

Antibacterial Agents

Chemistry and Functions of Colicins. Proceedings of a conference, Philadelphia, May 1972. LOWELL P. HAGER, Ed. Academic Press, New York, 1973. xiv, 138 pp., illus. \$7.50.

The resurgence of interest in colicins began in the early 1960's with the finding from Nomura's laboratory that the killing action of different colicins was exerted by a variety of biochemical mechanisms and was probably membrane-associated. To date the colicins isolated and purified appear to be simple proteins composed solely of amino acid residues. Recently, as reported in this volume, Nomura and his colleagues have shown that colicin E3 acts, in vivo and in vitro, as an extremely specific nuclease, cleaving a small fragment near the 3' terminal end of the 16S RNA of the 30S ribosomal subunit, but only in intact ribosomes. The mechanism of action of no other colicin is known in as much detail, although the closely related molecule E2 has been studied extensively by Almendinger and Hager, who report that it appears to cleave DNA through the intermediate action of endonuclease I.

An immunity mechanism, apparently involving a specific inhibitor, protects colicinogenic cells from the killing action of the colicin that they produce. The in vitro E3 assay system has permitted a start on the isolation of this very specific inhibitory material, which appears to be a protein. Konisky has shown that colicins Ia and Ib have very similar amino acid compositions and that antisera prepared against the two isolated colicins show almost total cross-reactivity, indicating very similar three-dimensional structures. Yet cells producing one of these two colicins are not immune to the other.

The genetic determinants of colicins, col factors, are stable extrachromosomal elements. Helinski summarizes his studies on the replication of these elements. A variety of closed circular forms are found or can be induced, and particularly intriguing is the implication of covalently linked RNA inserted as a primer in the DNA replication process.

Perhaps the most fascinating aspect of colicins is their close association with the cell membrane. They must be transported across the membrane during secretion from the colicinogenic cell. The target cells appear to have clearly defined receptors. Sabet and Schnaitman report on the isolation of E3 receptor

protein, which binds the colicin extremely tightly and appears to be located in the outer membrane of the cell and possibly not at all on the inner plasma membrane. Since E3 must come in direct contact with the 30S ribosomal subunit, the colicin molecule itself must at least penetrate completely through the inner membrane even if it is not released internally into the cytoplasm. In the case of E2, if it is working through an intermediate protein, its entire action could, of course, occur in a membrane-bound form. Luria *et al.*, using tryptic action on membrane-bound colicins K and E1, suggest their probable role in affecting amino acid transport. A clear-cut demonstration that colicins exert their influence by action in the cytoplasm or, conversely, while bound to the membrane has yet to be made. These substances provide remarkably interesting model systems for membrane action in general, with all the possibilities for genetic and biochemical manipulation that are available in *Escherichia coli* and other bacteria.

The subject matter of this book is fascinating. The chapters are not uniform but all are worth reading. The offset printing is good and the typographical errors are minimal (almost zero). The half-time for its usefulness will be short in this rapidly moving field and is measured by the date of the next symposium on colicins, which may already have occurred. The papers were presented in May 1972. It is too bad that the book could not have lived up to its trade description "Academic Press Rapid Manuscript Reproduction."

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Books Received

Advances in Biophysics. Vol. 4, 1973. Masao Kotani, Ed. University Park Press, Baltimore, and University of Tokyo Press, Tokyo, 1973. x, 234 pp., illus. \$14.50.

Advances in Electronics and Electron Physics. Vol. 34. L. Marton, Ed. Academic Press, New York, 1973. x, 362 pp., illus. \$29.50.

After Suicide. Samuel E. Wallace. Wiley-Interscience, New York, 1973. xvi, 270 pp. \$9.95.

Agents of Bacterial Disease. Albert S. Klainer and Irving Geis. Harper and Row, New York, 1973. xviii, 168 pp., illus. Paper, \$15.

Aliens from Space. The Real Story of Unidentified Flying Objects. Donald E.

Keyhoe. Doubleday, New York, 1973. xiv, 322 pp. \$7.95.

