BOOK REVIEWS

Biotechnology in Agriculture, (eds) S. Natesh, B. L. Chopra and S. Ramachandran, (Published by Oxford and IBH Publishing Co. Pvt. Ltd., 66, Janpath, New Delhi 110 001), 1987, pp. 321, Rs. 245/-.

This is a compilation of 30 papers presented at an International Workshop on 'Biotechnology in Agriculture: Evolving a Research Agenda for the ICGEB', held at New Delhi during September 17–22, 1985. The International Centre for Genetic Engineering and Biotechnology (ICGEB) which had organized the Workshop, has stated as its objectives; 'to bring together the fruits of modern technology to the developing countries through a network of national, regional and international cooperation of R & D centres.' Over 60 leading research workers in the field were brought together for five days to discuss the most recent developments in the areas of Plant Molecular Biology and Biotechnology. The 30 papers have been divided and presented under four headings viz. (1) Molecular biology and genetic engineering or nitrogen fixation, (2) Plant cell culture, somatic hybridization and cryopreservation, (3) Differentiation and regeneration in plant cell and tissue culture, and (4) Genes of agricultural interest and selectable markers. In his 'Keynote' address Dr M. S. Swaminathan of International Rice Research Institute, Manila, has covered the broad aspects of biotechnology and agricultural betterment in the developing countries. He has projected the population growth along with the demand for food-grains and has pointed out the need for promoting the ecological and economic sustainabilities for increasing the productivity.

The utilization of the latest biotechnology tools such as tissue culture, cell and protoplast culture, production of manoclonal antibodies and immunogenic substances, increasing the efficiency of biological nitrogen fixation, etc., are of great relevance. The papers on nitrogen fixation give the latest information on genetics of nitrogen fixing bacteria and genetic control of the processes involved in the fixation. More specifically, the complexity of gene control in *Azotobactor*, *Azospirillum*, *Anabaena*, *Cyanobacterium* and *Rhizobium* have been discussed in depth. The article by C. A. Atkins on the 'Genetics of legume nodule development' brings out certain important areas of research to be undertaken for better understanding of the nodulation and nitrogen fixation processes.

In the next set of articles on 'Plant cell culture and hybridization research' results on the latest findings in gene transfer in cereals, legumes, vegetable crops, oil-seeds and commercial crops are discussed. The importance of Somaclonal variation and its use in crop improvement and cryopreservation of plant cell cultures and its prospects in agricultural and forest biotechnology have been brought out.

Tissue culture technique has been in use for plant improvement for nearly three decades now. About 250 species of plants have been successfully regenerated by this technique. The achievements in crop improvement through this technique in respect of rice, wheat, maize, rubber tree, coconut, etc., have been remarkable. Anther culture has been utilized for rice crop improvement. Plant cell culture for improvement of legumes and cereals as well as several oil bearing plants is being routinely used in many parts of the world. Somatic cell genetics and organogenetics are new pathways for regeneration of whole plants from tissue culture. The importance of this method in plant improvement has been discussed by E. G. Williams. The applied aspects of this technology is reflected in the survival rate of the plantlets in the main field and these have been brought out by V. Jagannathan and R. A.de Fossard in their papers.

In the next set of papers the applicability of gene transfer technology in agriculture is brought out by the authors with specific examples. The markers in respect of barley, aleurone genome by G. R. Chandra and S. Muthukrishnan; Cereal genomes by S. Muthukrishnan *et al*, Application of transposable elements in plants by P. Starlinger; Nodulin genes in legume crops by D. P. S. Verma and J. Stanley; Selected markers for gene manipulation in pea and barley by S. Kumar and S. P. Sharma; Genetic engineering of plant proteinase inhibitors by C. A. Ryan *et al*; Genetics of *Erwinia* soft-rot by A. K. Chatterjee *et al*; Gene transfer systems in Cynobacteria by R. Haselkorn; Gene control of polypeptides of chloroplast by A. Gnanam and C. C. Subbiah, and Genetics of protein storage in legume seed by R. Bollini *et al* are classical works presented in support of the theme of 'Genes of agricultural interest and selected markers'.

The recommendations of the workshop summarized on pages 311 to 317 are valuable for the

workers in this field and also for the policy-makers. Not only the importance of intensive research in the field has been brought out, but also priority and thrust areas have been identified.

This publication is very valuable compilation of the best and the latest thoughts by top scientists in this field of specialization. The authors and the editors deserve to be appreciated and congratulated for their valuable contributions.

G. RANGASWAMI
Sri Ramachandra Educational
and Health Trust,
Ramachandranagar,
Porur, Madras 600 016.

Organic Photochemistry, 1987, Vols. 8 and 9, pp. 368, (ed. A. Padwa, Published by Marcel Dekker Inc., 270, Madison Avenue, 10016, USA), Price: USA and Canada $ 99.75, Elsewhere $ 119.50.

The field of Organic Photochemistry continues to witness explosive growth. While collection of photoreactivity data on diverse functional groups remains the principal activity, there is also an increasing emphasis on the applications and implications of the results in related interdisciplinary areas. The two volumes under review reflect this trend.

