

THE FIRST AMERICANS

Early Man in the New World

By Kenneth Macgowan. Pp. xviii+260. (New York: The Macmillan Company; London: Macmillan and Co., Ltd., 1950.) 37s. 6d. net.

THE evidence for early man in America, before the development of the traits connected with agriculture and a settled life, has hitherto been scattered in a number of technical publications, many of them difficult of access to readers in Great Britain. This book presents the material in a manner both popular and scientific. Mr. Kenneth Macgowan, distinguished in other fields, is an amateur anthropologist; but the book shows that he has read both widely and critically, and the result is clear and generally accurate.

In a book of this length, it is at first surprising to European readers to find forty pages devoted to Old World prehistory; but this is clearly necessary when addressing a public unfamiliar with that field. The author is critical of Mortillet's classification of the Palaeolithic, which he regards as a scientific strait-jacket; but it has done good and necessary service even if it has been applied too rigidly, and in the final chapter, which is admittedly speculative, he himself seems to look with too favourable an eye on reports of specifically European types of Palaeolithic implement (bearing Mortillet's names) in the New World. He places Harrison, of Eolith fame, in Suffolk instead of Kent, and does not know that Oakley's fluorine analysis work has ruled out an early date for Piltdown man; but these are minor points.

The best source of information on early man in North America is a handbook by H. M. Wormington published by the Denver Museum of Natural History, which appears in the bibliography. This author has, with good reason, abandoned the term Yuma altogether; but it must be noted that Mr. Macgowan has retained it, apparently on purpose. Apart from this, the information given for all parts of America is up to date and, in most cases, as full as the nature of the book demands, though rather more might have been made of Junius Bird's work in south Chile, and his presumed early pressure-flaking sites on the coast of Peru are worth a mention. In connexion with the supposed find of mastodon in association with pottery near Quito in Ecuador, it is certainly a pity that the site did not get more satisfactory investigation (p. 145). Jijon y Caamaño, a distinguished Ecuadorian archaeologist, told me that he had the gravest doubts about the association, and dated the pottery as late as the twelfth century. If mastodon had survived until this late date, other evidence of its presence should surely have been found by now either in Ecuador or Peru. The find was described by Uhle, who was concerned in it, and the mention of Maya influence on the pottery is a reminder of the extremely speculative nature of his writings at this time.

Some of the later chapters, containing discussions of diffusion, with special reference to Gladwin's views, and of agriculture, are interesting and stimulating, but relevant rather to a time later than that of the main theme of the book. Chapter II contains a statement (p. 208) that no maize had been found with the Coastal Chavin culture, which is not true, since Bird specifically states that it appeared at this very time. Further, we have, since 1949, had more

precise information about the date of the appearance of this culture and of maize than is given here, in the shape of a radiocarbon date of 2665 ± 200 years, or about 700 B.C.

The book deserves to be widely read. Not only does it present a large body of information in a readable form, but also it is written in such a way as to encourage its readers to assimilate new facts and to make their theories fit them.

G. H. S. BUSHNELL

ELECTRONIC THEORIES OF ORGANIC CHEMISTRY

Physical Aspects of Organic Chemistry

By Dr. William A. Waters. Fourth edition, completely rewritten. Pp. xii+539. (London: Routledge and Kegan Paul, Ltd., 1950.) 35s. net.

WHEN the first edition of this book appeared, the application of the wave-mechanical treatment of electron behaviour to organic molecules was in its infancy, the concept of hyperconjugation was unknown, the duality of mechanism of substitution and elimination reactions was generally unsuspected, little was known regarding the kinetics of aromatic substitution, and free-radical chemistry was largely restricted to the reactions of more stable radicals like triphenylmethyl. The very great advances in our knowledge of these topics alone, during the past fifteen years, indicate the magnitude of the task involved in the up-to-date revision of this book which Dr. W. A. Waters has attempted in the fourth edition.

The scope is wider than the title might suggest, since the author attempts the application of "the broad conclusions of the electronic theory of valency" to all the principal reactions of organic compounds. Although the size of the book has been increased by some fifty pages, it is obvious that only the more salient features of such a wide field could be included, and this new edition constitutes a very readable and valuable survey of the present theoretical outlook. The impression is gained, however, that the author has been somewhat hampered and circumscribed by the original framework of earlier editions. There is an unhappy blending of different nomenclatures, and the treatment of some topics is not as up to date as might be expected. The intentional historical development of current ideas from their earlier and cruder precursors is valuable, but curtailment of such treatment would have permitted fuller elucidation and the presentation of a more accurate and complete picture of the conclusions derived from recent extensive kinetic studies.

Thus the whole treatment of ester hydrolysis is based essentially on Lowry's termolecular mechanism which, since it envisages proton-transfer from acidic to basic oxygen as a rate-determining step, would find very limited acceptance to-day. In consequence, Day and Ingold's mechanism of acid-catalysed ester hydrolysis is erroneously described (p. 347) as a bimolecular electrophilic substitution S_E2 . Restriction of the account of the effect of substituent groups in 1:2-eliminations to those governed by the Hofmann rule (that is, control by the inductive effect) is liable to confuse the reader when he encounters similar eliminations which follow the Sayzeff rule (control by the electromeric effect). A strange and