

BOOK REVIEWS

Annual Review of Genetics: Vol. 15, 1981, Editors Herschel L. Roman, Allen Campbell and Lawrence M. Sandler. Published by Annual Review Inc., 4139 El Camuo Way, Palo Alto, California 94306, USA. Pages: 417, Price not given.

The main objective of Annual Reviews is the updating of information on current research activities. Many a time, the editors are not able to incorporate some of the topics which should have been there. This volume is no exemption for this. However, a wide variety of topics of current interest have been reviewed for the benefit of those who are not actively working in these areas.

The review on Sister Chromatid Exchange discusses the properties, mechanisms and the biological significance of this phenomenon. Yeast is the organism of choice to study chromosome exchange and study of such a system could provide valuable information on the superficially unrelated processes of gene expression in normal and pathological states in higher organism. Transposable elements which move from one place to other control gene expression. The nature and their promotional functions in prokaryotes are discussed in detail. Genetic analysis of the major outer membrane of *Escherichia coli* is advantageous as a model system for studying membrane. Human leukocyte blood group is a very fascinating genetic system and has direct diagnostic value.

Perhaps frog oocyte is the most efficient system in which purified genes can be transcribed and expressed. The techniques of introducing the gene, fate of the injected DNA and the expression are discussed in detail. *Drosophila* genome organization is reviewed in the light of the recombinant DNA technology. Discussions are centered around satellite and ribosomal DNAs, heterochromatic genes and on the programmed changes during development and evolution.

SV 40 is a proved carrier for the introduction of foreign DNA into mammalian cells. It is used to produce encapsidated virus or multiplies as recombinant molecule as episome or integrates with the host chromosome. The review on directed mutagenesis explains how specific mutations are produced by cleavage by restriction enzyme and integration of foreign DNA. This technology has already provided new insight into the nature of regulatory elements in DNA and has tremendous impact on protein structure and function.

Methods in Physiological Plant Pathology—2nd Edition, 1982 by A. Mahadevan and R. Sridhar. Published by Sivakami Publications, 40, 1st Main Road, Indra Nagar, Madras 600 020, pp. 316, Price Rs. 30/-.

This book constitutes the 2nd edition, the first edition having been published in the year 1975. The book provides some very useful and important methods which are of great interest to students and researchers in the field of experimental Plant Pathology or to be more precise, Physiological Plant Pathology. While the classical Plant Pathologist is interested in the nature of symptoms, host range of the pathogen, epidemiology of the disease and control measures, the experimental Pathologist is interested in the Physiological interaction of the host and parasite as influenced by environment, ultimately resulting in the host succumbing to the parasite or not allowing it to get established and produce typical symptoms of the disease. The methods in the book, can be broadly grouped into (i) those relating to the assay of toxins and enzymes, (ii) changes in cellular permeability and initial events in pathogenesis, (iii) estimation of respiration and oxidative enzymes, (iv) alterations in growth regulators, (v) photosynthesis, chlorophyll and carotenoids, and (vi) preformed inhibitors (prohibitors), phytoalexins, and impedins, etc. At the end of each method(s) some important reference(s) wherein the method(s) has been successfully used, have been provided. Each method has been described carefully giving all the relevant details, so that the student or researcher has no difficulty in using it. In the end, an appendix containing valuable information on weights and measures, buffer solutions, standard solutions, indicator solutions, stains disinfectants, formulae for selected culture media, light filters for colorimeters, purification of the commonly used organic solvents, a list of manufacturers and suppliers of chemicals, glassware and equipment has also been provided.

The manual, no doubt will be of immense help to students of Plant Pathology, Physiology and Chemistry and Entomology. The book is moderately priced and therefore within the reach of all students interested in experimental Plant Pathology. In the end, I wish to congratulate Prof. Mahadevan and Sridhar for revising and bringing out this second edition.

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Annual Review of Physiology: (Vol.44) Ed.: I. S. Edelman (Annual Reviews Inc., Palo Alto, CA, USA), 1982, pp. 744, Price: USA \$22.00 Elsewhere \$25/-.

