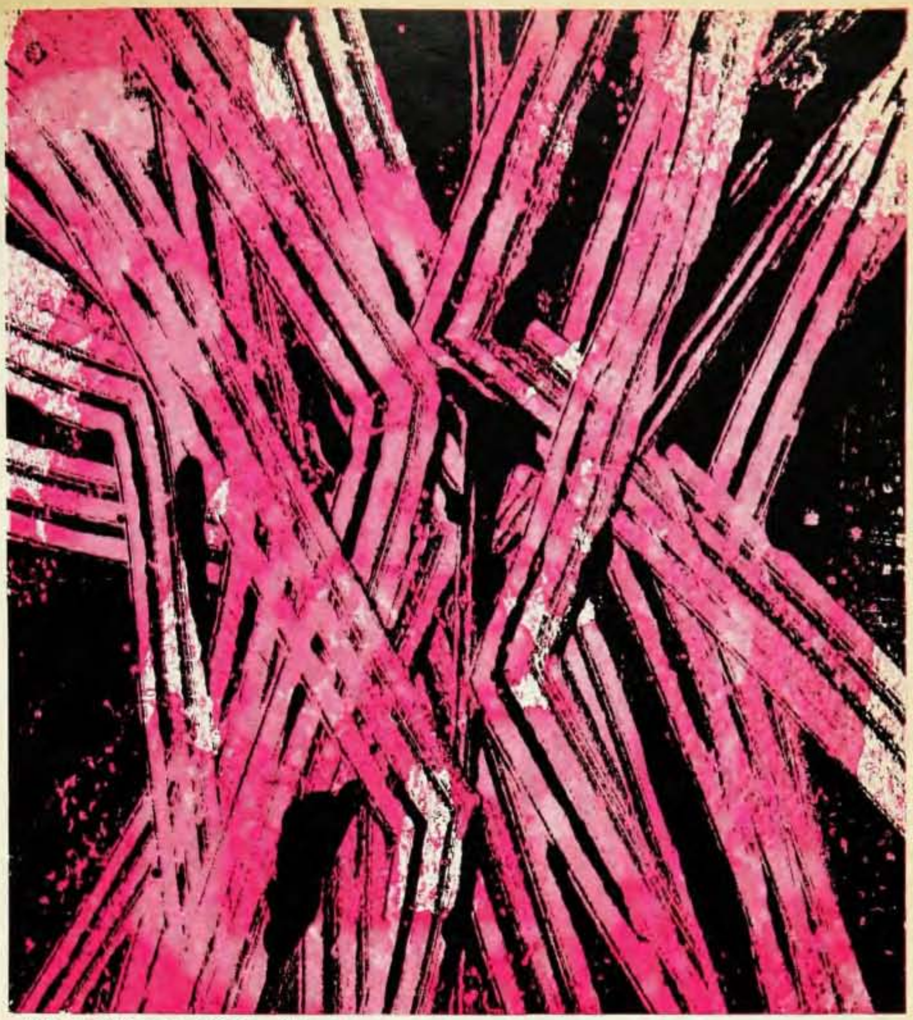
which has a general clinical interest for the layman as well as the scientific specialist. Like Eichwald's paper, it is pure biology. The very first chapter is by Thomas H. Jukes on "Some Recent Advances in Studies of the Transcription of the Genetic Message": it is all biochemistry. There are no allusions to cryptogrammetry or analysis of molecular structure. It simply gives a good review of hard facts about the coding triplets as found in DNA and RNA.

Chapters 4, 5, and 6 deal with physical as well as biological problems. Howard J. Curtis in his paper on the microbeam as a tool in radiobiology describes a 22-MeV deuteron beam having diameters down to 0.025 mm. Their biologic effects in animals lead to the conclusion that heavy cosmic-ray particles are not a special hazard for space flight. Bernard Smaller gives a timely review of electron paramagnetic resonance studies of biologic interest in which attention is focused on the recent detection and identification of the triplet state of organic molecules. The sixth paper, by Don Ridgeway on polarimetric analysis of protein structure, gives a good and useful review of theory as well as facts.

