Book Reviews

Organic Synthesis. vol. I, *Open-Chain Saturated Compounds;* vol. II, *Open-Chain Unsaturated Compounds, Alicyclic Compounds, Aromatic Compounds.* Vartkes Migrdichian. Reinhold, New York; Chapman and Hall, London, 1957. 1822 pp. $35 per set (not sold separately).

In these days when the study of reaction mechanisms occupies an ever-increasing proportion of the published work on organic chemistry, the appearance of a treatise devoted to the factual information concerning organic synthesis can only be welcomed. The author's stated aim of "completeness" also is commendable, but obviously even an 1800-page treatise on so vast a subject can be complete only if considerable flexibility in definition is allowed. This two-volume work is somewhat similar to Richter's classic treatise, and a third volume is contemplated on heterocyclic compounds. In view of the well-known *Organic Syntheses* series, the title of Migrdichian's work appears to be somewhat unfortunate.

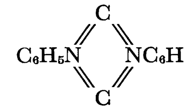
The author's division of subject matter into 30 chapters is, for the most part, conventional. However, it would have seemed preferable to place the chapter on Friedel-Crafts reaction in volume II rather than in volume I and the material on carbohydrates in a separate chapter rather than with alcohols in chapter 1. Volume I contains separate chapters devoted to the Grignard reaction, organometallic compounds, and organic compounds of nonmetals and metalloids, while volume II contains special chapters on diene synthesis and on aromatic diazo compounds. Only 105 pages are devoted to alicyclic compounds, including the steroids.

Following each chapter is a long list of literature references, which taken together comprise a total of some 250 pages. Chapter 30 contains 719 numbered references, many of which contain more than five literature citations. Volume II ends with an 88-page index. Both volumes contain innumerable structural formulas. Most subjects are discussed in gratifying detail. Experimental descriptions are supplied, both for general and for representative special methods of synthesis. The factual material appears to be authoritative. That one man could compile such a tremendous amount of information is indeed remarkable.

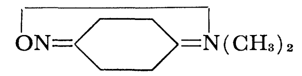
To note isolated faults in a treatise so ambitious in scope is, of course, easy. On the other hand, no one reviewer could possibly be competent to present a critical review of all parts of such a work. Although these volumes contain a veritable wealth of information which no organic chemist can afford to be without, they nevertheless exhibit a number of very serious faults. Prime among these is the woefully inadequate proofreading. This was performed so carelessly that it is imperative for the publishers and author to make amends before a second edition appears. The one and a half pages of *errata* do not include even a minute fraction of the total number of misprints, misspellings, errors in structural formulas, ambiguous names, and so forth. Some of these are so serious that they render entire sentences unclear. From sheer exhaustion I stopped listing all the typographic errors at the end of four chapters. A sampling of these errors includes: "iaoms" (page 5); "acetals of formaldehyde appears . . . ." (page 46); "glyoxol" (page 104); "NaCH" (page 145); "thineyl" (page 184); "the reaction is initialed by . . . ." (page 866); "dially shows an exceptional behavior . . . with perbonzoic acid" (page 897); "6-hydroxyhydrindene couples at position 4" (page 1519); "the reaction of chlorine with benzaldehyde results in . . . formation of benzyl chloride" (page 1551). In my copy, pages 579 to 610 are missing, and pages 547 to 578 appear twice.

No consistent scheme of nomenclature is followed. The choice of unfortunate or ambiguous—and at times incorrect—names, coupled with typographic errors, leads to incongruous expressions such as "AiH_3" (page 12); "expoxide" (page 27); "p-methylaminobutyraldehyde" (page 118); "1,3-diphenyl-2-acetoxy-1,3-dione" (page 119); "bisulfite compound of 2-methyl-5-isopropylcyclohexane" (page 144); "2-hydroxy-2-naphthaldehyde" (page 208); "β-hydroxynaphthaldehyde" (page 218); "tertiary butyl ester has been acylated . . . ." (page 341); "propylaldehyde" (page 371); "pentyl dimagnesium bromide, like butylenedimagnesium bromide, reacts . . . ." (page 576); "cyclohexanoic acid" (page 883); "bis-isobutene ethylene" (page 891); "phenylhexyl acid" (page 917); "tert-isobutylene" (page 920); "diazobenzene chloride" (page 1284). "Tetramethylethylene hydroxy ethylamine" (page 89) is the name given to $(CH_3)_2COHCNH_2(CH_3)_2$. Errors in formulas appear on pages 42, 51, 93, 141, 170, 175, 564, 632, 1095, and at many other places.

