

Photosynthesis and the Environment (Advances in Photosynthesis, Govindjee, series editor). Edited by N. R. Baker. Kluwer Academic Publishers, Dordrecht. ISBN 0-7923-4316-6. 1997. 491 pp.

This volume, dealing with many important aspects of photosynthesis research, is the fifth in Govindjee's series: *Advances in Photosynthesis*. A book on environmental issues of plant sciences will always attract the attention of a wide range of readers. This is no different as the books on environmental aspects of photosynthesis are widely used.

Despite tremendous progress in our understanding of molecular mechanisms of photosynthetic processes and the structure-function relationship of photosynthetic apparatus at molecular level, our knowledge of the complexities of interactions of environmental factors with photosynthetic apparatus remains quite limited. Researchers are well aware that a variety of edaphic and environmental factors affect the photosynthetic processes. However, the detailed dynamics of the interactions of these factors need to be known to improve the photosynthetic performance of plants. In order to bring about improvements in crop productivity by agricultural and agrobiotechnological methods, the specificity of stress impairments of photosynthetic structures and functions and the factors that impart stress tolerance to photosynthetic systems must be fully understood.

Baker's book *Photosynthesis and the Environment* discusses these important topics comprehensively. The approach of this book is novel, integrating basic and applied aspects. This reflects the editor's personal approach to research at the University of Essex. The book contains twenty chapters, contributed by leading experts on the subject selected from Europe, USA, Canada and Japan. The first three chapters essentially introduce the primary processes of energy capture by antenna pigments, the regulation of light utilization in photoelectron transport. These provide a sufficient background for the readers to appreciate the dynamics of interactions of various environmental parameters with photosynthetic systems. Each chapter gives an account of the recent advances in the field. In addition to chapters dealing with the effects of fluctuating light, temperature or elevated

CO₂, the volume contains chapters on the regulation and co-ordination of carbon assimilation pathways and discusses how the enzymes alter the fluxes of metabolites through these pathways.

The role of sugars in the source-sink adjustments has gained much importance on studies related to high CO₂ levels, elevated temperature and drought. This volume contains several authoritative discussions on such current research topics. The chapter on the role of free radical and the scavenging enzyme during oxidative stresses is very illustrative.

As a large number of researchers in India work on photosynthetic performance under high light, high CO₂, high temperature, drought and UVB radiation, this volume should be useful. The editor has included articles on environmental stresses, except for salinity, metal ion stress, some specific nutrient stresses, and air pollutant stress effects in the book. The molecular biological approaches in studying environmental effects on photosynthesis are currently popular and the volume contains a small chapter. It would have been useful to have detailed treatments of signal transduction as well as on transgenic photosynthesis. The inclusion of stomatal biophysics and biochemistry in the volume adds to the strength of the book. Similarly, topics on gas-exchange models and measurements emphasize the multidisciplinary approaches for elucidating plant-environment interaction.

Professor Baker is to be lauded for bringing out this topical volume. The effects of environments on photosynthesis are of global concern. This volume will be useful to a wide spectrum of plant biologists working on ecology, forestry, crop science and agronomy. Teachers offering courses on crop physiology, plant physiology and environmental biology will find this a good reference. Like previous books in the series, *Photosynthesis and Environment* contains numerous illustrations, graphs and sketches. Uniformity in presentations in various chapters is also maintained. Thus the book will be liked by both students and teachers.

I wish to congratulate the Editor, Prof. Baker for this important addition to the series. The Kluwer Academic Publishers add to their reputation as publishers of advanced plant science texts and other high quality publications. It is unfortunate

that all the books in the series are very expensive and thus this book shall remain out of the reach of many students, teachers and school/college libraries. Unless inexpensive paperback editions are made available, the appreciation of the books in the series shall remain restricted. *Photosynthesis and the Environment* is very informative and quite a few researchers in plant sciences might like to have a copy of this book in spite of the prohibitive cost.

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Why Toast Lands Jelly-Side Down. Robert Ehrlich, Princeton University Press, 41 William Street, Princeton, New Jersey 08540, USA. 1997. Price: \$ 35 (HB) and \$ 14.95 (PB). 196 pp.

