

Textbook in Ecology

Among the textbooks in ecology that have been published in recent years Robert L. Smith's **Ecology and Field Biology** (Harper and Row, New York, 1966. 702 pp., illus. \$12.75) must be classed as better than average. In places it is good. Its chief defect is that it includes too much. The price of this is the lack of any clear theme. A rather prosaic style of writing is compensated for by the beautiful production, including superb illustrations. The book is intended for college juniors or sophomores, but I suspect much of it will go beyond their needs.

The book starts off with an orthodox conception of the community and proceeds then to cycles of elements and energy flow in communities. These concepts are dealt with as matters of fact. They could be dealt with in a much more exciting way to impress on young minds the necessity of knowing about these interrelations. In the description of the nitrogen cycle, for example, no suggestion is made about the essential role of nitrifying microorganisms and denitrifiers for the presence of life on this planet. A quantitative approach to cycles could have driven that message home. The roles of temperature, moisture, and light are inadequately treated, and again a quantitative approach is lacking.

There follows a chapter on "biological clocks." As an elementary synopsis it is excellent, but why put it in there? Back again to communities, but this time to discuss succession without much emphasis on causes. Twelve chapters on different sorts of habitats are each concluded with "suggested field activities" without much indication as to the point of these activities. This is followed by a brief chapter on the somewhat discredited concept of biomes.

The two chapters on population biology contain some useful information, but it is information without a message. Yet the contribution of Lotka and other demographers to our thinking on death rates, birth rates, and rates of increase is profoundly important to an appreciation of what is happening to man in the modern world. Few elementary students, or graduate students for that matter, appreciate the importance of expressing births and deaths in terms of age schedules or the importance of net reproductive rates and intrinsic rates as opposed to gross rates of increase. The data are

given but their significance is missed. As an exposition of population regulation this section is over-simplified and to that extent quite misleading.

It is good to see three chapters on evolution in an ecology text. The three concluding chapters on behavior are also welcome and are well oriented toward problems in ecology. The bibliography is quite enormous for an elementary book and is organized in a very helpful way. The book concludes with five appendices on statistics, measurements of temperature, light, and moisture, plant community analysis, some ways of measuring numbers of animals, and some suggestions for studying behavior in the field. I think the space in this section could have been more effectively devoted to specific studies that a class of students might make.

At the end, one is left wondering why ecologists make many of the measurements they do on ponds and forests and fish and birds. Perhaps it is just an occupational hazard of ecologists not to reason why. Modern ecology can be more than a compendium of facts, but somehow elementary texts do not succeed in conveying this. This book is no exception.

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Tensor Calculus for Students

J. Abram's **Tensor Calculus through Differential Geometry** (Butterworth, London, 1965. 176 pp., illus. \$7.50) is designed for students. Four of its eight chapters apply tensor methods to differential geometry, one to the mechanics of continuous media, and one to dynamics. A surprisingly large amount of material is covered—for example, the theorem of Schur in Riemannian geometry.

Only a slight knowledge of linear algebra and of vector calculus is presupposed, not much more than is presented in many current textbooks on the calculus of Newton and Leibnitz. By illustrating the need for a non-orthonormal vector basis in the context of polar coordinates in the plane, Abram motivates the student toward his point of view of arbitrary basis vectors. On the other hand, the development of the relevant techniques of the tensor calculus in terms of an

arbitrary basis in two dimensions lays the foundation for a very rapid generalization to Riemannian spaces of n dimensions.

The mathematical development is largely heuristic and intuitive because the author believes that formal mathematical language would prevent the reader from grasping the main ideas. Occasionally this leads him astray, as, for example, in his conclusion (p. 15) that both mathematically and intuitively it is "trivial" that three differential equations of the first order in three unknown functions have a solution, even though the equations in question are quadratic in the derivatives.

There are exercises at the end of each chapter, and a bibliography of 21 items for further study.

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Reprints

Aerodynamics: A Space-Age Survey. John E. Allen. Harper and Row, New York, 1966. 128 pp. Illus. Paper, \$1.25. Reprint, 1963 edition.

