

Only a few relatively minor defects are apparent. The bibliography might well have been made more extensive. Its 80 references include only a few reviews and chiefly recent articles from which (one hopes) it should be possible to trace back the relevant literature. In view of the role of vitamin A in keratinization in vertebrate tissue, the statement (p. 107) that it has no role apart from production of visual pigments may be questioned. It would have been of interest to include a discussion of the metabolic role (or of the little that is known about it) of the numerous symbiotic microorganisms of insects. But these are small matters compared to the positive values of this highly readable book.

WILLIAM TRAGER  
Rockefeller Institute, New York

## Radiation Research

**Advances in Radiation Biology.** vol. 1. Leroy G. Augenstein, Ronald Mason, and Henry Quastler, Eds. Academic Press, New York, 1964. x + 285 pp. Illus. \$11.

Until recently there were no review series devoted especially to the biological aspects of radiation research. Now there are two; the one reviewed here, *Advances in Radiation Research*, and *Current Topics in Radiation Research*, which was reviewed in the 7 May 1965 issue of *Science*. It is regrettable that this duplication has occurred. Both volumes contain well-written articles, but there is certainly no need for two review series in this one field. It is also regrettable that the present series, which offers no more in content than the other, should be appreciably more expensive.

In the first article, on the radiation chemistry of aqueous solutions, Harold A. Schwarz gives a very clear, succinct picture of the present knowledge of the radiation chemistry of water. The evidence for various products of irradiated water is summarized and evaluated, and some emphasis is placed upon the importance of rate constants.

In another chapter Gordon Tollin provides an excellent review of the various physical processes in photosynthetic energy conversion. He discusses the absorption and emission of

light, energy transfer, and electronic charge migration, with special emphasis on photosynthetic pigments in vitro. Attempts are made to relate these theories and observations to the energy conversion processes in photosynthesis, but they demonstrate the difficulty in making the connection between the simplified in vitro systems and the organized system in the cell.

Donald E. Wimber's chapter on intracellular irradiation with tritium should be read by all those who use this radionuclide for labeling purposes, for it is clear that the biological effects of the radiation from tritium are not negligible in many situations. Wimber gives a well-balanced account of the still rather scanty evidence on this problem.

The effects of small doses of radiation, in the order of a few tens of rads down to even fractions of a rad, are reviewed by Arne Forssberg. The information on this subject has been quite scattered, and it is valuable to have it brought together in a careful and critical review.

The chapter by J. Liebster and J. Kopoldová, on the radiation chemistry of amino acids, is a long and careful compilation of the many reactions for which there is some evidence; each amino acid or group of amino acids is discussed in turn. The chapter will probably be of great use to investigators in this field, but it will be less useful than the other chapters to those who want a succinct picture of a field other than their own.

In the final chapter, "The relative role of ionization and excitation processes in the radiation inactivation of enzymes," Leroy G. Augenstein, Tor Brustad, and Ronald Mason emphasize the theory of energy absorption and conversion processes. These authors make a particular point of studies on the temperature dependence of inactivation by radiation and point out the difficulties with the simpler ionization models for radiation action.

In general this is a well-written volume that will repay reading by anyone in the field.

R. F. KIMBALL

Biology Division,  
Oak Ridge National Laboratory,  
Oak Ridge, Tennessee

*Erratum:* In my review of *Principles of Dynamics*, by Donald T. Greenwood [*Science* **148**, 810 (1965)], I cited errors in Problem 5-9 and Eqs. (8-308). The author has shown me that he is in fact correct in both instances.—E. E. ZAJAC.

## New Books

### General

**From Semaphore to Satellite.** Anthony R. Michaelis. International Telecommunication Union, Geneva, 1965. 343 pp. Illus. \$9.50.

**Galileo: The Man, His Work, His Misfortunes.** James Brodrick. Harper and Row, New York, 1965. 152 pp. Illus. \$3.50.

**Grasses of the Texas Coastal Bend** (Calhoun, Refugio, Aransas, San Patricio, and northern Kleberg counties). Frank W. Gould and Thadys W. Box. Texas A&M Univ. Press, College Station, 1965. 197 pp. Illus. \$3.25.