Alpha-Fetoprotein and Hepatoma. Papers from a symposium, Tokyo, Dec. 1971. Hidematsu Hirai and Toru Miyaji, Eds. University Park Press, Baltimore, 1973. viii, 320 pp., illus. \$29.50. GANN Monographs on Cancer Research, No. 14.

Assessment of Sexual Function. A Guide to Interviewing. Vol. 8, Report No. 88. Group for the Advancement of Psychiatry, New York, 1973. pp. 755-850. Paper, \$3.50.

Automation Theory and Modeling of Biological Systems. M. L. Tsetlin. Translated from the Russian edition (Moscow, 1969) by Scitran (Scientific Translation Service). Academic Press, New York, 1973. xvi, 288 pp., illus. \$23.50. Mathematics in Science and Engineering, vol. 102.

The Backyard Astronomer. Alan E. Nourse. Watts, New York, 1973. vi, 118 pp., illus. \$7.95.

Basic Physics. A Linear Approach. Joseph W. Straley. Prentice-Hall, Englewood Cliffs, N.J., 1974. xiv, 354 pp., illus. \$11.95.

Biochemical Engineering. Shuichi Aiba, Arthur E. Humphrey and Nancy F. Millis. Academic Press, New York, ed. 2, 1973. xviii, 434 pp., illus. \$28.50.

Biochemistry of Catecholamines. The Biochemical Method. Toshiharu Nagatsu. University Park Press, Baltimore, 1973. xx, 362 pp., illus. \$24.50.

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Biological Oscillators. Their Mathematical Analysis. Theodosios Pavlidis. Academic Press, New York, 1973. xiv, 208 pp., illus. \$19.

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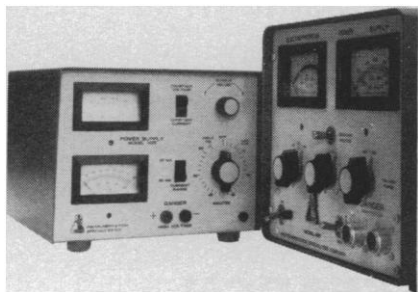
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Cluster Analysis for Applications. Michael R. Anderberg. Academic Press, New York, 1973. xiv, 360 pp., illus. \$25. Probability and Mathematical Statistics, No. 19.

Connections, Curvature, and Cohomology. Vol. 2, Lie Groups, Principal Bundles, and Characteristic Classes. Werner Greub, (Continued on page 1106)

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Stephen Halperin and Ray Vanstone. Academic Press, New York, 1973. xxii, 544 pp., illus. \$35. Pure and Applied Mathematics, vol. 47-II.

Contraception. L. I. Langley, Ed. Dowden, Hutchinson and Ross, Stroudsburg, Pa., 1973. xiv, 500 pp., illus. \$22. Benchmark Papers in Human Physiology.

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Disorders of Auditory Function. Proceedings of a conference, Dundee, Scotland, July 1971. W. Taylor, Ed. Published for the British Society of Audiology by Academic Press, New York, 1973. xiv, 272 pp., illus. \$14.

Drug Abuse in Industry. Growing Corporate Dilemma. Jordan M. Scher, Ed. Thomas, Springfield, Ill., 1973. xviii, 312 pp. \$11.95.

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Electron Microscopy of Enzymes. Vol. 1, Principles and Methods. M. A. Hayat. Van Nostrand Reinhold, New York, 1973. xviii, 204 pp., illus. \$16.95.

Encounter with Anthropology. Robin Fox. Harcourt, Brace, Jovanovich, New York, 1973. viii, 370 pp. \$8.95.

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Energy Conservation. Implications for Building Design and Operation. Proceedings of a conference, Bloomington, Minn., May 1973. Dean E. Abrahamson and Steven Emmings, Eds. All-University Council on Environmental Quality and School of Public Affairs, University of Minnesota, Minneapolis, 1973. vi, 156 pp., illus. Paper, \$5.

Epoxy Resins. Chemistry and Technology. Clayton A. May and Yoshio Tanaka, Eds. Dekker, New York, 1973. xiv, 802 pp., illus. \$59.50.

Evaluation. An Introduction to Research Design. Janet P. Moursund. Brooks/Cole, Monterey, Calif., 1973. vi, 154 pp. Paper, \$3.95.