The Architecture of Matter. Stephen Toulmin and June Goodfield. Harper and Row, New York, 1966. 398 pp. Illus. Paper, \$2.45. Reprint, 1962 edition.

Atomic Physics: An Atomic Description of Physical Phenomena. Gaylord P. Harnwell and William E. Stephens. Dover, New York, 1966. 413 pp. Illus. Paper, \$2.50. Reprint, 1955 edition.

The California Condor. Carl B. Koford. Dover, New York, 1966. 168 pp. Illus. Paper, \$2. Reprint, 1953 edition.

The Concepts and Theories of Modern Physics. J. B. Stallo. Percy W. Bridgman, Ed. Harvard Univ. Press, Cambridge, Mass., 1966. 355 pp. Paper, \$1.95. Reprint, 1960 edition.

Day of Trinity. Lansing Lamont. New American Library, New York, 1966. 254 pp. Illus. Paper, 75¢. Reprint, 1965 edition.

The Discovery of Time. Stephen Toulmin and June Goodfield. Harper and Row, New York, 1966. 280 pp. Illus. Paper, \$1.95. Reprint, 1965 edition.

The Evolution of Life. Everett C. Olson. New American Library, New York, 1966. 302 pp. Illus. Paper, 75¢. Reprint, 1965 edition.

Extraterrestrial Life: An Anthology and Bibliography. Report of a study held under the auspices of the Space Science Board, Natl. Acad. of Sciences—Natl. Research Council. Compiled by Elie A. Shneour and Eric A. Ottesen. NAS-NRC, Washington, D.C., 1966. 486 pp. Illus. \$6. Thirty-four papers reprinted from various journals and published between 1945 and 1965.

Infinite Matrices and Sequence Spaces. Richard G. Cooke. Dover, New York,

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Ionospheric Radio Propagation. Kenneth Davies. Dover, New York, 1966. 486 pp. Illus. Paper, \$2.25. Reprint, 1965 edition.

The Ivory-Billed Woodpecker. James T. Tanner. Dover, New York, 1966. 123 pp. Illus. Paper, \$2. Reprint, 1942 edition.

Magnetohydrodynamic Stability and Thermonuclear Containment. A. Jeffrey and T. Taniuti, Eds. Academic Press, New York, 1966. 230 pp. Illus. \$7.50. Reprints of twelve papers published in various journals between 1954 and 1963, and an introduction by A. Jeffrey and T. Taniuti.

Mental Maladies: A Treatise on Insanity. J. E. D. Esquirol. Hafner, New York, 1965. 495 pp. \$10.50. The History of Medicine Series, No. 25, issued under the auspices of the Library of the New York Academy of Medicine. Reprint, 1845 edition.

Mental Pathology and Therapeutics. Wilhelm Griesinger. Hafner, New York, 1965. 544 pp. \$10.50. The History of Medicine Series, No. 26, issued under the auspices of the Library of the New York Academy of Medicine. Reprint, 1867 edition.

Optimal and Self-Optimizing Control. Rufus Oldenburger, Ed. M.I.T. Press, Cambridge, Mass., 1966. 512 pp. Illus. Paper, \$6. Reprints of thirty-eight papers published in various journals between 1950 and 1964.

Personality: A Biosocial Approach to Origins and Structure. Gardner Murphy. Basic Books, New York, 1966. 1015 pp. \$10. Reprint with new preface, 1947 edition.

Pregnancy, Birth and Abortion. Paul H. Gebhard, Wardell B. Pomeroy, Clyde E. Martin, and Cornelia V. Christenson. Wiley, New York, 1966. 298 pp. Illus. Paper, \$1.65. Reprint, 1958 edition.

Principles of Human Relations: Applications to Management. Norman R. F. Maier. Wiley, New York, 1966. 484 pp. Illus. Paper, \$2.65. Reprint, 1952 edition.