**The Habitable Earth.** Ronald Fraser. Basic Books, New York, 1965. 155 pp. Illus. \$4.50. Science and Discovery Series.

**Hegel: Reinterpretation, Texts, and Commentary.** Walter Kaufmann. Doubleday, Garden City, N.Y., 1965. 498 pp. \$6.95.

**Human Diversity: The Nature and Significance of Differences among Men.** Kenneth Mather. Free Press (Macmillan), New York, 1965. 134 pp. Illus. \$5.95.

**An Illustrated Elementary Classification of Minerals, Rocks, and Fossils.** H. C. Curwen. Pergamon, London; Macmillan, New York, 1965. 195 pp. Illus. \$6.50.

**Industrial Wastewater Control.** A textbook and reference work. C. Fred Gurnham, Ed. Academic Press, New York, 1965. Twenty-four papers on the following topics: Food products—Animal (4 papers); Food products—Vegetable (4 papers); Mining (3 papers); Mineral products (4 papers); Manufactured products (6 papers); and General industries (3 papers). Chemical Technology Series of Monographs, edited by Raymond F. Baddour.

**Mental Retardation: Its Nature and Incidence.** A population survey of the state of Delaware. Joseph F. Jastak, Halsey M. MacPhee, and Martin Whiteman. Univ. of Delaware Press, Newark, 1963. 204 pp. \$6 (order from the University Bookstore, Univ. of Delaware).

**Missions to the Niger.** vol 1, *The Journal of Friedrich Hornemann's Travels from Cairo to Murzuk in the Years, 1797-98*; [and] *The Letters of Major Alexander Gordon Laing, 1824-26*. E. W. Bovill, Ed. Published for the Hakluyt Society by Cambridge Univ. Press, New York, 1964. 420 pp. Illus. \$7.50.

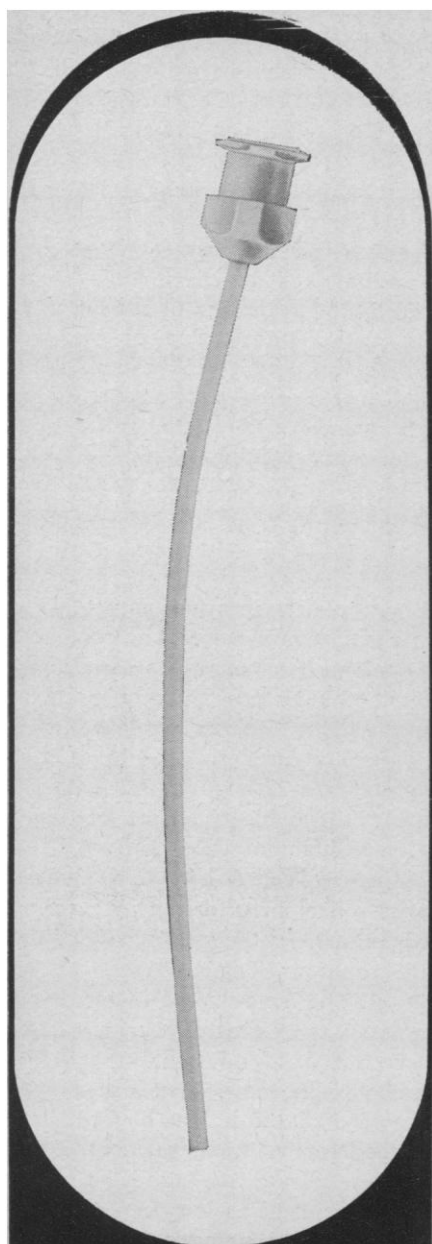
**The New Priesthood: The Scientific Elite and the Uses of Power.** Ralph E. Lapp. Harper and Row, New York, 1965. 254 pp. \$4.95.