The seventh and last paper, by Walter R. Stahl on the analysis of biological similarity, describes mathematical aspects of biological systems. It may best be described as a dimensional analysis of living systems with special emphasis on their amenability to scaling. Stahl shows that certain dimensional constants are invariant of body mass in mammals.

Direct Interactions and Nuclear Reaction Mechanisms. Conf. Proc. (Univ. of Padua, Sept. 1962). E. Clementel and C. Villi, eds. Vol. 1 of Nuclear Physics, edited by L. Lederman and J. Weneser. 1187 pp. Gordon and Breach, New York, 1963. $39.50.
Reviewed by E. Merzbacher, University of North Carolina and Army Research Office-Durham.

As the first volume of a new series of monographs and texts in nuclear physics, the editors have chosen the printed record of an international conference on Direct Interactions and Nuclear Reaction Mechanisms, held



Interpretation by William Thonson

at Padua, Italy, in September 1962. The choice is sound, since these proceedings provide as comprehensive a picture of the unfinished business of nuclear physics as one could hope for. The massive progress of the last thirty years in nuclear physics cannot obscure the large gaps that remain in our understanding of the nucleus as a uniquely complex quantum system.

There is no point in writing a lengthy review of this volume at this late date. It is only necessary to remind those physicists—and this includes graduate students—who are concerned with nuclear reactions and who have not yet had access to this book, that they cannot afford to ignore it. These proceedings were published quite expeditiously; yet sufficient care went into their production, and the publishers deserve to be commended. Professors Clementel and Villi are to be thanked particularly for making this well-edited record available to those of us who were unable to attend the conference.

In spite of a good many new developments in nuclear physics during the past two years, the conference summary by J. S. Blair can still be read with great profit as a thoughtful and measured opinion about our present understanding of the mechanism of the reactions used to explore nuclear structure. The volume, which concludes with this review lecture, should provide ample substance for the intense current discussions concerning the viability of low-energy physics.

Physical Chemistry. By A. J. Mee. 719 pp. Aldine, Chicago, 1964. $5.95.
Reviewed by Lars C. Luther, University of Copenhagen.

This text has, since its first edition in 1934, served as the standard introduction to physical chemistry in British colleges and universities. The sixth revised edition appeared in 1962, and now the first American edition is available. There are 235 illustrations, a combined name and subject index, and a list of questions on each chapter which, in addition to the "Give an account of . . ." type questions, contains 52 problems with answers. The very favorable impression made by the physical appearance of the book stands in no relation to a modest price.

The text is intended for students "who have not been well trained in physics or mathematics", and "the mathematics used is the simplest consistent with the subject being an exact science." Thus the guiding principle was to avoid lengthy and involved derivations and to concentrate on detailed descriptions of important experiments. The first two chapters take the reader through the imaginary museum of scientific apparatus from Landolt's tube for testing the law of conservation of matter to Dempster's positive ray apparatus. The account blows life into the history of fundamental concepts by frequently presenting raw data followed by analysis and a discussion of sources of error.

A brief description of the electronic structure of atoms and an excellent, up-to-date treatment of valence were recently written and inserted as chapters 3 and 4. Two chapters on thermodynamics (G for Gibbs and F for Helmholtz) adequately present the basic relationships. However, "degree of freedom" remains a vague concept, and very little attention is given to the Boltzmann distribution and partition functions. The following chapters, as promised, emphasize experiments and avoid the more elaborate theories. In many cases three to four experiments to determine one and the same property are described in detail. Even accepting an experimental slant, this reviewer feels that the book would have been more useful if some less important experiments had been replaced by fundamental theory.

The chapter on solids contains many loosely related facts but only a few lines about the Debye theory of specific heat. Introduction of the rudimentary results of band theory would have permitted mention of semiconductors. The chapter on kinetics seems incomplete without a paragraph on absolute reaction rates, and the development of the theory of unimolecular reaction rates terminates with Lindemann. It is surely wise not to try to cover everything, but why give preference to mesons