BOOK REVIEWS

Annual Review of Phytopathology, Vol. 24, 1986, (ed.) R. James Cook, (Published by Annual Reviews Inc., 4139 El Camino Way, Palo Alto, California 94306, USA), pp. 530, Price: USA $ 31.00, Elsewhere $ 34.00.

The volume contains, apart from the prefatory chapter, 22 review articles grouped as: historical (3 chapters), diagnosis (1 chapter), pathogens (1 chapter each on fungi, bacteria, nematodes, mollicutes, and 2 chapters on viruses), morphology and anatomy (2 chapters), physiology (2 chapters), breeding (1 chapter), epidemiology (1 chapter), chemical control (2 chapters), biological control (3 chapters), and special topics (1 chapter on banana industry); these chapters are followed by subject index, cumulative index of contributing authors as well as chapter titles from volume 15 (1977) to volume 24 (1986).

The prefatory chapter is by Paul Neergaard on plant health, while the biographical research attainments of A. H. R. Buller, William C. Snyder and Johanna Westerdijk have been highlighted in the historical reviews. A lot can be learnt from these chapters, specially devotion, sincerity and readiness for acceptability of new results. These reviews not only mention the outstanding research attainments but also the methodical approach and hard labour inputs in advancement of science. The personal anecdotes are extremely interesting and worth imbibing.

It has been emphasised that the elucidation of the mechanism of action (or resistance) of a fungicide/bactericide/viricide, etc is a long process requiring the dedicated integrated efforts involving various disciplines. However, the wide use of benzimidazoles in agriculture, veterinary medicines, anthelminthic drugs and experimental use in cancer chemotherapy created enough interest in workers on fungal cell biology and molecular genetics resulting in the details of site of action. Bioactive benzimidazoles are specific inhibitors of microtubule assembly that acts by binding to their heterodimeric subunit, the tubulin molecule.

Cross protection could be demonstrated with almost all the viruses for which distinct strains could be found. But the process is complicated and needs careful precautions because any virus can act synergistically also with another/second virus or and it may mutate to a more severe form. The experience with tomato mosaic suggests that for annual crops the difficulties in implementing cross protection may be sufficient to discourage attempts to use the above means of control. However, the success with citrus tristeza provides an encouraging example for perennial crops.

It appears that insects have played a crucial role in virus evolution. Two evolutionary pathways have been suggested to explain similarities between RNA viruses of plants and higher animals. Either these viruses have all descended from insect viruses, or, insects have functioned as intermediate hosts upon the transfer and introduction of plant viruses into animals or vice versa.

The chapters on disease management and banana industry; compost for control of soil borne pathogens; siderophores, thier biochemistry and role in biocontrol; rhizosphere ultrastructure; synthesis of phytoalexins and biochemical analysis of the induction process; remote sensing of plant stress; systemic fungicides and control of oomycetes; culture of mycoplasma-like organisms; mechanisms of resistance of plant viruses; pectic enzymes and pathogenesis; fungal melanins; biocontrol of nematodes; microclimate and powdery mildew are highly informative, thought provoking, and also mention critically the areas of research which need immediate attention for further exploration.

Pathogenicity is not considered a stable character for taxononomic purposes because a loss of a single gene might impair the ability of a plant pathogen to survive in nature and render it avirulent. Based on chemotaxonomic characters it is suggested to remove the pathogenic *Corynebacterium* and disperse them in the genera *Arthrobacter*, *Clavibacter*, *Curtobacterium* and *Rhodococcus*.

Recent reports conlcusively demonstrate that the reaction of certain tissue cultures to bacterial inoculations are similar to those of intact leaf tissues with respect to symptom development and host-parasite specificity. Attachment of incompatible bacterium to a single cell could be inhibited by L-rhamnose and D-glucose. Thus, the *in vitro* system using excised roots, explants, calli, suspension cells, etc. are potentially extremely powerful tools for elucidating host-pathogen interaction including reconstruction/adsorption/penetration. The

role of tissue-culture selections in future disease control strategies is enormous. Data must be generated on basic biochemical and genetical events for disease development for the efficient and optimal use of tissue culture technology in crop improvement/management.

The volume provides the recent advances made not only for the new discoveries but also the new shape/concept for older discoveries. Melanins (dark pigments), which were associated with immune response may now be inhibited to achieve control (because these pigments although not essential for growth and development, enhance the survival and competitive abilities of species under certain environments). Biocontrol appears now to be safest, and with more and more knowledge about the mechanism of virulence/resistance, larger number of biocontrol agents are being exploited. The use of siderophores or composts may really be the futuristic inputs. The volume is certainly useful for all those interested specially in plant pathology and generally in biochemistry, entomology, microbiology, physiology and taxonomy.

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Annual Review of Nutrition, Vol. 6, 1986, (ed.) Robert E. Olson, (Published by Annual Reviews Inc., 4139 EI Camino Way, Palo Alto, California 94303, USA) pp. 649, Price: USA $ 31, Elsewhere $ 34.

Annual Review of Nutrition publishes scholarly, critical reviews in the broad and highly diverse field of nutrition. Recent advances are surveyed and scope for future work often described, thus stimulating further research. A lot of chaff (which has a way of piling up in lay literature related to nutrition) is weeded out and findings based on experimentation presented, to "separate nutrition fact from fancy" – to quote the editor.