**On the Nature of Things.** Lucretius. Wendell Clausen, Ed. Translated by H. A. J. Munro. Washington Square Press, New York, ed. 2, 1965. 205 pp. Paper, 60¢.

**Physiatric Dictionary.** Glossary of physical medicine and rehabilitation. Herman L. Kamenetz. Thomas, Springfield, Ill., 1965. 181 pp. \$6.75.

**Priestly Lectures.** The 39th annual lectures (April 1965). pt. 1, *Chemical and Biological Studies with Deuterium* by Joseph Katz; pt. 2, *Chemistry in Liquid Metal Solvents* by Harold M. Feder, Phi Lambda Upsilon, Pennsylvania State Univ., University Park, 1965. 145 pp. Illus. Paper, \$3.25.

(Continued on page 1772)



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### NEW BOOKS

(Continued from page 1712)

**Safety and Accident Prevention in Chemical Operations.** Howard H. Fawcett and William S. Wood, Eds. Interscience (Wiley), New York, 1965. 637 pp. Illus. \$19.75. Thirty-one papers contributed by George T. Austin, Arthur H. Christian, Howard H. Fawcett, John H. Foulger, Michael A. Gimbel, Alfred J. Gorand, John V. Grimaldi, Joseph Guelich, Arthur B. Guise, W. G. Hudson, D. J. Kilian, Alan L. Kling, David M. Liston, Jr., Elliott MacDermid, Eleanor Mort, Jeremiah J. O'Driscoll, Donald Richmond, Jack S. Snyder, Stanley F. Spence, Elwood Swisher, William S. Wood, Edmund D. Zeratsky, Robert W. Van Dolah, and David T. Smith.

**Science in Action.** George K. Stone and Lucy W. Stephenson. Prentice-Hall, Englewood Cliffs, N.J., 1965. 414 pp. Illus. \$5.32 (juvenile book; teachers' edition, 320 pp., paper, \$2.24).

**Science You Can Use.** George K. Stone and Lucy W. Stephenson. Prentice-Hall, Englewood Cliffs, N.Y., ed. 2, 1965. 415 pp. Illus. \$5.32 (juvenile book).

**The Scientist.** Henry Margenau, David Bergamini, and the editors of *Life*. Time Inc., New York, 1965. 199 pp. Illus. \$3.95. Life Science Library, René Dubos, Henry Margenau, and C. P. Snow, Consulting Editors.

**Scientists on Science.** Informal, informative talks from the David Sarnoff Industry-Science Training Program. Merwin Dembling. Dutton, New York, 1965. 160 pp. Illus. \$3.95.

**SER 1: Environmental Abstracts.** Directed by C. Theodore Larson. Architectural Research Laboratory, Univ. of Michigan, Ann Arbor, 1965. 765 pp. Illus. \$15.

**Sexual Inversion: The Multiple Roots of Homosexuality.** Judd Marmor, Ed. Basic Books, New York, 1965. 368 pp. \$8.50. Sixteen papers: The View of the Biological Sciences (3 papers); The View of the Social Sciences (5 papers); and The View of the Clinician (8 papers).

**The Solar System and the Constellations: A Guidebook.** Clifford N. Anderson. Vantage Press, New York, 1965. 286 pp. Illus. Charts. \$8.50.

**Subcortical Mechanisms of Behavior.** The psychological functions of primitive parts of the brain. Robert A. McCleary and Robert Y. Moore. Basic Books, New York, 1965. 160 pp. Illus. \$2.95. Basic Topics in Physiological Psychology Series, edited by Edwin G. Boring.

**Symposium on Personnel Dosimetry for Accident High-Level Exposure to External and Internal Radiation** (Vienna, Austria), March 1965. International Atomic Energy Agency, Vienna, 1965. Addendum (in original languages); unpagged. Paper. Sixty-two abstracts of papers; the majority are in English and the others are in French and Russian.

