

drate bonding in plants, and the uses of commercial lignin products.

The author's familiarity with and attention to both the scientific and technological accomplishments in this difficult field will make his volume useful not only as a reference work but as a textbook; it should be appreciated by lignin investigators in both the academic and industrial spheres.

JOHN M. HARKIN

*Forest Products Laboratory,  
U.S. Department of Agriculture,  
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## Parts and Wholes in Biology

**Molecular Organization and Biological Function.** JOHN M. ALLEN, Ed. Harper and Row, New York, 1966. 255 pp., illus. Cloth, \$9; paper, \$5.

This multi-author volume contains eight essays which were presented as a lecture series at the University of Michigan in the spring of 1965. Thus from the start the reader faces the two-fold disadvantage of a substantial publication lag (which is of considerable significance for some of the fast-moving areas reviewed here) and the discontinuities in style, approach, and orientation which often afflict books written by several authors. Moreover, similar treatments of the same subjects, often by the same authors, have appeared elsewhere. So why this book? In my opinion its chief value lies in the collection of these essays into one small volume which can be read as a unit. For the "vertical sectioning" of molecular biology which this book as a whole represents drives home forcefully the basic notion that while cellular organelles and structures are made of molecules, the functions of these multimolecular structures are often much more than the sum of their unorganized molecular parts. Yet it is also clear that the parts contain within them the implicit interaction potentials needed to bring about, under appropriate conditions of environment and perhaps sequential availability of components, the self-assembly of the whole into a functional array.

This theme is clearly stated in the editor's preface and can be traced through the book by the appropriately oriented reader. The book opens with a discussion by Anfinsen on the "self-structuring" of protein conformations on the basis of information contained in the amino acid sequence, followed

by a review by Rich on the mechanisms whereby the nucleotide triplets of DNA are transcribed onto messenger RNA and then translated into sequenced polypeptide chains. Anderson then deals with the simplest type of multimolecular self-assembled system, represented by the bacteriophage, in which the whole is already much more than the sum of its parts. From here things become progressively more complex, and these complications correlate (of necessity) with a progressive loss of focus on the details of the molecular structure which is presumably responsible for the ever more complex edifices described: first Robertson on cell membranes, then Lehninger on mitochondria, Bogorad on chloroplasts, Dowling on visual receptors, and Gibbons on cilia and flagella.

The chapters are uniformly well written and profusely illustrated and provide something of value for each reader, be he a beginning student just becoming acquainted with molecular biology or a full-time research worker in one of the fields under discussion. However, it is likely that only the latter class of readers will be able to wring dry some of the more complex chapters.

But I hope that most readers will go through the entire book, for only in this way does the impact implicit in its organization come through. Both students and practicing investigators whose major interests fall on various parts of the spectrum of complexity presented here should be impressed and sobered: the molecular people with what an incredibly delicate balance of forces must be sorted out to "explain" the self-assembly of the complex structures from their constituent macromolecular parts, and the morphological people with the many levels of interacting organization which still remain to be fathomed before the beautiful structures they look at can be considered to be "understood."

It is a pity that even the paperbacked version of this book is expensive, since it is the sort of work that, if read by students, could help prevent the development and hardening of the "black boxes" which are often built around certain areas of subject matter as a consequence of the "horizontal" organization of many of our classical courses and research disciplines.

PETER H. VON HIPPEL

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Dartmouth Medical School,  
Hanover, New Hampshire*

## Books Received

**The Absorbent Mind.** Maria Montessori. Translated from the Italian by Claude A. Claremont. Holt, Rinehart and Winston, New York, 1967. 318 pp. Illus. \$6.95.

**Advances in Chromatography.** vol. 4. J. Calvin Giddings and Roy A. Keller, Eds. Dekker, New York, 1967. 394 pp. Illus. \$16.50. Seven papers.

**Analytical Chemistry of Plutonium.** M. S. Milyukova, N. I. Gusev, I. G. Sentyurin, and I. S. Sklyarenko. Translated from the Russian edition (Moscow, 1965) by J. Schmorak. Israel Program for Scientific Translations, Jerusalem; Davy, New York, 1967. 383 pp. Illus. \$21.

**Applied General Statistics.** Frederick E. Croxton, Dudley J. Cowden, and Sidney Klein. Prentice-Hall, Englewood Cliffs, N.J., ed. 3, 1967. 774 pp. Illus. \$10.

