

as a result of spreading diseases. Quite suggestive, also, is Ackerknecht's opinion that "history" is often the cause, rather than the consequence, of changes in morbidity—that malaria in Rome, for example, was the consequence rather than the cause of social dissolution. Likewise sound, I think, is the statement that medical history always shows "a combination of retreats and advances" rather than a growing "conquest" of diseases; though the recent increase in average life expectancy at birth may be viewed as a positive achievement. Certainly, as the author notes in closing, the contemplation of this vital theme "does not offer any cause for excessive optimism."

RICHARD HARRISON SHRYOCK
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 104 South Fifth Street,
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Strategists' Guide

The natural appeal of rational conflict lends an aura of excitement to the theory of games. Since the appearance in 1944 of von Neumann and Morgenstern's monumental treatise *Theory of Games and Economic Behavior*, the glamorous opportunity to solve a wide variety of decision-making problems has attracted numerous adherents. The businessman, the social scientist, the military strategist, the diplomat have heeded the call of a lustrous future filled with optimum strategies. In order to provide a clearer perspective to the nonmathematician and the potential user (or misuser) of game theory, Anatol Rapoport has written **Two-Person Game Theory: The Essential Ideas** (University of Michigan Press, Ann Arbor, 1966. 229 pp., illus. Paper, \$1.95; cloth, \$5).

Rapoport discusses the nature of the theory—what it is and what it is not, what it could become and what it cannot become. In order to lessen the notational worry, he confines his attention to the treatment of two-person games. After an opening chapter on the essential features of game theory, he tackles the difficult questions of what utility is and what relationship holds between utilities of different players. Next are presented highlights of the zero-sum theory: game matrix, saddlepoint, minimax, mixed strategy. Turning to the nonzero-sum theory,

Rapoport uses the Battle of the Sexes as an example to summarize and contrast varied methods of solution offered respectively by Shapley, by Nash, by Raiffa, and by Braithwaite. The treatment of nonnegotiable games analyzes such conflicts as the Prisoner's Dilemma and Chicken. A chapter on the inductive theory is followed by a detailed example discussing a diplomatic conflict concerning international inspection to control treaty evasions.

The final chapter, entitled "Opportunities and limitations," is vital reading for all players in game theory. Here the author identifies the usefulness of game theory—and it is not a sort of usefulness that readily appeals to strong advocates of practical application, but it is a type that must not be dismissed. In summary I quote the book's penultimate sentence: "The great philosophical value of game theory is in its power to reveal its own incompleteness."

RICHARD A. GOOD
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Gauss on Number Theory

Carl Friederich Gauss is one of the handful of mathematical giants who tower above the merely great mathematicians. Although he flourished over a century ago, his work has a very modern flavor. Moreover, he is a masterly expositor, with the virtues of simplicity, clarity, and care for historical detail. It is therefore scandalous that virtually none of his works have been available in English. Now at last we have his **Disquisitiones Arithmeticae** [Translated from the second German edition (Göttingen, 1860) by Arthur A. Clarke. Yale University Press, New Haven, Conn., 1966. 492 pp., illus. Paper, \$2.95; cloth, \$12.50]. Perhaps the greatest single treatise on number theory (the study of the properties of whole numbers), it presupposes no more than a knowledge of arithmetic and elementary algebra, and a willingness to construct and work out numerous arithmetical examples to illustrate the argument. The principal topics are elementary theory of congruences, the law of quadratic reciprocity, forms, and the division of the circle (a little trigonometry is required for this last topic). Both mathematical specialists and amateurs will find

much of interest in this book. Admirers of Gauss will not be surprised to find, in sections 267 through 270, that he used matrices to represent linear transformations and the row-column product to represent their composition almost half a century before Caley's "invention" of matrices. Section VIII, referred to several times by Gauss and not included in this book, may be found in volume 2, pages 510-14, of the collected works. The only significant weakness in the translation is the absence of an alphabetical index. Congratulations to Clarke! Let us hope that he will make more classics available in English.

KENNETH O. MAY
*Department of Mathematics, University
 of Toronto, Toronto, Canada*

New Books

Mathematics, Physical Sciences, and Engineering

Advances in Machine Tool Design and Research. Proceedings of the Sixth International Machine Tool Design and Research Conference (Manchester, England), September 1965. S. A. Tobias and F. Koenigsberger, Eds. Pergamon, New York, 1966. 807 pp. Illus. \$36. There are 48 papers.

