIM, P.O. Box 107, North Quay, Brisbane)

24-28. International **Planned Parenthood Federation**, Western Pacific regional conf., Seoul, Korea. (T. Katagiri, IPPF Western Pacific Regional Office, No. 2, 1-chome, Sadohara-cho, Ichigaya, Shinjuku, Tokyo, Japan)

24-28. **Radioisotope Sample Measurement Techniques** in Medicine and Biology, intern. symp., Vienna, Austria. (J. H. Kane, Intern. Conferences Branch, Div. of Special Projects, U.S. Atomic Energy Commission, Washington, D.C. 20545)

24-29. International Federation for **Information Processing**, congr., New York, N.Y. (AFIP, 345 E. 47 St., New York 10017)

24-1. **Cloud Physics**, intern. conf., Tokyo and Sapporo, Japan. (H. Hatakeyama, Japan Meteorological Agency, Otemachi Chiyoda-ku, Tokyo)

25. American **Iron and Steel Inst.**, annual, New York, N.Y. (G. S. Rose, 150 E. 42 St., New York 10017)

25-26. American **Otological Soc.**, Colorado Springs, Colo. (J. A. Moore, 525 E. 68 St., New York 10021)

25-27. **Armed Forces Communications and Electronics Assoc.**, 19th annual conv., Washington, D.C. (AFCEA, 1725 Eye St., NW, Washington 20006)

25-27. American Astronautical Soc./Aerospace Electrical Soc., **Space Electronics** symp., Los Angeles, Calif. (L. T. Isaacs, Douglas Aircraft Corp., Long Beach, Calif.)

25-28. American Assoc. for **Contamination Control**, 4th annual, Miami Beach, Fla. (W. T. Maloney, AACC, 6 Beacon St., Boston, Mass. 02108)

25-29. Structure and Control of the

Melanocyte, conf., Sofia, Bulgaria. (N. Anchev, c/o Oncological Inst., Sofia)

25-29. American Assoc. on **Mental Deficiency**, 89th annual, Miami Beach, Fla. (J. E. Horner, AAMD, Oregon Fairview Home, 2250 Strong Rd., SE Salem)

26-28. Canadian **Botanical Assoc.**, Carleton University, Ottawa, Ont. (R. L. Taylor, Plant Research Inst., C.E.F., Ottawa, Canada)

26-28. **Cineradiography**, 3rd symp., Antwerp, Belgium. (S. Masy, Steenweg op Waver 256, Heverle, Belgium)

26-28. **Peaceful Uses of Space**, 5th natl. conf., St. Louis, Mo. (G. W. Ferguson, Fleishman-Hillard, Inc., 407 N. 8 St., St. Louis 63101)

26-28. **Analysis Instrumentation** and Chemical and Petroleum Instrumentation, 1st ISA intern. symp., Montreal, Quebec, Canada. (E. J. Minnar, ISA, 530 William Penn Pl., Pittsburgh, Pa. 16219)

26-29. Biological Characterization of **Human Tumors**, intern. symp., Abbaye de Royaumont, France. (W. Davis, c/o Chester Beatty Research Inst., Fulham Rd., London, S.W.3, England)

26-29. Electrochemical Aspects of **Molecular Biology**, symp., Jena, East Germany. (H. Berg, Inst. für Mikrobiologie und Experimentelle Therapie, Deutsche Akademie der Wissenschaften zu Berlin, Beuthenbergstr. 11, Jena)

27-29. American **Gastroenterological Assoc.**, Montreal, Quebec, Canada. (D. Cayer, 2240 Cloverdale Ave., Winston-Salem, N.C.)

27-29. American **Ophthalmological Soc.**, Hot Springs, Va. (S. D. McPherson, Jr., 1110 W. Main St., Durham, N.C.)

27-29. American Assoc. of **Physical Anthropologists**, annual, Pennsylvania State Univ., University Park. (F. E. Johnston, Dept. of Anthropology, Univ. of Pennsylvania, Philadelphia 4)

27-30. **Neuro-Ophthalmology and Neurogenetics**, intern. congr., Albi, France. (M. Amalric, Congrès Intern. de Neuro-Ophthalmologie et Neuro-Génétique, B.P. 79, Albi, Tarn, France)

27-30. German Bunsen Soc. for **Physical Chemistry**, 64th general assembly, Innsbruck, Austria. (Deutsche Bunsengesellschaft für Physikalische Chemie, Varrentrappstr. 40-42, 6 Frankfurt am Main, Germany)

27-11. World **Meteorological Organization**, 17th executive committee session, Geneva, Switzerland. (WMO, 41 avenue Giuseppe Motta, Geneva)

28-1. Canadian Assoc. of **Geographers**, annual, Vancouver, B.C. (Local Arrangements Committee, Dept. of Geography, University of British Columbia, Vancouver)

30-2. Recent Advances in **Adrenal Steroid Metabolism**, symp., Montreal, Quebec, Canada. (Chemical Inst. of Canada, 48 Rideau St., Ottawa 2)

30-2. Canadian **Dental Assoc.**, conv., Quebec. (L. Bernier, 1024, avenue des Erables, Quebec)

30-2. American **Thoracic Soc.**, Chicago, Ill. (F. W. Webster, 1790 Broadway, New York 10019)

30-2. National **Tuberculosis Assoc.**, Chicago, Ill. (S. Wicker, 1790 Broadway, New York 10019)

30-3. **Medical Library Assoc.**, annual, Philadelphia, Pa. (MLA, 919 N. Michigan Ave., Chicago 11, Ill.)