cerned with the alteration of images by interposition of various types of masks in the diffraction field between object and image. The variety of results available is essentially unlimited, and the entire theory of linear filtering, a major area by itself, becomes the theoretical basis for the process.

The principal topics of the book are tied together by introductory discussions of diffraction and coherence. The chapters are self-contained and therefore may be taken up in any order.

EMMETT N. LEITH
Institute of Science and Technology, University of Michigan, Ann Arbor

Gas-Phase Chemistry

Unimolecular Reactions. P. J. ROBINSON and K. A. HOLBROOK. Wiley-Interscience, New York, 1972. xviii, 372 pp., illus. $19.95.

Unimolecular reactions are those in which a single chemical species decomposes or rearranges. In gases, these are the ones whose rates are most susceptible to theoretical explanation and prediction. They have been studied since the beginning of modern physical chemistry, and the field has been a model of how science ought to work. There have been a 1928 theory so far ahead of its time as to remain the standard treatment for 30 years, a rivalry between two mutually exclusive successors, a resulting outburst of inspired experimentation, and a culminating synthesis of ideas well described in this book.

The coverage of literature is extremely complete. Every piece of work of any surviving importance is there. The thoroughness with which the theoretical development is surveyed does not, however, detract from the experimentalist's outlook that characterizes the book. It is primarily about how to apply the fully developed theory.

The earlier treatments are introduced in a way which might at first lead the uninitiated reader to suppose they are still under test. This notion is quickly dispelled by the main part of the book, in which the authors undertake to induce people to make more widespread use of the theory. They do this by presenting a carefully structured general framework and a detailed analysis of the mathematical complexities that arise in practice. Best of all, they lead the reader by the hand through a complete "RRKM" calculation for a realistically chosen example. These parts alone are enough to sell the book. The reader who already has experience in unimolecular chemistry will turn first to the absolutely mandatory appendix A—comparison of the notational eccentricities of the principal researchers. In its later chapters, the book is an exhaustive survey of experimental results, including descriptions of chemical activation and of isotope effects.

It is hard to find anything to criticize. The authors have in a footnote anticipated my objection to calling the molecule's reactive configuration an "activated complex." An illustration of the confusion this engenders is the appearance and disappearance of maxima in their potential energy diagrams, which may perplex some readers. Imaginative solution chemists can also use the theory, and the authors might have given them a little more encouragement.

The book is billed as a text. Besides this, I think it will remain an important reference work for many years to come. Its publishers have produced it with a promptness that I hope will be diligently imitated by others. I was astonished to find on page 103 the very recently discovered molecule that may be the herald of the next round of surprises in this rich and unpredictable area of research.

DON BUNKER
Department of Chemistry, University of California, Irvine

Plant Problems

The Dynamics of Meristem Cell Populations. Proceedings of a conference, Rochester, N.Y., Aug. 1971. MORTON W. MILLER and CHARLES C. KUEHNERT, Eds. Plenum, New York, 1972. xviii, 310 pp., illus. $19.50.

Years ago I was told by a famous animal cell biologist that root tips made such good experimental material because all the cells were the same. This volume clearly and emphatically makes the case that plant meristems, both roots and shoots, are far more complex than even the most knowledgeable assumed a decade or two ago.

This volume ranges over a variety of topics concerned with meristems: their physiology, their dynamics, and the effect of radiation on them. The contributors include John Torrey, Jack Van't Hof, Elizabeth Cutter, Ernest Ball, F. A. L. Clowes, D. Davidson, Francesco D'Amato, Alan Haber, and others. The papers themselves contain large numbers of facts and are thoroughly documented. One of the most interesting, however, is one by J. R. K. Savage and M. W. Miller that is essentially a theoretical treatment of the problem of the heterogeneity of the cell population with regard to the collection of data. They deal specifically with radiation and chromosomal aberration, but the problems they discuss are applicable to many other situations.

Despite the obvious qualifications of the authors and the importance of the topics, the volume as a whole is disappointing. Many of the data presented have already been published, yet the papers are written as research reports rather than reviews. Moreover, little effort has been made to interest the reader in the topics. At least half of the papers are unnecessarily difficult to read. The transcribed discussions at the end of the papers could just as well have been left off for all they add of either information or interest.

More important than the writing is the feeling of frustration generated in the reader. The problems are there, even more problems than a few years ago, yet the answers seem no closer. The quiescent center in roots is a good example. As the papers by Torrey, Clowes, and Davidson make abundantly clear, the quiescent center exists and many of its characteristics are known in great detail. Yet, we still do not know its function. Torrey's proposal that it is the center of cytokinin production is interesting, but one made at least ten years ago and still no more than an interesting hypothesis.

The field of plant development is an exciting one, but if this volume is any indication it has gotten bogged down in details, and new, different approaches will be needed to answer the many questions that remain.

WILLIAM A. JENSEN
Department of Botany, University of California, Berkeley

Research on Muscle

Muscle Biology. A Series of Advances. Vol. 1. R. G. CASSENS, Ed. Dekker, New York, 1972. x, 300 pp., illus. $17.50.

This volume is based on a lecture series sponsored by the Institute of Muscle Biology in Wisconsin. There are