Advances in Structure Research by Diffraction Methods. vol. 2. R. Brill and R. Mason, Eds. Vieweg, Braunschweig; Interscience (Wiley), New York, 1966, 170 pp. Illus. \$9.75. Four papers.

Bioluminescence in Progress. Proceedings of the Luminescence Conference sponsored by the Japan Society for the Promotion of Science and by the National Science Foundation, under the United States-Japan Cooperative Science Program (Kanagawa-ken, Japan), September 1965. Frank H. Johnson and Yata Haneda, Eds. Princeton Univ. Press, Princeton, N.J., 1966. 664 pp. Illus. \$15. There are 35 papers.

Chebyshev Methods in Numerical Approximation. Martin Avery Snyder. Prentice-Hall, Englewood Cliffs, N.J., 1966. 126 pp. Illus. \$7.50.

Contamination Analysis and Control. James L. Dwyer. Reinhold, New York, 1966. 349 pp. Illus. \$15.

Effects of High-Energy Radiation on Inorganic Substances. A symposium (Seattle, Wash.), October-November 1965. American Soc. for Testing and Materials, Philadelphia, 1966. 176 pp. Illus. Paper, \$5.25; members, \$3.70. Eight papers.

Electrical Methods in Geophysical Prospecting. George V. Keller and Frank C. Frischknecht. Pergamon, New York, 1966. 527 pp. Illus. \$18.50. International Series of Monographs in Electromagnetic Waves, vol. 10.

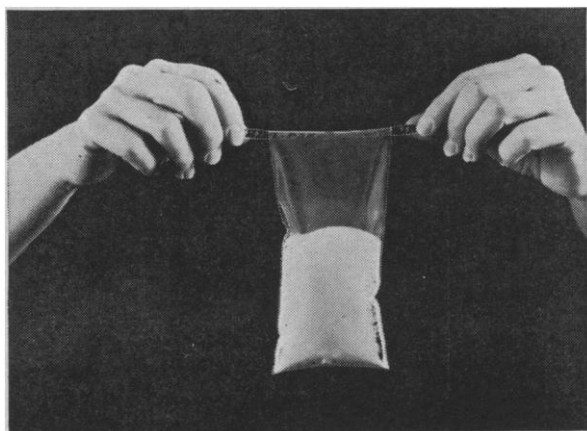
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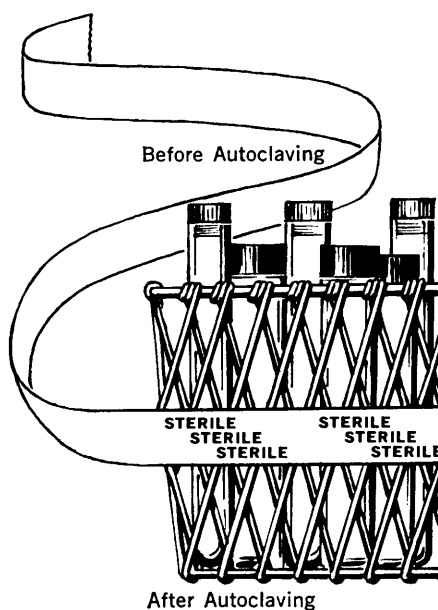
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NEW BOOKS

(Continued from page 642)

Electron Radiation Damage in Semiconductors and Metals. James W. Corbett. Academic Press, New York, 1966. 420 pp. Illus. \$16.50. Solid State Physics Series, Suppl. 7.

Elements of Thermodynamics. D. ter Haar and H. Wergeland. Addison-Wesley, Reading, Mass., 1966. 174 pp. Illus. \$9.75. Addison-Wesley Series in Advanced Physics.

First Concepts of Topology: The Geometry of Mappings of Segments, Curves, Circles, and Disks. W. G. Chinn and N. E. Steenrod. Random House, New York, 1966. 168 pp. Illus. Paper, \$1.95.

Fourier Transforms and the Theory of Distributions. J. Arsac. Translated from the French edition (Paris, 1961) by Allen Nussbaum and Gretchen C. Heim. Prentice-Hall, Englewood Cliffs, N.J., 1966. 334 pp. Illus. \$14.

Gas Phase Reaction Rate Theory. Harold S. Johnston. Ronald, New York, 1966. 372 pp. Illus. \$10. Modern Concepts in Chemistry.

Gases and Plasmas. Paul D. Thompson. Lippincott, Philadelphia, 1966. 176 pp. Illus. \$4.25.

Gear Lubrication. Proceedings of a symposium organized by the Mechanical Tests of Lubricants Panel of the Institute of Petroleum (Brighton, England), October 1964. Published for The Institute of Petroleum, London. Elsevier, New York, 1966. Unpagged. Illus. \$20. There are 40 papers.