Although "theoretical discussions are beyond the scope of this work," grossly incorrect or misleading formulas nevertheless should not appear. However, formulas with pentacovalent nitrogen occur repeatedly—for example on pages 102, 181, 1346, and 1466. Sulfonium salts (page 93) and oxonium salts (pages 80 and 1286) are shown with all bonds covalent. The author was extremely uncritical to reproduce, without comment, formulas such as



(page 445) and



(page 1437). Ring structures are written for azoxy compounds (page 1623), azides (page 1630), and diazoalkanes (pages 1633 and 1635). Sterically impossible formulas with fused 3- and 4-membered rings appear for piazthiol (page 1446) and methylanthranil (page 1449).

The author's claim that "reaction mechanisms receive mention only when well-nigh complete agreement exists on their essential correctness" is misleading and is not fulfilled. The few theoretical discussions are very poorly written. The discussion of the mechanism of coupling of diazonium salts contains vague and incorrect ideas: "The reaction, which is bimolecular, is one of condensation between the undissociated, polarized diazo compound and the aromatic body in an activated state, in which a hydrogen atom has acquired an induced positive charge" (page 1511). "It would appear that in the [coupling] reaction with phenols, it is the free phenol formed by the dissociation of the phenolate that couples with the diazo compound" (page 1513).

The article cited for the mechanism of the Perkin reaction (page 1389) was published in 1928; the latest reference for the mechanism of the Hofmann reaction (page 381) is dated 1911. The mechanism of addition of hydrogen halide to olefins is discussed in these words: "The normal reaction may be considered the result of the attack of a positive halogen ion on the positive carbon atom, following the addition of a proton to the negative atom" (p. 863). Statements like "the mechanism of the [Willgerodt] reaction has not been elucidated" (page 244) would seem to require elaboration. Curved arrows to illustrate reaction mechanisms are used only rarely, and in one case (page 1294) the resulting formulas are garbled. The Elbs persulfate oxidation is mistakenly called the "Dakin oxidation" (page 1277), while the latter reaction is presented (page 1281) without its "name." Reactivity of halogen compounds is discussed in chapter 11 with no mention of theory. An outdated theoretical discussion of chelation in *o*-hydroxy aromatic ketones is given on page 1368, along with a garbled structural formula.

It is to be expected that a treatise such as the present one will not be up to date with the literature. In general, few references later than 1950 are given. Thus, in chapter 25 only one article later than 1947 is cited, and in chapter 2, only one article later than 1949. A given paper sometimes is cited in the same chapter under different numbers and sometimes is listed twice under the same number. Certain interesting reactions are presented—for example, at the top of page 476—with no reference to the literature.

I noticed many cases where space was wasted because of needless repetition of subject matter. For example, the reaction depicting the oxidation of an acetylene derivative with selenium dioxide is given on page 999 and again on page 1022 and is mentioned in words on page 1001; the related literature reference appears as Nos. 541, 408, and 270. The reaction of diphenyl ether with hydriodic acid is described in almost identical words at two different places on page 1285. Formulas illustrating the conversion of benzoquinone to the triacetate of hydroxyhydroquinone are given on pages 1307 and 1310.

Some index entries under *acetaldehyde* and under *acetal* appear to have been interchanged. Diiodoacrylic acid is listed under *D* and also under *A*, while dimethylketene appears under *D* but not under *K*.

While the relative amount of space allotted to various topics justifiably is a point on which few would agree, it nevertheless seems unfortunate that only one page (901) is devoted to polymerization of unsaturated compounds and only three and a half pages (835–838) to the preparation of alkenes by dehydration of alcohols and by pyrolysis of esters. The addition of sulfur chloride to ethylene is mentioned (page 876) without noting that the product is called "mustard gas." Apparently no discussion of DDT as such is presented anywhere in the work.

