

nology. This book will be an excellent textbook, particularly for the basic course in physical chemistry that follows a modern general chemistry program.

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Interdisciplinary Summary

Water Metabolism in Plants. Theodore T. Kozlowski. Harper and Row, New York, 1964. xx + 227 pp. Illus. Paper, \$3.95.

Water is an expendable resource of limited supply. Competition for water in domestic, industrial, and agricultural use is increasing. In many parts of the world land use is limited by water shortage. Consequently, research on ways to promote efficient use and to eliminate waste of water is of vital importance. Kozlowski's *Water Metabolism in Plants* is timely, and it will prove useful to botanists, horticulturists, foresters, engineers, and public officials entrusted with responsibility for just and efficient use of water.

Following a brief introduction in which he cites the principal reviews, Kozlowski discusses xerophytism in some detail, pointing out the various means by which plants endure drought. Water balance in plants is then treated. There are 119 references in chapter 1, 93 of which cite work published since 1949, the publication date of two books which thoroughly reviewed this subject. Similar coverage is provided other topics in subsequent chapters. Thus, Kozlowski's volume is very valuable in its coverage of the current literature.

Chapter 2 discusses water relations of cells and tissues, briefly reviewing classical aspects, and describing current ideas. Terminology is discussed, and methods for measuring osmotic quantities are described. Finally, active water uptake is given detailed consideration.

Absorption of water is covered in chapter 3. Available water and soil moisture constants are discussed, terminology is considered, and water uptake by healthy and by diseased plants is described.

Various theories of water transport are discussed in chapter 4. The pros and cons of the cohesion theory are given. Evidence for tensions in water

columns, continuity of water in plants, hydrostatic gradients, and the tensile strength of water is reviewed.

Chapter 5 considers water loss by guttation and transpiration. Factors regulating transpiration are given detailed treatment. Experiments on evapotranspiration are described, and the significance of transpiration in ion uptake, mineral distribution, and mineral loss from plants is discussed.

The effects of water deficits on plants are detailed in chapter 6. Water availability and moisture stress are considered. The effects of water deficit on physiological processes are described. The role of water in plant growth is documented, particularly with respect to trees. As a forester, Kozlowski speaks with authority in this field, and much of the evidence is from his own researches. He is to be complimented for producing a text and reference volume of great usefulness.

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Marine Algae

Seaweed Symposium, Proceedings. The fourth international symposium, held at Biarritz, France, in September 1961. Ad. Davy de Virville and J. Feldmann, Eds. Pergamon, London; Macmillan, New York, 1964. xxiv + 467 pp. Illus. \$15.

The volume contains some 80 papers. Two general conferences were presented: "Growing marine seaweeds" by L. Provasoli and "Algal polysaccharides and their biological relationship" by E. Percival. The other papers are about equally divided among the following topics: biology (life histories and taxonomy), ecology, chemistry, and utilization. The reports are mostly in French or English, with a few in German.

Among the shorter papers may be mentioned "Photosynthesis and growth in *Macrocystis pyrifera*" by the late K. A. Clendenning; "Sur un nouveau procédé de cartographie des algues marines" by Davy de Virville; and "Auxins and gibberellins in marine algae" by J. A. Mowat. (The latter does not acknowledge, however, the much earlier work by van Overbeek).

Floristic and ecological surveys include the Southern Gulf of Mexico (H. J. Humm); Vietnam (Pham Hoang

Ho); the North Pacific (R. F. Scagel); Yoron Island, South Japan (T. Tanaka); and northwest Greenland (R. T. Wilce). Reports on life history and taxonomy range from phytoplankton through temperate and tropical benthic algae to the giant kelps, in chapters too numerous to cite.

Chemical studies cover nitrogen metabolism, polysaccharides (including the enzymatic transfer of sulfate to these), carbohydrases, bromophenols, ascorbic acid, and the sugar components of phycobilins. There is a discussion of the fatty acids of red algae, as determined by gas chromatography.

Industrial utilization of algae is described in Iceland, Denmark, Poland, Germany, Scotland, Canada, France, and Norway. An interesting British application is described in the paper entitled "Liquid seaweed as a fertilizer."