This Volume presents a total of 44 review articles on recent advances in physiology, under the sections of gastro-intestinal physiology, comparative and integrative physiology, renal and electrolyte physiology, respiratory physiology, cell and membrane physiology, cardiovascular physiology, chemotaxy and motility, and endocrinology and metabolism.

The reviews discuss several of the interesting developments which have been taking place in the progress of physiology in recent years:— Gastro-intestinal circulation appears to be regulated by the degree of activity in the gastric glands and parenchymal cells of the villi, in addition to the intrinsic auto-regulatory mechanisms of vascular smooth muscle. The gastro-intestinal hormones may also regulate the circulation in the liver. The mechanisms to protect thermally sensitive organs (notably, the brain), and to dissipate excess heat during the increase in heat production due to locomotion in endothermic animals have been reviewed. The new knowledge on the heterogeneity of structure of various types of nephrons as well as the transport properties of the different parts of the nephron have been reviewed, referring to the renal function in phosphate homeostasis, extracellular fluid expansion and renal water repletion reaction. The non-respiratory functions of the lungs, particularly with reference to the role of the pulmonary vascular endothelium in the regulation of systemic arterial blood pressure by conversion of angiotensin I to II, inactivation of prostaglandins, norepinephrine and 5-hydroxytryptamine (while not affecting dopamine and epinephrine) have been succinctly reviewed. The acetylcholine receptor turnover in the muscle cell plasma membrane and the transport of ions in sarcoplasmic reticulum have also been discussed. The properties of myocardial cell membrane and sarcoplasmic reticulum with respect to sodium-potassium pump, calcium-sodium exchange and pump processes; the consequences of regulation of the calcium fluxes through slow channels in the sarcolemma and also the various ionic fluxes by influencing the ionic channels (local anaesthetics and calcium antagonists) and Na, K-ATPase (cardiac glycosides) have been dealt with in detail. The stimuli for chemotactic behaviour of leukocytes, which fight against infections by phagocytosis, have been considered to be parts of the complement fixation system, C5A, formylated peptides and arachidonic acid derivatives. There are multi-faceted reviews on peptide hormones which have been discovered during the past decade in the gastro-intestinal tract, pituitary and brain. It appears that the peptide "hormone plasma membrane receptors form oligomeric complexes with nucleotide regulatory units that bind GTP

and mediate either the stimulation or inhibition of adenylate cyclase by GTP". Calcium with its cytosolic receptor called calmodulin seems to play the second messenger role in protein secretion and receptor endocytosis and translation of peptide messengers. As there is a separate Annual Review to cover the Neuroscience advances, the coverage of nervous system is not present in this volume.

The Annual Review of Physiology, being the single most authentic source of knowledge on recent advances, will be of outstanding value to those who are in the specialities of Physiology and Medicine.

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World Literature on Reclamation and Management of Salt Affected Soils: (1950-1981) by K. N. Pahwa and I. C. Gupta, Associated Publishing Company, 8763, Shidipura, Karolbagh, New Delhi, 1982; i-xii + 352 pages; Rs. 180.00 or US \$50.00 or £25.00

The book comprises annotated bibliography of world literature on reclamation and management of salt affected soils, published during the years 1950 to 1981. The 811 abstracts are arranged alphabetically by the surname of the author (first author in case of joint authorship), followed by title of the paper/book, name of the periodical (properly abbreviated)/publisher, year of publication, volume of the periodical, page range and language (indicated by symbol) of the periodical in case it is not in English. The source of information has been drawn from Journals (211), Proceedings of seminars and symposia (38), relevant chapter of books (13), and books (27) published from 46 countries. The abstracts are well documented and informative. This will be a good reference book for those interested in the subject as all the publications referred to, by the authors may not be available in a single library. The authors have done a good job of documentation.

