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 Book review
 

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**Shapiro, A. (ed.): Mobile Genetic Elements.** London, New York: Academic Press 1983. 688 pp., 138 figs. Hard bound £ 43.00.

The understanding of mobile genetic elements is a necessity for anyone interested in explaining the biology of prokaryote or eukaryote organisms. These DNA sequences which are transferred within or between genomes may affect cellular phenotype not only by the genomic position of their integration, but also by their orientation, gene content, and their ability to cause chromosome rearrangements such as chromosome breaks, deletions and inversions. "Mobile Genetic Elements", edited by J. A. Shapiro, is an excellent compilation of reviews encompassing both prokaryotic and eukaryotic transposable element systems. Each of the fourteen chapters is a well-balanced overview of a particular transposable element system. The organization of the individual chapters greatly facilitates the usefulness of the book by having a short outline of chapter contents at the beginning and a sufficient list of references in alphabetical order at the end. However, reorganization of the chapters within the book would have facilitated the introduction of nonspecialists to the field of mobile genetic elements. Rather than an initial chapter by N. Fedoroff reviewing the complex "two-element" systems of controlling elements in maize, the fifth chapter concerning the prokaryotic IS elements (reviewed by Arber et al.) would be a better and simpler approach. IS elements are well described molecularly and exhibit many structural and biochemical characteristics which are recurrent themes in later chapters.

The prokaryotic chapters on Tn3 and Tn10, reviewed by F. Heffron and N. Kleckner respectively, are excellent up-to-date accounts of these systems and quite nicely follow and extend the IS element review. The review by A. Campbell on bacteriophage  $\lambda$  and that concerning the temperate bacteriophage Mu, written by A. Toussaint and A. Résibois, would have been better placed after that of the other prokaryotic transposons. The first two eukaryotic systems to be described in the book are the Ty element of yeast, reviewed by

G.R. Fink, and several of the dispersed repetitive DNAs of *Drosophila* reviewed by G. Rubin. The retrovirus chapter written by H. E. Varmus follows shortly there after and clearly relates the structure of eukaryotic retroviruses to that of the Ty element and several previously described *Drosophila* transposable elements. Although this chapter is the most lengthy chapter (73 pages with 20 pages of references), it is clearly written and does not contain extraneous information.

Finally, several chapters discuss phenomena directly related to the presence of mobile DNA sequences. These include a review by J. Bregliano and M. Kidwell on hybrid dysgenesis in *Drosophila*; Flagellar phase variation in *Salmonella typhimurium* described by M. Silverman and M. Simon; mating-type conversions of *Saccharomyces cerevisiae*; and antigenic variation in trypanosomes by P. Borst. Some of these phenomena were mentioned briefly in the 1977 Cold Spring Harbor book on "DNA Insertion Elements, Plasmids, and Episomes" (eds. A. I. Bukhari, J. A. Shapiro, and S. L. Adhya). It was definitely time for them to be included as separate chapters in such a review of mobile genetic elements.

The review by Zambryski et al. on the T-DNA of *Agrobacterium* is well written and sufficiently reviews material necessary for the understanding of this bacteria-plant DNA interaction. However, it is unnecessarily placed between the review of retroviruses and phase variation and would have been better placed at the end of the volume. In such a position (perhaps following the maize review article), it would naturally lead into a final chapter concentrating on the prospective use of known transposable elements as vectors for gene transfer systems. Although such a chapter does not exist in this book, it, together with a chapter discussing other unstable systems mentioned in the literature but not biochemically characterized, would have been useful to the uninitiated reader.

Overall the reviews are well written by well qualified authors. The book would be an excellent guide for an advanced undergraduate or graduate course on the subject of mobile genetic elements.

H. Saedler, Köln