Hill's Equation. Wilhelm Magnus and Stanley Winkler. Interscience (Wiley), New York, 1966. 135 pp. Illus. \$8.50.

Infra-red Instrumentation and Techniques. A. E. Martin. Elsevier, New York, 1966. 190 pp. Illus. \$12.

Intelligent Life in the Universe. I. S. Shklovskii and Carl Sagan. Based on a translation of the Russian edition by Paula Fern. Holden-Day, San Francisco, 1966. 525 pp. Illus. \$8.95.

Introduction to Free Radical Chemistry. William A. Pryor. Prentice-Hall, Englewood Cliffs, N.J., 1966. 128 pp. Illus. Paper, \$2.50; cloth, \$5.50. Prentice-Hall Foundations of Modern Organic Chemistry Series.

Introduction to Real Analysis. Casper Goffman. Harper and Row, New York, 1966. 174 pp. Illus. \$7.50. Harper's Series in Modern Mathematics.

Introduction to the Chemical Process Industries. Richard M. Stephenson. Reinhold, New York, 1966. 480 pp. Illus. \$14.75.

A Laboratory Manual for Experimental General Chemistry. C. R. McLellan and W. C. Tucker. Davis, Philadelphia, 1966. 317 pp. Illus. Paper, \$4.50.

The Laser. William V. Smith and Peter P. Sorokin. McGraw-Hill, New York, 1966. 510 pp. Illus. \$15.50.

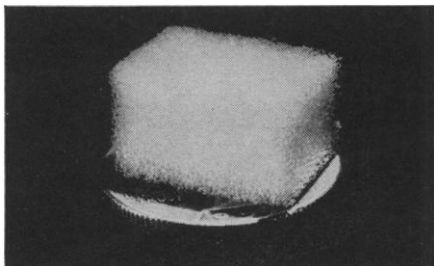
Linear Spaces of Analytic Functions. Pasquale Porcelli. Rand McNally, Chicago, 1966. 168 pp. Illus. \$8.

Liquids and Solutions. Dale Dreisbach. Houghton, Mifflin, Boston, 1966. 204 pp. Illus. Paper, \$2.95. Classic Researches in General Chemistry Series.

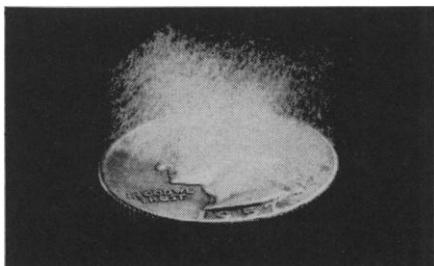
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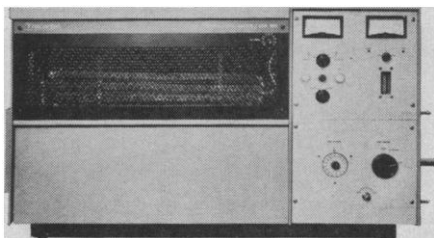


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Modern Foundations of Systems Engineering. William A. Porter. Macmillan, New York 1966. 509 pp. Illus. \$14.95.

Modern University Calculus: With Co-ordinate Geometry. Stoughton Bell, J. R. Blum, J. Vernon Lewis, and Judah Rosenblatt. Holden-Day, San Francisco, 1966. 1975 pp. Illus. \$11.75.

A New Look at Geometry. Irving Adler. Day, New York, 1966. 414 pp. Illus. \$7.95.

Organic Insertion Reactions of Group IV Elements. Edmund Yanovich Lukevits and Mikhail Grigor'evich Voronkov. Translated from the Russian edition (Riga, 1964) by Michael J. Newlands. Consultants Bureau, New York, 1966. 425 pp. Illus. \$25.

Outline of Historical Geology. A. K. Wells and J. F. Kirkaldy. Murby, London; Barnes and Noble, New York, ed. 5, 1966. 503 pp. Illus. \$7.75.

Perspectives in Geometry and Relativity. Essays in honor of Václav Hlavatý. Banesh Hoffmann, Ed. Indiana Univ. Press, Bloomington, 1966. 505 pp. Illus. \$15. There are 47 papers.

The Physics and Astronomy of Galaxies and Cosmology. Paul W. Hodge. McGraw-Hill, New York, 1966. 189 pp. Illus. Paper, \$2.95; cloth, \$4.95.

