

Some readers doubtless will question whether or not the material should really be called "physical" organic. This statement is to be construed as a characterization rather than as a criticism. Students, and others, who wish to have a quick look at what is thought about the mechanisms of randomly chosen reactions will find Gould's book to be a more useful source than any other text as a primary reference work. Furthermore, the discussions will often be found to be remarkably *sensitive reflections, considering their brevity*, of current thinking on the subjects. On the other hand, the expert in any given field will be likely to find that important refinements have not been developed very thoroughly. Furthermore, some readers will be bothered by the dearth of numbers in the book. For example, although Chapter 9, "Reactions of Carboxylic Acids and Esters," contains a modest number of quantitative statements concerning relative reactivity, I have been unable to find a single rate constant. Such a state of affairs is not uncommon even in more sophisticated texts but it leaves me with the fear that readers may spend all of their time worrying about the relative rates of reactions A and B with little regard to absolute facts such as the actual velocities under experimental conditions.

As has been indicated, the scope of the book is wide. The first three chapters deal with various aspects of structural theory. The fourth discusses acids and bases, including the Hammett acidity functions and the significance of Grunwald's activity postulate. Chapters 5 and 6, a very interesting pair, treat non-kinetic and kinetic methods for the study of reaction mechanisms. Chapter 7 treats the general problem of substituent effects on reactivity, including the Hammett and Taft equations. The last two-thirds of the book is devoted to chapters in which various types of reactions are discussed. The chapter titles are as follows: "Nucleophilic Substitution Reactions in Aliphatic Systems," "Reactions of Carboxylic Acids and Esters," "Carbanions and Enolization," "Electrophilic and Nucleophilic Substitutions in Aromatic Systems," "Beta-Elimination Reactions," "Addition Reactions," "Participation of Neighboring Groups in Nucleophilic Substitution Reactions and in Rearrangements," "Further Molecular Rearrangements," and "Free-radical Reactions."

The author has included a large number of exercises at the ends of the chapters which should be an asset in the presentation of courses based upon the text. Some of these problems are subtle and rather interesting.

I foresee substantial use of this book as either a primary or secondary reference in second courses in organic. It also deserves popularity as a quick access source among chemists in fields other than physical organic. I hope that use of the latter sort will often be followed by consultation of the primary literature to which Gould has supplied references in generous numbers (50-200 per chapter).

CONTRIBUTION NO. 2588

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**The Hydrogen Bond.** By GEORGE C. PIMENTAL, University of California, Berkeley, and AUBREY L. McCLELLAN, California Research Corporation, Richmond. W. H. Freeman and Company, 660 Market Street, San Francisco 4, California. 1960. xi + 475 pp. 16 × 24 cm. Price, \$9.50 (Text edition); \$11.40 (Trade edition).

The hydrogen bond is of great interest to chemists and biologists, and it has been subject to a considerable amount of investigation. The volume of literature on this subject is considerable and is steadily increasing. This book represents a comprehensive and critical review of this mass of literature. It is written with emphasis upon the physical and chemical facts with a threefold objective in mind: to compile and summarize the experimental facts, thereby furnishing a basis for interpretation of hydrogen-bond behavior in substances not yet studied; to present a critical discussion of the present state of the theory; and to present a bibliography (through 1956) which will aid workers in the field.

In reading the book it appears that the authors have succeeded in reaching their goals.

"The Hydrogen Bond" consists of twelve chapters. The first is an introductory chapter dealing with definitions,

occurrence, properties and the importance of the hydrogen bond.

The next three chapters deal with methods of detection of hydrogen bond. Dielectric, pressure-volume-temperature, association, conductance, melting point, vapor pressure, solubility, etc., measurements are discussed among the non-spectroscopic techniques. The spectroscopic techniques that are discussed include infrared, Raman, nuclear magnetic resonance, ultraviolet and visible, and nuclear quadrupole spectroscopy.

Chapter 5 deals with intramolecular hydrogen bonds and chapter 6 consists of a stimulating discussion of what groups form hydrogen bonds. The seventh and eighth chapters deal with the thermodynamic properties and the theory of the hydrogen bond, respectively.

Chapters 9, 10 and 11 treat hydrogen bonding in crystals, proteins and nucleic acids, and practical systems such as fibers, cloth, leather, etc., respectively.

Chapter 12 represents the authors' look into the future and consists of a brief discussion of promising experimental techniques, applications and theoretical developments. The book also has three appendices which contain symbols and notations, thermodynamic properties of hydrogen bonds and equilibrium constants for hydrogen-bond formations. An important part of the book is the bibliography of 2242 references. Another attractive feature is the inclusion in each chapter of a summary or conclusions. Critical discussions supplement the factual records. These discussions should be very helpful to the beginning workers in the field as well as the seasoned investigator. In this reviewer's opinion, a shortcoming of the book is the omission of mathematical detail; however, if such detail were included, the size of the volume would increase. In addition, it may be argued that the interested reader can with profit refer to the references included in the bibliography.

This book will certainly be a welcome addition to the libraries of all scientists interested in hydrogen bonding.

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**Metabolic Aspects of Renal Function.** By WILLIAM D. LOTSPEICH, M.D., Professor and Chairman, Department of Physiology, University of Cincinnati, College of Medicine. Charles C Thomas, Publishers, 301-327 East Lawrence Avenue, Springfield, Illinois. xiv + 214 pp. 16 × 23.5 cm. Price, \$7.50.

The functions of the kidney can be analyzed more precisely and in more penetrating fashion in the intact animal and man than can those of any other organ. This derives from the versatility of clearance methods which permit quantification of the rates of glomerular filtration, tubular reabsorption, and tubular secretion of a variety of normal constituents of blood plasma and of foreign test substances as well. Micromethods for the sampling of glomerular filtrate and tubular fluid, for the perfusion of single renal tubules and for the measurement of electrical potential differences, have contributed toward an even more fundamental understanding of tubular functions. Finally, studies of uptake and discharge of materials in kidney slices, of enzyme activities of slices and homogenates, of rates of turnover of intermediates, and of actions of inhibitors give promise of ultimately defining metabolic pathways and membrane carrier mechanisms.

"Metabolic Aspects of Renal Function" is a synthesis of evidence derived from these several lines of approach. Few could have written such a book, for few have had the training and experience in renal physiology and biochemistry which Dr. Lotspeich has had. The book is logically organized and lucidly written in a pleasing style. The scope of the book has been defined by the author's research interests. It is, however, more than an account of his personal research accomplishments. Rather it is an analytic and synthetic review of the present status of those fields to which he has contributed most significantly. Where data specifically related to the kidney are lacking, the author draws on information derived from other organs and tissues, makes reasonable predictions as to their possible application to the kidney, and frequently outlines profitable avenues of investigation. The graduate student and the mature investi-