

for isolation implies that the separation of carbon monoxide occurs prior to the diffusion of the residual components from the cage. Furthermore, the finding that the ether **4** (eq 2) obtained in the present work was optically inactive rules out conceivable mechanisms in which the R group is not free to racemize and ac-

cords most simply with a radical recombination step.

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Book Reviews

Carbocyclic Non-Benzenoid Aromatic Compounds. By DOUGLAS LLOYD, Senior Lecturer in Chemistry, United College of St. Salvador and St. Leonard, University of St. Andrews (Scotland). American Elsevier Publishing Co., Inc., 52 Vanderbilt Ave., New York, N. Y. 1966. x + 220 pp. 15.5 x 23 cm. \$13.00.

I have awaited the appearance of this book with bated breath as the time has come, due to the research explosion in this field, for the publication of an up-to-date sequel to "Non-Benzenoid Aromatic Compounds" published in 1959. In the 1959 volume, a number of authorities banded together to produce a book of wide scope in which the material was critically discussed throughout. The announced size of the volume under review appeared to be just right for bringing the subject up-to-date and to introduce a discussion of systems which were unknown or just beginning to be recognized in 1959.

A monograph is of value mainly if it treats its subject critically. It may be of some, though lesser value, if the material is presented as a factual, uncritical review, provided it is at least an exhaustive treatment, enabling the reader to save time in searching the literature, even if he must do the critical evaluation himself. Unfortunately, there is very little in the present volume to commend on either count.

The first chapter on "Aromaticity and Aromatic Character" (15 pages) is superficial and not up-to-date. Although the definition of aromaticity based upon ring current, as determined experimentally from the nmr spectrum, is given and incidentally mentioned in the section on annulenes, no criticism is made, pro or con, of this method of measuring aromaticity. The second chapter on "Derivatives of Cyclopropene" (19 pages) is a short factual review of work on these compounds carried out within the past 6-7 years, including some references to the 1965 literature. This chapter as well as the next on "Derivatives of Cyclobutadiene" (20 pages) at least contain many references subsequent to 1959 though much of the information in the latter chapter may be found, critically treated by Baker and McOmie, in the 1959 volume. Relatively, this is even more evident in the chapter on "Derivatives of Cyclopentadiene" (43 pages). The next two chapters concern themselves with "Tropylium Salts" (19 pages) and "Tropone, Tropolones and Related Compounds" (45 pages). The first of these cites 68 (out of 88) references of work published since 1958; the latter cites 60 (out of 250) references of work published during the same period. The indication given by this arithmetic is amply justified by reading the text which in the main is a rehash of material previously reviewed critically by Nozoe.

The next chapter on "Medium and Large Ring Compounds" is of 19 pages' duration. Much recent information appears on annulenes, including papers after 1963 when the chemistry of annulenes, making up the bulk of this chapter, was more ably reviewed by Sondheimer (Chapter 7, ref 41). Vogel's bridged cyclodecapentaenes are recorded but though "cyclononatetraenides" form a section of 2 pages, no mention is made of the important contributions of Winstein and of others to the chemistry of cyclononatene (*e.g.*, *J. Am. Chem. Soc.*, **86**, 4485 (1965)), which might have been of interest in the context of critical comments in this chapter were the subject treated critically.

The ultimate chapter of the book is entitled "Polycyclic Compounds" (35 pages). There is little or no justification for a rehash of synthetic methods for preparing azulenes; indeed their classification and some of the examples parrot those of Keller-Schierli and Heilbronner in the 1959 volume, except that these authors treated the subject critically. Those of Hafner's papers which could not have been mentioned in 1959, for chronological reasons, are referred to in the present book. The last 9 pages treat cursorily the sesquifulvalenes, calicenes, pentalenes, and heptalenes, and some recent references are cited. The book is pleasant to look at, its form-

ulas esthetically pleasing. For the reasons given above, however, it is very disappointing and is not recommended.

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