**Three Centuries of Microbiology.** Hubert A. Lechevalier and Morris Solotorovsky. McGraw-Hill, New York, 1965. 544 pp. Paper, \$4.95.

**Ticks of the Genus Ixodes in Africa.** Don R. Arthur. Univ. of London Press, London; Oxford Univ. Press, New York, 1965. 356 pp. Illus. \$11.20.

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**Tizard.** Ronald W. Clark. M.I.T. Press, Cambridge, Mass., 1965. 478 pp. Illus. \$10.

**Translators and Translations: Services and Sources in Science and Technology.** Frances E. Kaiser, Ed. Special Libraries Assoc., New York, ed. 2, 1965. 224 pp. Paper, \$14.50. A list of 470 freelance translators and 87 commercial translating firms, located principally in the U.S. Part 3 covers 342 pools and other sources of translated information (for example, the Arctic Institute of North America and the Argus Information Service), and part 4 cites 194 bibliographies and lists of translated literature. The five computer-produced indexes cover languages, subjects, geographical distribution, and international and national information centers, depositories, and societies.

**U.S. Military Strategy in the Sixties.** Robert N. Ginsburgh. Norton, New York, 1965. 160 pp. \$4.

**La vie dans les mers.** Jean-Marie Pérès. Presses Universitaires de France, Paris, 1965. 128 pp. Paper. "Que Sais-je?." Le Point des Connaissances Actuelles, No. 72.

**Volcanism, Tectonism, and Plutonism in the Western United States** (*Spec. Pap. Geol. Soc. Am.* No. 80). James Gilluly. Geological Soc. America, New York, 1965. 79 pp. Illus. Paper.

**Wanderers in the Sky: The Motions of Planets and Space Probes.** Thornton Page and Lou Williams Page, Eds. Macmillan, New York, 1965. 352 pp. Illus. \$7.95. A compilation of 99 articles published during the last 30 years in *The Telescope*, *The Sky*, and *Sky and Telescope*. The subject headings are: The Dawn of Understanding (11 papers); Newton's Mechanical System (15 papers); Recent Probing of Space (30 papers); The Hazards of Interplanetary Space (12 papers); and Our Moon, A Big Satellite (31 papers).

**Warriors of the Colorado: The Yumas of the Quechan Nation and Their Neighbors.** Jack D. Forbes. Univ. of Oklahoma Press, Norman, 1965. 398 pp. Illus. \$5.95.

**The Water Story in Central Iowa** (Water Atlas No. 1). F. R. Twenter and R. W. Coble. Iowa Geological Survey, Iowa City, 1965. 97 pp. Illus. Paper.

**Weed Control Handbook.** Issued by the the British Weed Control Council. E. K. Woodford and S. A. Evans, Eds. Blackwell, Oxford; Davis, Philadelphia, ed. 4, 1965. 452 pp. Illus. \$6.50.

