Nonchromosomal Genes

Extrachromosomal Elements in Lower Eukaryotes. REED B. WICKNER, ALAN HINNEBUSCH, I. C. GUNSALUS, ALAN LAMBOWITZ, ALEXANDER HOLLAENDER, and five others, Eds. Plenum, New York, 1986. x, 568 pp., illus. Basic Life Sciences, vol. 40. From a symposium, Urbana, IL, June 1986.

The focus of this collection of papers is primarily on molecular and genetic aspects of extrachromosomal elements in a wide variety of fascinating biological systems. Different systems are covered in more or less depth in accordance with the degree of available information. Not unexpectedly, the most detailed analyses are generally those that have been carried out on extrachromosomal elements in the intensively studied yeast *Saccharomyces cerevisiae*. Three sections deal in turn with the yeast mitochondrial genome and its introns, the double-stranded RNAs found in intracellular viruslike particles in yeast, and yeast plasmids, both nuclear and cytoplasmically inherited. In these sections the papers on the yeast elements are juxtaposed with papers on less widely studied organisms. The strategy of putting together papers about comparable elements in different organisms is successful here. For example, the papers about double-stranded RNAs in the plant pathogenic fungi *Endothia* and *Ustilago* are made even more interesting by placing them in the context of the in-depth molecular genetic analyses of double-stranded RNAs that have been possible in yeast.

Relatively up-to-date information about extrachromosomal elements in a variety of less widely known lower eukaryotes has been brought together here. Since these systems are usually considered in separate journals or books, read by nonoverlapping readerships, this is a particularly valuable aspect of the volume. The section on symbionts is a case in point. Perhaps the best studied endosymbionts are those of the ciliated protozoan *Paramecium*. However, as John J. Preer, Jr., points out in his overview to this section, the distinction between cellular organelles and intracellular symbionts may depend "only on the time in evolution that the association began and the degree to which the different elements have become interdependent." In light of this biological context, the paper by Dutcher on the circular linkage group of genes encoding flagellar and basal body components in *Chlamydomonas* is especially fascinating.

Readers with varying levels of interest in the topics covered in this volume will find it worth reading. It is a useful resource for graduate students, or indeed for molecular biologists or geneticists with only a passing interest in extrachromosomal elements, because it collects up-to-date reviews on a group of organisms not usually gathered under one roof. For example, the papers on double-stranded RNAs together comprehensively review the genetics of these systems, as does the paper by Dutcher mentioned above on flagellar genes. The papers on plasmids in *Dictyostelium* and in yeasts, by Williams and Gunge respectively, are just two examples of useful reviews and reference sources on less well-studied systems. The yeast specialist will find a collection of up-to-date information on extrachromosomal elements, as well as on various aspects of yeast gene expression and chromosomal elements, in the last two sections. And finally, for the experimentalist who is puzzled by the appearance of an unexpected band in a gel of uncut DNA from a new strain, the volume provides a resource for considering the many different types of extrachromosomal DNA or RNA that are possible, together with ways for studying them experimentally.

ELIZABETH H. BLACKBURN
Department of Molecular Biology, University of California, Berkeley, CA 94720

Some Other Books of Interest

The Statistical Consultant in Action. D. J. HAND and B. S. EVERITT, Eds. Cambridge University Press, New York, 1987. xii, 189 pp., illus. $34.50.

Quoting a comment by A. Ehrenberg that textbook examples of statistical analysis are often "so grossly oversimplified as to make a pretentious mockery of real-life situations," the editors represent this collection of papers as the result of "an attempt to present the reality of statistical consulting." In the two opening chapters, both written in a light vein, Hand and Everitt give taxonomies of clients and consultants (the *gong*, for instance, is "a consultant who starts every conference by drawing a bell-shaped curve") and Greenfield gives "cameos" of some encounters between statisticians and clients. The remaining ten papers (all of whose authors are, like the editors, affiliated with British institutions) are somewhat more technical and describe particular statistical endeavors addressing questions on a variety of subjects, among them relation of protein levels in blood to drug dosage, effectiveness of new drugs, utility of a routine surgical procedure, effects of acid rain on tree roots, sex ratios in moths, classification of microorganisms, quality control in the garment industry, and modeling of unemployment data. A brief general bibliography on statistical consulting and name and subject indexes complete the volume, which the editors hope will be useful as a complement to standard textbooks in statistics.—K.L.

Advances in Chronobiology. JOHN E. PAULY and LAWRENCE E. SCHEVING, Eds. Liss, New York, 1987. In two volumes. Part A, xxvii, 528 pp., illus. $130. Part B, xxxii, 613 pp., illus. $130. Progress in Clinical and Biological Research, vols. 227A and 227B. From a conference, Little Rock, AR, Nov. 1985.

These two volumes contain some 50 of the approximately 140 papers presented at (or prepared for) the 17th international conference of the International Society for Chronobiology, which was founded in 1935 as the International Society for the Study of Biological Rhythms. For publication the papers have been grouped by general theme. Part A contains groups on the chronophysiology of plants and microorganisms (8 papers), cell biology (9 papers), chronophysiology in various animal species (10 papers), gastrointestinal rhythms (5 papers), and immunology and endocrinology (7 papers). In part B are collected papers having to do with development and aging (9 papers), cardiovascular rhythms (8 papers), clinical chronobiology (16 papers), shift work (4 papers), "psychiatry and behavior" (9 papers), and methodology (6 papers). Each volume has its own subject index and lists the contents of the other. The work as a whole is dedicated to Franz Halberg, who provides an opening chapter entitled "Chronobiology: professional wallflower or paradigm of biomedical thought and practice?"—K.L.

Some Mathematical Questions in Biology: Circadian Rhythms. American Mathematical Society, Providence, RI, 1987. xii, 265 pp., illus. Paper, $36. Lectures on Mathematics in the Life Sciences, vol. 19. From a symposium, Philadelphia, May 1986.

This latest volume stemming from a series of annual symposiums held as part of the AAAS meetings contains six papers that "discuss, analyze, and compare . . . various experimental, theoretical, and mathematical approaches" to the understanding of circadian rhythms and sleep. The papers are: "A comparative analysis of models of the human sleep-wake cycle" by Strogatz; "Sleep intensity and timing: a model for their circadian control" by Beersma *et al.*; "Temporal subdivision of the circadian cycle" by Kronauer; "Detecting a phase singularity in a coupled stochastic system" by Enright and Winfree; "Mammalian circadian rhythms: a neural network model" by Carpenter and