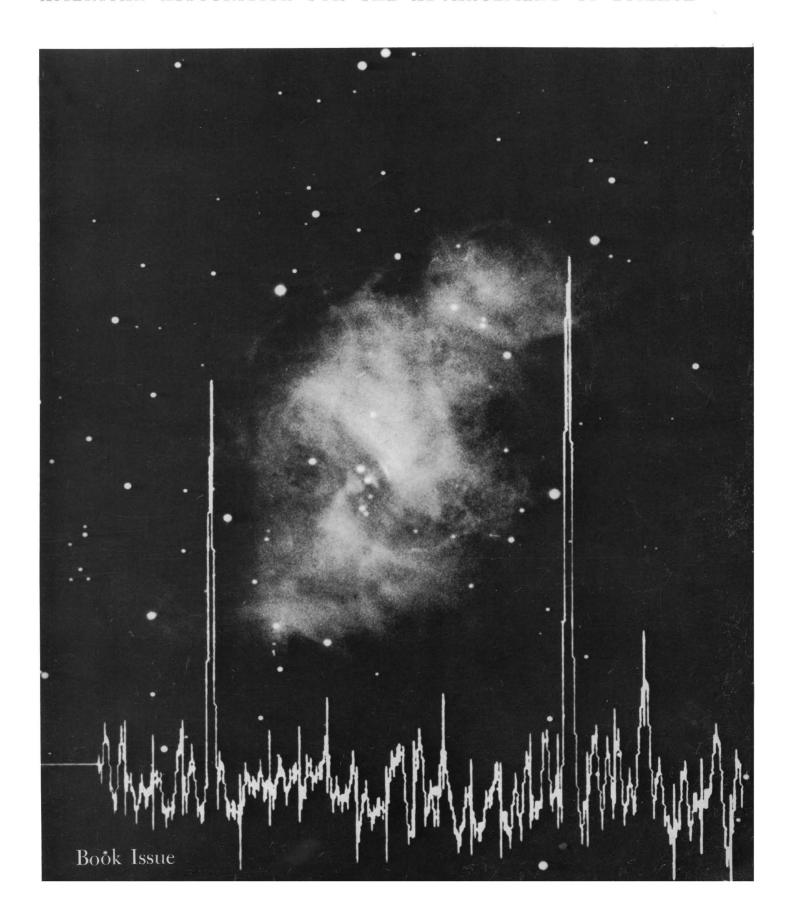
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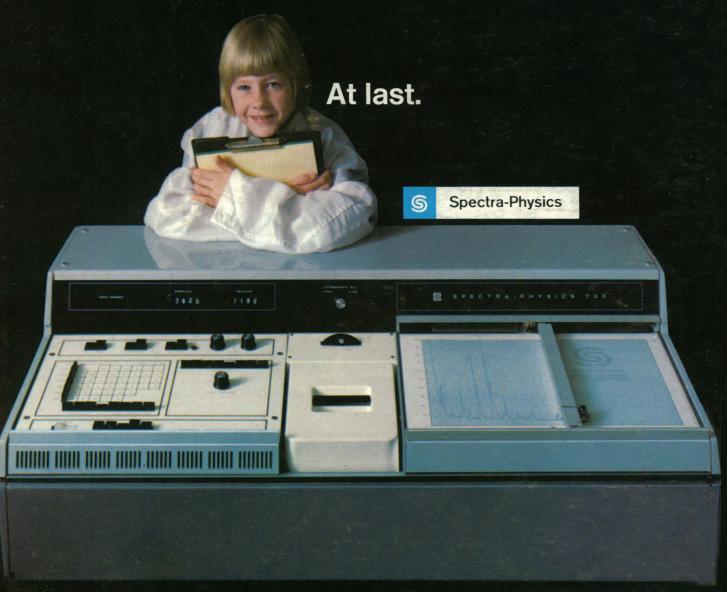
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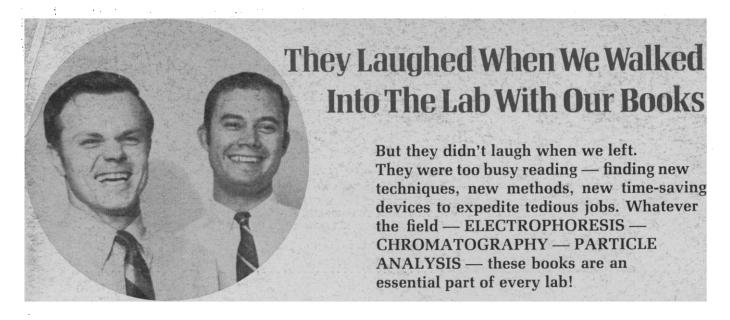
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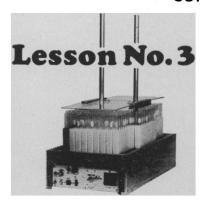


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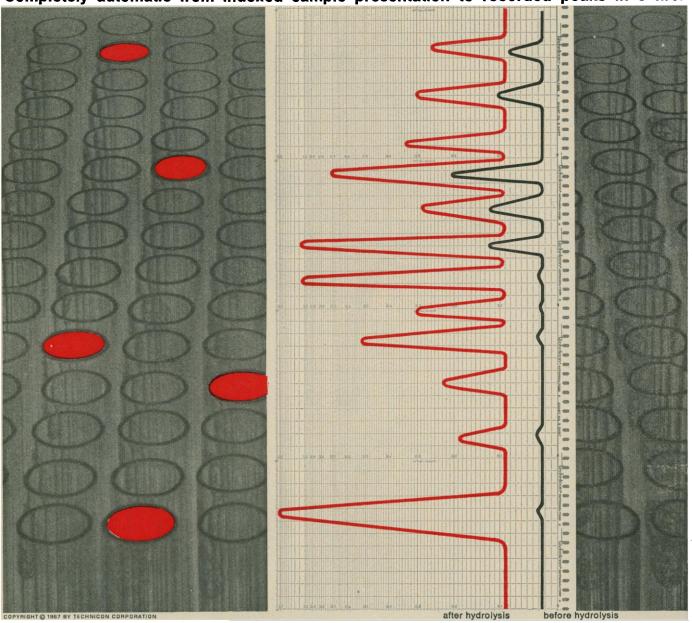
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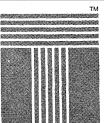


