

suspect that the argument will not be readily resolved.

The cyprinids are the subject of Buth's review. He describes the current knowledge of this taxonomically complex family and reports the use of biochemical characters in elucidating their taxonomic relationship. Finally, Kornfield deals with the problems of cichlid taxonomy and evolution. He describes studies on the electrophoretic and chromosomal characterization of the family and recognizes the need for more basic biological and genetic research particularly in the fields of reproductive behaviour and the mechanisms of sex determination.

This volume highlights the important position of fisheries research in the attempts to unravel the problems of evolutionary genetics. The chapters are well written and informative and the book can be recommended to all geneticists.

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Gene expression (UCLA Symposia on Molecular and Cellular Biology New Series, Vol. 8. Editors D. H. Hamer and M. J. Rosenberg. Alan R. Liss, Inc., New York, 1983. Pp. xxiii + 612. Price £58.00.

"Gene Expression" is the latest volume in the rapidly growing series of UCLA symposia which started in 1972. The symposium dealt with gene structure and function in a wide variety of biological systems. Researchers working on the molecular biology of prokaryotic, lower and higher eukaryotic systems were brought together to compare and contrast the regulatory mechanisms operating to control gene expression in different organisms.

The book adopts a mechanistic approach and is divided into seven sections: DNA structure and DNA-protein interactions, promoters and enhancers, transcriptional regulation, gene regulation in development, termination and post-transcriptional controls, gene structure and function, and gene transfer. In addition, this volume includes workshop summaries on post-initiation control mechanisms, and DNA modifications and gene expression. The individual sections of the book include between four and nine papers; each section contains studies of both prokaryotes and eukaryotes. The papers are mostly short, specific reports of original research data although some are short overviews of previously reported material. This mechanistic organisation concentrates the subject into a detailed dissection of gene expression and its regulation, and attempts to focus on the similarities of the mechanisms rather than the usual approach which stresses the differences.

It is difficult to decide exactly at whom such texts are aimed. Primarily, the book presents a very convenient source of highly detailed material from a wide variety of organisms for researchers, students and teachers of gene expression. Both the individual papers and the references they contain enable an almost effortless

introduction to a specific field without the need to resort to extensive literature searching. However, the price will not encourage many people to purchase personal copies even if their interests lie directly in this field. For this reason, I imagine it will only find a place in university and research institute libraries.

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Chilling tolerance of young plants demonstrated on the example of maize (*Zea mays* L.). Peter Stamp. Verlag Paul Parey: Berlin, Hamburg. 1984. 83 pp. DM 48.00.

Improvement of maize varieties so that they can be reliably grown in the relatively cool spring conditions in Northern Europe has been the concern of several groups of European plant breeders. In the face of limited success in selecting for tolerance of cool temperatures the main thrust of breeding has been in the direction of early maturing varieties. Dr Stamp advances the view that a clearer understanding of the biochemical and physiological background to chilling injury is necessary before breeders can begin to incorporate valuable genes from exotic genetic material so as to improve chilling tolerance.

The book is based very largely on Dr Stamp's own work which has been published in at least 18 papers in German and in English during the last four years. The book, with its mere 67 pages of text, is therefore a summary of this work and provides an excellent opportunity to survey the remarkable range of achievement of the author. As a framework on which to hang very detailed sections on the development and function of the root (p. 25) and the shoot (p. 36), he begins by discussing Levitt's ideas concerning the nature of chilling stress. I find these semantics off-putting because specific plant responses to chilling stress may not be exclusively either "plastic" (*i.e.*, involving some permanent change in the composition or properties of the plant) or "elastic" (involving reversible or compensatory changes). Readers who experience similar irritation, take heart and read on, for the clear, if rather concentrated, information given in subsequent pages is most illuminating. The work by Stamp on nearly every aspect of the chemical composition, growth, morphology, anatomy and biochemistry of the maize plant is a *tour de force* which few can emulate. At each stage he adopts an approach where varieties from contrasting climatic origin are compared; these are mainly inbred lines of flint and dent types. In spite of his own analyses of root development and of the importance of the parameter, leaf:root (surface area) ratio, he concludes that not enough is known about the relevance of various root traits, such as branching pattern, in chilling tolerance to provide a rational basis for the selection of any given trait.

The author's analysis of leaf development and photosynthesis under chilling conditions indicates that there is considerable genotypic variation in photosynthetic efficiency of the total leaf area of young plants; subsequent metabolic reactions involved in developing new leaf after CO₂ fixation show little genotypic variation. The activity of the Ribulose biphosphate carboxylase (RUBP carboxylase) in genotypes contrasting in chilling sensitivity showed considerable variation. Some lines attained high activity under chilling conditions; this was most marked when Middle European varieties were compared with those of tropical/subtropical origin—the difference being greatest at 14°C.

The work reported here follows a very logical development—a model for the interaction that ought to take place more frequently between physiologists and breeders. Although there is more in this book for the physiologist it should be essential reading for breeders working with maize; it is thoroughly recommended.

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