of gene regulation); others are quite unclear (e.g., on coadaptation, hybrid dysgenesis, evolutionarily stable strategies). The book has the virtue of including topics that are often given short shrift (e.g., estimation procedures, sexual selection, heterogeneous environments), but some are not developed in sufficient depth (e.g., the theory of clines, gene frequency dynamic traits under stabilizing or disruptive selection, the problem of defining fitness in ecological terms). Hedrick is at his best in presenting theory in a clear—if often uninspired—way: the greatest weaknesses are in the verbal application of theory to evolutionary problems such as coadaptation, speciation, and the evolution of life histories. To be sure, the mathematical treatment of some of these issues is only beginning, but it is nevertheless richer than Hedrick’s brief, often superficial presentation suggests.

Hedrick provides an excellent sample of empirical cases to illustrate the theory, but seldom ventures to suggest generalizations about the prevalence of various phenomena in real populations. He seems more comfortable with the theoretical than with the empirical literature of evolutionary genetics, so that the book is a guide to how to think about population genetics phenomena rather than a summary of how evolution actually occurs at the genetic level. There are exceptions, though; for example, Hedrick provides an excellent analysis of the IQ controversy, and takes a strongly anti-hereditarian stance.

Rethinking Plant Disease Management


It is a pleasure to welcome a needed, well-done book. Old-line disease control courses need revamping based on epidemiological principles. Fry has provided a book that will make that task easy and has done so without overdoing the epidemiological bases of the principles.

The author’s intention is to identify and integrate logical approaches to plant disease management, combining theoretical and practical elements based on a knowledge of epidemiology. The book’s emphasis is on principles and strategies, and, sensibly, the author makes no attempt to present a compendium on disease control. The writing is accurately targeted on students who have had a single plant pathology course as well as others who need to know why specific practices are (or are not) used and the effects they may have on disease development.

There are three sections: an introduction, which includes a discussion of diagnosis, a second part on basic epidemiology as the basis of practical management, and a long third section, which discusses management by reducing initial inoculum, by reducing the rate of disease development, and through the use of resistance. A final chapter illustrates the integration of control practices for several agroecosystems and was written by various experts knowledgeable about those systems.

There are also two chapters on chemicals used to manage disease, justification of their use, and specific indications of the main and side effects. There is a valuable bibliography and a good index.

I have read the book with the hypothetical attitude of one who may wish to offer a course in disease management but is deficient about his knowledge and experience. I conclude that the book will be of immense help in this way. Even if one does not use the book’s typology as the course syllabus, there are to be found here solid, logical presentations of the bases of disease-management strategies. One will be able to substitute and augment when one has available such superb chapters as the ones on pathogen-vector relationships and on disease forecasting, which can be used very profitably as written. Because the book is written much like a review article, students and teachers will find numerous citations of most-important papers to be a base they can build from individually.

What I missed was a feeling for the author’s own ideas in many important areas; I wish the book were more “personal” in its approach. Also, unfortunately, the work is directed entirely at high technology, specifically US agriculture. Since the same principles must apply in the less-developed countries, special attention on management in these economically, socially, and educationally different societies would have added a special element.

R. D. Schein
Department of Plant Pathology
Pennsylvania State University
University Park, PA 16802

A New and Different Botany Text


The Saigos have produced a really new and different botany text. This one is written to help students realize the importance of plants to their lives and to help them understand the dynamic interaction of plants with all life on this earth. The first chapter establishes the tone for the rest of the book, cleverly calling attention to the hundreds of ways plants affect us daily. Table 1-1 outlines a possible morning-to-night set of activities with all the many commonly overlooked encounters one has with plants and plant products. This theme of “relevance” is continued throughout the book both by stated examples and by selection of subject matter.

The first ten chapters contain an up-to-date coverage of the common subject matter found in most such texts. The last ten chapters include some “routine” botanical information but with a very practical flavor. Chapter 11 (“From Seedling to Harvest”), for example, teaches structure of seeds and seedling growth through to a mature plant with fruits from the perspective of good gardening practices. Chapter 13 (“Prokaryotes and Nonvascular Plants”) and Chapter 14 (“Vascular Plants”) include an excellent treatment of the great diversity of plants using an evolutionary approach with 54 and 34 diagrams and photographs, respectively, to illustrate the ideas and concepts presented.

Subject matter not commonly found in many botany texts is covered in Chapters 12 and 15–20. The titles give some perspective of this subject matter (“Disease Mechanisms and Responses,” “Useful Plants and Their Products,” “Food and Other Uses of Wild Plants,” “Hazardous Plants,” “Indoor Plants,” and “Landscape Design”), but the titles do not convey how clearly the message “Plants are important to each of us” is presented. The chapter on biomes of North America should be required reading for all who travel across our wonderful continent; it would enrich the lives of all who take the time to read it.

The book is profusely illustrated with line drawings, light photographs, electronmicrographs, and electron scan photographs. These are carefully selected to enhance understanding and to present important concepts visually. Especially helpful are the numerous tables that summarize large quantities of information and show the interrelationships of diverse subject matter subsets. These, too, contain carefully selected examples that are likely to be recognized by most readers.