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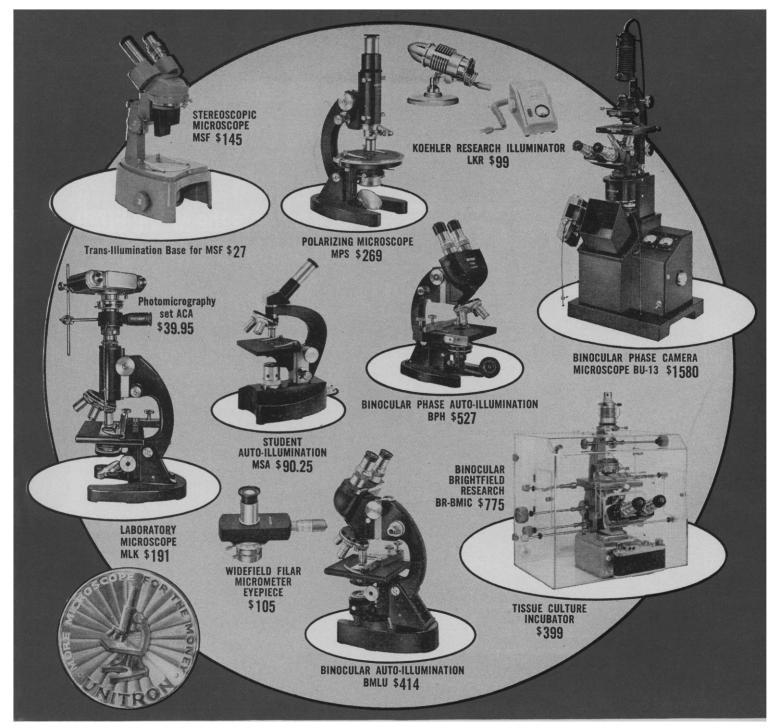
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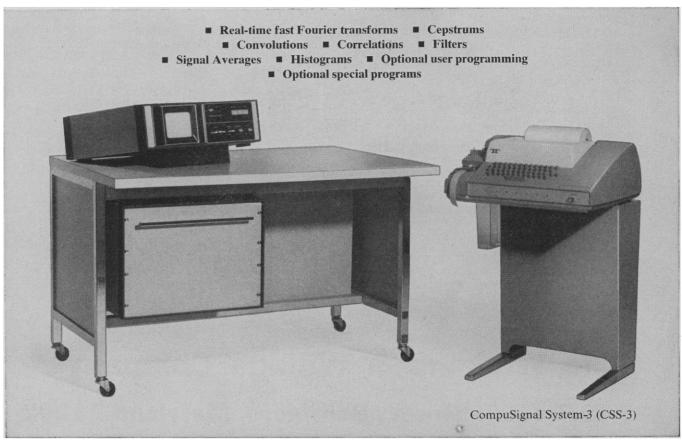
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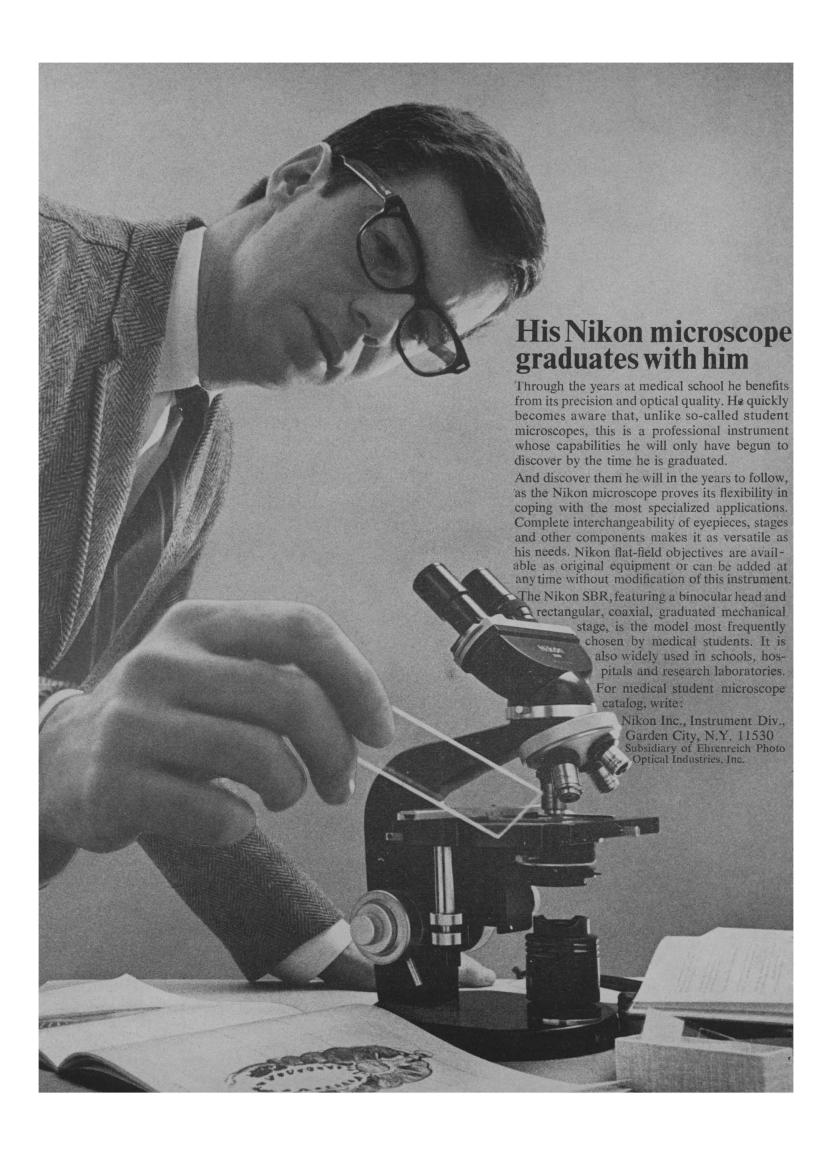
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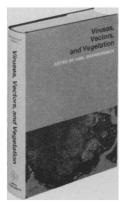
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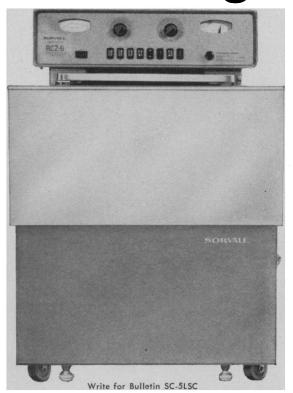


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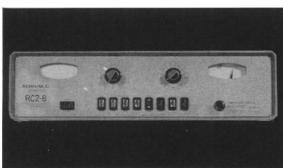
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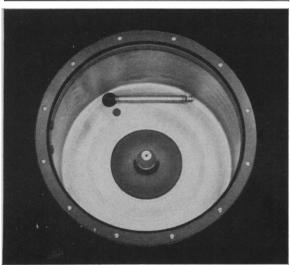


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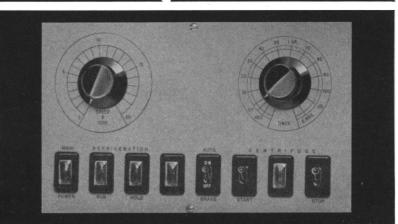
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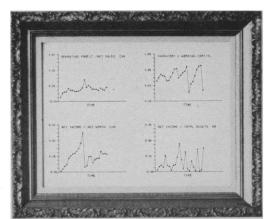






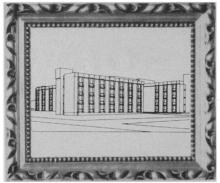


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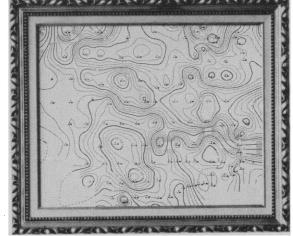


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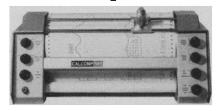


