

Hensen (15) at the University of Illinois indicate that UDPG may play a role in the formation of adaptive enzymes initiating galactose metabolism, a problem that was posed by the author of this article at the meeting last June at the McCollum-Pratt Institute, when discussing mechanism of enzyme action (16).

HERMAN M. KALCKAR¹

Universitetets Institut for Cytofysiologi
Copenhagen, Denmark

References

1. *Science* **119**, 59 (1954).
2. H. M. Kalckar and E. Cutolo, Comm. II, Congr. Internat. du Biochim., Paris, 1952, p. 260.
3. H. M. Kalckar, *Biochem. Biophys. Acta* **12**, 250 (1953).
4. A. Munch-Petersen, H. M. Kalckar, E. Cutolo, and E. E. B. Smith, *Nature* **172**, 1036 (1953).

¹ At present visiting scientist at Enzyme Section, National Institutes of Health, Bethesda, Md.

5. H. M. Kalckar, B. Braganca, and A. Munch-Petersen, *Nature* **172**, 1038 (1953).
6. P. Berg and W. K. Joklik, *Nature* **172**, 1008 (1953).
7. H. A. Krebs and R. Hems, *Biochem. Biophys. Acta* **12**, 172 (1953).
8. P. Berg and W. K. Joklik, methods to be published from the Institut for Cytofysiologi, Univ. of Copenhagen.
9. D. Geller, M. Borbiero, A. G. Szent-Györgyi, and H. M. Kalckar, unpublished studies, Woods Hole, 1953.
10. W. W. Kjelley and H. M. Kalckar, unpublished studies, National Institutes of Health, 1954.
11. R. Bergkvist and A. Deutsch, *Acta Chem. Scand.* **7**, 1307 (1953).
12. L. F. Leloir and E. Cabib, *J. Amer. Chem. Soc.* **75**, 5445 (1953).
13. L. F. Leloir and C. E. Cardini, *J. Amer. Chem. Soc.* **75**, 6084-85 (1953).
14. E. E. B. Smith, A. Munch-Petersen, and G. T. Mills, *Nature* **172**, 1038 (1953).
15. W. J. Rutter and H. G. Hansen, *J. Biol. Chem.* **203**, 311 (1953).
16. H. M. Kalckar, "Mechanism of transglycosidations," in W. D. McElroy and B. Glass, Eds., *Mechanism of Enzyme Action* (Johns Hopkins Press, Baltimore, 1953-54), p. 675.

Received February 19, 1954.

Book Reviews

The World of Primitive Man. Paul Radin. Henry Schuman, New York, 1953. 370 pp. \$5.00.

Dr. Radin always has approached the data of anthropology in his own unique manner, irrespective of the fashion of the moment, and he has seldom failed to be provocative. In this respect, his new volume is as characteristic of him as any of his earlier books and monographs. At a time when anthropologists and other social scientists have felt the need of being more discriminating in their vocabulary, Radin says: "I employ the words *culture*, *civilization*, and *society* interchangeably and also the phrases *primitive civilization* and *aboriginal civilization* interchangeably." And, when concepts used in the analysis of kinship systems and social organization are undergoing refinement, "classificatory" and "clan" are generalized according to his own conceptions. The latter, he writes (p. 193), "in spite of all the attacks that have been made upon its ubiquity, particularly by American anthropologists, is clearly the fundamental form the social-political organization of primitive people assumed."

The central problem that concerns the author is continuous with his discussion of *Primitive Man as Philosopher* (1927) and some passages of this earlier volume, with only minor changes, occur in *The World of Primitive Man*. For some reason or other, Radin entertains the notion that "few anthropologists, at bottom, have been willing to admit that primitive man was ever effectively guided by rationalistic or realistic considerations in the attainment of his goals" (p. 194). Without minimizing the role of magical beliefs and practices, he wants to demonstrate that there has been less interference "with the orderly processes of life" and processes of "rational and objective thinking" from these sources than has been supposed. In consequence, the author believes it can be shown that prior to, and apart from, the great civilizations

(Egyptian, Babylonian, Indian, Chinese, and Greco-Roman) aboriginal civilizations developed at least three positive features that, in contrast with what we find characteristic of the former seem "at first blush" almost "semi-perfect." These are (p. 11): "the respect for the individual, irrespective of age or sex; the amazing degree of social and political integration achieved by them; and the existence there of a concept of personal security which transcends all governmental forms and all tribal and group interests and conflicts." In none of these aboriginal cultures, Radin says, "did those basic economic distortions and crises arise that have existed in all the major civilizations since 3000 B.C." And, in the primitive cultures, too, the myth of the after-life was more poorly developed, "there was no devaluation of life on earth"; on the contrary, "man's most insistent plea was that he be allowed to return to the earth." In other words (pp. 7-8), "instead of life on earth being regarded as an insignificant incident" as we find in the great civilizations, in the aboriginal cultures, "just the contrary held true; life in the after-world was so interpreted."