**Archaeology: An Illustrated Introduction.** Liam de Paor. Penguin Books, Baltimore, 1967. 111 pp. Illus. Paper, \$1.45.

**Biology of Invertebrata.** James H. Wilmoth. Prentice-Hall, Englewood Cliffs, N.J., 1967. 479 pp. Illus. \$12.

**Building Structures Primer.** James E. Ambrose. Wiley, New York, 1967. 133 pp. Illus. \$7.95.

**Calculus.** Michael Spivak. Benjamin, New York, 1967. 598 pp. Illus. \$12.90.

**Cataclysms of the Earth.** High Auchincloss Brown. Twayne, New York, 1967. 287 pp. Illus. \$6.

**The Chemistry of Organometallic Compounds: The Main Group Elements.** John J. Eisch. Macmillan, New York, 1967. 192 pp. Illus. \$5.95.

**Chemistry of Solids.** Andrew K. Galwey. Chapman and Hall, London; Barnes and Noble, New York, 1967. 220 pp. Illus. Paper, \$5.50; cloth, \$9.

**Chemistry of the Earth's Crust.** vol. 2. Proceedings of the Geochemical Conference commemorating the centenary of V. I. Vernadskii's birth. Translated from the Russian edition (Moscow, 1964) by N. Kaner. R. Amols, Translation Ed. Israel Program for Scientific Translations, Jerusalem; Davy, New York, 1967. 715 pp. Illus. \$25. Fifty-one papers.

**Le Chloroplaste: Croissance et Vieillesse.** C. Sironval, Ed. Masson, Paris, 1967. 365 pp. Illus. Paper, 75 F.

**The Computer in American Education.** A conference (Stanford, Calif.), November 1965. Sponsored by the Association for Educational Data Systems and the Stanford School of Education. Don D. Bushnell and Dwight W. Allen, Eds. Wiley, New York, 1967. 330 pp. Paper, \$3.95; cloth, \$5.95. Nineteen papers.

**Concepts and the Structure of Memory.** A symposium (Pittsburgh, Pa.), April 1966. Benjamin Kleinmuntz, Ed. Wiley, New York, 1967. 300 pp. Illus. \$7.95. Eleven papers.

**The Conquest of Epidemic Disease: A Chapter in the History of Ideas.** Charles-Edward Amory Winslow. Hafner, New York, 1967. 425 pp. \$9.50. Reprint, 1943 edition.

**The Corrosion of Light Metals.** Hugh P. Godard, W. B. Jepson, M. R. Bothe-well, and Robert L. Kane. Wiley, New York, 1967. 372 pp. Illus. \$13.95. The Corrosion Monograph Series.

(Continued on page 1492)

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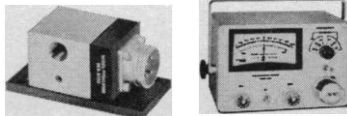
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**BOOKS RECEIVED**

(Continued from page 1428)

**Crop Responses to Water at Different Stages of Growth.** P. J. Salter and J. E. Goode. Commonwealth Agricultural Bureaux, Farnham Royal, Bucks, England, 1967. 256 pp. Illus. \$6.80.

**The Depth of Cold.** A. R. Meetham. Barnes and Noble, New York, 1967. 173 pp. Illus. \$4.75.

**Design of Active-Site-Directed Irreversible Enzyme Inhibitors.** B. R. Baker, Wiley, New York, 1967. 341 pp. Illus. \$13.50.

**Design of Digital Computers: An Introduction.** Hans W. Gschwind. Springer-Verlag, New York, 1967. 538 pp. Illus. \$19.80.

**Diabetes mellitus: Theorie-Klinik-Therapie.** G. Mohnike, Ed. Verlag Volk und Gesundheit, Berlin, 1967. 437 pp. Illus. MDN 34.90. Thirty-five papers.

**Dialogues on Mathematics.** Alfréd Rényi. Holden-Day, San Francisco, 1967. 106 pp. Illus. Paper, \$2.50; cloth, \$4.95.

**A Dictionary of Geography.** W. G. Moore. Praeger, New York, 1967. 254 pp. Illus. \$5.50.

**A Dictionary of Geology.** John Chalkinor. Univ. of Wales Press, Cardiff; Oxford Univ. Press, New York, ed. 3, 1967. 314 pp. Illus. \$6.75.