The book concludes with an appendix, by the Food and Agricultural Organisation of the United Nations, on statistics of the seaweed industries of the world.

There is no subject index.

It is a striking commentary on the increased study of algae that the reports of the international conferences on seaweeds have grown from a small paperbound book issued after the first symposium (Edinburgh, 1952) to this substantial volume. No doubt an even larger book will follow the Halifax conference that is scheduled for 1965—hopefully in less than 3 years after the meetings.

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Nesmeyanov Jubilee Volume

Selected Works in Organic Chemistry.

A. N. Nesmeyanov. Translated from the Russian edition (Moscow, 1959) by Avraham Birron and Z. S. Cole. David P. Gelfand, Ed. Pergamon, London; Macmillan, New York, 1964. xvi + 1172 pp. Illus. \$30.

Some four years ago it was my pleasure, as a member of the National Academy of Sciences and as Science Adviser to the Secretary of State, to accompany Detlev W. Bronk, who was at that time President of the National Academy of Sciences of the U.S., on a trip to the Soviet Union; the purpose of the trip was to meet with the president of the Academy of Sciences of the U.S.S.R., A. N. Nesmeyanov, and to

formulate the memorandum of agreement for cultural exchange visits between scientists of the Soviet Union and the United States. At most of the conferences, Professor Nesmeyanov was accompanied by the late A. V. Topchiev.

In intervals between the business meetings, I had an opportunity to talk with Nesmeyanov about his work, which included a considerable amount of absorption spectra of organic compounds with chromophoric centers (ferrocenes). I had published work in the same general area, and each of us was well aware of the other's work. I had an opportunity to visit his laboratory at the Lomonosov University (Moscow) and was particularly impressed by the fact that, although he carried a heavy administrative load as President of the Soviet Academy of Sciences (an operating organization with a large budget and many employees), he still held to a schedule which permitted a reasonable amount of time for visiting the laboratory and working with his research students and associates.

This continued interest and the productivity of directed work has resulted in a production rate of research papers which is matched only by such other scientific leaders as Roger Adams, Willstater, Hanzsch, Pope, Robinson, and Bancroft. The collection and translation into English of a selection of his papers on the occasion of Nesmeyanov's 60th birthday (in 1959) provides the chemist with a well-printed and easily read compilation of considerable size (1100 pages) and importance. The work is essentially organized into three major areas of his interest.

The first section deals with organo-metallic compounds, their synthesis, structure, stereoisomeric effects, and the ferrocene derivatives. The second deals with elemento-organic compounds, including onium compounds and organo-derivatives of silicon, titanium, and fluorine. The third deals with papers in synthetic organic research or chlorovinyl ketones, polychlorohydrocarbons, and related compounds.

Owing to the change that is inevitable in a political assignment, Nesmeyanov was replaced as President of the Soviet Academy in 1961-1962, only a short time after the Russian edition of this book was published. However, he was not relegated to oblivion or left without a reasonable assignment as is often the case with those scientists who accept politically sensitive assignments. He was given a choice assignment, the director-

ship of the Institute of Organo-Element Compounds, an institute that he had earlier organized. That relief from his political assignment has made it possible for him to publish and direct work is well indicated by the fact that during a 1-year period (June 1963 to June 1964), after 2 years of freedom from heavy administrative responsibilities, he was co-author of more than 60 papers published in Soviet journals.

It may well be that a supplementary volume of equivalent size, covering the work of the intervening years, will be issued on Nesmeyanov's 80th birthday. Although many may feel that a number of co-workers were assigned to Nesmeyanov, there can be no doubt that many of these workers sought the privilege of working with him, and many of the papers show evidence of the distinct personal interest and work of the preceptor or guiding professor. Most of his papers are published jointly with one or more of his associates, but his name does not appear as the first author on about a fourth of the papers, a reasonable recognition of the major contributions of his associates.

This collection of research papers also presents us with an interesting moral—if the spark of research can be kept alive by opportunity and assistance even though time may be limited by other duties and the rate of production may be quite low during an administrative assignment, it may be possible to fan the embers of interest into a steady flame when the opportunity is provided to revert to a research program.