Plasma Physics in Theory and Application. Wulf B. Kunkel, Ed. McGraw-Hill, New York, 1966. 512 pp. Illus. \$15.50. There are 13 papers.

Plastics Extrusion Technology and Theory. Gerhard Schenkel. Translated from the second German edition (Munich, 1963) by L. A. H. Eastman. B. S. Glyde, Translation Ed. Iliffe, London; Elsevier, New York, 1966. 477 pp. Illus. \$24.

Principles and Methods of Sheet-Metal Fabricating. George Sachs. Revised and enlarged by Henry E. Voegeli. Reinhold, New York, ed. 2, 1966. 572 pp. Illus. \$15.

Project Surveying. General adjustment and optimization techniques with applications to engineering surveying. P. Richardus and J. S. Allman. North-Holland, Amsterdam; Interscience (Wiley), New York, 1966. 479 pp. Illus. \$20.

Relativity is Dead. Otto Luther. Key Research Corp., Yorba Linda, Calif., 1966. 159 pp. Illus. \$7.50.

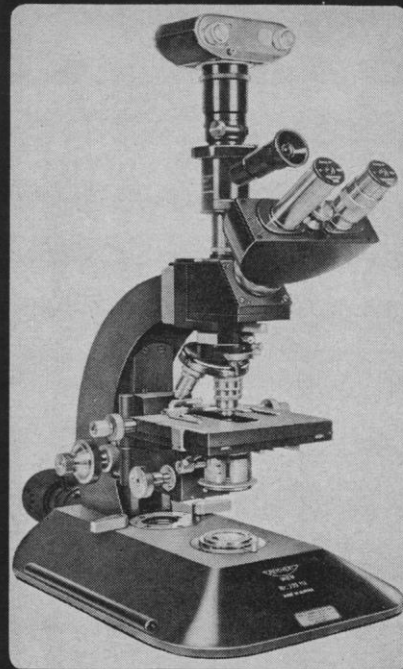
Research Program Effectiveness. Proceedings of the conference sponsored by the Office of Naval Research (Washington, D.C.), July 1965. M. C. Yovits, D. M. Gilford, R. H. Wilcox, E. Staveley, and H. D. Lerner, Eds. Gordon and Breach, New York, 1966. 560 pp. Illus. \$10. There are 24 papers.

Reviews of Plasma Physics. vol. 2. M. A. Leontovich, Ed. Translated from the Russian edition (Moscow, 1963) by Herbert Lashinsky. Consultants Bureau, New York, 1966. 305 pp. Illus. \$12.50. Four papers.

Séminaire Bourbaki. 12 vols. Benjamin, New York, 1966. Unpaged. Individual volumes, \$12.25; set, \$129. There are 294 invited papers in theoretical mathematics, presented at the seminar, most of them in French, in the years 1948-1965.

Statistical Physics. Gregory H. Wannier. Wiley, New York, 1966. 544 pp. Illus. \$11.50.

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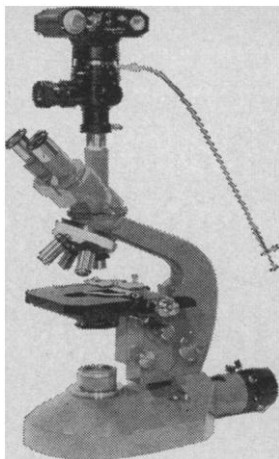
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The Structure of Glass. vol. 6, *Properties, Structure, and Physical-Chemical Effects*. E. A. Porai-Koshits, Ed. Translated from the Russian edition (Moscow, 1965) by E. Boris Uvarov. Consultants Bureau, New York, 1966. 242 pp. Illus. \$25. There are 54 papers that were given at the Fourth All-Union Conference on the Glassy State (Leningrad), March 1964.

Survey of Progress in Chemistry. vol. 3. Arthur F. Scott, Ed. Academic Press, New York, 1966. 304 pp. Illus. \$7.95. Five papers.

Textbook on Mechanized Information Retrieval. Allen Kent. Interscience (Wiley). New York, ed. 2, 1966. 391 pp. Illus. \$10.95.

UV Atlas of Organic Compounds. vol. 1. Published in collaboration with the Photoelectric Spectrometry Group, London, and the Institut für Spektrochemie und Angewandte Spektroskopie, Dortmund. Plenum Press, New York, 1966. Unpaged. \$6.

Biological and Medical Sciences

Actions of Chemicals on Dividing Cells. Bengt A. Kihlman. Prentice-Hall, Englewood Cliffs, N.J., 1966. 272 pp. Illus. \$10.