The fact that the science of nutrition encompasses a variety of disciplines is borne out by the fact that in the first six volumes 50% of the pages deals with the basic and experimental nutrition, 33% with clinical nutrition and the remainder with topics related to epidemiology, anthropology and public health nutrition. The notion amongst basic scientists that nutrition is a science of goneby days can be dispelled. Biological Scientists looking for rewarding and challenging research areas need to take a fresh look at unsolved problems in nutrition.

Volume 6 begins with a prefatory essay by Dr Hamish N. Munro of Massachusetts Institute of Technology. He makes a case for applying molecular and cell biology to problems in nutrition science. New techniques and concepts need to be applied to nutrition research. Other reviews of basic interest pertain to energetics of alcohol (F. Herlong), regulation of cholesterol biosynthesis (R. C. Sexton), metabolism of sulphur-containing amino acids (M. H. Stipanuk), proteins and amino acid requirements of fishes (R. P. Wilson and J. E. Halver), biochemical functions of ascorbic acid (S. Englard and S. Seifter), vitamin D receptors: nature and function (M. R. Hausler), biochemical basis of manifestations of iron deficiency, (P. R. Dallman), mutagens and carcinogens in foods (C. Furihata and T. Matsushima), metabolism, nutrition and function of carotenoids (T. W. Goodwin), metabolism and function of myo-inositol and inositol phospholipids (B. J. Holub), and gastrointestinal microflora in mammalina nutrition (D. C. Savage).

Reviews in clinical nutrition include topics such as carnitine metabolism and function in humans (C. J. Rebouche and D. J. Paulson), nutrition and infection (G. J. Keusch and M. J. G. Farthing), pathophysiology of anorexia nervosa and bulimia nervosa (R. C. Casper), inherited biotin-treatable disorders and associated phenomena (L. Sweetman and W. L. Nyhan), labile methyl groups and promotion of cancer (P. M. Newberne and A. E. Rogers), calcium and hypertension (N. Karanja and D. A. McCarron) and metabolic adaptation to low intakes of energy and protein (J. C. Waterlow).

Topics in nutritional anthropology such as diet and human behaviour (M. J. P. Kruesi and J. L. Rappoport), the impact of culture on food-related behaviour (M. L. Axelson) and food likes and dislikes (P. Rozin and T. A. Vollmecke) will interest social anthropologists as well as others including lay public.

The volume ends with a review in comparative nutrition on Somatic nutrient requirements of ruminants (J. M. Asplund). It is a truly diverse and rich fare. Some related articles in other Annual Reviews have also been indexed. The book is recommended for reading to all interested in the field of nutrition, biochemistry and medicine.

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Environmental Control of Circadian Rhythms in Plants by K. S. Sundararajan, (Published by Agro-Botanical Publishers (India), Old Ginnani, Bikaner), pp. 120, Rs. 120/US $ 22.

This book is a scholarly and authentic compilation of information about biological rhythms. This will be useful to students of the subject of chronobiology at the Master's degree level. In addition to giving a lucid introduction to the subject the book deftly handles research information on the state-of-the-art of chronobiology and the biochemical, biophysical and kinetic features of circadian rhythms. In addition to writing on plant circadian rhythms the author gives extensive descriptions of insect clocks and in the bargain delivers more than what the title promises. The author has modelled his book on a perennial classic (the third English edition was brought out by the publishers Springer-Verlag in 1973) by Erwin Bünning, who in many ways is a 'natural' successor to his countryman Wilhelm Pfeffer (1845–1920). K. S. Sundararajan acknowledges his debt to Bünning and this debt is most conspicuous in the last three chapters of the book.

Dr. Sundararajan's book comes to the Indian market at a most suitable juncture. Hopefully many more Indian authors will write monographs on this fascinating subject each from his own point of view. Subjectivity in writing monographs, as long as the author is knowledgeable, can make for lively reading. The author of this book is an authority on plant circadian rhythms and alludes to his work on the circadian clock of the common Indian cotton plant *Gossypium hirsutum*. I wish he had cited more Indian examples to impress on his readers the ubiquity of the phenomenon as well as the stupendous periodicity of the world we inhabit. 1980 is the cut-off year in this book for literature coverage. In a PNAS paper in 1985 it has been reported that a high molecular weight polypeptide ($M_r \neq 230{,}000$ protein p 230) may be part of the circadian clockwork in *Acetabularia*.

While the general production is good it is most unfortunate that innumerable printer's errors and spelling mistakes have been overlooked. I counted as many as 250. For the price (which works out to a rupee a page) the reader has a right to expect more exacting publication standards. Hopefully there will be a second edition minus these irritants. I recommend this monograph to the student, librarian, researcher and the layman alike.

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NEWS

METEOR-OBSERVING RADIO LOCATOR TO DETERMINE WIND VELOCITIES

An automatic radio locator complex built in Kharkov (Ukraine), helps Ukrainian scientists to watch the flight of meteors, thereby determining wind direction and velocities at high altitudes.

Entering the earth's atmosphere at great speed, meteors burn themselves out at altitudes of 75–105 km, leaving a trail consisting of ionized gas which is scattered by winds.

The radio beam detects the trail of ionized gas and by following the movement of the gas gathers information on how and where air currents move.

This enables the scientists to prepare long-term weather forecasts. (*Soviet Features*, Vol. XXVI, No. 34, March 19, 1987, p. 1; Information Department, USSR Embassy in India, P. B. 241, 25 Barakhamba Road, New Delhi 110 001).

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