**Discovering Rocks and Minerals: A Nature and Science Guide to Their Collection and Identification.** Roy A. Gallant and Christopher J. Schuberth. Published for the American Museum of Natural History. Natural History Press, Garden City, N.Y., 1967. 127 pp. Illus. \$3.95.

**Earth Photographs from Gemini III, IV, and V.** Natl. Aeronautics and Space Administration, Washington, D.C., 1967 (order from Superintendent of Documents, Washington, D.C.). 276 pp. Illus. \$7.

**Education and Social Crisis.** Perspectives on teaching disadvantaged youth. Everett T. Keach, Jr., Robert Fulton, and William E. Gardner, Eds. Wiley, New York, 1967. 427 pp. Illus. Paper, \$4.95; cloth, \$7.95. Forty-nine papers.

**Electrochemistry of Semiconductors.** Viktor A. Myamlin and Yuri V. Pleskov. Translated from the Russian edition (Moscow, 1965). Plenum Press, New York, 1967. 454 pp. Illus. \$19.50.

**Electronic Absorption Spectra and Geometry of Organic Molecules.** An application of molecular orbital theory. Hiroshi Suzuki. Academic Press, New York, 1967. 582 pp. Illus. \$24.

**Electronic Counting Circuits.** J. B. Dance. Iliffe, London, 1967. 390 pp. Illus. \$16.75.

**Electronics for Biologists.** Franklin F. Offner. McGraw-Hill, New York, 1967. 197 pp. Illus. \$6.95.

**Elementary Particle Physics.** Stephen Gasiorowicz. Wiley, New York, 1966. 635 pp. Illus. \$14.95.

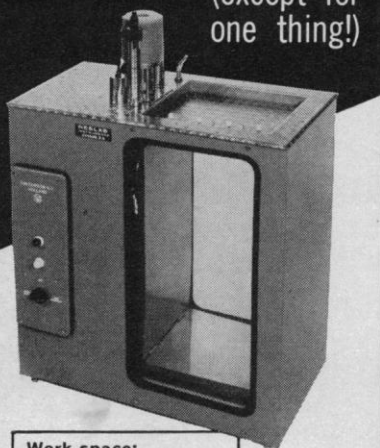
**Elementary Theory of Metals.** B. Donovan. Pergamon, New York, 1967. 273 pp. Illus. \$13.50. International Encyclopedia of Physical Chemistry and Chemical Physics.

**The Elements of Physics: A New Approach.** F. A. Kaempffer. Blaisdell (Ginn), Waltham, Mass., 1967. 303 pp. Illus. \$8.50.

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**Eleventh Symposium (International) on Combustion** (Berkeley, Calif.), August 1966. Organized by the Combustion Institute. Combustion Institute, Pittsburgh, Pa., 1967. 1224 pp. Illus. \$42. There are 117 papers.

**The Empty Ark.** Philip Kingsland Crowe. Scribner, New York, 1967. 319 pp. Illus. \$7.50. An account of three journeys in search of vanishing wildlife undertaken on behalf of the World Wildlife Fund.

**Encyclopaedic Dictionary of Physics.** Suppl. vol. 2. J. Thewlis, Ed. Pergamon, New York, 1967. 463 pp. Illus. \$25.

**Encyclopedia of Chemical Technology.** vol. 12, *Iron to Manganese*. Herman F. Mark, John J. McKetta, Jr., and Donald F. Othmer, Eds. Interscience (Wiley), New York, ed. 2, 1967. 919 pp. Illus. \$50.

**Encyclopedia of Polymer Science and Technology.** vol. 6, *Enzymes to Finishing*. Herman F. Mark, Norman G. Gaylord, and Norbert M. Bikales, Eds. Interscience (Wiley), New York, 1967. 832 pp. Illus. \$50.

**L'Endocrinologie des Vers et des Mollusques.** Maurice Durchon. Masson, Paris, 1967. 249 pp. Illus. Paper, 60 F.

**Engineering: An Introduction to a Creative Profession.** George C. Beakley and H. W. Leach. Macmillan, New York, 1967. 560 pp. Illus. \$9.95.

