as an environment (chiefly physical and chemical factors) and 60 percent to biotic communities. The total length, however, has been increased by 22 percent. Although many or most of the paragraphs are essentially unchanged, areas of recent research emphasis in limnology are brought up-to-date nicely. The chapter entitled "The problem of production," for example, is now 18 instead of 10 pages, "Communities in running waters" is doubled in length, and there are new short sections on saline waters, plankton bacteria, and elemental nitrogen and methane. The previous edition was criticized for its "too selected" list of selected references, but this situation has been remedied by a much longer and more useful literature list.

The translators have preserved Ruttner's easy and unstilted style, which often approaches an essay-like quality. For use as a textbook in limnology courses at the levels of university seniors and beginning graduate students, this careful revision will undoubtedly attain much wider use than its predecessor.

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Plant Physiology

Plant Metabolism. G. A. Strafford. Harvard University Press, Cambridge, Mass., 1963. viii + 152 pp. Illus. $2.75.

This is a disappointing book. The reader is assured on the cover that it is an authoritative and up-to-date account of plant metabolism, with an extensive bibliography. It is none of these. The first of many factual errors is a large structural formula on the cover with a trivalent H atom. The extensive bibliography is a list of eight texts and monographs and articles which appeared in the *Annual Reviews of Plant Physiology* between 1950 and 1960.

The author (whose address is not given) strikes a more modest tone in the introduction where he states that the primary audience is advanced British high school students, and if the Harvard University Press is responsible for the cover, they are culpable. Nevertheless, regardless of the level of reader aimed at, there is no excuse for the inaccuracies that litter the text. These occur in each of the six chapters: "General biochemical principles," "Photosynthesis," "Nitrogen metabolism," "Mineral nutrition," "Translocation," and "Respiration." Little would be gained by giving even a partial list of the errors, but they range from misleading information on energy concepts and ATP and enzymes to errors of fact in listing major fatty acids and micronutrients in plants. The chapter on photosynthesis and the various tables are shot through with errors of fact and interpretation.

If this were not enough, it is also very doubtful that the book can achieve its aim of interesting biologists and chemists in the field of plant metabolism. Little is said about the whole range of problems that remain to be solved in plant metabolism, or of the location and control of biochemical reactions in the cell. The challenging problems of growth and differentiation are not mentioned. None of the excitement that comes from actually doing experiments in metabolism is transmitted, and the methods by which our present knowledge has been gained are not given adequate coverage.

Instead, there is a dry and often inaccurate recital of some of the biochemical facts. Surely the University Scholarship examiners alluded to in the introduction recognize that metabolism is more than this, and certainly the prospective biologist deserves more in the way of inspiration.

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New Books

Mathematics, Physical Sciences, and Engineering

Cosmic Rays. T. E. Cranshaw. Oxford Univ. Press, New York, 1963. 137 pp. Illus. Paper, $2.90.

Cobol. A self-instructional manual. James A. Saxon. Prentice-Hall, Englewood Cliffs, N.J., 1963. 202 pp. Illus. Paper, $6.

Engineering Design. A systematic approach. Robert Matousek. Translated from the 1957 German edition by A. H. Burton. D. C. Johnson, Ed. Interscience (Wiley), New York, 1963. 272 pp. Illus. $8.50.

Error Propagation for Difference Methods. Peter Henrici. Wiley, New York, 1963. 81 pp. Illus. $4.95.

Foundations of Thermodynamics. Peter Fong. Oxford Univ. Press, New York, 1963. 104 pp. Illus. $2.50.

Inorganic Chemistry. A guide to advanced study. R. B. Heslop and P. L. Robinson. Elsevier, New York, ed. 2, 1963. 599 pp. Illus. $9.

Inorganic Thermogravimetric Analysis. Clement Duval. Translated from the French by Ralph E. Oesper. Elsevier, New York, ed. 2, 1963. 738 pp. Illus. $22.

Progress in Materials Science. vol. 10, Nos. 3 and 4, No. 3, *Precipitation Hardening*, A. Kelly and R. B. Nicholson (251 pp., $7.50); No. 4, *Surface Diffusion*, J. M. Blakely (48 pp.). Pergamon, London; Macmillan, New York, 1963. Illus. Paper.

Quanta and Reality. A symposium. A. B Pippard *et al.* American Research Council, Larchmont, N.Y., 1963. 96 pp. Illus. $3.95.

The Quantum Theory of Fields. Proceedings of a conference (University of Brussels), October 1961. Stoops, Brussels; Interscience (Wiley), New York, 1963. 261 pp. Illus. $8.

Radioactive Tracers in Physical Metallurgy. C. Leymonie. Translated from the French edition (1960) by Vernon Griffiths. Wiley, New York, 1963. 222 pp. Illus. $8.50.

Rare Metal Extraction. By chemical engineering techniques. W. D. Jamrack. Pergamon, London; Macmillan, New York, 1963. 372 pp. Illus. $10.

Rarefied Gas Dynamics. vols. 1 and 2. Proceedings of a symposium (Paris), 1962. J. A. Laurmann, Ed. Academic Press, New York, 1963. (vol. 1, 557 pp.; vol. 2, 545 pp.). Illus. $16 each.

Recent Developments in Network Theory. Proceedings of a symposium (Cranfield, England), 1961. S. R. Deards, Ed. Pergamon, London; Macmillan, New York, 1963. 262 pp. Illus. $12.50.

Recent Research on Beta-Disintegration. A. I. Alikhanov. Translated from the Russian edition (1960) by William E. Jones. Pergamon, London; Macmillan, New York, 1963. 156 pp. Illus. $3.

Recovery and Recrystallization of Metals. Proceedings of a symposium (New York), February 1962. L. Himmel, Ed. Interscience (Wiley), New York, 1963. 399 pp. Illus. $20.

The Scientific Papers of Sir Goeffrey Ingram Taylor. vol. 3, *Aerodynamics and the Mechanics of Projectiles and Explosions*. G. K. Batchelor, Ed. Cambridge Univ. Press, New York, 1963. 571 pp. Illus. $17.50.

Selected Principles of Chemistry. Jay A. Young. Prentice-Hall. Englewood Cliffs, N.J., 1963. 175 pp. Illus. Paper, $2.95.

A Study of Splashes. A. M. Worthington. With an introduction and notes by Keith Gordon Irwin. Macmillan, New York, 1963. 191 pp. Illus. $4.95. A facsimile reprint of Worthington's lecture before the Royal Institution (London, 1894) and the original volume *A Study of Splashes* published in 1908. The 1908 volume was reviewed in *Science* [**39,** 464 (1909)] by R. W. Wood.

Technique of Inorganic Chemistry. vol. 2, *Nuclear Chemistry*. Noah R. Johnson, Eugene Eichler, and G. Davis O'Kelley. Interscience (Wiley), New York, 1963. 216 pp. Illus. $8.

Zone Melting of Organic Compounds. E. F. G. Herington. Wiley, New York, 1963. 170 pp. Illus. $5.95.