for graduate students and researchers in molecular biology and related fields.

Volume 1 begins with a rather perfunctory discussion of the genetic code and the synthesis of polypeptide chains. This is followed by two excellent chapters on structure-function relationships in the ribosome and transfer RNA. By this time the reader has gained an understanding of our present knowledge of protein synthesis and is prepared for the next section, on control.

In this section the initiation, elongation, and termination of RNA synthesis as deduced from transcription studies on phage genomes are presented. The section also contains discussions of the control mechanisms operating in the lactose, L-arabinose, galactose, and arginine systems in *Escherichia coli*. This reviewer questions the inclusion of all this material in a section on transcription because there had not been a rigorous demonstration of control at the transcriptional level in *ara* and *arg* when the book went to press. A good feature of this section is an excellent general discussion of positive and negative control in both inducible and repressible systems.

The final part of volume 1 describes the reproduction of DNA. Included are chapters on replication, modification, repair, recombination, and the cell division cycle.

Volume 2 is divided into two sections dealing respectively with the structure of the eukaryotic genetic apparatus and with the expression of eukaryotic genes. The first chapter reviews the evidence for the continuity and semiconservative replication of DNA in the chromosome. The organization of chromatin fibers is discussed in terms of the folded-fiber model. The molecular events associated with the cell division cycle are related to the classical descriptions of these events. Two chapters are devoted to the protein components of the chromosome and sequences of DNA. The large amount of work on sequence analysis and modification of histone proteins is reviewed. A final section discusses the structure of chromatin. The chapter on DNA sequences contains a fine summary of hybridization studies, analyzing important procedures and pointing out the pitfalls and limitations of this type of work. A section on the organization of heterochromatin discusses possible mechanisms of band formation.

The complexity of the eukaryotic genetic apparatus is evident from the material presented in the second part of the volume. A chapter on transcription and processing of RNA begins with a detailed analysis of the methods used to characterize RNA sequences. The processing of heterogeneous nuclear RNA and 45*S* precursor RNA is discussed. A chapter on control of transcription describes eukaryotic RNA polymerases and presents some of the models for control of gene expression. The final chapter discusses nuclei transplantation experiments and somatic cell hybridization studies. The use of cell fusion for studies of nuclear gene expression and genetic mapping is illustrated.

In general the author is careful to define terms and to qualify statements on matters that may still be controversial. An excellent selection of photographs is an added feature of this volume.

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Carbon-13 Spectroscopy

Topics in Carbon-13 NMR Spectroscopy. Vol. 1. GEORGE C. LEVY, Ed. Wiley-Interscience, New York, 1974. xii, 292 pp., illus. $17.50.

The authors of each of the six chapters in this book present solid introductions illustrated with examples drawn largely from their own work. For the first volume in a series on carbon-13 NMR (nuclear magnetic resonance) spectroscopy, chemical shifts and relaxation are obvious topics. Theoretical calculations of shifts are treated by R. Ditchfield and P. D. Ellis, and an empirical approach to them is presented by G. Maciel. For the chemist who wants to utilize carbon-13 as a structural tool, Maciel's ideas will prove valuable. Ditchfield and Ellis, taking a more rigorous approach, succeed in both presenting several theoretical treatments and in delineating the experimental facts, which they have treated most satisfactorily.

Spin relaxation is presented by J. R. Lyerla and G. C. Levy. The theory of mechanisms is covered extensively and illustrated with numerous examples. For the beginner in carbon-13 research this chapter can serve as a thorough introduction to experimental problems. It also serves as an introduction to the more specialized chapters of the book. From Jacob Schaefer's chapter it is clear that both shifts and spin relaxation parameters are valuable in the study of polymers. F. A. L. Anet relies heavily on the spin relaxation chapter in his discussion of high field systems. The organic chemist who will use carbon-13 as an analytical tool will find J. Stothers's chapter most valuable. Stothers has extended a section of his earlier monograph and presents examples of both carbon-13 and deuterium tracer studies.

The authors have succeeded in their objective, which is to sell carbon-13 NMR spectroscopy as a technique. Some of the chapter introductions are similar to those found in other collections on magnetic resonance. Where this occurs, however, direct applications to carbon-13 are also presented, and it is convenient to have the introductory material at hand. All six chapters present enough experimental data to make the significance of their topics obvious. The book is significantly different from other monographs on this subject. For those who are already experienced in proton magnetic resonance applications, this volume can aid in gaining an understanding of carbon-13 spectroscopy.

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Disordered Materials

Amorphous and Liquid Semiconductors. J. TAUC, Ed. Plenum, New York, 1974. x, 442 pp., illus. $28.

By now, most scientists are aware that the electronic properties of disordered materials are at least as diverse as those of crystalline solids and that amorphous solids and liquids can be insulators, semiconductors, or metals. Nevertheless, there has been little effort to rewrite the texts and modify the courses in solid state theory to avoid misleading students and novices about the importance of periodicity. It is even difficult to find specialized texts that adequately cover amorphous and liquid materials; apart from the book by Mott and Davis, currently being revised, there are only several recent conference proceedings and one monograph. One reason for this lack is the rapid progress that has taken place over the past decade, spurred