There is physics in everyday life, and in *Why Toast Lands Jelly-Side Down*, the author Robert Ehrlich has tried to get the reader acquainted with it. And I think he has done so quite successfully. This is due partly to his chosen method—the book is an exercise in DIY (do-it-yourself) and offers the pleasure of finding things out. It is equally due to his choice of problems, taken mostly from our shared everyday experiences, but requiring explanations that in most cases go just a little beyond the common sense. Thus there are elementary and direct demonstrations that communicate to the reader the few basic principles of physics that underlie the diversity of phenomena, mostly mechanical though, e.g. Newton's laws of motion, laws of conservation of energy, momentum, etc. Then there are analyses of apparently simple phenomena that point to deeper implications, e.g. the steady drift motion of an object on an inclined plane which is being gently tapped, that relates to the physics of electrical resistivity and friction. And then there are some ingenious simulations that drive home some rather subtle facts far removed from common experience, but of great interest, e.g. the expanding universe. The combination of demonstration, explanation and simulation has an

empowering effect on the reader. All along the reader is encouraged to try things out himself/herself. The most sophisticated equipment required is no more than an OHP.

There are over some 150 problems posed and resolved – about 50 in mechanics, 15 in fluid mechanics, 18 in wave motion, 7 in electricity and magnetism, 15 in optics, 10 in modern physics and so on. So, you have a choice.

My greatest favourites were the problem of the Toast Landing Jelly-Side Down,

the Tippy Top, Stick-Slip motion under tapping, and the expanding universe, to name just a few.

One does detect some weaknesses here and there. The discussion of Tippy Top is rather vague and leaves the curious reader unconvinced. Also, when discussing the case of the Toast Landing Jelly-Side Down, the author could have aptly mentioned the case of the cat landing on its four feet – a curious problem of pesematology, though the explanation is quite different. One would have expected

some examples from the physics of toys – the case of the rattleback perhaps, though not of the Levitron™ of course.

Let me conclude by saying that all in all I have enjoyed reading the book and trying out some of the things described in it. Strongly recommended for high school/college students.

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TRENDYS in BIOCHEMISTRY

Trendys in biochemistry is an informal national forum devoted to promote discussions on the newly emerging areas in the general field of biochemistry and molecular biology. This forum was initiated on the basis of a unique type of activity originally started by Prof. T. Ramasarma of Biochemistry Department, IISc., Bangalore wherein a few interested people used to gather once in a while and discuss various frontier topics and thought-provoking concepts in modern biology. Some people felt that this is an activity which deserves to be 'nationalized' so that it can benefit many youngsters by promoting innovative thinking and the courage to speak up and discuss any breakaway idea. The first such meeting was held in January 1994 at University of Hyderabad (Prof. Goverdhan Mehta). The second meeting was held at National Institute of Immunology, New Delhi, in 1995 (Drs S. Hasnain and Kanuri S. Rao). The third and fourth were held at CFTRI, Mysore (1996; Dr V. Prakash) and IICB, Calcutta (1997; Drs Jyotirmoy Das and Pranab Sarkar) respectively. During the Fourth meeting, it was decided that the Fifth meeting may be organized at Hyderabad so that the original charter of this forum could be once again emphasized and revitalized.

It is the philosophy of these meetings that about 10–15 persons who could fit into the concept of these meetings are to be invited to speak on topic of their choice which should be more in the nature of a concept, or a thought or a breakaway idea. The presentation could also be an integrated and critical review of a new development in a well-defined area that could be related to the area of interest of the speaker but this forum is not intended for presenting data of one's own research findings. All the invitees are expected to find their own travel money. Local hospitality would be provided by the organizers. The 1998 meeting is likely to take place some time during the month of August.

Scientists interested to know more and participate in this kind of activity may please contact Prof. Kalluri Subba Rao, Head, Department of Biochemistry, University of Hyderabad, Hyderabad 500 046. Phone: 040-3010451 (O), 040-3010256 (R); Fax: 040-3010120/145. E-mail: ksrsl@uohyd.ernet.in.