Radin espouses a stimulating thesis, but it is doubtful whether most anthropologists will be immediately convinced without more evidence than the author presents in this book. His ethnographic erudition is not in question, but he strides through the literature with seven-league boots, documenting his generalizations from a few selected cultures and quoting at length from source material. Nevertheless, the question remains whether his selected examples are representative of the primitive world at large and whether more systematic and detailed comparisons are not in order. Radin thinks primitive peoples have something to teach us. After quoting the reflections of the Eskimo Anarlungua when he stood atop a New York sky-

scraper, the author closes his book with this message: "Nature is great, but man is greater still."

A. IRVING HALLOWELL

Department of Anthropology
University of Pennsylvania

Structure and Mechanism in Organic Chemistry.

C. K. Ingold. Ithaca, N. Y.: Cornell Univ. Press, 1953. 828 pp. Illus. \$9.75.

Chemists have for many years owed a debt of gratitude to Cornell University for the series of monographs that have arisen out of the Baker Lectures. One important function served by these lectures, and by the resulting books, is that distinguished leaders in the different branches of chemistry are given the opportunity to set forth in considerable detail, and in a more systematic way than is possible in the journal literature, their own contributions to the science. This latest addition to the growing collection of definitive monographs is a worthy companion of its predecessors. Professor Ingold is to be both congratulated and thanked for this stimulating discussion of his outstanding work on reaction mechanisms. No chemist can afford to be ignorant of the material that is presented here.

An idea of the field that has been explored by the author can be most easily obtained from a list of the titles of the 15 chapters:

Valency and Molecular Structure; Interaction Between and Within Molecules; Physical Properties of Molecules; The Aromatic Nucleus; Classification of Reagents and Reactions; Electrophilic Aromatic Substitution; Nucleophilic Aliphatic Substitution; Olefin-forming Eliminations; Saturated Rearrangements; Unsaturated Rearrangements; Aromatic Rearrangements; Additions and Their Retrogression; Acids and Bases; Carboxyl Reactions; and Nucleophilic Aromatic Substitution.

As is evident from this list, reactions which proceed by free-radical mechanisms are almost completely ignored. This deficiency would of course be a serious one if the book were regarded as a comprehensive treatment of "structure and mechanism in organic chemistry"; it becomes of minor importance, however, when the book is instead regarded as what it actually is—a summary of the work of the author and of his colleagues. Similarly, the frequent failure to give due recognition to parallel, or even earlier, work of other investigators who have not been associated with Ingold is regrettable, but the value of the book as a survey of the author's own contributions is not thereby greatly decreased. It is, in fact, a tribute to the remarkable breadth of the author's interests that, even with this limitation, so large a segment of organic chemistry is covered.

Some features of *Structure and Mechanism in Organic Chemistry* will certainly be found irritating by a number of readers. The prose style is complicated and, especially in the initial chapters, makes comprehension difficult. The meaning is often obscured also by the use of many specially coined words, of which

only a few like "electrophilic" and "nucleophilic" have as yet become generally familiar. Moreover, since the treatment of complex problems requires that a great many independent factors be considered, one not infrequently gets the unfortunate impression that a new effect is invented for the explanation of each new observation. Even though these criticisms doubtless have some justification, nevertheless, they do not seriously detract from the unquestionable excellence of this valuable and instructive book which is, in fact, both the best and the most easily readable presentation of Ingold's work that is now available.

G. W. WHELAND

Department of Chemistry, The University of Chicago

Applied Electron Microscopy. Robert B. Fischer. Bloomington, Ind.: Indiana Univ. Press, 1953. 231 pp. Illus. \$4.85.

Introduction to Electron Microscopy. Cecil E. Hall. New York-London: McGraw-Hill, 1953. 451 pp. Illus. \$9.00.

According to the prefaces, both of these volumes are based on courses the respective authors have taught for several years, both courses are offered to seniors and graduate students of diverse interest and background in science, both authors state the same general objectives—and similarity terminates with these points. The contrasts between the two volumes impress me as a result of the authors' differing views as to the rigorousness with which they feel fundamental background needs to be developed.

The little volume by Fischer is so simply and nicely written that it can easily be perused in an evening. Comparisons of electron microscopy with the more familiar light microscopy are numerous. The few equations, not being developed, have to be taken on faith and seem to contribute little. Roughly half the volume is given over to specimen preparation and description of representative pictures (hence, I presume, the title); this is about the same amount of space as is given to these subjects in the considerably larger volume by Hall. It is difficult to see how the material given by Fischer can be stretched to fill the time of a college course or, without supplement, give a sound basis for the development of independent electron microscopists. The volume does seem to me to have real value, however, both for those seeking only a superficial appreciation of the subject, and for those who are in a position to collaborate with a competent electron microscopist and, hence, need only a simplified introduction.

The larger volume by Hall is a systematic account beginning with essential elements of physical theory and logically developing the subject step by step. He manages to work in a good many pages of mathematical exposition and documentation without calling for a background beyond the sophomore level of mathematics and physics. The present reviewer is one of those who finds the mathematical sections of most physics books overly abbreviated shorthand that can