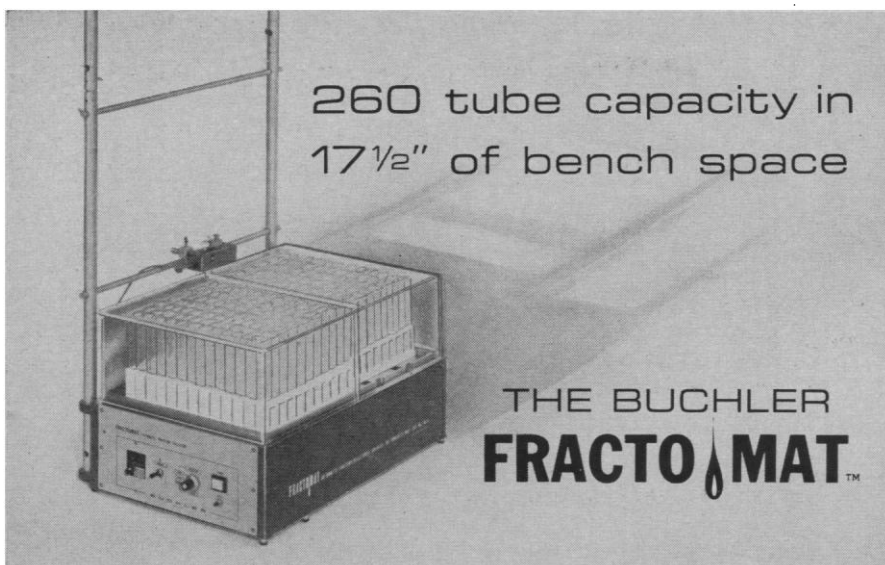
Principles of Psychophysiology. An introductory text and readings. Richard A. Sternbach. Academic Press, New York, 1966. 313 pp. Illus. \$7.50. Reprints of ten readings published in various journals between 1928 and 1964.

Probability and Experimental Errors in Science. An elementary survey. Lyman G. Parratt. Wiley, New York, 1966. 271 pp. Illus. Paper, \$1.65. Reprint, 1961 edition.

The Remaking of a Culture: Life and Education in Puerto Rico. Theodore Brameld. Wiley, New York, 1966. 494 pp. Paper, \$2.65. Reprint, 1959 edition.

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The Scientific Renaissance, 1450-1630. Marie Boas. Harper and Row, New York, 1966. 376 pp. Illus. Paper, \$2.45. The Rise of Modern Science Series, vol. 2, edited by A. Rupert Hall. Reprint, 1962 edition.

Survey and Forecast. Readings for students of science and technology. Samuel I. Bellman, Ed. Chandler, San Francisco, Calif., 1966. 484 pp. Illus. Paper, \$3.75. Reprints of thirty papers published between 1961 and 1964.

Tenth Annual Edition the Year's Best S-F. Judith Merrill, Ed. Delacorte Press, New York, 1966. 400 pp. \$4.95. Reprints of 33 papers.

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A Treatise on Bessel Functions and Their Applications to Physics. Andrew Gray and T. M. MacRobert. Dover, New York, 1966. 341 pp. Illus. Paper, \$2.25. Reprint of ed. 2, 1922.

Valence and the Structure of Atoms and Molecules. Gilbert Newton Lewis. Dover, New York, 1966. 174 pp. Illus. Paper, \$1.50. Reprint, 1923 edition.

Economics and the Social Sciences

Advances in Experimental Social Psychology. vol. 2. Leonard Berkowitz, Ed. Academic Press, New York, 1965. 360 pp. Illus. \$9.50. Eight papers: "Vicarious processes: A case of no-trial learning" by Albert Bandura; "Selective exposure" by Jonathan L. Freedman and David O. Sears; "Group problem solving" by L. Richard Hoffman; "Situational factors in conformity" by Vernon L. Allen; "Social power" by John Schopler; "From acts to dispositions: The attribution process in person perception" by Edward E. Jones and Keith E. Davis; "Inequity in social exchange" by J. Stacy Adams; and "The concept of aggressive drive: Some additional considerations" by Leonard Berkowitz.

