THE CHEMICAL FOUNDATIONS OF MOLECULAR BIOLOGY, Robert F. Steiner, 468 pp., $12.95, D. Van Nostrand Company, Inc., Princeton, New Jersey, 1965.

The author of this book defines molecular biology rather broadly as "those aspects of biology which can be described at the molecular level." While some may take exception to this definition, it is unlikely that anyone will find serious quarrel with the content of this book. Despite the definition, it is not another textbook of biochemistry but rather a superb treatment of biopolymers—their nature, the relationship of their structure to function, their cellular site, and their biosynthesis. The author, Robert F. Steiner, is eminently well qualified for this task as Head of the Biological Macromolecules Branch, Physical Biochemistry Division, of the Naval Medical Research Institute.

The introduction contains a discussion of the major biopolymers, cellular organization, genetic principles, and the substructure of the gene (cistron concept). Following this, Dr. Steiner proceeds in a systematic manner to discuss amino acids, chemical structure of proteins, physical properties of proteins, the relationship of structure and function of particular proteins including some enzymes, nucleotides, the structure and function of deoxynucleic acid and ribonucleic acids including their biosynthesis and role in protein synthesis, viral nucleic acids as carriers of biological information, carbohydrates and their biosynthesis, and energy transformations in biological systems.

The chapters on chemical and physical properties of proteins contain sections on the methodologies involved in ascertaining amino acid sequence, molecular weight, size, shape, and conformation of these macromolecules. Both theory and technique are considered in these sections.

Four appendices describe (A) how the primary structure of the B-chain of insulin was elucidated, (B) some basic thermodynamic concepts, (C) chemical methods of peptide synthesis and (D) biological oxidation and reduction.

The book is adequately illustrated. It contains a good selection of references at the end of each chapter, a usable index, and is remarkably free of errors. However, two things contribute to make this an outstanding book. The material is very well organized and the author has a knack for presenting what could be difficult material in a clear and concise style. Although the book was written for advanced undergraduate students, it ought to be considered for use by graduate students in biological chemistry as well. For a book of this quality,

the price is unusually low. I highly recommend this book to students and scientists interested in this relatively new, rapidly developing area of biology.

Ralph H. Kathan
College of Medicine
University of Illinois
Chicago, Illinois

MOLECULAR ORGANIZATION AND BIOLOGICAL FUNCTION, John M. Allen, Ed., 243 pp., Cloth-$9.00; Paper-$5.00, Harper and Row, Publishers, New York, 1967.

This book contains eight papers by as many contributors. All the articles center around the title of the book. John M. Allen, the editor, is at his best in the preface. He does better than the title suggests for he traces the direction taken by biology in the last decade. Sensing the drift of thought, Allen with sure broad strokes starts the deep running tide. The crux of the direction as he sees it is that in the biological sciences both cellular structure and function have been progressively "molecularized."

The first essay by C. B. Anfinsen explains in very clear fashion how protein tertiary structure is determined by the primary amino acid sequences. Alexander Rich then describes how protein synthesis is thought to be carried out by the flow of ribosomes on polycistronic messengers. Now that we have arrived at an understanding of how proteins are folded and sequentially formed, the biological function of the T-even phages is considered in relation to their molecular organization by T. F. Anderson. The biological membrane, being the fundamental structure of the cell, is presented in a very critical and carefully documented paper by J. David Robertson. In addition to using the electron microscope to support his thesis of the unit membrane, he further substantiates it by his X-ray diffraction studies. In order to move to a higher order of structure A. L. Lehninger correlates the ultrastructure of the chemical respiratory assemblies necessary to carry on active oxidative phosphorylation. L. Bogorad describes the constant presence of lamella in plastids and the unresolved problem of how this relates to photochemistry and electron transport. In this review he also points out other intriguing problems concerning the development of the plastids and the qualitatively different DNA found in them. The visual receptors are reviewed by J. E. Dowling. He points out the relationship found in chemical studies which suggest that a substantial portion of the membrane-limited discs of the outer segment visual cells may be visual pigment. The final article is contributed by I. R. Gibbons in which he seeks