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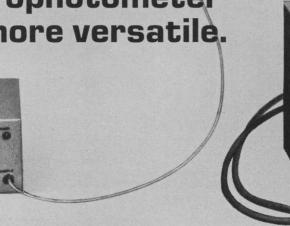
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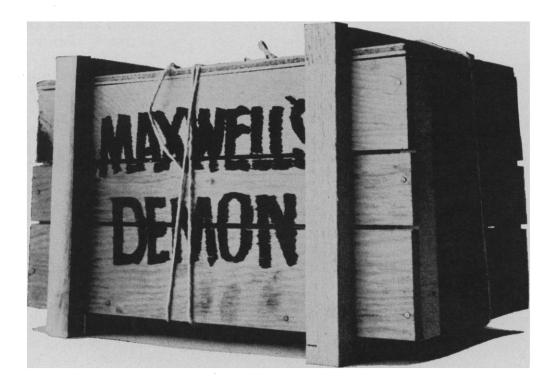
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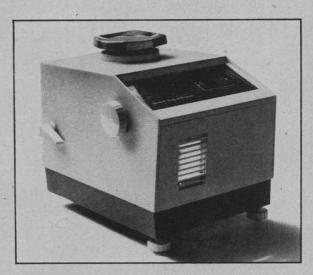
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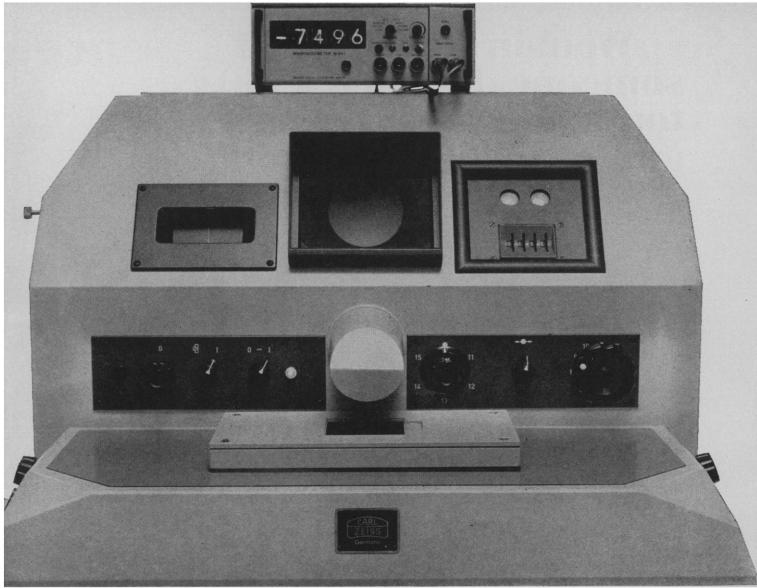


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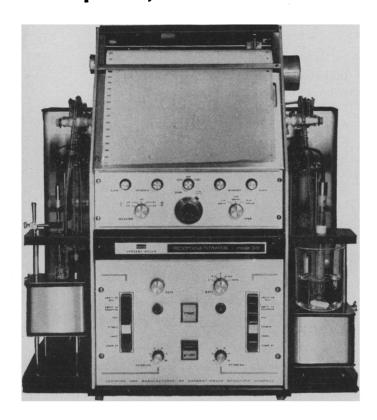
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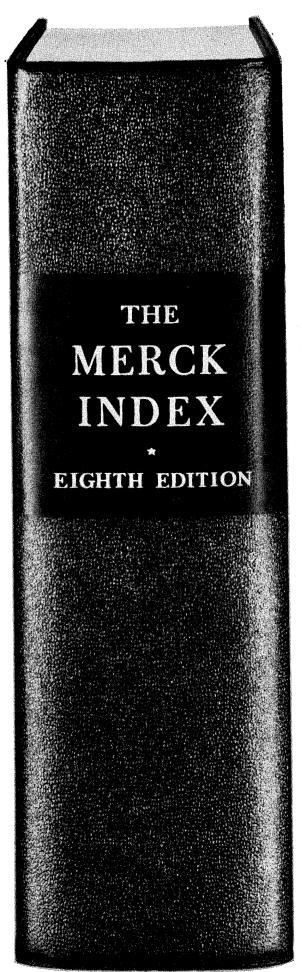
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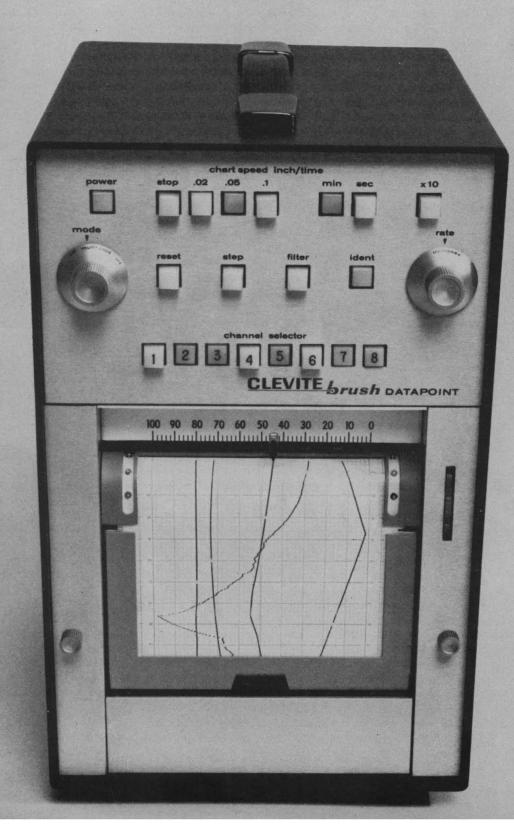
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Persistent Pesticides

Controversy over pesticides is heating up. Michigan and Arizona have banned the use of DDT, and, beginning in 1970, Sweden will restrict its application. Secretary Finch has appointed a commission to tell the government what to do about it, and the Food and Drug Administration has seized shipments of coho salmon containing DDT or its derivatives at concentrations of more than 5 parts per million.

Few man-made chemicals have had as profound an effect on human lives as DDT has had. It has been instrumental in saving many millions of lives, in part through control of insect vectors, in part through increased food production. The quality of many crops has been improved greatly through its use, and in some instances yields have more than doubled. Were the United States to stop the use of all pesticides, food prices would rise sharply and supplies of many foods would be inadequate. Although some people might prefer banning all pesticides, the real issues are the choice of pesticides (for example, persistent or nonpersistent) and the conditions under which they are to be used. In this controversy, some agriculturalists and industrial interests defend the application of persistent chemicals such as the chlorinated hydrocarbons-DDT, dieldrin, endrin, and others. Conservationists and many members of the concerned public advocate the use of nonpersistent chemicals such as the carbamates or the phospho-organics—for example, malathion. The defenders of persistent chemicals point to their effectiveness and low cost. DDT is a relatively inexpensive chemical, and one or two applications may suffice for a season. Much of the cost of using pesticides arises from the labor involved in applying them. Hence, complete abandonment of the chlorinated hydrocarbons now would result in a substantial increase in the nation's food bill.

The defenders of DDT point to the remarkable fact that in 3 decades of use there has been no documented instance in which human deaths have resulted from proper application of the chemical, and relatively few deaths have occurred even with drastically improper use. Moreover, DDT and its relatives are not truly persistent but are slowly destroyed in soil. DDT is slowly degraded in man, and it is also excreted, so that concentrations do not build up indefinitely. Typical human fat contains DDT and its degradation products at concentrations on the order of 12 parts per million.

An undesirable property of the chlorinated hydrocarbons is that they are somewhat volatile and may be carried far from the point of application. Residues of DDT have been found in seals and penguins in Antarctica. When a farmer in Europe applies the chemical to his crops, some of the molecules are destined to accumulate in you and me.

Part of the current concern about DDT is due to new biological findings in animals other than man. Among the effects demonstrated have been an interference with shell deposition in some birds and an estrogenic stimulus in rats by a component of commercial DDT. Highly controversial is a report, soon to be released, that describes carcinogenic effects of large amounts of DDT in tumor-susceptible mice. Most scientists would agree that use of DDT should be curtailed, and indeed consumption of DDT in the United States has been declining; during the 1967 crop season only half as much was applied as in the peak year of 1959. However, use in other countries is increasing.