Nesmeyanov has been recognized by many honors and awards in his own country and in the countries of the Soviet bloc. He is also a foreign Fellow of the Royal Society of London and of the Royal Society of Edinburgh and an honorary member of the Chemical Society (London), of the New York Academy of Sciences, and of many of the satellite academies.

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New Books

Biological and Medical Sciences

Advances in Insect Physiology. vol. 2. J. W. L. Beament, J. E. Treherne, and V. B. Wigglesworth, Eds. Academic Press, New York, 1964. 376 pp. Illus. \$11. Six papers: "Resilin. A rubberlike protein in arthropod cuticle" by Sven Olva Andersen

and Torkel Weis-Fogh "The active transport and passive movement of water in insects" by J. W. L. Beament; "Colour discrimination in insects" by Dietrich Burkhardt; "Insect ecdysis with particular emphasis on cuticular hardening and darkening" by C. B. Cottrell; "The control of visceral muscles in insects" by K. G. Davey; and "The hormonal regulation of growth and reproduction in insects" by V. B. Wigglesworth.

Advances in Pharmaceutical Sciences. vol. 1. H. S. Bean, A. H. Beckett, and J. E. Carless, Eds. Academic Press, New York, 1964. 346 pp. Illus. \$11.50. Four papers: "Rheology" by Alfred N. Martin, Gilbert S. Banker, and A. H. C. Chun; "Solubility in systems containing surface-active agents" by B. A. Mulley; "Preservation of emulsions against microbial attack" by Doreen L. Wedderburn; and "Contemporary trends in heat sterilization" by G. R. Wilkinson and L. C. Baker.

Anatomy of the Dog. Malcolm E. Miller, George C. Christensen, and Howard E. Evans. Saunders, Philadelphia, 1964. 953 pp. Illus. \$20.

Atlas of Human Anatomy. vols. 1-3. vol. 1, *Osteology, Arthrology and Syndesmology, Myology* (317 pp.); vol. 2, *Splanchnology, Ductless Glands, Heart* (229 pp.); vol. 3, *Nervous System, Angiology, Sense Organs* (326 pp.). Ferenc Kiss and János Szentágothai. Pergamon, London; Macmillan, New York, ed. 17, 1964. Illus. \$17.50.

Biology Data Book. Compiled and edited by Philip L. Altman and Dorothy S. Dittmer. Federation of American Societies for Experimental Biology, Washington, D.C., 1964. 653 pp. Illus. \$10.

Brain Function. Cortical excitability and steady potentials: Relations of basic research to space biology. Preceedings of a conference (Los Angeles, Calif.), 1961. Mary A. B. Brazier, Ed. Univ. of California Press, Berkeley, 1963. 412 pp. Illus. \$10.

Control of Cell Division and the Induction of Cancer. An international symposium (Lima, Peru, and Cali, Colombia), May 1964 (National Cancer Monograph 14). C. C. Congdon and Pablo Morichavez, Eds. U.S. Department of Health, Education, and Welfare, Washington, D.C., 1964 (order from Superintendent of Documents, Washington, D. C.). 411 pp. Illus. \$4.50. Some 25 papers presented at the conference.

Computers in Medicine and Biology (*Ann. N.Y. Acad. Sci.* 115, art. 2). Harold E. Whipple, Ed. New York Acad. of Sciences, New York, 1964. 598 pp. Illus. Paper, \$9. Some 40 papers on the following topics: Computer Methods and Systems; Technological Foundations; Physiology; Neurophysiology; Psychiatry and Psychophysiology; Biological Applications; and Cardiology. The papers are based on a conference sponsored by the academy and held in May 1963.

Diabetische Angiopathie. Internationales Symposium über Diabetesfragen, Institut für Diabetes, Forschung und Behandlung, "Gerhardt Katsch" (3 October 1962), Karlsburg Greifswald. Gerhard Mohnike. Akademie Verlag, Berlin, 1964. 527 pp. Illus.

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