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 REVIEWS
 

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**Annual Review of Plant Physiology**, Vol. 31. Edited by Winslow R. Briggs, Paul B. Green, Russell L. Jones. (Annual Review Inc., 4139 El. Camino Way, Palo Alto, California 94306), 1980. Pp. 724.

The first review paper by D. A. Phillips deals with "Efficiency of Symbiotic Nitrogen Fixation in Legumes". It has been the constant endeavour of microbiologists, physiologists and breeders to enhance the N<sub>2</sub> fixation in legumes. Increasing the efficiency by selection of strains of *Rhizobium* which possess the hydrogenase system that recovers H<sub>2</sub> evolved from nitrogenase is one of the interesting approaches.

"Photocontrol of Carotenoid Biosynthesis" by R. W. Harding and W. Shropshire Jr. deals with the nature of the photoreceptor, the mechanism of regulation and such of the steps in the synthesis of carotenoids regulated by light.

The paper by W. H. Outlaw Jr. "A Descriptive Evaluation of Quantitative Histochemical Methods Based on Pyridine Nucleotides" discusses the technique involving pyridine nucleotides coupling reactions in some of the plant systems, particularly stomatal regulation.

B. B. Buchanan has reviewed the topic "Role of Light in the Regulation of Chloroplast Enzymes". It emphasizes the role of light in activating the enzymes through its effect on reduced thio-redoxin, the reduced LEM, enzyme effectors, increased Mg concentration and shift in pH.

"Cyanogenic compounds" by E. E. Conn describes the distribution and biosynthesis and cellular localisation of the cyanogenic compounds in plants and their role in repelling or inhibiting herbivores. D. C. Walton has reviewed the topic on "Biochemistry and Physiology of Abscisic Acid". The review on the growth regulator is complete and highly useful, with the recent techniques for quantitation.

"Mechanisms of Electron Flow in Photosystem II and Toward Photosystem I" by B. R. Velthuys provides further evidence that of oxidising enzyme complex system accumulates 4 oxidising equivalents (S<sub>4</sub>) in light before donating electrons to the oxidised chlorophyll. A new key component probably the earliest in the chain has been detected by EPR.

In the review article by R. Flavell entitled "The Molecular Characterisation and Organisation of Plant Chromosomal DNA Sequences" based on the distribution of nucleotides, a common nucleotide sequence organisation pattern in plant chromosomes is drawn. "Mechanisms of Action of Herbicides" by D. E.

Moreland deals with the different herbicides which act upon the chloroplast reactions, mitochondrial electron transport and phosphorylation, membrane interactions, cell division, nucleic acid metabolism and protein synthesis.

Under the topic "Organelles and Cells" there are two papers. The paper on "Plastid Replication and Development in the Life Cycle of Higher Plants" by J. V. Possingham deals with the origin factors influencing the division of chloroplasts and the changes in the plastids of the various plant parts.

"Development of Non-Green Plastids" by W. W. Thomson and J. M. Whately deals with various types of plastids, etioplasts, chromoplasts and also control of chloroplast development.

In the group tissues, organs and whole plants, five papers cover topics such as senescence, translocation and tropic movements. "Organogenesis: A Biophysical View" by P. B. Green deals with the basic concepts of symmetry and structural polarity in organogenesis.

The review paper on "Leaf Senescence" by H. Thomas and J. L. Stoddart deals with the genetic, correlative and environmental aspects of leaf senescence, factors influencing senescence, the role of growth regulators and the importance of preventing leaf senescence in growth and productivity.

The review paper on "The Establishment of Tropic Curvatures in Plants" by R. D. Firn and J. Digby deals with a critical analysis of the earlier theories and models on geotropism followed by a new model of their own, in which it is proposed that the outer cell layers are the sites of georesponses and these cells also perceive the stimulus of gravity.

"Quantitative Interpretation of Phloem Translocation Data" is reviewed by P. E. H. Minchin and J. H. Troughton who discuss the new methodology in which short-lived high energy emitting isotope <sup>14</sup>C is used to understand the mechanism of the movement of photosynthates.

