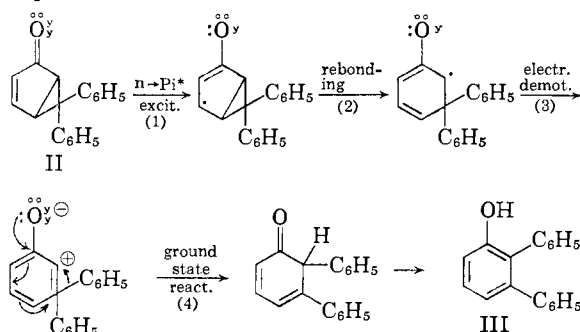


(3) electron demotion, and (4) transformations having ground state parallel.

The II to III rearrangement again involves four steps



Significantly, this treatment reasonably accounts for the involvement of electron deficient Pi systems in $n \rightarrow \pi^*$ photochemical transformations. These mechanisms are applicable to the santonin to lumisantonin and related rearrangements, even accommodating the known¹¹ reaction stereochemistry. Furthermore, the general approach is applicable to a large number of other photochemical reactions. These points will be considered in detail in our full paper on the present subject and in related papers.

DEPARTMENT OF CHEMISTRY
UNIVERSITY OF WISCONSIN
MADISON 6, WISCONSIN

HOWARD E. ZIMMERMAN
DAVID I. SCHUSTER

RECEIVED SEPTEMBER 5, 1961

(11) D. H. R. Barton and P. T. Gillam, *J. Chem. Soc.*, 4596 (1960); *cf. ref. 2 also.*

BOOK REVIEWS

Chemical Aspects of the Structure of Small Peptides. An Introduction. By DOROTHY WRINCH, M. A. Cantab, D. Sc. Oxon., D.Sc. Lond., Visiting Research Professor at Smith College, Massachusetts, USA. Enjar Munks-gaard, Ltd., 6 Nørregade, Copenhagen, Denmark. 1960. 194 pp. 18 × 25.5 cm. Price, Dan. kroner 24.—.

Dating from the earliest structural studies, there has been speculation regarding the existence of tetrahedral "orthoamide" bonds in proteins. Half a century has passed, however, and the question remains essentially unanswered. In large measure, demonstration of such bonding by chemical means is hindered by the extreme complexity of the molecule in question as well as by the existence of an "uncertainty principle": namely, that a protein cannot be readily submitted to chemical examination without some modification of its intimate structure. Detection by physical means of a small number of tetrahedral linkages in the presence of a preponderance of trigonal peptide bonds is, again, a problem of enormous proportions. In 1936, Dr. Wrinch proposed a "cyclol" theory in which amide bonds were abandoned and a totally tetrahedral structure for proteins was advanced. In more recent times, a small amount of chemical evidence has appeared which demonstrates the ability of amides to form relatively stable tetrahedral or "ortho" linkages. However, the evidence is based on circumstances which are highly specialized and geometrically favorable. Dr. Wrinch has now brought forth a Monograph in which she reviews the limited chemical data and proceeds to reapply the "cyclol" concept to small peptides. What might have been presented simply and concisely in a dozen pages has been expanded to almost two hundred by the use of a maze of symbolism and grandiloquence. The promise that "this Monograph reports results obtained in an enquiry into chemical aspects of the structure of small peptides" is not fulfilled, since no original experimental work, chemical or otherwise, is reported. On the basis of three or four reported cases of "orthoamide" linkages, Dr. Wrinch asks for "the repudiation of the amide hypothesis" for small peptides. In the face of overwhelming evidence from spectral data alone, such a request cannot merit serious consideration. Certainly, the majority of students of peptide and protein structure are aware that their best efforts, to date, have led only to primary sequences and that considerable effort will have to be expended to elucidate more intimate structural details, among which there may be found a small number of covalent linkages of the "ortho" peptide variety. This is an area in which conservatism can be displaced only by very convincing experimental data. Because of the extreme views pre-

sented, based on such meager evidence, and because of the unnecessarily lengthy text, this reviewer cannot recommend Dr. Wrinch's Monograph as a major contribution to the literature of protein chemistry.

NATL. INST. OF ARTHRITIS AND METABOLIC DISEASES
NATIONAL INSTITUTES OF HEALTH
BETHESDA 14, MARYLAND

LOUIS A. COHEN

Gas Chromatography. Second International Symposium Held under the Auspices of the Analysis Instrumentation Division of the Instrument Society of America, June, 1959. Edited by HENRY J. NOEBELS, Beckman Instruments, Inc., Fullerton, Calif., R. F. WALL, Monsanto Chemical Co., Texas City, Tex., and NATHANIEL BRENNER, The Perkin-Elmer Corp., Norwalk, Conn. Academic Press Inc., 111 Fifth Avenue, New York 3, N. Y. 1961. xvi + 463 pp. 16 × 23.5 cm. Price, \$16.00.

A graph is presented on page 375 of the volume under review on which are plotted the number of articles in the literature dealing with gas chromatography in each year from 1952 to 1959. This number has risen from a few articles in 1952 to nearly 800 in 1959; moreover the slope appears still to be rising and must be almost infinite by now. In such a situation it is almost impossible for the average chemist, who wishes to use gas chromatographic techniques as a routine tool, to keep up with the more recent developments in the field. Publication in book form of groups of papers presented at periodically scheduled symposia offers the reader an opportunity to become familiar with some of these developments in a manner which is economical of his time.

As with all collections of this nature, the quality of presentation is somewhat uneven, the topics discussed are necessarily limited, and the choice of those topics is unlikely to meet with approval, or the needs, of every reader. Nevertheless, there is much useful information in this book and it should be available to all who have any interest whatsoever in gas chromatography and its application.

The present volume contains a large selection of specific applications, several articles on detectors (including methods of expressing sensitivity) and recording systems, one on some theoretical considerations of large diameter chromatographic columns, one showing experimental relations between sample size and carrier flow rate and HETP, and, gratifyingly, two devoted to detailed consideration of the role of the solid supporting material in a column. There is