The book is dedicated to the memory of late Dr. J. W. Leather who did pioneering work on soil in India in the earliest part of the present century. Besides Leather's work, some good work on soil salinity was done in different states of India prior to 1950. Inclusion of a short account of the pioneering work would have enhanced the value of this book. Wherever the abstracts are taken directly from the authors', this could have been indicated. The author index, subject index, source index, and geographical index are useful features of the book.

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Annual Review of Phytopathology—Vol. 19 1981.

Edited by Grogan, Zentmyer, Cowling. Published by Annual Reviews Inc., Palo Alto, California, U.S.A. Price: U.S.A. \$20.00 elsewhere \$21.00.

The volume comprises of 25 papers of topical interest to plant pathologists, mycologists, microbiologists, geneticists, environmental scientists and biochemists. It starts with the recollections and reflections of Prof. L. M. Black of the University of Illinois, Urbana, USA, a world renowned Virologist particularly known for his outstanding researches on wound tumor virus. Three papers deal with the life and works of three outstanding personalities—Gerald Thorne (Nematology), W. J. Dowson (Plant bacteriology) and G. W. Keitt (Fungal diseases).

The rest of the papers can be classified into the following broad categories *viz.* Appraisal of plant disease (3 papers), Pathogens (5 papers), Morphology and anatomy (1 paper), Physiology of host pathogen interaction (1 paper), Breeding for resistance (2 papers), Epidemiology and influence of environment (2 papers), Action of toxicants and chemical control (2 papers), and a special article—Extension: the face of Plant Pathology. Since space does not permit me to review every individual article, I shall confine my comments to a selected few. However, it may be stated that all the articles are chosen by the editors after a great deal of thinking and entrusted them to the care of experts who have done an excellent job.

The paper of Ellis Griffiths on Iatrogenic plant diseases a new term for diseases which result from or are increased in severity by the use of specific plant protection chemical is of special interest. Demonstration and analysis of this class of diseases can be expected to produce a clearer understanding of disease problems and overall strategies for control. Discussing the structural requirements of systemic fungicides, Eddington emphasises the physiological and chemical requisites for systemicity and summarises the future prospects and direction of research in this vital area.

Ellingboe's paper is a critical review of the current understanding of genetics of host, genetics of pathogen, gene-for-gene relationship between the host and pathogen, horizontal vs. vertical resistance etc. As a result of detailed analysis he suggests that horizontal

resistance is an artifact of how the experiment was conducted and almost all the naturally occurring genetic variability seems to follow the gene-for-gene pattern.

J. F. Shepherd in his article "Protoplasts as source of resistance" presented a critical assessment of the potential contributions that protoplasts manipulation and culture can provide to the development of disease resistant crop plants. Soil-borne pathogens inflict heavy losses to our crop plants and are difficult to control. The paper "Solar heating (Solarization) of soil for control of soil-borne diseases" by Katan reviews the work done in Israel and other parts of the world for disinfection of soil through solar heat—a novel method and can be usefully deployed in an integrated manner with other methods such as use of pesticides, resistant cultivars etc.

Diagnosis of plant disease and maintenance of plant health is complex and Grogan's review paper on this subject is very informative and useful especially for those starting their career as extension pathologists. A number of virus diseases are transmitted in nature efficiently by arthropod and nematode vectors. The transmission ecology with special emphasis on pathogen-vector-host interactions have been described admirably by Harris in his review paper entitled "Arthropod and nematode vectors of plant viruses". Stilbenes, the 14 carbon phenolic molecules have long been known for their antifungal properties and their role as performed antimicrobial agents responsible for the durability of the heartwood of various tree species has been studied intensively by researchers. The article of Hart is a critical appraisal of these little known compounds as post-infectious inhibitors of wood rotting fungi.

Undoubtedly this volume like the earlier volumes contains excellent reviews which are critical and thought provoking for which the editors and contributors deserve hearty congratulations of all engaged in teaching, research and extension of plant pathology. The volume will be an asset to any library or individual scientist.

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