**Where Science and Politics Meet.** Jerome B. Wiesner. McGraw-Hill, New York, 1965. 310 pp. \$6.95.

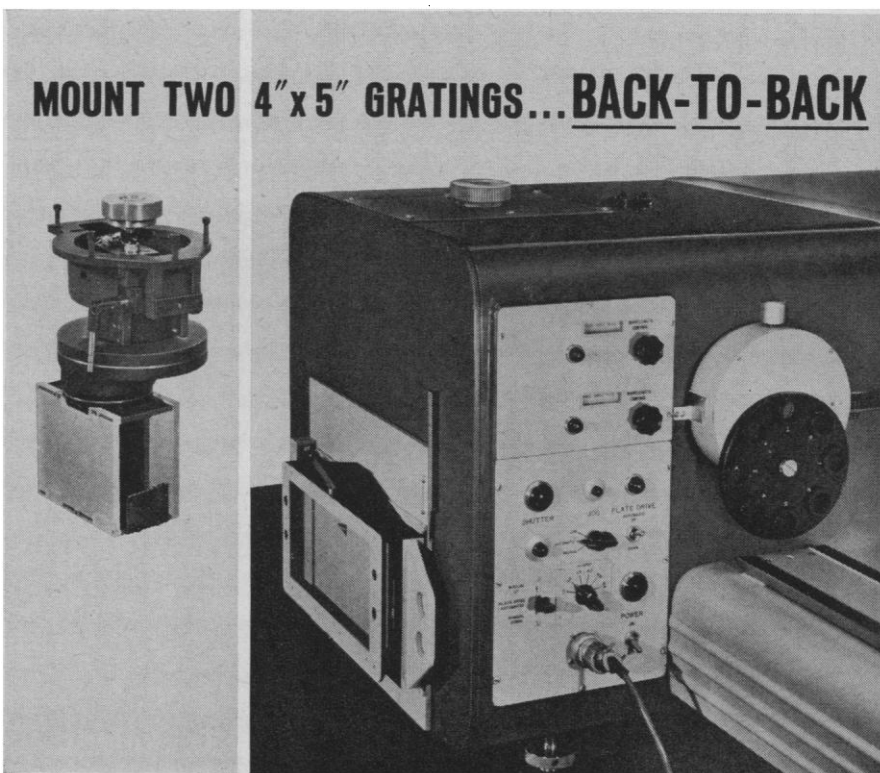
**The Works of Charles Darwin.** An annotated bibliographical handlist. R. B. Freeman. Dawsons, London, 1965. 91 pp. 55s.

**The World of Engineering.** John R. Whinnery, Ed. McGraw-Hill, New York, 1965. 316 pp. Illus. Paper, \$3.95; cloth, \$5.95. Eleven papers contributed by John R. Whinnery, L. Talbot, W. R. Hibbard, Jr., Rolf Eliassen, J. R. Pierce, Charles Süsskind, Leonardo Zeevaert, Charles T. Morrow, M. P. O'Brien, Irene Carswell Peden, and F. E. Terman.

**Zuni Grammar** (*Univ. New Mex. Publs. Anthropol.* No. 14). Stanley Newman. Univ. of New Mexico Press, Albuquerque, 1965. 77 pp. Paper, \$2.

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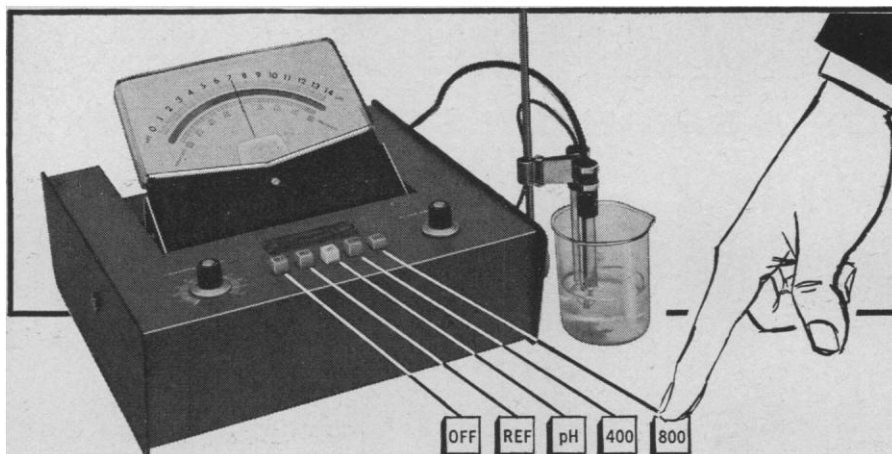


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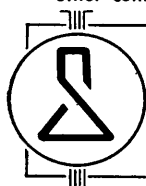
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**The Atomic Nucleus.** M. Korsunsky. Translated from the Russian by G. Yanovsky. Gordon and Breach, New York; Noordhoff, Groningen, Netherlands, 1965. 457 pp. Illus. \$12.50.

