
BOOK REVIEWS

Les Thrips Biologie Importance Agronomique by A. Bournier, Institute National de la Recherche, Agronomique, Paris, 1983, pp. 128 + 91 figures. Price not known.

The significance of bioecological studies on thrips has been increasingly recognised in view of the considerable damage potential of many species to agricultural and horticultural crops all over the world. This handy publication by Prof. A. Bournier is a timely effort which seeks to present in a unique way the biology of the principal species numbering around 35, damaging cultivated plants in Europe. Beginning with a new account of the elements of morphology and anatomy of thrips, the author has discussed the ecological and behavioural aspects involving in some detail the role of biotic and abiotic components in the population dynamics of some species, as well as the diverse types of developmental cycles (homodynamic and heterodynamic), the different types of parthenogenesis as well as Brachypterism and macropterism. In discussing the thrips populations, reference has also been made to their migratory capabilities. The methods of collection and evaluation of populations, preservation and culture of thrips are included in the last chapter. A fairly extensive bibliography comprising about 250 references has also been included. The illustrations, both line drawings and plates, are excellent and add considerably to the value of the book.

Besides Thysanopterists, all students of agricultural entomology will find this volume extremely useful.

T. N. ANANTHAKRISHNAN

Entomology Research Institute,
Loyola College,
Madras 600 034

Annual Review of Plant Physiology by Winslow R. Beaggs, Vol. 34, (Published by Annual Reviews Inc. 4139, Palo Alto, Elcamino way, California 94306, USA) 1983, pp. 475, Price USA \$27/- Elsewhere \$30/-

The review articles published in this Volume 34, 1983 are grouped under three major headings. Under

the heading 'Molecule and Metabolism', there are six review papers. In the paper on "Photosynthetic Reaction Centres" by R. J. Cogdell the structure of reactions centres, the kinetics of primary photochemical reactions of the anaerobic photosynthetic bacteria and the oxygen evolving photosynthetic organs are reviewed. An extensive review, highly useful to scientists working on growth regulators, on "Biosynthesis and Metabolism of Cytokinins" by D. S. Letham and L. M. S. Palni deals with the metabolism of exogenously applied cytokinins and biosynthesis and stability of naturally occurring cytokinins. The review paper by P. A. Castelfranco and S. L. Beale on "Chlorophyll Biosynthesis: Recent Advances and Areas of Current Interest" gives a comprehensive picture of all the steps involved in chlorophyll biosynthesis with special emphasis on the effect of certain exogenous chemicals and hormones. The role of light on biosynthesis of chlorophyll and its regulation is also dealt with. The other articles covered under this heading are (a) "Arabinogalactan Proteins: Structure, Biosynthesis and Function" by G. B. Fincher *et al.* (b) "*myo*- Inositol: Its Biosynthesis and Metabolism" by F. A. Loewus and M. W. Loewus (c) "Adenine Nucleotide Ratios and Adenylate Energy Charge in Energy Metabolism" by A. Pradet and P. Raymond.

Under the heading "Organelles and Cells", five papers are reviewed. The article on "Photosynthetic Assimilation of Exogenous HCO_3 by Aquatic Plants" by W. J. Lucas deals with the strategies used for HCO_3 acquisition and benefit of HCO_3 transport. An exhaustive review on "Biology of Stomatal Guard Cells" by E. Zeiger, gives evidences for the lack of calvin cycle enzymes in guard cells. The importance of potassium and other organic acids and blue light on guard cell metabolism is also discussed. The article on "Aspects of Nitrogen Metabolism in Nitrogen Fixing Legumes and Other Plant-Micro Associations" by G. Eisebrenner and H. J. Evans is of immense interest both for microbiologists and physiologists working in this area. The paper on "Organization and Structure of Chloroplast Genes" by P. R. Whitefield and W. Bottomley deals with structure and organization of genes in chloroplast DNA. The review paper on "Heritable Variation in Plant Cell Culture" by F. Meins Jr. is of interest to molecular geneticist.

Under the heading "Tissues—Organs and Whole Plants" five review papers are included. "Regulation of

Pea Internode Expansion by Ethylene" is reviewed by C. D. Eisinger. The author has brought out, lot of experimental evidence to show that the ultimate effect of ethylene on lateral expansion is on mechanical properties of cell wall *via* altered cellulose microfibril orientation, cross linking within the wall or enrichment of the pectic fraction. Giacinta's article on "Phloem Loading of Sucrose" discusses about the mechanisms and control of sucrose loading into the phloem. "Regulation of Ion Transport" by A. D. M. Glass deals with the osmotic effects and the nutritional effects on the ion transport regulation. The other articles under this heading are "Developmental Mutants in Some Annual Seed Plants" by G. A. Mary and "Concept of Apical Cells in Bryophytes and Pteridophytes" by E. M. Gifford Jr.

The prefatory chapter is written by Pei-sung Tang on "Aspiration-Reality Circumstances: The Devious Trial of Roaming Plant Physiologist". The last para in this paper could very well be true of many physiologists.

K. S. KRISHNA SASTRI

University of Agricultural Sciences
Bangalore 560 024

Bio-Energy-Re-News A journal of Energy from Biomass, (India House Developments, 134-G, Palam Colony, New Delhi 110 045), 1983, Vol. 1, No. 1 (Vol. 1/6 and Vol. 1/5 an unnumbered issue) 6 issues per year (including special issues) 3 Tiered subscription: India Rs. 75/- Third World \$ 20/- Developed countries \$ 30 (£12) + postage.