Advances in Optical and Electron Microscopy. vol. 1. R. Barer and V. E. Cosslett, Eds. Academic Press, New York, 1966. 293 pp. Illus. \$11.50. Six papers.

Advances in Reproductive Physiology. vol. 1. Anne McLaren. Logos Press, London; Academic Press, New York, 1966. 295 pp. Illus. \$12.50. Nine papers.

Biochemistry. Israel S. Kleiner and James M. Orten. Mosby, St. Louis, ed. 7, 1966. 927 pp. Illus. \$11.50.

Biology of Parasites: Emphasis on Veterinary Parasites. Proceedings of the Second International Conference of the World Association for the Advancement of Veterinary Parasitology (Philadelphia), September 1965. E. J. L. Soulsby, Ed. Academic Press, New York, 1966. 370 pp. Illus. \$13.50. There are 19 papers.

The Biology of Populations. Robert H. MacArthur and Joseph H. Connell. Wiley, New York, 1966. 216 pp. Illus. \$5.95.

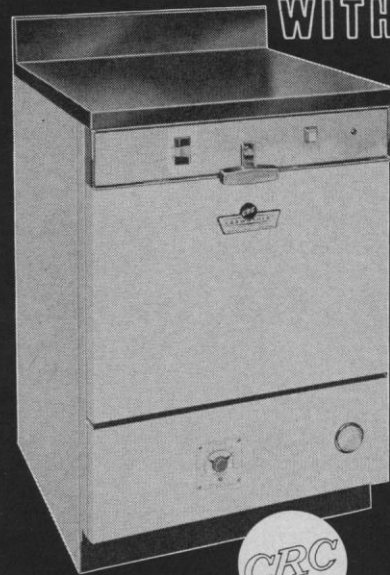
Brain and Conscious Experience. Study Week of the Pontificia Academia Scientiarum (Rome), September–October 1964. John C. Eccles, Ed. Springer-Verlag, New York, 1966. 613 pp. Illus. \$16.80. There are 21 papers.

The Chemistry of Fats and Other Lipids. vol. 9, pt. 1, *Polyunsaturated Acids*. Ralph T. Holman, Ed. Pergamon, New York, 1966. 161 pp. Illus. Paper, \$7.75. Four papers.

The Chromosomes of the Algae. Maud B. E. Godward. St. Martin's Press, New York, 1966. 222 pp. Illus. \$11. Six papers.

Clinical Pathology of the Serum Electrolytes. Proceedings of an Applied Seminar on the Serum Electrolytes in Clinical

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Medicine under the auspices of the Association of Clinical Scientists (Washington, D.C.). F. William Sunderman and F. William Sunderman, Jr., Eds. Thomas, Springfield, Ill., 1966. 460 pp. Illus. \$24.50.

Community Psychiatry. Proceedings of a Symposium on Community Psychiatry, sponsored by the University of Wisconsin Department of Psychiatry, the Wisconsin Psychiatric Institute, and the Wisconsin State Department of Public Welfare, Division of Mental Hygiene. Leigh M. Roberts, Seymour L. Halleck, and Martin B. Loeb, Eds. Univ. of Wisconsin Press, Madison, 1966. 262 pp. Illus. \$6. There are 12 papers.

The Comparative Ethology and Evolution of the Sand Wasps. Howard E. Evans. Harvard Univ. Press, Cambridge, Mass., 1966. 544 pp. Illus. \$15.

Comparative Leukaemia Research. Proceedings of an International Wenner-Gren Symposium (Stockholm), September 1965. G. Winqvist, Ed. Pergamon, New York, 1966. 278 pp. Illus. \$13.50. There are 29 papers.

Comprehensive Biochemistry. vol. 14, *Biological Oxidations*. Marcel Florkin and Elmer H. Stotz, Eds. Elsevier, New York, 1966. 530 pp. Illus. \$25. Ten papers.

Differentiation and Growth of Hemoglobin- and Immunoglobulin-Synthesizing Cells. A symposium (Gatlinburg, Tenn.), April 1966. Sponsored by the Biology Division, Oak Ridge National Laboratory. Wistar Institute Press, Philadelphia, 1966. 234 pp. Illus. Paper. There are 14 papers reprinted from *Journal of Cellular Physiology*, vol. 67, Suppl. 1, June 1966.

Dynamics of Development: Euthenic Pediatrics. Dorothy V. Whipple. McGraw-Hill, New York, 1966. 664 pp. Illus. \$15.