**Automatic Control Systems Engineering.** vols. 1 and 2. vol. 1, *Control Systems Engineering* (395 pp.); vol. 2, *Advanced Control Systems Engineering* (783 pp.). A. W. Langill, Jr. Prentice-Hall, Englewood Cliffs, N.J., 1965. Illus. \$16 each. International Series in Engineering of the Physical Sciences, edited by James B. Reswick and Warren M. Rohsenow.

**Basic Quantum Chemistry.** Leon F. Phillips. Wiley, New York, 1965. 190 pp. Illus. Paper, \$3.95; cloth, \$5.50.

**Chemistry of the Iron Group Metalloids: Ferrocene, Ruthenocene, Osmocene.** pt. 1. Myron Rosenblum. Interscience (Wiley), New York, 1965. 257 pp. Illus. \$12.50. The Chemistry of Organometallic Compounds Series, edited by Dietmar Seyferth.

**The Classical Atom.** Francis L. Friedman and Leo Sartori. Addison-Wesley, Reading, Mass., 1965. 128 pp. Illus. Paper, \$2.50. Addison-Wesley Series in Physics: Origins of Quantum Physics, vol. 1, David Lazarus, Consulting Ed.

**The Classical Moment Problem: And Some Related Questions in Analysis.** N. I. Akhiezer. Translated from the Russian edition (Moscow, 1961) by N. Kemmer. Hafner, New York, 1965. 263 pp. Illus. \$10. University Mathematical Monographs, edited by D. E. Rutherford.

**Concepts of Calculus.** A. H. Lightstone. Harper and Row, New York, 1965. 507 pp. Illus. \$8.75. Harper's Modern Mathematics Series (undergraduate title), edited by I. N. Herstein and Gian-Carlo Rota.

**A Concise Text-Book of Organic Chemistry.** C. G. Lyons, S. McLintock, and Nora H. Lumb. Pergamon, London, 1965. 263 pp. Illus. Paper, 21s. The Commonwealth and International Library Series, edited by Sir Robert Robinson and Athelstan Spilhaus.

**A Course in Mathematical Analysis.** vol. 3, pt. 2, *Integral Equations Calculus of Variations.* Édouard Goursat. Translated from the French ed. 5 (Paris, 1956) by Howard G. Bergmann. Dover, New York, 1964. 401 pp. Illus. Paper, \$2.75.

**Diffusion Processes and Their Sample Paths.** Kiyosi Itô and Henry P. McKean, Jr. Academic Press, New York; Springer, Berlin, 1965. 339 pp. Illus. \$14.50. Die Grundlehren der Mathematischen Wissenschaften in Einzeldarstellungen, vol. 125, edited by J. L. Doob, E. Heinz, F. Hirzebruch, E. Hopf, H. Hopf, W. Maak, S. MacLane, W. Magnus, F. K. Schmidt, and K. Stein.

**Double Layer and Electrode Kinetics.** Paul Delahay. Interscience (Wiley), New York, 1965. 333 pp. Illus.

**Dynamics of Nonhomogeneous Fluids.** Chia-Shun Yih. Macmillan, New York, 1965. 320 p. Illus. \$11.95. Macmillan Series in Advanced Mathematics and Theo-



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retical Physics, edited by Mark Kac and  
others.

**Electron and Ion Beam Science and  
Technology.** First International Conference  
(Toronto, Canada), May 1964. Robert  
Bakish, Ed. Wiley, New York, 1965. 957  
pp. Illus. \$24.50. Forty-seven papers pre-  
sented at the conference which was spon-  
sored by the Electrothermics and Metal-  
lurgy Divisions of the Electrochemical So-  
ciety in cooperation with the Metallurgical  
Society.

**Electrospark Machining of Metals.** vol.  
3. B. A. Krasnyuk, Ed. Translated from  
the Russian edition (Moscow, 1963). Con-  
sultants Bureau, New York, 1965. 184  
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**Elementary Applied Thermodynamics.**  
Irving Granet. Wiley, New York, 1965.  
298 pp. Illus. \$8.