The American Indian: Perspectives for the Study of Social Change. Fred Eggan. Aldine, Chicago, 1966. 207 pp. Illus. \$5.75. Lewis Henry Morgan Lectures Series.

The American Male. Myron Brenton. Coward-McCann, New York, 1966. 252 pp. \$5.95.

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Experimental Phonetics: Selected Articles. Grant Fairbanks. Univ. of Illinois Press, Urbana, 1966. 280 pp. Illus. \$6.50.

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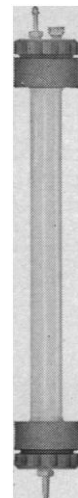
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Handbook of Soviet Psychology. A comprehensive directory of vital facts about Soviet Psychology. Prepared for the International Congress of Psychology (Moscow), August 1966. Dan I. Slobin, Ed. International Arts and Sciences Press, White Plains, N.Y., 1966. 146 pp. Illus. Paper, \$8. *Soviet Psychology and Psychiatry*, Special Issue, Spring-Summer 1966, vol. 4, No. 3-4.

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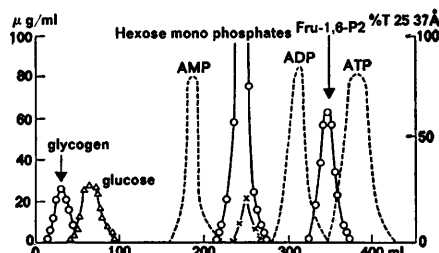
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Personality Research: A Book of Readings. Donn Byrne and Marshall L. Hamilton, Eds. Prentice-Hall, Englewood Cliffs, N.J., 1966. 425 pp. Illus. Paper, \$5.50. Prentice-Hall Psychology Series, edited by Richard S. Lazarus. Thirty-six papers on the following topics: Background (5 papers); Methodology (14 papers); Selected Examples of Personality Research (16 papers); and Integration of Personality Variables (1 paper).

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Poverty: American Style. Herman P. Miller, Ed. Wadsworth, Belmont, Calif., 1966. 318 pp. Paper, \$3.95. Forty-one papers on the following topics: Historical Perspectives (8 papers); Perspectives from Four Disciplines (4 papers); Counting Up the Poor (5 papers); How the Poor Get Along (7 papers); Conventional Programs to Combat Poverty (5 papers); The Great Society's Program: Breaking the Chain (6 papers); and Other Solutions: A Peek into the Poverty Toolbag (6 papers).

Psychological Stress and the Coping Process. Richard S. Lazarus. McGraw-Hill, New York, 1966. 480 pp. Illus. \$12.50.

Psychology. Wilbert James McKeachie and Charlotte Lackner Doyle. Addison-Wesley, Reading, Mass., 1966. 719 pp. Illus. \$8.50.

Psychology: The Science of Interpersonal Behavior. Max L. Hutt, Robert L. Isaacson, and Milton L. Blum. Harper and Row, New York, 1966. 444 pp. Illus. \$7.50.

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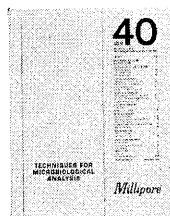
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Today's Information for Tomorrow's Products: An Operations Research Approach. George K. Chacko. Thompson, Washington, D.C., 1966. 239 pp. Illus. \$11.

Transport and the Economic Integration of South America. Robert T. Brown. Brookings Institution, Washington, D.C. 1966. 302 pp. Illus. \$6.

Volunteers for Peace: The First Group of Peace Corps Volunteers in a Rural Community Development Program in Colombia, South America. Morris I. Stein. Wiley, New York, 1966. 272 pp. Illus. \$7.95.

Women in the Soviet Economy: Their Role in Economic, Scientific, and Technical Development. Norton T. Dodge. Johns Hopkins Press, Baltimore, 1966. 351 pp. Illus. \$10.