In the article on "The Mineral Nutrition of Higher Plants" by D. T. Clarkson and J. B. Hanson, a new approach to the role of elements based on their inorganic properties is taken. The paper "Transport and Partitioning of Nitrogenous Solutes" by J. S. Pate reviews the importance of the nitrogen species translocated in the xylem fluid, specially in the nodulated and non-nodulated species, the export of nitrogenous substances from the leaf, the relationship between nitrogen transport and the production and partitioning of photosynthates are dealt with.

In the area of population and environment, four topics are reviewed.

"Mechanisms of Salt Tolerance in Non-halophytes" by H. Greenway and Rana Munns deals with the ionic effects of Na and its interaction with other ions particularly calcium and potassium.

The paper on "The Initial Event in Injury to Plants by Air Pollutants" by R. L. Heath highlights the air pollution damage to the plants. Oxidants, weak acids, strong acids, their effect on ozone and in the plant on the chloroplast system, transpiration and water movement are discussed.

"Photosynthetic Response and Adaptation to Temperature in Higher Plants" by J. Berry and O. Bjorkman deals with the ecological aspects of photosynthetic temperature adaptation and CO<sub>2</sub> uptake and leaf temperature in C<sub>3</sub> and C<sub>4</sub> plants.

"Evolution of Biochemical Pathways: Evidence from Comparative Biochemistry" by D. J. Chapman and M. A. Ragan discusses several important metabolic pathways in the plant systems. In addition carbohydrate, TCA cycle, amino acid biosynthetic pathways, the nitrate and sulphate respiration and role of O<sub>2</sub> in evaluation are also discussed.

In the Prefatory Chapter, "Some Recollections and Reflections" by Anton Long the account of his problems and difficulties, during his early scientific career, attracts attention. A gratifying feature is what has been a loss to Opera has been a gain to Plant Physiology.

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**Handbook of Solar Radiation Data for India.**  
Compiled by A. Mani. (Allied Publishers Pvt. Ltd.,  
A 104, Mayapuri, Phase II, New Delhi 110 064),  
1980. Pp. 498. Price : Rs. 250.

Although measurements of solar radiation and sunshine hours have been made at various stations in India since 1957, the data had not been compiled and published so far in a useful and usable form. The "Handbook of Solar Radiation Data for India" thus fulfils a long-standing need of Indian engineers and scientists working in the field of solar energy who need these data for the design and performance evaluation of solar collectors and systems.

The handbook is a very welcome addition to the literature. The get-up and layout is excellent and it is essentially error free. It consists mostly of tables giving the mean hourly global and diffuse radiation

and sunshine data for 18 stations all over India. In addition, tables of climatological data in the form of hourly mean values of dry bulb temperature, relative humidity, wind speed and rainfall are given for the same stations. Data on direct solar radiation, long-wave radiation and net radiation for a few stations are also given. Finally, tables giving tilt factors for many slopes are also presented. A brief and clear text describing the fundamentals of solar radiation, the instruments used for measuring it, and the radiation climatology of India is provided at the beginning.

With increasing emphasis on the use of alternative sources of energy, the number of institutions and persons working in the field of solar energy has increased considerably in the last few years. Projects on the utilization of solar energy, through direct processes like photo-thermal and photo-voltaic, and through indirect processes like bio-mass, are in progress all over the country. For all these projects, the present Handbook will provide valuable information so that devices and systems can be evaluated properly in terms of their efficiency of utilization. The book will also be of considerable use to refrigeration and air-conditioning engineers who are concerned with calculating the solar loads on the walls and roofs of buildings. It should therefore prove to be a convenient reference book for many years to come.

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**Science of Engineering Materials. Volume 3.** By  
Manas Chanda. (The Macmillan Company of India  
Limited, New Delhi; Low Cost University Editions),  
1980). Pp. xiii + 232. Price : Rs. 15.00.

The book under review consists of five chapters dealing with the following aspects: (1) Mechanical Properties, (2) Electrical, Electronic and Optical Properties, (3) Magnetic Properties, (4) Thermal Properties, (5) Corrosion and Radiation. Many problems, both descriptive and objective, have been worked out and these would be quite useful to the students. Suggestions for further reading are also given at the end of each chapter. All the topics have been covered in a lucid and elementary manner. The book is recommended for study at the undergraduate level.

In the opinion of the reviewer a book of this type should also deal with the mechanical properties of ceramics and composites and thermoelastic properties. It is hoped that this would be looked into in the next edition.

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