Dr S. Paul a journalist interested in Bioenergy publishes the journal, with an impressive, national and international editorial board consisting of basic and applied scientists. As per the nomenclature of the journal, it is re-news, meaning republication of news items in Biomass and energy published elsewhere. However in the numbers under review there are several interesting items, like for instance vermicomposting.

As is natural in a popular journal of this type, the fare is mixed with uneven editing. There is no general style seen. Perhaps this would emerge after the journal has established itself. Vermiculture as a fertilizer source is attractive and has impressive potential.

Fuels from Biomass have been reviewed by Dr S. Paul. With so much of literature available in this field

the treatment could have been more explicit and comprehensive. The treatment of Neem similarly is cursory.

The special issue on decentralised energy is a mixed fare of kundalini, systems approach, biogas briefs tit bits, energy from wastes and nitrogen fixation all dealt with as news items! Some valuable bibliography is given in biogas technology.

Knowing the difficulties of getting out a journal in the Indian situation, the attempt is laudable and it is hoped that quickly the journal will mature into a semipopular re-news journal and bring important international and national Bio-energy news items to the Indian public quickly and regularly. The get up should be uniform so also the presentations.

K. S. GOPALKRISHNAN

Biochemical Engineering Research Centre,
Indian Institute of Technology,
New Delhi 110 016

Molecular Biology of Egg Maturation by R. Porter and J. Whelan (Pitman Books Ltd, 128 Long Acre, London-WC 2E 9AN) 1983, Pages. viii + 310. Price USA \$25, £25.00.

This book represents the proceedings of the ninety eighth Ciba Foundation Symposium held at London in November 1982. These symposia are well known for highlighting new and significant research findings in modern biology especially in interdisciplinary areas. The present volume contains contributions from distinguished investigators, all working on the developmental biology of the egg but bringing with them expertise in different disciplines like genetics, endocrinology and molecular biology. A note worthy feature of the symposium is the importance given to the comparative aspects of oogenesis and oocyte maturation by bringing within one cover, work done on insects, echinoderms, amphibians, birds and to some extent in mammals.

The autotrophic events in the egg and the heterotrophic events in follicle cells, liver and oviduct, the latter leading to the formation and export of nutritional components into the egg are described by different authors. The direct interaction between follicle cells and the developing oocyte has been pointed

out. The hormonal mechanisms involved in the regulation of synthesis of egg yolk components like carrier proteins for water soluble vitamins in liver and components of egg surface and egg white in oviduct have been presented in depth. A significant finding is the continuous requirement for vitamin carrier proteins for foetal well being and hence for successful completion of gestation in mammals. Other papers highlight different topics like the contribution of maternal gene transcripts (all classes of RNA) in the immediate post fertilization events, the profitable use of retroviruses to investigate the temporal sequence of expression of genes in the fertilized mouse egg, the variety of nonsteroidal factors involved in starfish oocyte maturation, the oocyte as an endocytic as well as a secretory cell and the biochemistry of sperm receptor in the egg.

This compact volume comes in an attractive hard cover. The cover diagram in fact illustrates the research areas touched upon by the symposium speakers, providing thereby a broad perspective. The book is useful to all workers in developmental biology and reproductive biology.

Department of Zoology,
University of Delhi,
Delhi 110 007.

K. MURALIDHAR

Hybrid and Mixed Finite Element Methods by S. N. Atluri, R. H. Gallagher and O. C. Zienkiewicz, (John Wiley & Sons Limited, Boffins Lane, Chichester, Sussex PO19 1UD, England), 1983, pp. 598, Price \$85/-£45/-

This volume is a tribute by the colleagues, associates and former students of Prof Theodore H. H. Pian for his pioneering contributions to the area of mixed and hybrid finite element methods, and contains papers presented at an International Symposium held at Georgia Institute of Technology, Atlanta, Georgia, USA, during 8-10 April 1981 in honour of Prof. Pian in connection with his 60th birth day.

The Finite Element Method, as we know it to-day, was introduced about 30 years ago and attracted wide attention. Initially, the minimum potential and complementary energy principles served as the basis. The

Finite Element Method based on the minimum potential energy principle has received the greatest nourishment and has evolved an attractive numerical tool in the hands of researchers and designers. The possibility of achieving an improved efficiency in the finite element formulations, by relaxing strict application of these principles and/or using other variational principles such as Hu-Washizu and Hellinger-Reissner's principles as the basis, has been the motivation for attempting the hybrid/mixed finite element formulations. The 1964 paper of Prof. Pian marked the beginning of development of these methods. Initial attempts, despite the lack of adequate mathematical support, proved very attractive, because of advantages such as, the possibility of improved accuracies, simultaneous choice of static and displacement variables and the feasibility of their direct evaluation. This volume embodies the cream of the work done in this area, over the last 20 years.

This book contains 28 papers, by leading researchers. More than 9 papers cover the basic mathematical aspects. Application to plates and shells, with or without shear deformation effects, is discussed in 6 papers; 4 papers cover nonlinear effects, both geometric and material, and another set of four papers on fracture mechanics. Analysis of composites and contact stress problems are dealt with in two papers each. Couple stress analysis, structural stability, vibrations and optimal design have received attention in separate papers on each of these topics.

The book ends in a fitting manner, with a personal account of Prof. Pian. He gives his reflections and remarks and traces the evolution of the hybrid and mixed finite element methods, starting from the stage of a simple attractive idea to the present day, well developed field of great practical utility. A complete list of his publications is also given.

The editors have to be complimented for bringing out a valuable book of this type which is overdue. It gives the latest state of the art and will be of permanent value to researchers and students in the area of computational solid mechanics.

A. V. KRISHNA MURTY

Department of Aerospace Engineering,
Indian Institute of Science,
Bangalore 560 012.