Suppression of the application of chlorinated hydrocarbons will not end controversy over pesticides. Unanticipated, possibly dangerous, side effects of the new substitutes will be discovered. Conservationists will continue to criticize, and that will be useful, for all of us have a large stake in the quality of the environment.—Philip H. Abelson



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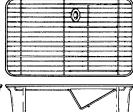
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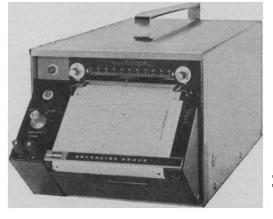
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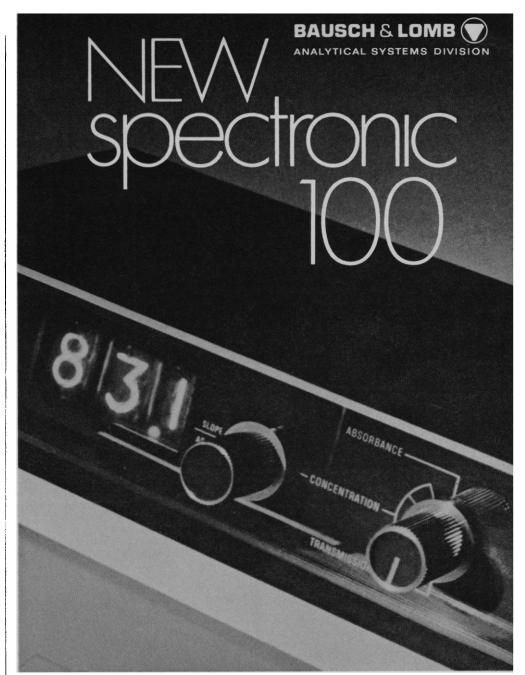
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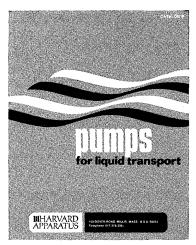
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Liquid Crystals, G. H. Brown, G. J. Dienes, and M. M. Labes, Eds., 4 Oct. 1968, 111

Liquid Metals, N. H. March, 25 Oct. 1968, 448

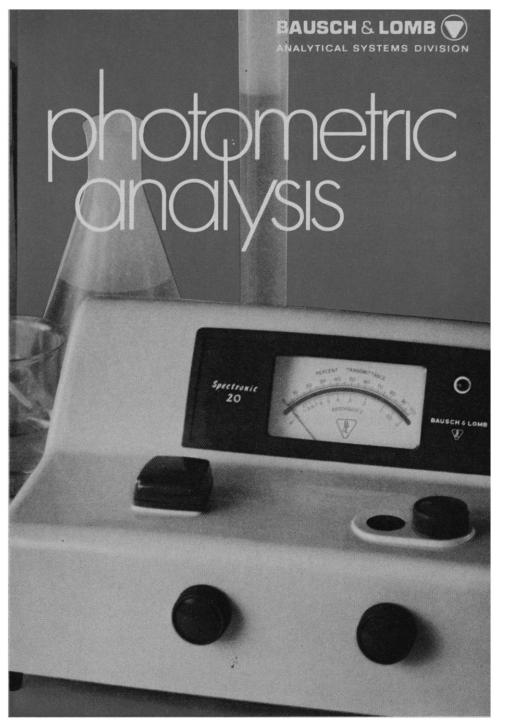
The Liquid State, J. A. Pryde, 14 June 1968, 1213

Le Livre du Ciel et du Monde, N. Oresme,

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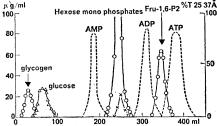
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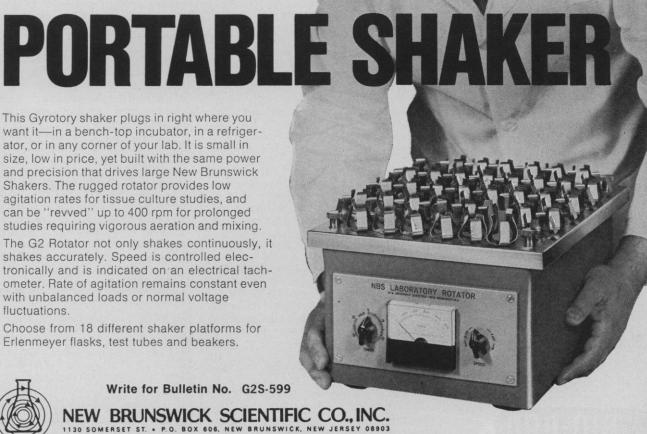
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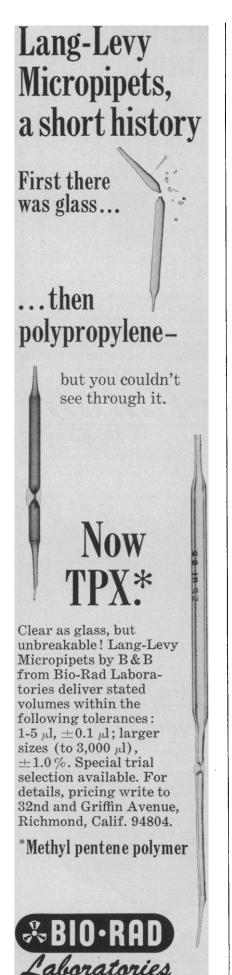
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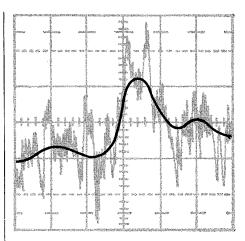
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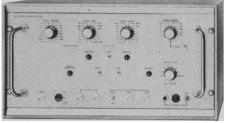
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Problems of Chinese Geotectonics (in Chinese), C. Kuo-ta et al., 22 Nov. 1968, 888

Problems of Structural Geology (in Chinese), 22 Nov. 1968, 888

Proceedings of the Fourteenth International Ornithological Congress, D. W. Snow, Ed., 26 July 1968, 352

Proceedings of the Third International Congress of Human Genetics, J. F. Crow and J. V. Neel, Eds., 14 June 1968, 1215

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Progress in Gas Chromatography, J. H. Purnell, Ed., 1 Nov. 1968, 557

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Progress in Theoretical Biology, vol. 1, F. M. Snell, Ed., 23 Aug. 1968, 775

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Prostaglandins, S. Bergström and B. Samuelsson, Eds., 13 Sept. 1968, 1124

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The Quaternary, vol. 2, K. Rankama, Ed., 24 May 1968, 868

Quaternary Paleoecology, E. J. Cushing and H. E. Wright, Jr., Eds., 10 May 1968, 670

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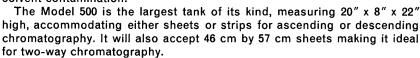
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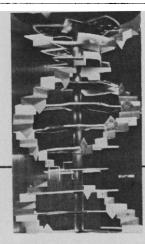
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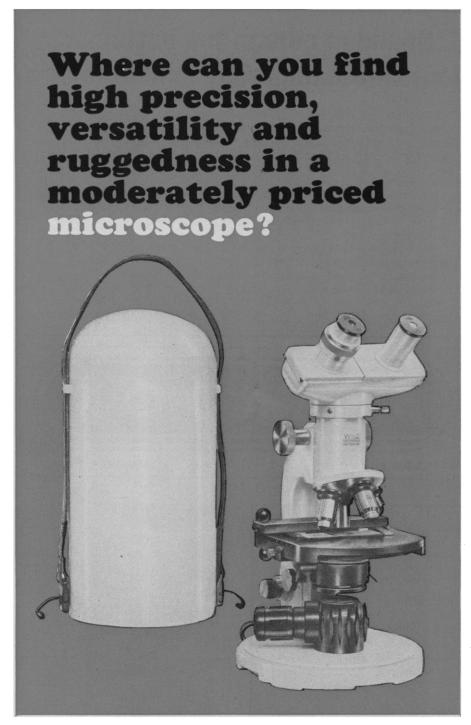
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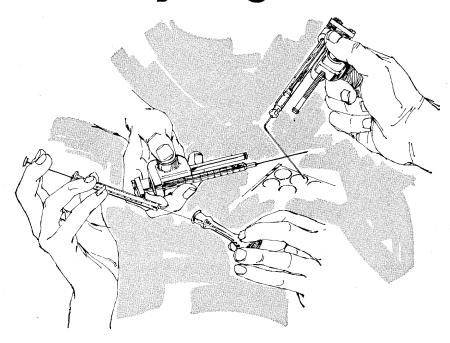
Teratology of the Central Nervous System, H. Kalter, 13 Dec. 1968, 1259