**Engineering Manual.** Robert H. Perry, Ed. McGraw-Hill, New York, ed. 2, 1967. Unpag. Illus. \$11.75.

**Entropy and Low Temperature Physics.** J. S. Dugdale. Hillary House, New York, 1967. 206 pp. Illus. \$6.

**Environmental Perception and Behavior.** A symposium (Columbus, Ohio), April 1965. David Lowenthal, Ed. Department of Geography, Univ. of Chicago, Chicago, 1967. 94 pp. Illus. Paper, \$4. Five papers.

**Epidemic Disease in Mexico City, 1761-1813: An Administrative, Social, and Medical Study.** Donald B. Cooper. Published for the Institute of Latin American Studies. Univ. of Texas Press, Austin, 1967. 250 pp. \$6.

**Essays in Biosynthesis and Microbial Development.** John D. Bu'Lock. Wiley, New York, 1967. 83 pp. Illus. \$5.95. E. R. Squibb Lectures on Chemistry of Microbial Products.

**Ethnographic Atlas.** George Peter Murdock. Univ. of Pittsburgh Press, Pittsburgh, 1967. 134 pp. \$4.95.

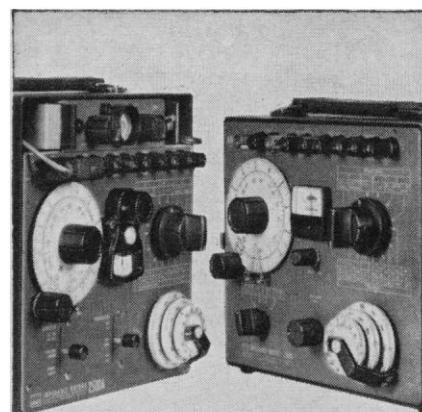
**Evolution and Human Behavior.** Alexander Alland, Jr. Published for the American Museum of Natural History. Natural History Press, Garden City, N.Y., 1967. 259 pp. Illus. Paper, \$1.45; cloth, \$5.95.

**Evolution of the Forebrain: Phylogenesis and Ontogenesis of the Forebrain.** A symposium (Frankfurt and Sprengling, Germany), August 1965. R. Hassler and H. Stephan, Eds. Thieme, Stuttgart, 1966; Plenum, New York, 1967. 472 pp. Illus. \$28.

**The Evolution of the Microscope.** S. Bradbury. Pergamon, New York, 1967. 367 pp. Illus. \$12.50.

**Experiments in Second-Language Learning.** Edward Crothers and Patrick Suppes. Academic Press, New York, 1967. 384 pp. Illus. \$13.50.

**Fertilization: Comparative Morphology, Biochemistry, and Immunology.** vol. 1.



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Charles B. Metz and Alberto Monroy, Eds. Academic Press, New York, 1967. 503 pp. Illus. \$19. Nine papers.

**Fiber Optics: Principles and Applications.** N. S. Kapany. Academic Press, New York, 1967. 447 pp. Illus. \$17.50.

**536 Puzzles and Curious Problems.** Henry Ernest Dudeney. Scribner, New York, 1967. 442 pp. Illus. \$7.95.

**Fortschritte der Zoologie.** vol. 18, pt. 2. Hans Bauer and Gerhard Czihak, Eds. Fischer, Stuttgart, 1967. 336 pp. Illus. Paper. Four papers.

**Friction and Lubrication.** F. P. Bowden and D. Tabor. Methuen, London; Barnes and Noble, New York, 1967. 178 pp. Illus. \$3.75. Methuen's Monographs on Physical Subjects.

**The Genetic Analysis of Behaviour.** P. A. Parsons. Methuen, London; Barnes and Noble, New York, 1967. 184 pp. Illus. \$4.50.

**The Geography of Frontiers and Boundaries.** J. R. V. Prescott. Aldine, Chicago, 1967. 190 pp. Illus. Paper, \$2.45. Reprint, 1965 edition.

**Geography of Religions.** David E. Sopher. Prentice-Hall, Englewood Cliffs, N.J., 1967. 128 pp. Illus. Paper, \$1.95; cloth, \$4.50. Foundations of Cultural Geography Series.

