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 An outdated theoretical discussion of chelation in *o*-hydroxy aromatic ketones is given on page 1368, along with a garbled structural formula.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

them and do not participate in them. Pavlov made great contributions to neurophysiology, some of which have some applicability to the understanding of prison experiences, as they do to the understanding of many other types of experience; but Pavlov's hypotheses about the temperamental characteristics of dogs, and the relation of these to certain types of conditioning procedures, provide only the dimmest sort of illumination for the complex social and political phenomena of modern times.

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Glossary of Geology and Related Sciences. J. V. Howell, coordinating chairman. American Geological Institute, Washington, D.C., 1957. x + 325 pp. $6.

The idea for this *Glossary* was formed in early 1950, work was started on it 1 Mar. 1953, and it was published in June 1957. With a staff of about 90 specialists, it covers some 25 geologic fields, going from "*a,* direction . . ." to "*zygote,* a fertilized egg. . . ." J. V. Howell and his group have accumulated a great number of terms, and although I have not read them all, those I have checked are well handled and correct. Lynn M. Nichols, of the *Oil and Gas Journal,* is technical editor and has edited all of them, to the betterment of the book.

There has long been a need for this *Glossary.* There are perhaps five dozen dictionaries and glossaries in which various geologic terms are defined, but this is the first one that covers the field and related sciences. (This covers some 14,000 terms.) Everyone connected with the project should feel proud of a good job well done. It is expected that this edition will be exhausted before long, and additional terms will be included in the next. We all need the book and should use it.

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Quantum Chemistry, an Introduction. Walter Kauzmann. Academic Press, New York, 1957. 744 pp. Illus. $12.

The author of this book set out to produce an elementary textbook. In this he has succeeded, with some spectacular pedagogical features. Mathematical operations for important elementary topics are written out in unusually great detail, and all pertinent mathematics is presented in connection with extremely clever examples from classical mechanics before quantum mechanics is introduced. Because of the patient presentation of the mathematical methods and because of detailed discussions of concepts, this adds up to a long book: 744 pages of small and very small type, 230 problems, 254 references, 158 figures, 47 tables, and more than 2800 equations. In spite of its length, the book is less complete in coverage, less useful as a handbook to the chemist who is using quantum mechanics in his research, and less complete in the presentation of details of advanced topics than are certain other textbooks in this field. However, as an introductory textbook for the average senior or graduate student in chemistry, this book has many extremely attractive features, and it should be widely useful.

In the first 150 pages there are problems in classical mechanics which give rise to the same mathematical operations that are met with later in quantum mechanics. For example, surface harmonics, including *s, p, d, f,* and so on, notation, is introduced in terms of the normal modes of vibration of the ocean on a completely flooded planet. Also a correlation diagram, in going from the normal modes of a square membrane to the normal modes of a round membrane, illustrates correlation diagrams in general, perturbation theory, and the reason for proper linear combination of degenerate normal modes. Similar illustrations are given for the variation method, symmetry operations, systems with strong or weak coupling, and so on.

With all difficult mathematical operations already covered in the treatment of easily visualized mechanical systems, the author is able to concentrate in the next 400 pages on the physical and chemical concepts of quantum chemistry. The topics covered are the usual ones: the Schroedinger equation and its exact solution and interpretation for simple systems, the uncertainty principle, angular momentum operators, atomic systems (two long chapters), molecules (two long chapters), van der Waals forces, and time-dependent processes. On these topics and problems the book is critical, stimulating, and up to date.

At this point, on page 546, we encounter a second book, based on the same plan as the first but carrying out this pattern less successfully. The subject of this second book is the quantum theory of light. The first 90 pages are devoted to the "classical theory of optics," largely the Lorentz theory of electrons and their interaction with light waves. The last chapter is devoted to patching up this theory with quantum considerations. Surely the author would have been excused if at the end of his book he had indulged himself in a short, difficult chapter on this, his field of research. Instead, we have a very long section which attempts to make the subject simple and easily visualized; one gets the impression that this section is artificial, specialized, and not of the same polished quality as the rest of the book.

Often a student comes up with one or another of two unfortunate attitudes toward quantum chemistry. On the one hand, he may be repelled by the mathematical details; he may want a nonmathematical version of quantum mechanics; and he may memorize several words, some of them having many syllables. On the other hand, a student may work through the treatment of the hydrogen atom and a few other cases; he is thrilled by the success of the theory, and at once he wants to hang up his laboratory apron, throw away his test tubes, and start calculating the answer to his technical chemical problems. In fine philosophic passages, Kauzmann consciously combats both of these profitless attitudes. The point is firmly made that nonmathematical quantum mechanics is like dehydrated water; the student is sternly told that he must master the mathematical methods, derivations, and operations in order to understand what has been done, what can be done, and what cannot be done with present techniques. The early optimist is warned that in spite of all the mathematics one can learn and even with high-speed computers, one does not in the foreseeable future expect quantitative theoretical solutions to routine chemical problems.

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Biochemical Problems of Lipids. Proceedings of the second international conference held at the University of Ghent 27–30 July 1955. G. Popják and E. Le Breton, Eds. Interscience, New York, 1957. iv + 505 pp. Illus. $10.75.

This book is a compilation of some 69 of the 80 papers presented at the second international conference. Most of these papers are in English, but quite a few are in French and German. The breadth of subjects covered by the book is indicative of the broad field of interests in lipid chemistry.

Part I is devoted to physical and chemical properties of the lipids, methods of separation, and structures. Of special interest is the article by A. T. James and A. J. P. Martin on gas-liquid chromatography as it is used in the separation and identification of methyl esters of saturated and unsaturated fatty acids. This procedure is perhaps the most exciting in the field of lipid chemistry at the moment.

Part II is concerned with metabolism