Yearbook of Physical Anthropology 1964. Santiago Genovés T., Sheilagh T. Brooks, and Gabriel W. Lasker, Eds. Published for The American Association of Physical Anthropologists. Instituto de Investigaciones Historicas, Universidad Nacional Autonoma de Mexico and Instituto Nacional de Antropologia e Historia, Mexico, D.F., 1966 (order from Instituto Nacional de Antropologia e Historia, Cordoba 45, Mexico 7, D.F.). 296 pp. Illus. Paper, \$4.50. Yearbook Series, vol. 12. Nineteen papers.

Zulu Tribe in Transition: The Makhanya of Southern Natal. D. H. Reader. Humanities Press, New York, 1966. 373 pp. Illus. \$7.50.

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Initiation aux Mécanismes Réactionnels en Chimie Organique. P. Sykes. Dunod, Paris, 1966. 276 pp. Illus. Paper, F. 28.

Instrument and Chemical Analysis Aspects of Electron Microanalysis and Macroanalysis. Herbert A. Elion. Pergamon, New York, 1966. 264 pp. Illus. \$15. Progress in Nuclear Energy, Series 9, Analytical Chemistry, vol. 5.

An Introduction to Crystal Chemistry. R. C. Evans. Cambridge Univ. Press, New York, ed. 2, 1966. 422 pp. Illus. Paper, \$2.95; cloth, \$9.50.

Introduction to Finite Mathematics. John G. Kemeny, J. Laurie Snell, and Gerald L. Thompson. Prentice-Hall, Englewood Cliffs, N.J., ed. 2, 1966. 479 pp. Illus. \$8.95.

