

CO₂ in Photosynthesis

Encyclopedia of Plant Physiology. vol. 5, part 1 and part 2, *The Assimilation of Carbon Dioxide*. W. Ruhland, Ed. Springer, Berlin, 1960. Part 1, xl + 1013 pp. Part 2, xvi + 868 pp. Illus. DM. 530.

The present volume represents the most ambitious treatment of photosynthesis attempted since the publication of Rabinowitch's monumental work, and it reflects the increasing attention given to this fascinating biological process by workers in diverse scientific disciplines. The most comprehensive coverage is given to the physical chemistry of photosynthesis, with critical reviews by Livingston, Franck, French, Witt, Kok, and others. The intermediary biochemistry of photosynthesis is treated in several chapters, many of which strongly emphasize the work and the views of a particular laboratory. In general, these cover the reactions of oxygen-producing plants; against this there is only one, but very excellent, chapter on photosynthetic bacteria (by Gest and Kamen), which is set apart in the second part of this volume together with an extensive treatment of the chemosynthetic bacteria (Larsen, Schlegel, Engle, and Umbreit).

Intermediary carbon metabolism of oxygen-producing plants is presented in detail by Calvin and Bassham, while partial and cell-free photosynthetic reactions are reviewed by Clendenning (Hill reaction), Kessler (photoreduction and oxygen production), Arnon (chloroplast reactions), and Simonis (phosphorylation). Comparative biochemistry receives due emphasis in the informative chapter on carotenoids by Goodwin and in the treatment of chlorophyll chemistry by Aronoff. Several chapters are devoted to the physiology of photosynthesis and form a link to the very extensive review of ecological observations, to which a major part of the second volume is devoted. The chapters on the ecology of photosynthesis provide a valuable treatment of this field, which, in this comprehensive fashion, has not been available for some time.

In keeping with the encyclopedic nature of this work, an overwhelming amount of well-established material is presented. At times, however, the very detail of this material appears to prevent clear statement of the problems which exist and which make the field of photosynthesis a dynamic field of research.

Unfortunately, the treatise was planned before the Emerson-Blinks two-light effect was generally known; it is treated briefly in the chapter by Haxo, and some of its theoretical implications are considered by Franck. Future reviews might usefully include a separate analysis of the application of biochemical genetics to the field of photosynthesis, and also a more extensive treatment of its enzymology.

The two parts of this volume contain a tremendous amount of useful information; the big price tag probably will prevent its widespread acquisition by individual research workers.

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20th Century Blend

Life Pictorial Atlas of the World. By the Editors of *Life* and Rand McNally. Time, New York; Rand McNally, Chicago, Ill., 1961. 600 pp. Illus. Regular ed., \$30; deluxe ed., \$35.

Here is the earth portrayed in maps, diagrams, colored photographs of relief model globes, and large landscape photographs. The resulting work is academically sound but occasionally jarringly garish and opulent.

Map makers are chronically troubled by the complexity of the world they study and the limited space in which the desired information is to be portrayed. One result of the ample budget allocated to this atlas is a near elimination of the latter problem. In this atlas a number of maps and diagrams are used to describe each area treated. The first sheet is a political map with place names and boundaries. It is old-fashioned in format. A second sheet shows land forms by a merged shaded relief technique. This sheet is color coded to show the type of vegetation. Succeeding smaller maps then show major resources, population distribution, or transport routes, as appropriate. In some cases, specific earth form cross sections, farm plans, or town plans are used. Photographs, which are frequently superb, highlight the significant features. The diverse maps and graphs are related by the terse, usually insightful, text.

The degree of detail in coverage varies from one area to another. Canada and the United States rate a two-page spread for each province or state. How-

ever, the entire Soviet Union is described in only eight pages plus a further four photographs. Mainland China is equally slighted. The impressions conveyed of these vast, complex, continent-spanning countries are far too simple.

This is an atlas of merit and one which was costly to produce. Regrettably the price is sufficiently high to limit its distribution to institutions.

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New Books

Mathematics, Physical Sciences, and Engineering

Academician V. I. Smirnov's Linear Algebra and Group Theory. Richard A. Silverman, Ed. McGraw-Hill, New York, 1961. 474 pp. Illus. \$12.50.

Advances in Fluorine Chemistry. vol. 2. M. Stacey, J. C. Tatlow, and A. G. Sharpe, Eds. Butterworths, Washington, D.C., 1961. 220 pp. Illus. \$8.

Advances in Geophysics. vol. 7. H. E. Landsberg and J. Van Miegheem. Academic Press, New York, 1961. 343 pp. Illus. \$11.

Automat und Mensch. Über menschliche und maschinelle Intelligenz. Karl Steinbuch. Springer, Berlin, Germany, 1961. 260 pp. Illus. DM. 28.50.

Basic Laws of Matter. H. S. W. Massey and Arthur R. Quinton. Herald Books, Bronxville, N.Y., 1961. 178 pp. \$3.75.

The Chemical and Biological Action of Radiations. vol. 5. M. Haissinsky, Ed. Academic Press, London; Masson, Paris, 1961. 289 pp. Illus. \$8.

The Climates of the Continents. W. G. Kendrew. Oxford Univ. Press, London, ed. 5, 1961. 608 pp. Illus. 55s.

The Determination of Stability Constants and Other Equilibrium Constants in Solution. Francis J. C. Rossotti and Hazel Rossotti. McGraw-Hill, New York, 1961. 439 pp. Illus. \$12.50.

Electrical Contracting. Ray Ashley. McGraw-Hill, New York, 1961. 296 pp. Illus. \$10.

Geometry Through Practical Applications. Julio A. Miro. Barnes and Noble, New York, 1961. 286 pp. Paper, \$1.75.

Interfacial Phenomena. J. T. Davies and E. K. Rideal. Academic Press, New York, 1961. 487 pp. Illus. + plate. \$14.

The Radiation Chemistry of Water and Aqueous Solutions. Augustine O. Allen. Van Nostrand, Princeton, N.J., 1961. 215 pp. Illus. \$6.

Refractory Metals and Alloys. Metallurgical Society Conferences, vol. 11. M. Semchyshen and J. J. Harwood, Eds. Interscience, New York, 1961, 635 pp. Illus. \$22.

Treatise on Analytical Chemistry. pt. 2, *Analytical Chemistry of the Elements*, vol. 5, N, P, Th, Zn-HF. I. M. Kolthoff and Philip J. Elving, Eds. Interscience, New York, 1961. 430 pp. Illus. \$13.75.