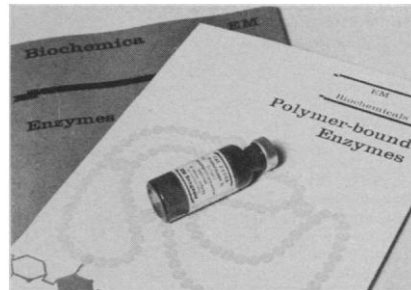
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Exercises in General, Organic, and Biological Chemistry. Arne N. Langsjoen. Burgess, Minneapolis, ed. 3, 1973. xii, 156 pp., illus. Spiral bound, \$4.50.

A Flora of the Tahoe Basin and Neighboring Areas. Gladys L. Smith. University of San Francisco, San Francisco, 1973 (available from Gladys L. Smith, 730 28th Ave., San Francisco, Calif.). ii, 232 pp., illus. Paper, \$5.85. Reprinted from *The Wasmann Journal of Biology*, vol. 31, No. 1 (1973).

The Freshwater Snails of Taiwan (Formosa). Gary L. Pace. Malacological Review, Whitmore Lake, Mich., 1973. ii, 118

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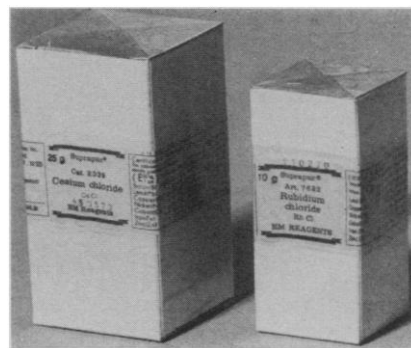
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pp., illus. Paper, \$15. Malacological Review, Supplement 1.

A General Systems Philosophy for the Social and Behavioral Sciences. John W. Sutherland. Braziller, New York, 1973. xii, 210 pp., illus. Cloth, \$6.95; paper, \$2.95. International Library of Systems Theory and Philosophy.

Handbook of Perception. Vol. 3, Biology of Perceptual Systems. Edward C. Carterette and Morton P. Friedman, Eds. Academic Press, New York, 1973. xx, 522 pp., illus. \$28.

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An Introduction to Electromagnetic Theory. P. C. Clemmow. Cambridge University Press, New York, 1973. xii, 298 pp., illus. Cloth, \$16.50; paper, \$6.95.

Iron-Sulfur Proteins. Vol. 1, Biological Properties. Walter Lovenberg, Ed. Academic Press, New York, 1973. xiv, 388 pp., illus. \$33. Molecular Biology Series.

Kinetics and Mechanisms of Reactions. B. E. Dawson. Methuen Educational, London, 1973 (U.S. distributor, Barnes and Noble, New York). viii, 68 pp., illus. Paper, \$3.50. Methuen Studies in Science.

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Logic Design for Behavioral Scientists. Roy Udolf. Nelson-Hall, Chicago, 1973. xiv, 272 pp., illus. \$10. Professional-Technical Series.

Lost Discoveries. The Forgotten Science of the Ancient World. Colin Ronan. McGraw-Hill, New York, 1973. 126 pp., illus. \$10.95.

The MAA Problem Book III. Annual High School Contests of the Mathematical Association of America 1966-1972. Compiled and with solutions by Charles T. Salkind and James M. Earl. Random House, New York, 1973. vi, 186 pp., illus. Paper, \$2.12. New Mathematical Library, No. 25.

Les Mammifères de France et du Bénélux (Faune Marine Exceptée). M.-C. Saint Girons. Doin, Paris, 1973. vi, 482 pp., illus. 138 F.

Mental Illness and the Economy. M. Harvey Brenner. Harvard University Press, Cambridge, Mass., 1973. xxvi, 288 pp., illus. \$15.

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Molecular Mechanisms of Enzyme Action. Proceedings of a symposium, Tokyo, 1966. Yasuyuki Ogura, Yuji Tonomura, and Takao Nakamura, Eds. University Park Press, Baltimore, 1973. xii, 324 pp., illus. \$19.50. NRI Symposia on Modern Biology.

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Better Eating. Michael Jacobson. Center for Science in the Public Interest, Washington, D.C., 1973. vi, 102 pp., illus. Paper. \$2.50.