Textbook of Theoretical Botany, vol. 3, R. C. McLean and W. R. Ivimey-Cook, 15 Nov. 1968, 786

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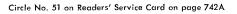
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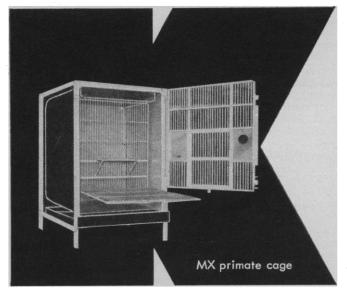
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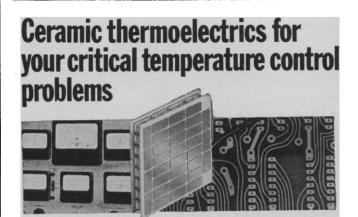
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Thermoluminescence of Geological Materials, D. J. McDougall, Ed., 28 Mar. 1969, 1442

Thermometric Titrimetry, H. J. V. Tyrrell and A. E. Beezer, 3 Jan. 1969, 62 Thomas Willis, 1621-1675, H. Isler, 13

Dec. 1968, 1264

Thymidine Metabolism and Cell Kinetics, J. E. Cleaver, 1 Nov. 1968, 556

Tobacco and Tobacco Smoke, E. L. Wynder and D. Hoffmann, 2 Aug. 1968, 455

Topics in Population Genetics, B. Wallace, 21 Mar. 1969, 1316 "Torrey Canyon" Pollution and Marine

Life, J. E. Smith, Ed., 23 Aug. 1968,

Towards a Theoretical Biology, vol. 1, C. H. Waddington, Ed., 13 Sept. 1968, 1122

Tracks, E. A. R. Ennion and N. Tinbergen, 10 May 1968, 658

Trackers of the Skies, E. N. Hayes, 28 Mar. 1969, 1443

Traité de Biologie de l'Abeille, R. Chauvin, Ed., 13 Sept. 1968, 1123

Traité de Paleobotanique, vol. 2, E. Boureau, Ed. 28 June 1968, 1442

Treasures of Prehistoric Art, A. Leroi-Gourhan, 12 July 1968, 150

Treatise on Collagen, vol. 1, G. N. Ramachandran, Ed.; vols 2 and 3, B. S. Gould, Ed., 11 Apr. 1969, 172

The Trial of the Assassin Guiteau, C. E. Rosenberg, 2 Aug. 1968, 453

Tritium-Labeled Molecules in Biology and Medicine, L. E. Feinendegen, 17 May

Tropical Crops: Dicotyledons, J. W. Purseglove, 7 Mar. 1969, 1050

Ultrastructure of Fertilization, C. R. Austin, 14 Mar. 1969, 1187

Uniformity and Simplicity, C. C. Albritton, Jr., Ed., 2 Aug. 1968, 453

The Unprepared Society, D. N. Michael, 4 Apr. 1969, 58

Urea as a Protein Supplement, M. H. Briggs, Ed., 22 Nov. 1968, 889

Venomous Animals and Their Venoms, vol. 1, W. Bücherl, E. E. Buckley, and V. Deulofeu, Eds., 31 May 1968, 984 Vistas in Astronomy, vol. 9, A. Beer, Ed., 29 Nov. 1968, 990

Water Deficits and Plant Growth, T. T. Kozlowski, Ed., 25 Apr. 1969, 416

Wirkungsmechanismen von Fungiziden und Antibiotika, M. Girbardt, Ed., 5 July 1968, 37

Wood as Raw Material, G. Tsoumis, 15 Nov. 1968, 788

Yams, D. G. Coursey, 14 Mar. 1969, 1188

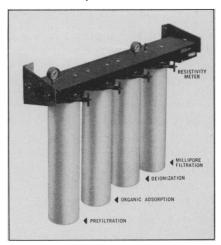
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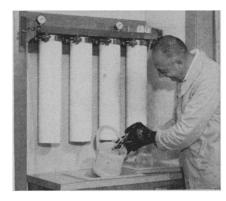
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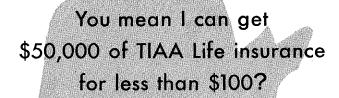
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Books Received

Advances in Computers. Vol. 9. Franz L. Alt and Morris Rubinoff, Eds. Academic Press, New York, 1968. xiv + 370 pp., illus. \$15.

Advances in Enzyme Regulation. Vol. 6. Proceedings of the 6th symposium on Regulation of Enzyme Activity and Synthesis in Normal and Neoplastic Tissues, Indianapolis, 1967. George Weber and Catherine E. Forrest Weber, Eds. Pergamon, New York, 1968. xiv + 518 pp., illus. \$19.

Advances in Nuclear Physics. Vol. 2. Michel Baranger and Erich Vogt, Eds. Plenum, New York, 1969. xiv + 434 pp., illus. \$18.50.

Advances in Parasitology. Vol. 6. Ben Dawes, Ed. Academic Press, New York, 1968. xx + 416 pp., illus. \$13.50.

Aghvook, White Eskimo. Otto Geist and Alaskan Archaeology. Charles J. Keim. University of Alaska Press, College. 1969 (distributor, University of Washington Press, Seattle). xx + 316 pp. + 41 plates. \$7.95.

Analysis and Synthesis of Linear Active Networks. Sanjit Kumar Mitra. Wiley, New York, 1969. xviii + 574 pp., illus. \$15.95.

The Analysis of Certain Major Classes of Upper Palaeolithic Tools. Hallam L. Movius, Jr., Nicholas C. David, Harvey M. Bricker, and R. Berle Clay. Hugh Hencken, Ed. Peabody Museum, Harvard University, Cambridge, Mass., 1968. iv + 60 pp., illus. Paper, \$2. American School of Prehistoric Research, Bulletin No. 26.

Analysis of Organoaluminium and Organozinc Compounds. T. R. Crompton. Pergamon, New York, 1968. xvi + 356 pp., illus. \$16. International Series of Monographs in Analytical Chemistry, vol. 31.

Animal Social Psychology. A Reader of Experimental Studies. Robert B. Zajonc. Wiley, New York, 1969. x + 326 pp., illus. \$10.95. Series in Psychology.

The Apparatus of Science at Harvard, 1765–1800. Collection of Historical Scientific Instruments. David P. Wheatland, assisted by Barbara Carson. Harvard University Press, Cambridge, Mass., 1968. xii + 204 pp., illus. \$20.