As soon as the serious shortcomings are overcome, Migrdichian's treatise seems certain to take its place among the indispensable reference works of organic chemistry. Even with these shortcomings, the work is tremendously valuable to all experienced organic chemists. However, the uninitiated is certain to experience considerable confusion and dismay in using these volumes in their present form. Without deemphasizing the rightful emphasis on factual knowledge, this work could be unified and improved by a discussion of many of the facts in terms of basic theoretical concepts. Such an approach would not necessarily add any pages and, indeed, might make possible considerable saving of space. Perhaps the main merit of the electron theory of organic chemistry is that its judicious use permits a satisfying unification of many facts previously considered unrelated or anomalous.

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Battle for the Mind. A physiology of conversion and brainwashing. William Sargant. Doubleday, Garden City, N.Y., 1957. 263 pp. + plates. $4.50.

William Sargant has written entertainingly about 18th-century Methodism, Voodoo, the Eleusinian mysteries, and North Carolina snake handlers, coupling these with accounts of combat fatigue, the London blitz, miscarriages of British justice, and Chinese Communist thought reform. Sargant has a catholic enthusiasm for Pavlov, and he would have us believe that the great Russian explained all of these very simply. He draws some interesting parallels, even though he has to draw some of them a long way. This book should be labeled "speculation" and read with this in mind; otherwise the reader may come away with some mistaken ideas.

It is quite true that the effects of anxiety, fatigue, loss of sleep, hunger, pain, debilitation, and circulatory disturbances may reduce a man to a state of mental dullness, loss of discrimination, confusion, pliability, and increased suggestibility. It is also true that the Communist state police know this and make use of their knowledge in extracting confessions. But these effects, by and large, are transient and disappear when the normal physiological state is restored. It is not true that Communist police can alter beliefs at will. I have gone over the evidence on this point at some length and am satisfied that the victims of the "purge trials" of the 1930's and 1950's, the various foreigners "tried" by China and the satellites, and the American airmen who "confessed" to bacteriological warfare in Korea, when they had recovered from the ordeal of interrogation, were generally aware of the extent to which their "confessions" were untrue and "cooperated" with their captors because it seemed to be the wisest course open to them in the extremely difficult situations in which they found themselves.

Sudden, emotionally charged, and relatively permanent conversions to Communism do occur, and sometimes they happen to people who were formerly strongly anti-Communist. They are rare, and the overwhelming majority occur outside of prisons, in a variety of unpremeditated circumstances, to people who seem to have a need for religious conversion, and who also have a propensity for being reconverted to other faiths at a later date. The very rare conversions among Communist captives seem to occur only among such susceptible people. The mass appeal of Communism, however emotionally charged it may be, is based on its promise to better the lot of those who see themselves as poor, downtrodden, and exploited. Such people, along with others who identify with them for idealistic or practical reasons, support the party with varying degrees of irrationality and dedication, like that of supporters of other dynamic political movements.

There is no good evidence that the Communists have developed indoctrination techniques superior to those used by non-Communist nations, or based on new and scientifically devised principles. By a mixture of strict control, limited information, didactic teaching, and reward-and-punishment, they can produce a great deal of compliant behavior among their captives and create some awareness among them of the ostensible social and political goals of Communism; but the Communist record for producing firm conversions among the skeptical or hostile is dismal. Among all of the American military prisoners in Korea, including the notorious "21 who stayed," I can think of less than a half-dozen who were "converted" to Communism (using any reasonable definition of this term), and even these were people not previously hostile to it. A diligent investigation of young Hungarian workers, students, and intellectuals—members of Communist groups who spent their adolescence in Communist schools and some of whom spent years in the hands of the State Defense Bureau (AVH)—has uncovered some misinformation among them, and a vast amount of skepticism and hostility toward the Communist regime, but nothing remotely resembling effective methods of thought control.

Communist state police methods are just that: police methods. The evidence indicates that scientists did not design