Each chapter begins with an introduction and a special full-page photograph along the lines of...
an "Asubelian organizer." The content is separated into appropriate topics, and each chapter closes with a summary and suggested readings. Occasionally, chapter supplements are included with special-interest items such as direction for budding, grafting, etc. Basically, all subject matter is presented progressively, from that which is most likely to be known to the least likely.

This botany text is a marvelous piece of work. It is so well written, so well illustrated, so well organized, and contains botanical information so much needed by all who would understand life on this earth that it is a pleasure to recommend it not only for classroom use but for wider reading as well.

S. N. POSTLETHWAIT
Department of Biological Sciences
Purdue University
West Lafayette, IN 47906

ABSCISIC ACID


In the introductory chapter, Addicott and Carns give a brief history of the several independent lines of investigation that led to the isolation and identification of abscisic acid. They note that Theophrastus (285 B.C.) mentioned that roses were not propagated from seed because of the slow germination of the seed; rose hips and seed are now known to be rich in abscisic acid. It should be of great interest to the historian and the experimentalist to read that many of the presently known responses of plants to abscisic acid were observed in the 1930s, 1940s, and 1950s—well before the structure was determined and verified in 1965—as responses of plants to fractions of plant extracts.

For those somewhat familiar with the subject, the list of the contributors—F. T. Addicott, L. J. Audus, M. Black, C. H. Bornman, H. R. Carns, W. J. Davies, K. Dorffling, T. D. Ho, T. A. Mansfield, B. V. Milborrow, I. D. J. Phillips, S. A. Quairrie, J. A. Sacher, D. Tietz, M. E. Van Stevenick, R. F. M. Van Stevenick, S. N. Visscher, D. C. Walton, and P. F. Wareing—will assure that this will be an excellent and useful book. The topics covered include biogenesis, detection, estimation, transport of abscisic acid, and the structure—activity relationships of analogs of abscisic acid, as well as the involvement of abscisic acid in abscission, drought avoidance, membrane transport, and dormancy and apical dominance, seed germination and dormancy, root growth and geotropism, leaf senescence, and morphogenesis. The chapter on the effects of abscisic acid on animal (principally insect) growth and reproduction deserves special attention because of the ecological implications and because the few observations already made should provoke more definitive researches. The chapter on the biochemical mode of action reminds us that abscisic acid certainly causes a response at the level of transcription and also—almost certainly—at the level of translation. Rapid progress in understanding the details of these responses can be expected.

For me, the most interesting part of the book is not that dealing with the experiments that outline biogenesis, metabolism, and mode of action, but rather the chapter on the morphological responses to abscisic acid. Here lie the fresh clues to a better understanding of how abscisic acid "_works." The book ends with a concise, clear, and coherent summary by Addicott and R. F. M. Van Stevenick.

Because this book has been edited by one of the codiscoverers of abscisic acid, who is also one of the principal contributors to our present knowledge of abscisic acid, I think it appropriate to say that his chapters in the book show his scholarly interest in the subject and his affection for his colleagues.

J. E. VARNER
Department of Biology
Washington University
St. Louis, MO 63130

HEAT SHOCK PROTEINS

Heat Shock: From Bacteria to Man. J. Schlessinger, N. Ashburner, and A. Tissieere. Cold Spring Harbor Laboratory, Cold Spring Harbor, NY, 1982. 440 pp., illus. $45.00; $54.00 outside US.

This book contains proceedings of a meeting on heat shock proteins held at Cold Spring Harbor Laboratory, New York, in 1982. The meeting, which brought together 130 scientists from a variety of backgrounds, was the first time scientists had met to discuss this important research area. Results of the investigations of these scientists were presented in 90 papers. Half of the papers were formal talks, and half were poster presentations. This book not only summarizes the formal talks but also presents the most complete survey of current information on heat shock. Since heat shock research at the microbial level has been limited to just a few researchers, it is a delight to read the summary by Dr. Alfred Tissier of the Department of Molecular Biology, University of Geneva, Switzerland, which provides a good overview to the topics in the book as well as a good literature review for a novice to this area.

The book covers a broad range of living organisms. It begins with a section on the effect of heat shock on gene organization and transcription, covering everything from yeast cells to mammalian cells. It describes the heat shock gene in different animal species very well and also provides a very thorough analysis of the region of the heat shock locus. The next section provides presentations on chromatin structure. This particular section is not for the novice reader but will interest scientists interested in structure alterations and perturbations associated with heat shock gene expression. The third section covers gene regulation and response. It was thought that the heat shock response, which was described in Drosophila, was confined to higher eukaryotes, but this symposium has shown that the heat shock response also occurs in complex organisms. This area of heat shock research has attracted much interest and has led to contradictory conclusions because the answers are not simple.

In summary, this book is essentially a literature review and a very good reference book. Because the book is a compilation of papers from the Cold Spring Harbor meeting, the sections do not relate to one another closely enough to make the book easy to read. Heat shock research may be interesting, but it requires in depth knowledge of gene regulation and molecular biological mechanisms to understand. Therefore, although this reference book should be in the hands of all heat shock researchers, it is not a good overview for the inexperienced reader.

THOMAS P. DAVIS
Laboratory of Analytical Chemistry and Mass Spectrometry
Department of Pharmacology
University of Arizona
Health Sciences Center
Tucson, AZ 85724

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