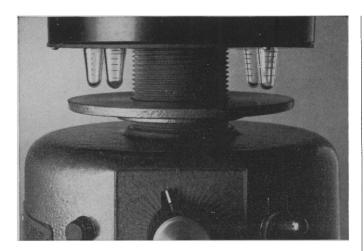
Applications de l'électricité à la biologie et à l'aménagement des pêches continentales. A symposium, Belgrade, 1966. Institut National de la Recherche Agronomique, Paris; United Nations Food and Agricultural Organization, Rome, 1968. 280 pp., illus. 35 F. Commission Européenne Consultative pour les Pêches dans les Eaux Intérieures.

Applications of Critical Path Techniques. A conference, Brussels, 1967. Jas. Brennan, Ed. Elsevier, New York, 1969. viii + 452 pp., illus. + 15 plates. \$19.50.

Applied Animal Nutrition. The Use of Feedstuffs in the Formulation of Livestock Rations. E. W. Crampton and L. E. Harris. Freeman, San Francisco, ed. 2, 1969. xxiv + 760 pp., illus. \$12. Agricultural Science Series.

Applied Automata Theory. Julius T. Tou, Ed. Academic Press, New York, 1968. xii + 332 pp., illus. \$18. Electrical Science Series.

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ical Science for Nonscience Students. PSNS Project Staff. Wiley, New York, 1969. xvi +544 pp., illus. \$8.95.

The Archaeology of New York State. William A. Ritchie. Published for the American Museum of Natural History by Natural History Press, Garden City, N.Y., ed. 2, 1969. xxxvi + 364 pp., illus. \$15.

Arms Control in International Politics. David V. Edwards. Holt, Rinehart and Winston, New York, 1969. viii + 200 pp. Cloth, \$7.50; paper, \$4.50.

Astronomers Royal. Colin A. Ronan. Doubleday, Garden City, N.Y., 1969. xiv + 226 pp., illus. + 16 plates, \$5.95.

Atomic Physics. Proceedings of the First International Conference on Atomic Physics, New York, 1968. Benjamin Bederson, Victor W. Cohen, and Francis M. J. Pichanick, Eds. Plenum, New York, 1969. xiv + 626 pp., illus. \$25.

Basic Quantum Mechanics. Klaus Ziock. Wiley, New York, 1969. xvi + 272 pp., illus. \$9.95.

Basic Ship Theory. K. J. Rawson and E. C. Tupper. Elsevier, New York, 1968. xx + 644 pp., illus. \$20.

Biodeterioration of Materials. Microbiological and Allied Aspects. Proceedings of the First International Biodeterioration Symposium, Southampton, England, 1968. A. Harry Walters and John J. Elphick, Eds. Elsevier, New York, 1968. x + 742 pp., illus. \$39.

Biological Aspects of Cancer and Aging. Studies in Pure Line Mice. Leonell C. Strong. Pergamon, New York, 1968. xvi + 224 pp., illus. \$10. International Series of Monographs in Pure and Applied Biology: Modern Trends in Physiological Sciences, vol. 31.

Biometeorology. Proceedings of the 28th Annual Biology Colloquium, Corvallis, Oregon, 1967. Theme: Weather and Life. 1968. x + 174 pp., illus. \$5.

The Book of Mars. Samuel Glasstone. National Aeronautics and Space Administration, Washington, D.C., 1968 (available from the Superintendent of Documents, Washington, D.C.). viii + 318 pp., illus. Paper, \$5.25. NASA SP-179.

CBW. Chemical and Biological Warfare. A conference, London, 1968. Steven Rose and David Pavett, Eds. Beacon, Boston, 1969. 214 pp. \$7.50.

Changing Services for Changing Clients. Published for the National Association of Social Workers by Columbia University Press, New York, 1969. xiv + 130 pp. Paper, \$3.

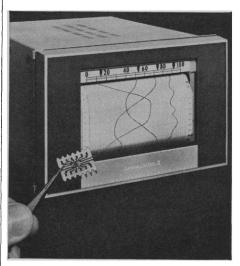
The Civilizational Process. Darcy Ribeiro. Translated from the Portuguese by Betty J. Meggers. Smithsonian Institution Press, Washington, D.C., 1968 (distributor, Random House, New York). xviii + 206 pp. + 2 plates. \$6.50. Smithsonian Publication 4749.

Clinical Aspects of Immunology. P. G. H. Gell and R. R. A. Coombs, Eds. Blackwell Scientific Publications, Oxford, ed. 2, 1968 (U.S. distributor, Davis, Philadelphia). xxxii + 1360 pp., illus. + 40 plates. \$26.

Collected Works of Count Rumford. Vol. 2, Practical Applications of Heat. Sanborn C. Brown, Ed. Belknap Press of Harvard University Press, Cambridge, Mass., 1969. xii + 524 pp., illus. \$10.

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Colorado River Guidebook. A Geologic and Geographic Guide from Lees Ferry to Phantom Ranch, Arizona. Troy L. Pewe. Published by the author, 538 East Fairmont Drive, Tempe, Ariz., ed. 2, 1969. 80 pp., illus. Paper, \$2.50.

Computational Solution of Nonlinear Operator Equations. Louis B. Rall. Wiley, New York, 1969. x + 230 pp., illus. \$14.95.

The Conflict of Generations. The Character and Significance of Student Movements. Lewis S. Feuer. Basic Books, New York, 1969. xii + 548 pp. \$12.50.

Constitution and Biosynthesis of Lignin. K. Freudenberg and A. C. Neish. Springer-Verlag, New York, 1968. x + 132 pp., illus. \$7. Molecular Biology, Biochemistry and Biophysics, vol. 2.

Contending Approaches to International Politics. Klaus Knorr and James N. Rosenau. Eds. Published for the Princeton Center of International Studies by Princeton University Press, Princeton, N.J., 1969. x + 302 pp., illus. \$7.50.

Continuum Theory of Inhomogeneities in Simple Bodies. A Reprint of Six Memoirs. W. Noll, R. A. Toupin, and C.-C. Wang. Springer-Verlag, New York, 1968. viii + 176 pp., illus. \$6.50.

Control of Plant-Parasitic Nematodes. Subcommittee on Nematodes, Committee on Plant and Animal Pests, Agricultural Board, National Research Council. National Academy of Sciences, Washington, D.C., 1968. xii + 172 pp., illus. Paper, \$5. Principles of Plant and Animal Pest Control, vol. 4. NAS Publication 1969.

Convex Structures and Economic Theory. Hukukane Nikaido. Academic Press, New York, 1968. xiv + 410 pp., illus. \$19.50. Mathematics in Science and Engineering, vol. 51.

The Course of Evolution. J. Marvin Weller. Illustrated by Harriet Weller. McGraw-Hill, New York, 1969. xxvi + 702 pp., illus. \$15.50. McGraw-Hill Series in Population Biology.

Cryosurgery of Skin Cancer and Cryogenic Techniques in Dermatology. Setrag A. Zacarian. Thomas, Springfield, Ill., 1969. xiv + 226 pp., illus. \$20.50.

The Cultural History of Marlborough, Virginia. An Archeological and Historical Investigation of the Port Town for Stafford County and the Plantation of John Mercer, Including Data Supplied by Frank M. Setzler and Oscar H. Darter. C. Malcolm Watkins. Smithsonian Institution Press, Washington, D.C., 1968 (available from the Superintendent of Documents, Washington, D.C.). viii + 224 pp., illus. \$3.75. National Museum Bulletin 253.

Current American and Foreign Programs. Task Force on Prescription Drugs. U.S. Department of Health, Education, and Welfare, Washington, D.C., 1968 (available from the Superintendent of Documents, Washington, D.C.). xviii + 206 pp., illus. Paper, \$2. Background Pa-

Deep-Water Teleostean Fishes in California. John E. Fitch and Robert J. Lavenberg. University of California Press, Berkeley, 1968. 160 pp., illus. Paper, \$2.25. California Natural History Guides, No. 25.