**Elementary Differential Equations.** Wil-  
liam E. Boyce and Richard C. DiPrima.  
Wiley, New York, 1965. 375 pp. Illus.  
\$7.75.

**Epoxides and Their Derivatives.** M. S.  
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I.P.S.T. Staff. Israel Program for Scien-  
tific Translations, Jerusalem; Davey, New  
York, 1965. 511 pp. Illus. \$20.25.

**Error in Digital Computation.** vol. 1.  
Proceedings of an advanced seminar (Mad-  
ison, Wis.), October 1964. Louis B. Rall,  
Ed. Wiley, New York, 1965. 334 pp. Illus.  
\$6.75. Five papers: "The problem of error  
in digital computation" by John Todd;  
"Techniques for automatic error monitor-  
ing and control" by Robert L. Ashenurst;  
"The automatic analysis and control of  
error in digital computing based on the  
use of interval numbers" by Ramon E.  
Moore; "Error in digital solution of linear  
problems" by Ernest L. Albasiny; and  
"The propagation of error in the digital  
integration of ordinary differential equa-  
tions" by Peter Henrici.

**Essentials of Modern Organic Chemis-  
try.** William A. Bonner and Albert J.  
Castro. Chapman and Hall, London; Rein-  
hold, New York, 1965. 665 pp. Illus. \$8.95.

**Functional Analysis.** Kôzaku Yosida.  
Academic Press, New York; Springer,  
Berlin, 1965. 470 pp. Illus. \$16.50. Die  
Grundlehren Der Mathematischen Wis-  
senschaften, vol. 123.

**Functionals and Their Applications.** Se-  
lected topics, including integral equations.  
Griffith Conrad Evans. Dover, New York,  
1964. 159 pp. Illus. Paper, \$1.50. Enlarged  
and corrected republication of *Cambridge  
Colloquium*, 1916, pt. 1, 1918.

**Fundamental Chemistry.** Donald H. An-  
drews and Richard J. Kokes. Wiley, New  
York, ed. 2, 1965. 825 pp. Illus. \$8.50.

**Fundamentals of College Physics.** W.  
Wallace McCormick. Macmillan, New  
York, 1965. 831 pp. Illus. \$10.95.

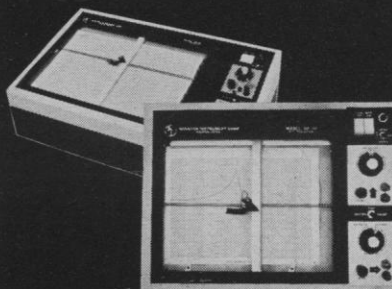
**Handbook for Theoretical Computation  
of Line Intensities in Atomic Spectra.** I.  
B. Levinson and A. A. Nikitin. Translated  
from the Russian edition (Leningrad,  
1962) by Z. Lerman. C. Roth, Transla-  
tion Ed. Israel Program for Scientific  
Translations, Jerusalem; Davey, New  
York, 1965. 248 pp. Illus. \$12.75.

**Handbook of Compositions at Thermo-  
dynamic Equilibrium.** Charles R. Nod-  
dings and Gary M. Mullet. Interscience  
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**Handbook of Vacuum Physics.** vol. 2,



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*Physical Electronics*. A. H. Beck, Ed. pt. 1, *Fundamentals of Electric Discharges in Gases*. Grey Morgan. Pergamon, London; Macmillan, New York, 1965. 186 pp. Illus. Paper, \$6.

**Introductory Numerical Analysis of Elliptic Boundary Value Problems**. Donald Greenspan. Harper and Row, New York, 1965. 176 pp. Illus. \$7. Harper's Series in Modern Mathematics, edited by I. N. Herstein and Gian-Carlo Rota.

**Irreducible Representations of the Space Groups**. O. V. Kovalev. Translated from the Russian edition (Kiev, 1961) by A. Murray Gross. Gordon and Breach, New York, 1965. 158 pp. Illus. \$7.