Ecological Energetics. John Phillipson. St. Martin's Press, New York, 1966. 61 pp. Illus. Paper, \$1.50. Studies in Biology, No. 1.

The Ecology of Malnutrition in Central and Southeastern Europe: Austria, Hungary, Rumania, Bulgaria, Czechoslovakia. Jacques M. May. Hafner, New York, 1966. 306 pp. Illus. \$10.50. Studies in Medical Geography, vol. 6.

Enzymes in Serum: Their Use in Diagnosis. Keith S. Henley, Ellen Schmidt, and Friedrich W. Schmidt. Thomas, Springfield, Ill., 1966. 132 pp. Illus. \$5.75. American Lecture Series.

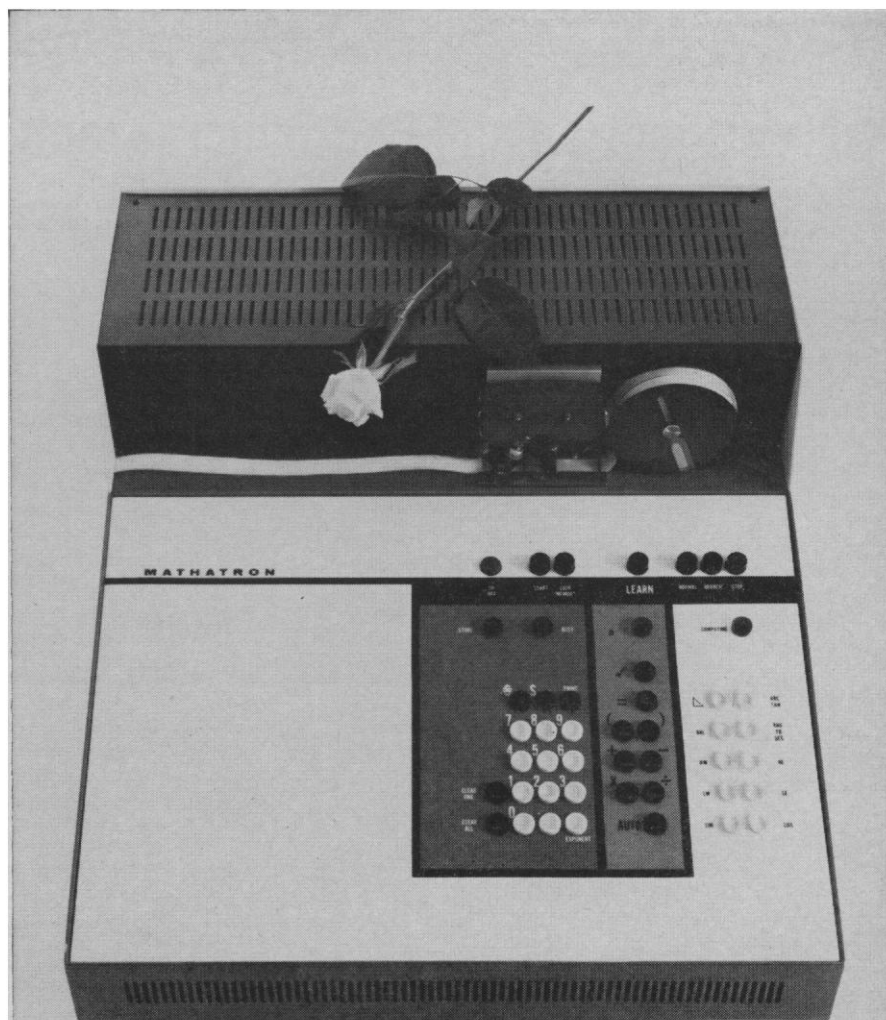
Essentials of Biological Chemistry. James L. Fairley and Gordon L. Kilgour. Reinhold, New York, ed. 2, 1966. 334 pp. Illus. \$9. Reinhold Chemistry Textbook Series.

An Experimental Approach to Biology. Peter Abramoff and Robert G. Thomson. Freeman, San Francisco, 1966. 265 pp. Illus. Paper, \$3.75.

The Genetics of Tribolium and Related Species. Alexander Sokoloff. Academic Press, New York, 1966. 224 pp. Illus. \$8.50. Advances in Genetics Series, Suppl. 1.

The Graduate Education of Physicians. Report of the Citizens Commission on Graduate Medical Education. Council on Medical Education, American Medical Association, Chicago, 1966. 128 pp. Paper.

Hypochondriacal Syndromes. G. A. Ladee. Elsevier, New York, 1966. 432 pp. Illus. \$21.50.