Dinoflagellates of the Caribbean Sea and Adjacent Areas. E. J. Ferguson Wood.

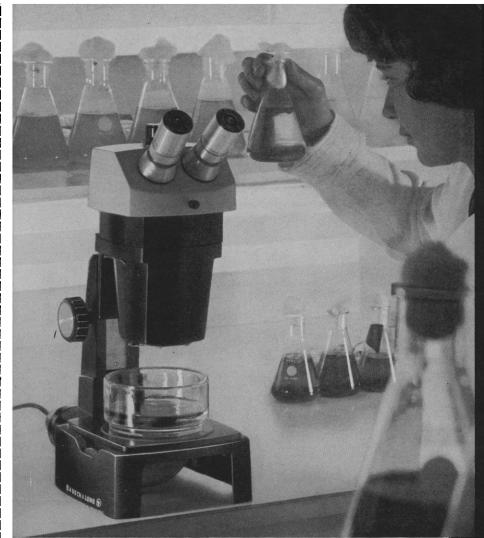


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University of Miami Press, Coral Gables, Fla., 1969. 144 pp., illus. \$12.

Discussion and Group Methods. Theory and Practice. Ernest G. Bormann. Harper and Row, New York, 1968. xii + 340 pp., illus. \$8.95.

The Dropout. Causes and Cures. Lucius

The Dropout. Causes and Cures. Lucius F. Cervantes, with the assistance of Grace Platts Husted. University of Michigan Press, Ann Arbor, 1969. x + 246 pp. Cloth, \$5.95; paper, \$2.45. Reprint of the 1965 edition.

The Drug Makers and the Drug Distributors. Task Force on Prescription Drugs. U.S. Department of Health, Education, and Welfare, Washington, D.C., 1968 (available from the Superintendent of Documents, Washington, D.C.). viii + 88 pp., illus. Paper, \$1. Background Papers.

The Drug Prescribers. Task Force on Prescription Drugs. U.S. Department of Health, Education, and Welfare, Washington, D.C., 1968 (available from the Superintendent of Documents, Washington, D.C.). x + 54 pp. Paper, 60ϕ . Background Papers.

The Drug Users. Task Force on Prescription Drugs. U.S. Department of Health, Education, and Welfare, Washington, D.C., 1968 (available from the Superintendent of Documents, Washington, D.C.). xii + 148 pp., illus. Paper, \$1.50. Background Papers.

The Earth in Space. A collection of papers dedicated to Sydney Chapman. A. H. Cook and T. F. Gaskell, Eds. Published for the Royal Astronomical Society by Blackwell Scientific Publications, Oxford, 1968. viii + 248 pp., illus. + 11 plates. \$15. Reprinted from the Geophysical Journal of the Royal Astronomical Society, vol. 15, Nos. 1 and 2.

Economic Development. The Cultural Context. Thomas R. De Gregori and Oriol Pi-Sunyer. Wiley, New York, 1969. xiv + 146 pp. Cloth, \$6.95; paper, \$3.50.

L'Électronique Quantique. Daniel Launois. Presses Universitaires de France, Paris, 1968. 136 pp., illus. Paper, 3.30 F.

Engineering Compendium on Radiation Shielding. Vol. 1, Shielding Fundamentals and Methods. R. G. Jaeger, E. P. Blizard, A. B. Chilton, M. Grotenhuis, A. Hönig, Th. A. Jaeger, and H. H. Eisenlohr, Eds. Springer-Verlag, New York, 1968. xii + 540 pp., illus. \$60.

The Era of the System. How the Systems Approach Can Help Solve Society's Problems. Gerald Rabow. Philosophical Library, New York, 1969. vi + 154 pp. \$4.50.

Essays in Biochemistry. Vol. 4. P. N. Campbell and G. D. Greville, Eds. Published for the Biochemical Society by Academic Press, New York, 1968. x + 234 pp., illus. Paper, \$4.50.

Essays on World Education. The Crisis of Supply and Demand. International Conference on World Crisis in Education, Williamsburg, Va., 1967. George Z. F. Bereday, Ed. Oxford University Press, New York, 1969. xvi + 368 pp., illus. Cloth, \$7.50; paper, \$2.75.

Excavations at Pot Creek Pueblo.

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Ronald K. Wetherington. Fort Burgwin
Research Center, Taos, N.M., 1968. 104
pp., illus. Paper, \$2. Fort Burgwin Re-

search Center, No. 6.

Experiments in Physical Chemistry.

J. M. Wilson, R. J. Newcombe, A. R. Denaro, and R. M. W. Rickett. Pergamon, New York, ed. 2, 1968. xiv + 394 pp., illus. \$5.

Foundations of Differential Geometry. Vol. 2. Shoshichi Kobayashi and Katsumi Nomizu. Interscience (Wiley), New York, 1969. xvi + 472 pp. \$17.50. Interscience Tracts in Pure and Applied Mathematics, No. 15, Vol. 2.

Fracture. An Advanced Treatise. Vol. 2, Mathematical Fundamentals. H. Liebowitz, Ed. Academic Press, New York, 1968. xvi + 760 pp., illus. \$35.

Freshwater Fishes of Alabama. William F. Smith-Vaniz. Auburn University Agricultural Experiment Station, Auburn, Ala., 1968. x + 212 pp., illus. \$4.75.
Fundamentals of Immunology for Stu-

Fundamentals of Immunology for Students of Medicine and Related Sciences. Russell S. Weiser, Quentin N. Myrvik, and Nancy N. Pearsall. Lea and Febiger, Philadelphia, 1969. xviii + 366 pp., illus. \$9.75.

General System Theory. Foundations, Development, Applications. Ludwig von Bertalanffy. Braziller, New York, 1969. xvi + 290 pp., illus. Cloth, \$8.95; paper, \$3.95.

Handbook of World Salt Resources. Stanley J. Lefond. Plenum, New York, 1969. xxiv + 384 pp., illus. \$25. Monographs in Geoscience.

Heavily Doped Semiconductors. Viktor I. Fistul'. Translated from the Russian edition (Moscow, 1967) by Albin Tybulewicz. Plenum, New York, 1969. xii + 420 pp., illus. \$25. Monographs in Semiconductor Physics, vol. 1.

Helium-3 and Helium-4. William E. Keller. Plenum, New York, 1969. xii + 436 pp., illus. \$18.50. International Cryogenics Monograph Series, vol. 6.

A History of Machine Tools, 1700–1910. W. Steeds. Clarendon (Oxford University Press), New York, 1969. xx + 184 pp., illus. + 153 plates. \$17.75.

Human Factors in Quality Assurance. Douglas H. Harris and Frederick B. Chaney. Wiley, New York, 1969. xii + 236 pp., illus. \$10.95. Wiley Series in Human Factors.

Hydrogen-Bonded Solvent Systems. Proceedings of a symposium on Equilibria and Reaction Kinetics in Hydrogen-Bonded Solvent Systems, Newcastle upon Tyne, England, 1968. A. K. Covington and P. Jones, Eds. Taylor and Francis, London, 1968. xvi + 356 pp., illus. \$14.50.

Information in the Language Sciences. Proceedings of a conference, Warrenton, Va., 1966. Robert R. Freeman, Alfred Pietrzyk, and A. Hood Roberts, Eds. Elsevier, New York, 1968. xii + 248 pp., illus. \$15. Mathematical Linguistics and Automatic Language Processing, No. 5.

Interactions of Photons and Leptons with Matter. R. R. Roy and Robert D. Reed. Academic Press, New York, 1968. xiv + 322 pp., illus. \$14.50.