**The Geography of Soil.** Brian T. Bunting. Aldine, Chicago, 1967. 213 pp. Illus. Paper, \$2.45. Reprint, 1965 edition.

**The Geology of Carbonatites.** E. W. Heinrich. Rand McNally, Chicago, 1967. 621 pp. Illus. \$10.

**Guide to Fluorescence Literature.** Richard A. Passwater. Plenum Press, New York, 1967. 375 pp. \$19.50.

**A Guide to the Laser.** David Fishlock, Ed. Elsevier, New York, 1967. 174 pp. Illus. \$8.50. Eleven papers.

**Edmond Halley.** Angus Armitage. Nelson, London, 1966. 232 pp. Illus. 42s.

**Hamilton's Principle and Physical Systems.** B. R. Gossick. Academic Press, New York, 1967. 261 pp. Illus. \$8.50.

**Handbook of Telemetry and Remote Control.** Elliot L. Gruenberg, Ed. McGraw-Hill, New York, 1967. Unpaged. Illus. \$35.

**Histologie und Zytologie des Menschen: Einführung für Ärzte und Studenten.** H. Leonhardt. Thieme, Stuttgart, 1967. 415 pp. Illus. DM. 10.80.

**An International Bibliography: Water Resources Development, 1950-1965.** Compiled by H. Wellisch. Israel Program for Scientific Translations, Jerusalem; Davey, New York, 1967. 139 pp. Paper, \$8.50.

**International Review of Cytology.** vol. 21. G. H. Bourne and J. F. Danielli, Eds. Academic Press, New York, 1967. 400 pp. Illus. \$18. Seven papers.

**Introduction to Creative Design.** D. Henry Edel, Jr., Ed. Prentice-Hall, Englewood Cliffs, N.J., 1967. 251 pp. Illus. Paper, \$3.95; cloth, \$6.95.

**Introduction to Dynamic Systems.** James B. Reswick and Charles K. Taft. Prentice-Hall, Englewood Cliffs, N.J., 1967. 304 pp. Illus. \$8.95. Prentice-Hall Series in Engineering of the Physical Sciences.

**Introduction to Experimental Ecology.** T. Lewis and L. R. Taylor. Academic Press, New York, 1967. 413 pp. Illus. \$6.50.

**Introduction to Linear Algebra.** Peter J. Kahn. Harper and Row, New York, 1967. 464 pp. Illus. \$11.95. Harper's Series in Modern Mathematics.

**Introduction to the Quantum Theory of Scattering.** Leonard S. Rodberg and R. M. Thaler. Academic Press, New York, 1967. 412 pp. Illus. \$11.50.

**Invertebrate Nervous Systems: Their Significance for Mammalian Neurophysiology.** A conference (Pasadena, Calif.), January 1966. C. A. G. Wiersma, Ed. Univ. of Chicago Press, Chicago, 1967. 380 pp. Illus. \$10. Twenty-seven papers.

**Laboratory Manual of General Ecology.** George W. Cox. Brown, Dubuque, Iowa, 1967. 175 pp. Illus. Paper, \$3.75.

**Landmarks of the Western Heritage.** vol. 2, 1715 to the Present. C. Warren Hollister, Ed. Wiley, New York, 1967. 528 pp. Illus. Paper, \$4.95; cloth, \$7.95.

**The Larousse Encyclopedia of Animal Life.** Foreword by Robert Cushman Murphy. McGraw-Hill, New York, 1967. 640 pp. Illus. \$22.50 until 31 December; thereafter \$25.

**List Processing.** J. M. Foster. Elsevier, New York, 1967. 60 pp. Illus. \$4.50.

**Low Noise Electronics.** W. P. Jolly. Elsevier, New York, 1967. 159 pp. Illus. \$5. Introductory Science Texts.

**MAA Studies in Mathematics.** vol. 4, *Studies in Global Geometry and Analysis.* S. S. Chern, Ed. Published by the Mathematical Association of America. Prentice-Hall, Englewood Cliffs, N.J., 1967. 205 pp. Illus. \$4.

**Management Systems.** Peter P. Schoderbek. Wiley, New York, 1967. 495 pp. Illus. \$10.95. Wiley Series in Management and Administration.

**Mathematics and Computing: with FORTRAN Programming.** William S. Dorn and Herbert J. Greenberg. Wiley, New York, 1967. 613 pp. Illus. \$8.95.

**The Meaning of Crystallinity in Polymers.** American Chemical Society Symposium (Phoenix, Ariz.), January 1966. Fraser P. Price, Ed. Interscience (Wiley), New York, 1967. 155 pp. Illus. Paper, \$6.50. *Journal of Polymer Science*, No. 18, pt. C, Polymer Symposia.