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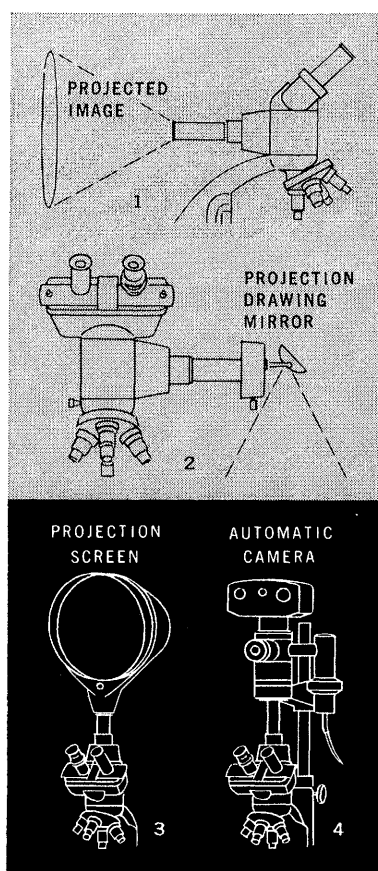
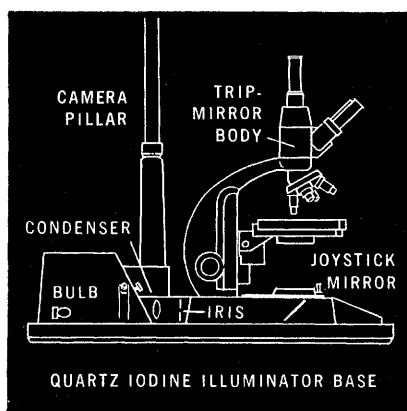
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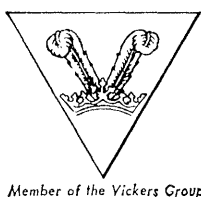
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Human Spatial Orientation. I. P. Howard and W. B. Templeton. Wiley, New York, 1966. 541 pp. Illus. \$13.50.