International Review of Neurobiology.

International Review of Neurobiology. Vol. 11. Carl C. Pfeiffer and John R. Smythies, Eds. Academic Press, New York, 1968. xx + 388 pp., illus, \$18,50.

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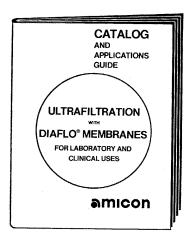
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The Mathematical Sciences. A Collection of Essays. Edited by the National Research Council's Committee on Support of Research in the Mathematical Sciences (COSRIMS) with the collaboration of George A. W. Boehm. Published for the NAS-NRC by MIT Press, Cambridge, Mass., 1969. xii + 276 pp., illus. \$8.95.

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Minnesota Symposia on Child Psychology. Vol. 2. Minneapolis, 1967. John P. Hill, Ed. University of Minnesota Press, Minneapolis, 1969. x + 174 pp., illus. \$5.

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The Oxford Book of Insects. Illustrations by Joyce Bee, Derek Whiteley, and Peter Parks. Text by John Burton, with I. H. H. Yarrow, A. A. Allen, L. Parmenter, and I. Lansbury. Oxford University Press, New York, 1968. viii + 208 pp., illus. \$10.

Papers on Evolution. Selected by Paul R. Ehrlich, Richard W. Holm, and Peter H. Raven. Little, Brown, Boston, 1969. xiv + 564 pp., illus. Paper, \$6.50.

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Peregrine Falcon Populations: Their Biology and Decline. A conference, Madison, Wis., 1965. Joseph J. Hickey, Ed. University of Wisconsin Press, Madison, 1969. xxii + 600 pp., illus. + plates. \$10.

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Physical Geography. Arthur N. Strahler. Wiley, New York, ed. 3, 1969. x + 740 pp., illus. + 5 plates. \$10.95.

Physical Measurement and Analysis of Thin Films. Eastern Analytical Symposium, New York, 1967. E. M. Murt and W. G. Guldner, Eds. Plenum, New York, 1969. xii + 196 pp., illus. \$12.50. Progress in Analytical Chemistry, vol. 2.

Physics. Samuel A. Marantz. Benziger, New York, 1969. xxii + 778 pp., illus.

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Joan Eiger Gottlieb. Reinhold, New York,
1968. xii + 116 pp., illus. Paper, \$2.25.
Selected Topics in Modern Biology.

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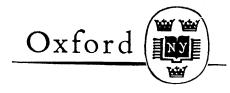
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vol. 155, art. 2, pp. 383-656.

Porphyrins and Related Compounds.
Biochemical Society Symposium No. 28,
London, 1968. T. W. Goodwin, Ed. Academic Press, New York, 1968. x + 176
pp., illus. \$6.75.

Principles of High-Resolution Radar. August W. Rihaczek. McGraw-Hill, New York, 1969. xii + 500 pp., illus. \$19.50.

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Proceedings of the International Symposium on Atomic, Molecular, and Solid-State Theory and Quantum Biology. Sanibel Island, Fla., 1968. Per-Olov Löwdin, Ed. Interscience (Wiley), New York, 1969. x + 382 pp., illus. Paper, \$17.50. International Journal of Quantum Chemistry, Symposium No. 2.

Proceedings of the Third Annual Leucocyte Culture Conference. Iowa City, 1967 William O. Rieke, Ed. Appleton-Century-Crofts, New York, 1969. xx + 736 pp., illus. \$15.

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Progress in Coordination Chemistry. Proceedings of the 11th International Conference on Coordination Chemistry, Haifa and Jerusalem, 1968. Michael Cais, Ed. Elsevier, New York, 1968. xxxvi + 856 pp., illus. \$45.

Prospectives of Pi-Interactions in Biological Systems. A conference, New York, 1967. Joseph Harris, Ed. New York Academy of Sciences, New York, 1969. Illus. Paper, \$8.50. Annals of the New York Academy of Sciences, vol. 153, art. 3, pp. 673–826.

Public Policy and the Use of the Seas. Norman J. Padelford. Department of Naval Architecture and Marine Engineering, Massachusetts Institute of Technology, Cambridge, 1968. xii + 362 pp., illus. Paper, \$5. Revised edition.

Public Policymaking Reexamined. Yehezkel Dror. Chandler, San Francisco, 1968 (distributor, Science Research Associates, Chicago). xiv + 374 pp., illus. \$7.50. Chandler Publications in Political Science.

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Report on a Collection of Mammals from Eastern New Guinea. Including Species Keys for Fourteen Genera. William Z. Lidicker, Jr., and Alan C. Ziegler. University of California Press, Berkeley, 1968. viii + 64 pp., illus. Paper, \$2.50. University of California Publications in Zoology, vol. 87.

A Revision of the Genus Camissonia (Onagraceae). Peter H. Raven. Smithsonian Institution Press, Washington, D.C., 1969 (available from the Superintendent of Documents, Washington, D.C.). Illus. Paper, \$1.75. Bulletin of the U.S. National Museum. Contributions from the U.S. National Herbarium, vol. 37, part 5, pp. 159–398.

Rich Schools, Poor Schools. The Promise of Equal Educational Opportunity. Arthur E. Wise. University of Chicago Press, Chicago, 1969. xiv + 230 pp. \$9.

Rings and Modules. Paulo Ribenboim. Interscience (Wiley), New York, 1969. viii + 168 pp., illus. \$12.95. Interscience Tracts in Pure and Applied Mathematics, No. 24.

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Social Mobility in the Caste System in India. An Interdisciplinary Symposium, Chicago, 1961. James Silverberg, Ed. Mouton, The Hague, 1968. 156 pp. Paper, 20 G. Comparative Studies in Society and History, Supplement 3.

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Sources of High-Intensity Ultrasound. Vol. 1. L. D. Rozenberg, Ed. Translated from the Russian edition (Moscow, 1967) by James S. Wood. Plenum, New York, 1969. xx + 316 pp., illus. \$25. Ultrasonic Technology.

Spektroskopische Methoden in der organischen Chemie. Rolf Borsdorf and Manfred Scholz. Akademie-Verlag, Berlin; Pergamon, New York; Vieweg, Braunschweig, 1968. 184 pp., illus. Paper, DM 6.80. Wissenschaftliche Taschenbücher, band 21.

A Stereotaxic Atlas of the Brain of the Cebus Monkey (Cebus apella). Sohan L. Manocha, Totada R. Shantha, and Geoffrey H. Bourne. Oxford University Press, New York, 1968. vi + 98 pp., illus. \$6.25.

Strategies of Educational Planning. Proceedings of the 2nd Annual Conference on the Economics of Education, Tallahassee, Fla., 1968. Richard H. P. Kraft, Ed. Educational Systems Development Center, Florida State University, Tallahassee, 1969. vi + 304 pp., illus. Paper.

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Vertebrates. C. J. McCoy, Jr. Reinhold, New York, 1968. x + 118 pp., illus. Paper, \$2.25. Selected Topics in Modern Biology.

Water in Biological Systems. A symposium, Tbilisi, U.S.S.R., 1966. L. P. Kayushin, Ed. Translated from the Russian edition (Moscow, 1967). Consultants Bureau, New York, 1969. viii + 112 pp., illus. Paper, \$15.

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Yengema Cave Report. Carleton S. Coon, in collaboration with Harvey M. Bricker, Frederick Johnson, and C. Lamberg-Karlovsky. University Museum, University of Pennsylvania, Philadelphia, 1968. viii + 78 pp., illus. + 35 plates. Paper, \$3.50. Museum Monographs.



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