**Lattice Dynamics**. Proceedings of the international conference (Copenhagen, Denmark), August 1963. R. F. Wallis, Ed. Pergamon, London; Macmillan, New York, 1965. 746 pp. Illus. \$28.50. One hundred papers on the following topics: Phonon dispersion curves (32 papers); Anharmonic effects (11 papers); Optical and dielectric effects (18 papers); Defects and lattice vibrations (20 papers); Elasticity (8 papers); and Recent developments (11 papers).

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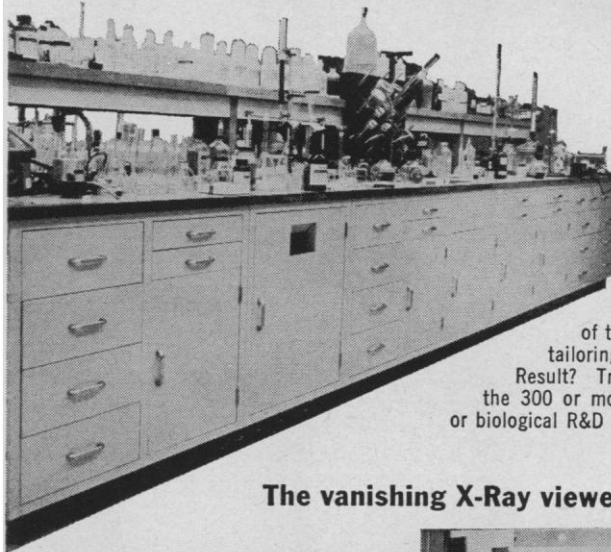
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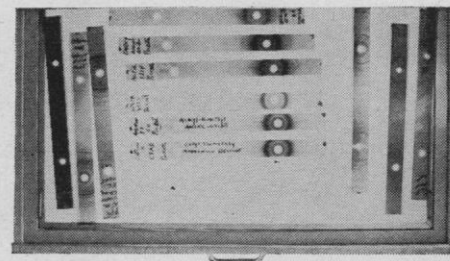
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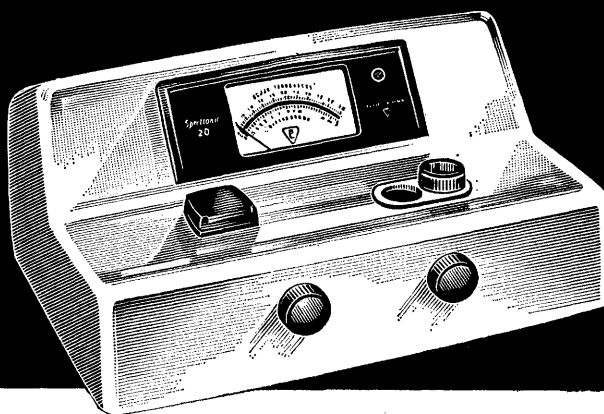
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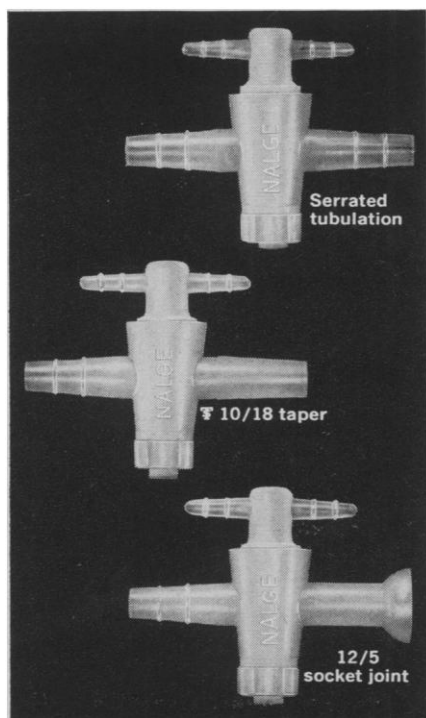
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