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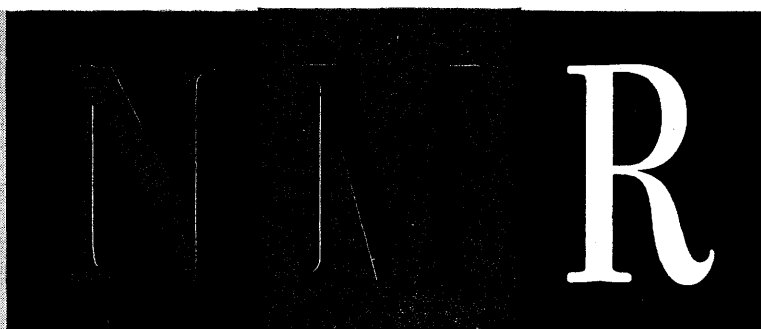
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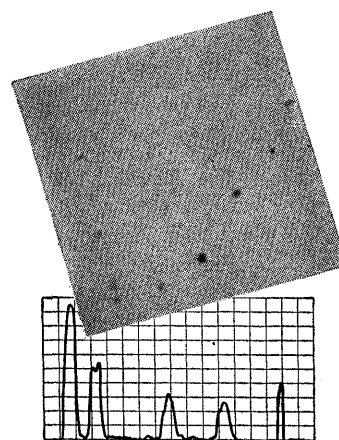
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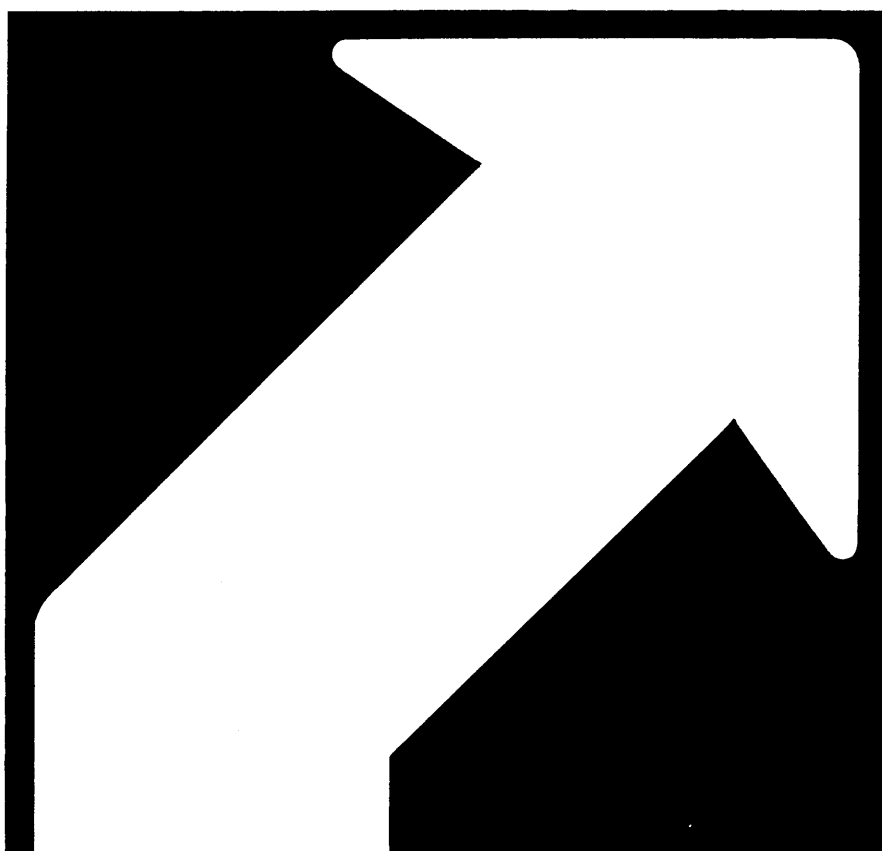
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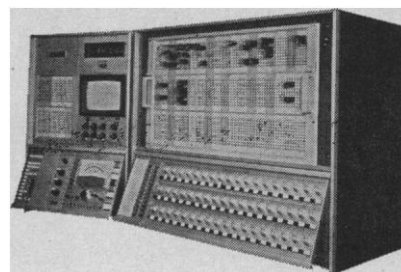
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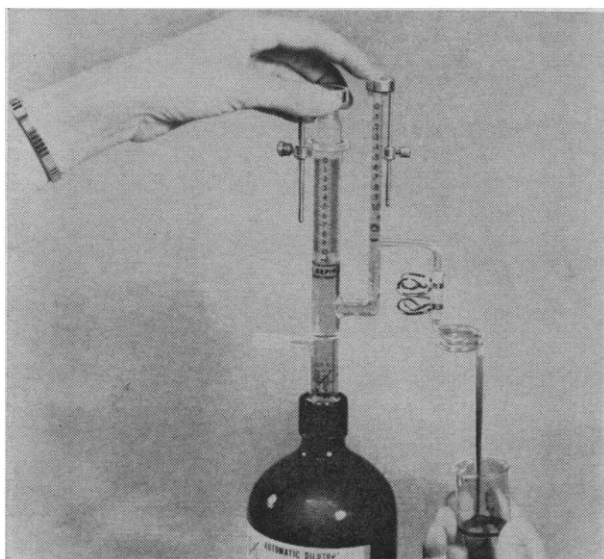
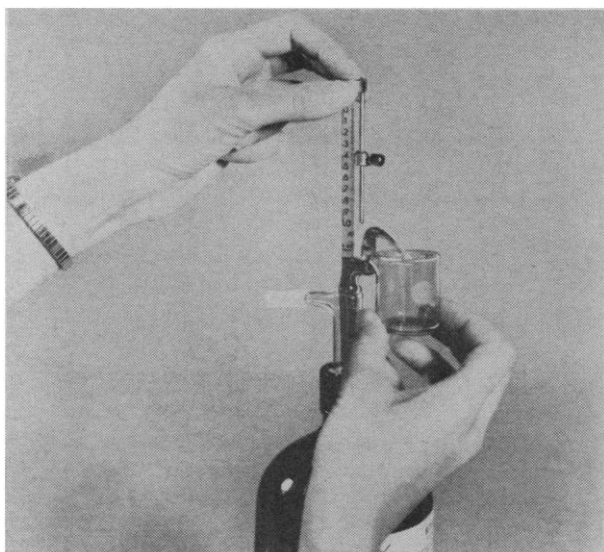
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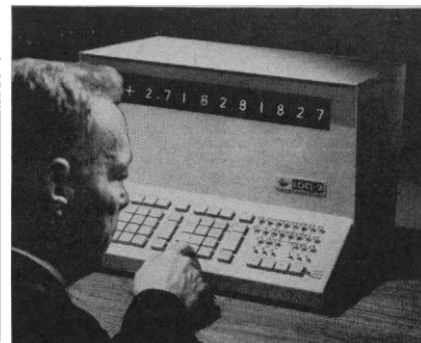
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