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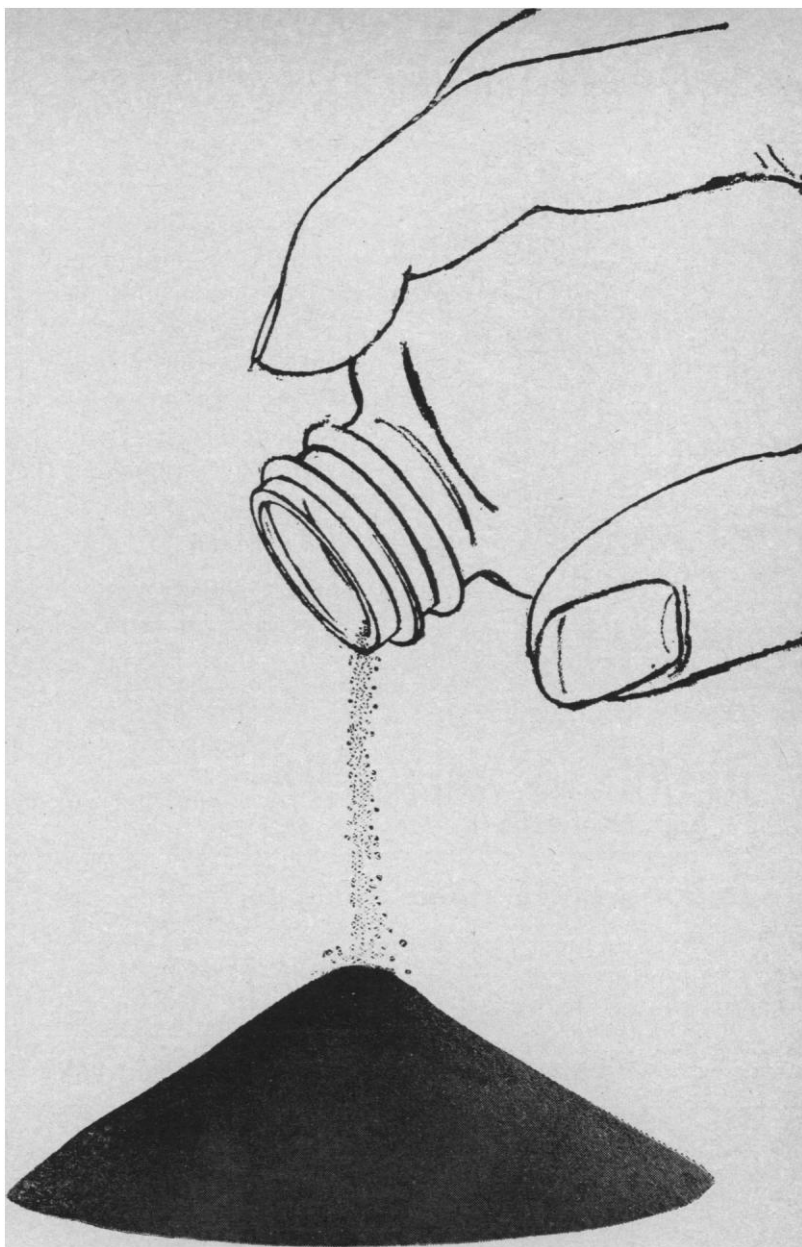
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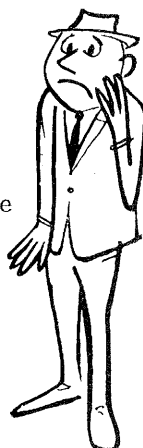
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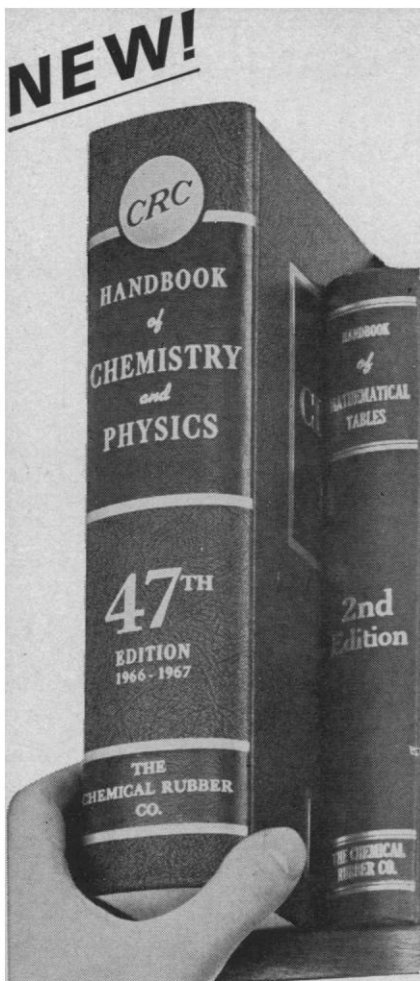
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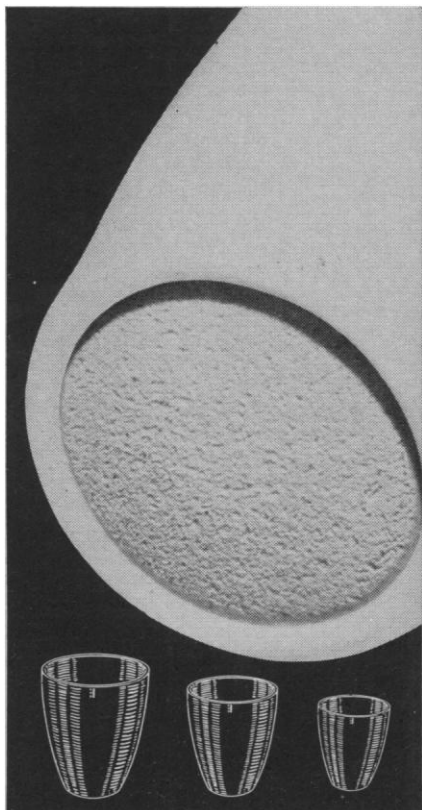
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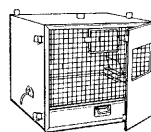
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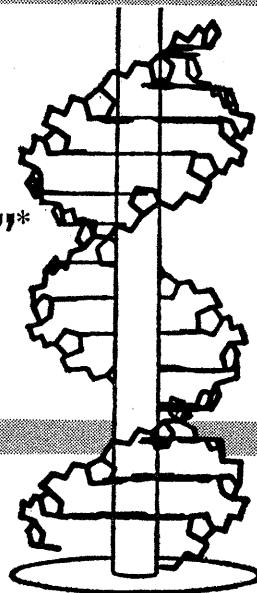
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