Book Reviews

W. Nagl: Chromosomen. Organisation, Funktion und Evolution des Chromatin. Pareys Studientexte Nr. 23
Berlin, Hamburg: P. Parey 1980. 228 pp., 112 figs. Soft bound DM 29,–.

A new textbook is presented containing far more than an extremely condensed summary of Nagl's handbook, which appeared some years ago. It contains the most recent results: literature is cited upto 1979. In particular, the author tries to elucidate the mechanisms of differentiation and the evolution of functions as far as they are based on chromatin structure. In the first chapter there is a general description of the chromosome, its morphology, heterochromatin, chromomeres, banding and it's functional structures. The ultrastructure of the chromosome in terms of DNA-content and DNA-organisation, patterns of repetitive and unique sequencies, as well as repetitive genes, are considered in the next chapter. The organisation of the chromatin is demonstrated as a consequence of the association of DNA with proteins, especially histones, and how they act on coiling, supercoiling, and how, by their action, the tertiary structure of the chromosome is controlled. Another chapter is devoted to the mechanisms of gene function and gene expression, including transcription, RNA-processing and translation. Attempts are made to give an understanding of gene regulation on different levels of organisation: availability of the DNA template and of polymerases, post-transcriptional regulation by hormones and other compounds and the mechanisms of determination. Cell cycles and DNA-replication, including those involved in differentiation, i.e. somatic polyploidy, endomitosis and differential replication, are considered in another chapter. The headline 'Chromosome genetics' indicates mutations, meiosis and sexuality. I liked to have seen a more detailed presentation of repair mechanisms and their role in producing mutations. The last chapter is devoted to evolution of the genetic code, the eucaryotic chromosome, of karyotypes and of differentiation. Finally, the chromosomes of man, their aberrations and the problem of cancer are drawn into consideration. It may be of particular interest that there is a chapter dealing with modern methods of investigation: electron microscopy, autoradiography, centrifugation, chromatography, electrophoresis, de- and re-naturation of DNA, establishing cot-curves, cell culture, cell hybridisation and cloning of DNA. Since most of the items demonstrated here have been acquired during the last years there has been no textbook available up to now. Nevertheless, these important facts have to be considered in every lecture on cytogenetics. Thus, this book is extremely helpful to the student as well as to the teacher. May I add just one proposal: 'the chromatid' is a neuter noun; why treat it as a female one, as many German authors do? G. Linnert, Berlin

Hsie, A.W.; O'Neil, J.P.; McElheny, V.K. (eds.): Mammalian Cell Mutagenesis: The Maturation of Test Systems. Banbury Report 2
New York: Cold Spring Harbor 1979. 504 pp., 88 figs., 51 tabs. Hard bound $45.00.

The 'Banbury Report 2, Mammalian Cell Mutagenesis: The Maturation of Test Systems' is based on a conference held in May 1979 by the Banbury Center, a daughter organization of the Cold Spring Harbor Laboratory. The first of its conferences was held in May 1978 on the subject of chemical mutagens.

Several test systems are necessary in order to identify cancer initiating or promoting substances which people encounter in their diet or their surroundings, at home or at work. From this point of view the papers presented in the Banbury Report 2 give a good survey of present knowledge of mammalian cell mutagenesis. They are divided in seven sessions (gene mutation; quantitative mutagenesis with rodent cells; criteria for a mutagen screening system; genetic, biochemical and molecular analysis of mutation; use of mutagen screening systems; quantitative mutagenesis of human cells; mutation, cancer and progress with mutagen testing). Each section was written by experts and presents new material acquired during experimental observation. Every paper is followed by comments. Four units include roundtable discussions on very interesting subjects (definition of criteria to define a genetic event; quantitative mutational systems – evidence for genetic events; identifying activation systems; genetic basis of mutation in human cell systems). At the end of the book a summary, a perspective and a bibliography are provided. 'Banbury Report 2' was published within a very short time.

This book represents 'three overlapping categories of research:

1. the investigation of basic mutational events that take place in mammalian cells;
2. the development of methods for the quantitation of mutation induction in cultured mammalian cells; and
3. the application of these methods for the screening of environmental mutagens.' It should be read by every biologist, biochemist, chemist or medical research worker interested in these fields of science. M. Herrmann, Erfurt