One-Man Research. Reminiscences of a Catholic Sociologist. Joseph H. Fichter. Wiley-Interscience, New York, 1973. xii, 258 pp. \$10.95.

Organic Syntheses with Noble Metal Catalysts. Paul N. Rylander. Academic Press, New York, 1973. x, 334 pp., illus. \$22.50. Organic Chemistry, vol. 28.

The Origins of Life on the Earth. Stanley L. Miller and Leslie E. Orgel. Prentice-Hall, Englewood Cliffs, N.J., 1974. x, 230 pp., illus. Cloth, \$10.95; paper, \$5.95. Concepts of Modern Biology Series.

Our Environment. The Outlook for 1980. Alfred J. Van Tassel, Ed. Lexington (Heath), Lexington, Mass., 1973. x, 590 pp., illus. \$20.

Oxidases and Related Redox Systems. Proceedings of a symposium, Memphis, Tenn., June 1971. Tsao E. King, Howard S. Mason, and Martin Morrison, Eds. University Park Press, Baltimore, 1973. Two volumes, illus. Vol. 1, xxvi, pp. 1-429; vol. 2, xxiv, pp. 430-884. The set, \$49.50.

Particle-Interaction Physics at High Energies. S. J. Lindenbaum. Oxford University Press, New York, 1973. xiv, 512 pp., illus. \$48. International Series of Monographs on Physics.

The People of America. T. D. Stewart. Scribner, New York, 1973. x, 262 pp., illus. + plates. Cloth, \$10; paper, \$3.95.

Perspectives in Biomedical Engineering. Proceedings of a symposium, Glasgow, June 1972. R. M. Kenedi, Ed. University Park Press, Baltimore, 1973. xx, 314 pp., illus. \$32.50.

Photophysiology. Current Topics in Photobiology and Photochemistry. Vol. 8. Arthur C. Giese, Ed. Academic Press, New York, 1973. xviii, 270 pp., illus. \$22.50.

Physics. Vol. 3, Modern Physics. Arnold L. Reimann. Barnes and Noble, New York, 1973 (distributor, Harper & Row, New York). xvi, 460 pp., illus. + appendix. Paper, \$6.95.

Physics of the Earth and Planets. A. H. Cook. Halsted (Wiley), New York, 1973. x, 316 pp., illus. \$24.75.

Pictorial Guide to the Moon. Dinsmore Alter. Revised by Joseph H. Jackson. Crowell, New York, ed. 3, 1973. viii, 216 pp., illus. \$8.95.

The Planets. Some Myths and Realities. Richard Baum. Halsted (Wiley), New York, 1973. 200 pp., illus. \$8.95.

Politics and Law in Health Care Policy. A Selection of Articles from the Millbank Memorial Fund *Quarterly*. John B. McKinlay, Ed. Published for the Millbank Memorial Fund by Provist, New York, 1973. xii, 404 pp. Cloth, \$7.95; paper, \$3.95. Millbank Resource Books.

Proceedings of the Symposium on Self-Paced Instruction in Chemistry, Dallas, Texas, Apr. 1973. Bassam Z. Shakhshiri, Ed. Chemical Education Publishing Co., Easton, Pa., 1973. iv, 148 pp., illus. Paper, \$4.50.

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Prostaglandins and Cyclic AMP. Biological Actions and Clinical Applications. Proceedings of a symposium, Ann Arbor, Mich., Nov. 1972. Raymond H. Kahn and William E. M. Lands, Eds. Academic Press, New York, 1973. xx, 306 pp., illus. \$11.50.

Psychotherapy. Clinical, Research, and Theoretical Issues. Hans H. Strupp. Aronson, New York, 1973. 816 pp., illus. \$25.

Radar Target Detection. Handbook of Theory and Practice. Daniel P. Meyer and Herbert A. Mayer. Academic Press, New York, 1973. xvi, 496 pp., illus. \$24.50. Electrical Science Series.

Radioisotope and Radiation Physics. An Introduction. M. Mladjenović. Translated by Sonja Subotić. Academic Press, New York, 1973. xii, 242 pp., illus. \$19.

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