**Mechanisms for Engineering Design.** S. B. Tuttle. Wiley, New York, 1967. 188 pp. Illus. \$9.95.

**Mechanisms of Inorganic Reactions: A Study of Metal Complexes in Solution.** Fred Basolo and Ralph G. Pearson. Wiley, New York, ed. 2, 1967. 715 pp. Illus. \$17.95.

**Methods of Contour Integration.** M. L. Rasulov. Translated by Scripta Technica. North-Holland, Amsterdam; Interscience (Wiley), New York, 1967. 453 pp. Illus. \$19. North-Holland Series in Applied Mathematics and Mechanics, vol. 3.

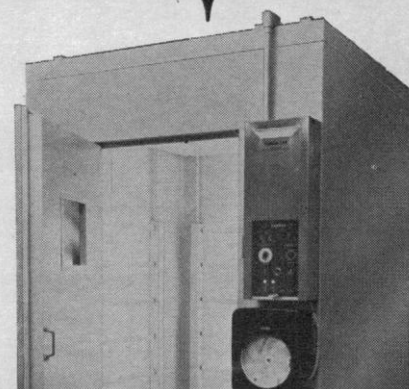
**Molecular Basis of Some Aspects of Mental Activity.** vols. 1 and 2. Proceedings of a NATO Advanced Study Institute (Drammen, Norway), August 1965. Otto Walaas, Ed. Academic Press, New York, 1966. vol. 1, 492 pp., \$19.50; vol. 2, 533 pp., \$21.50. Illus. Fifty-eight papers.

**Morphogenesis of the Vertebrates.** Theodore W. Torrey. Wiley, New York, ed. 2, 1967. 460 pp. Illus. \$10.95.

**The Next Ninety Years.** Proceedings of a conference (Pasadena, Calif.) March 1967. California Inst. of Technology, Pas-

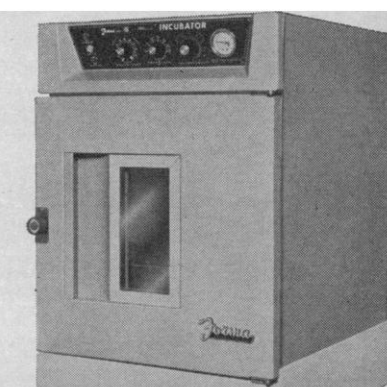
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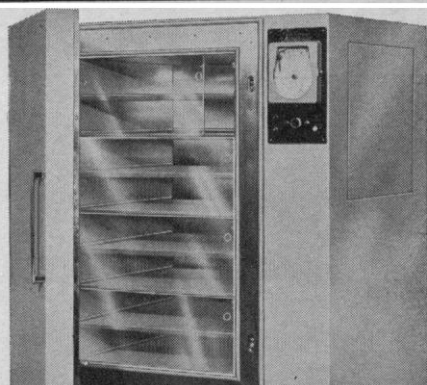
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adena, 1967. 194 pp. Illus. Paper. Seven papers and six discussions.

**Nutrition and the Composition of Milk.** Manfred Kirchgessner, Henning Friesecke, and Günter Koch. Translated from the German by Catherine T. M. Herriott. Lippincott, Philadelphia, 1967. 291 pp. Illus. \$11.

**Nutrition for the Growing Years.** Margaret McWilliams. Wiley, New York, 1967. 317 pp. Illus. \$6.95.

**Parliament, Parties, and Society in France 1946-1958.** Duncan MacRae, Jr. Macmillan, London; St. Martin's Press, New York, 1967. 391 pp. Illus. \$10.

**Parasites of North American Fresh-water Fishes.** Glenn L. Hoffman. Univ. of California Press, Berkeley, 1967. 496 pp. Illus. \$15.

**Peasant Society: A Reader.** Jack M. Potter, May N. Diaz, and George M. Foster, Ed. Little, Brown, Boston, 1967. 463 pp. Illus. Paper, \$4.75.

**Peptides.** Proceedings of the Eighth European Peptide Symposium (Noordwijk, The Netherlands), September 1966. H. C. Beyerman, A. van de Linde, and W. Maassen van den Brink, Eds. North-Holland, Amsterdam, 1967. 304 pp. Illus. \$12.50. Forty-six papers.

**Personal Selling: Behavioral Science Readings and Cases.** James H. Bearden. Wiley, New York, 1967. 373 pp. Illus. \$8.95.

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