Volume 8 begins with a chapter by J. P. Ferris on photochemical transformations on the primitive earth, a rather exotic topic for mainstream organic chemists. From the known photobehaviour of hydrocarbons and small molecules like ammonia and phosphine, a plausible scenario for the primitive earth is presented. Inherent assumptions are clearly stated. The second chapter by M. G. Steinmetz on 'Photochemistry with short uv light' mainly deals with the high energy photochemistry of alkenes and cycloalkenes, interspersed with discussions on mechanistic and theoretical aspects. This is followed by a review by R. S. Sheridan on 'Matrix isolation photochemistry'. After a brief account of experimental methodology, results on the direct observation of numerous interesting reactive intermediates like antiaromatic molecules, carbenes, nitrenes, cyclic alkynes, silenes, silylenes, radicals and diradicals are discussed. It is convincingly demonstrated that the stability threshold for the direct observation of reactive intermediates has been significantly lowered with the advent of matrix isolation techniques. The final chapter by Scheffer *et al* on 'The influence of the molecular crystalline environment on organic photorearrangements' reviews an area in which several Indian research groups are active. Coverage is restricted to photoreactions in one component molecular crystalline materials. Several types of organic photoreactivity patterns in the solid state are explained on the basis of structural data. Some of the concepts introduced by the authors, such as 'conformation specific photochemistry', 'steric compression control of photoreactivity' etc. are discussed with examples.

The first review in Volume 9 is by P.S. Mariano on photochemical reactions involving the C = N moiety, with emphasis on electron transfer processes. After a brief discussion on the similarity in the excited state properties of imines and carbonyl compounds and of iminium salts and olefins, cycloaddition reactions, involving the C = N unit are reviewed. Unresolved mechanistic questions are pointed out. This is followed by a detailed coverage of C = N photoreactions occurring via single electron transfer. The chapter ends with a discussion on flavin photochemistry and its relationship to the biochemistry of flavoproteins. Next, W. H. Laarhoven has reviewed photocyclizations and intramolecular cycloadditions of conjugated olefins. Numerous experimental data are presented to demonstrate the relation between the preferred ground state conformations of a compound and the structure of its primary photoproduct. The final chapter by V. N. Rajasekharan Pillai highlights a relatively new application of photochemistry to synthetic organic chemistry viz photolytic deprotection and activation of functional groups. The strategy of employing photocleavable protecting groups and of activating a functional group for a desired reaction by derivatizing with a chromophore are described with examples. Applications in the synthesis of peptides, carbohydrates and nucleotides have been presented.

With a few exceptions, the authors tend to emphasize on their own contributions. Nevertheless, the volumes will be useful library acquisitions as they contain material of interest not only to the professional organic photochemists but also to the researchers in other interfacial areas.

J. CHANDRASEKHAR
Department of Organic Chemistry
Indian Institute of Science,
Bangalore 560 012.

On-line Information Processing Through Mini and Micro Computers. (Eds) S. Nagarajan and H. C. Jain (Published by Society for Information Science, PID Building, Hillside Road, New Delhi 110 012), 1987, pp. 267, price: not given.

This publication contains the proceedings of the sixth annual convention and conference of the Society for Information Sciences held in December 1986 at Pilani, Rajasthan. There are 15 technical papers in this proceedings besides a foreword introduction to the conference and recommendations of the conference. The proceedings are badly produced with many hand-drawn figures (pp. 149, 150 and 145) in which the authors have not even used a ruler to draw straight lines. The lettering is unreadable as they are badly handwritten. Some figures such as the one on page 127 cannot be read at all as it is one big smudge. In the review copy pages 149 to 164 appear twice at different places. There are however a few interesting case studies which give experiences in setting up information systems in some of the laboratories in India. The other articles are either rehashing of known material or inconsequential "research papers".

V. Rajaraman
Computer Centre,
Indian Institute of Science,
Bangalore 560 012.

ANNOUNCEMENT

THE SECOND SEMINAR ON SCIENCE OF HUMAN DEVELOPMENT

The Second Seminar on Science of Human Development organised by Forum for the Advancement of Science of Human Development, will be held at the Central Electrochemical Research Institute, Karaikudi from September 30 to October 2, 1988. The first seminar held during 1986 touched upon all aspects of human development with overwhelming response from people of various walks of life. This seminar will penetrate deep into various aspects of Science of Human Development following a scientific pathway.

The development of a perfect human being in all aspects has been the concern of mankind from time immemorial. Science and Technology have been instrumental in removing monotony in life by improving its quality and rendering it easier to live to. Computers and Robotics have commenced copying human brain and executing difficult jobs done by man. However, various advanced civilizations have emphasised an all round development of balanced personality through the development of both mind and body. Scriptures of ancient India are full of descriptions of human endeavours in this direction.

Material wealth alone does not make a man happy. Many affluent societies with all their material wealth and achievements, still do not find happiness with them only. The happiness of man largely rests within self. Hence modern science should aim at human development with respect to health, hygiene and physiology of human body in addition to the growth of the mind and all its faculties, techniques like Yoga and various forms of Meditation try to remove stress and strain from different parts of the body and thus assist in retarding the process of ageing of both mind and body. The influence of these techniques has been attracting the attention of people of different parts of the globe and efforts are afoot in analysing them scientifically.

For further particulars, please contact: Shri Y. Mahadeva Iyer, Convener, Second Seminar on "Science of Human Development", CECRI Karaikudi 623 006.

Edited and published by Prof. M. R. A. Rao, Current Science Association, Bangalore 560 080.
Typeset and printed at Phoenix Printing Company Pvt Ltd, Attibele Indl Area, Bangalore 562 107.