

The second work is complementary to the first. Its purpose is to describe the fundamentals of electronic theory of chemical structure and of reaction mechanism over a wide field of organic chemistry. There are two sections. The first outlines the electronic theory of valency and includes a description of the transmission of polar effects in conjugated and non-conjugated systems, while the second and larger portion of the book deals with the various types of heterolytic and homolytic reactions and their occurrence in aliphatic and aromatic substitutions, in elimination and addition reactions, in prototropic processes, and finally, in reactions involving carbonyl groups. The book is clear and readable but its presentation is marred by numerous misspelt words and misleading statements. As an example of the former, there is written in connexion with Mannich bases, "... the case with which they de-animate . . ." (page 154). The second example results from Tchoubar's failure to distinguish between conjugative effects in the ground state (mesomeric effects) and those in the excited, transition states (electromeric effects). He remarks (page 175) that in aromatic nitration the steric effects of dimethyl groups in the *ortho* positions reduce or wholly suppress the deactivating and *meta* directing effects of nitro- and sulphonic-acid groups by suppressing the associated negative conjugative effects. This cannot be so, because only inductive effects can operate in such cases, and, indeed, in 1964, E. Baciocchi and G. Illuminati showed that there was no reduction in the deactivating influence of these groups. In my opinion these and other blemishes seriously diminish the value of this book for the general reader.

E. ROTHSTEIN

BASIC ORGANIC CHEMISTRY

Modern Textbook of Organic Chemistry

By G. P. Ellis. Pp. xii + 466. (London: Butterworth and Co. (Publishers), Ltd., 1966.) 57s. 6d.

It is most pleasing to have a good, well-written book on basic organic chemistry by a British author. In this book, aimed at the first two years of an honours course, or equivalent, the variations in reactions of the functional group for aliphatic and aromatic compounds are usefully considered together. The first chapter, which introduces fundamental concepts, is, as is the whole book, simply and informatively written. Each chapter, sub-divided into well-enumerated sections, includes rigorous adherence to the IUPAC system of nomenclature, most importantly even for simple compounds. Reactions are classified according to their type, for example, electrophilic substitution, addition which, with the emphasis on actual reactions with yields as examples, should enable the student to appreciate the subject. A summary at the end of each chapter outlines the various methods of preparation of the class of compound being discussed while other useful assets are spectral characteristics, surveys of economically important compounds, and selected questions, to which answers are thoughtfully provided. The superb cross-referencing, a highlight of the book, together with an excellent index ensure that the student can rapidly find any particular topic regardless of the lecture course he may be following.

The treatment of some reaction mechanisms does not reach the high standard maintained in other aspects; some intermediate steps are omitted and little explanation of the driving force is given. This is accentuated by the omission or complete misplacement of arrows to designate electron pair shifts and will only serve to further confuse the student (pages 229, 237). Again, tautomerism is not an intramolecular hydride shift as depicted (page 14), and the proposed mechanism for osazone formation is quite wrong (page 389). The badly distorted chair forms of cyclohexane with axial bonds at 90° to those

in the ring are of no help in an understanding of stereochemistry.

I hope that considerable attention will be directed to the correct placement of dots, charges, arrows, and three-dimensional depictions in any revised edition, for the typographical errors mar what is otherwise a most useful text-book.

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FERTILIZATION

Fertilization

By C. R. Austin. (Foundations of Developmental Biology Series.) Pp. x + 145. (Englewood Cliffs, N.J., and London: Prentice-Hall, 1965.) 21s. paper; 40s. cloth.

C. R. AUSTIN has been interested in the biology of the gametes for a long time and he has courageously undertaken to write this account of the cytological, physiological and behavioural mechanisms concerned with their union. Nor does he speak only as a compiler; his 20 years or more of research on this aspect of biology qualify him unusually well for the undertaking. The result is a notably significant book.

Too often in the past cytological studies of fertilization have been primarily descriptive with little attempt to evaluate the functional significance of the mechanisms involved. In this study the approach is from the functional rather than the purely morphological standpoint and much emphasis is placed on the method of experimentation. This book not only provides concrete information on gamete physiology, but also adopts a realistic attitude towards the larger problems and responsibilities growing out of our increased knowledge in this field. But although it is valuable to have our present knowledge of the subject accurately summarized and evaluated, a most important contribution of this slender volume is the attention it attracts to the problems that remain to be solved.

The first part of the book includes an introductory chapter with a concise account of the structure and function of the cell. This part then continues with a discussion of meiosis, mitosis and cell division. Then follow chapters which are devoted to a comprehensive and thorough discussion of the significance of fertilization, the form, differentiation, approximation, contact and fusion of the gametes, as well as the immediate consequences of fertilization. The final chapter describes unusual and abnormal forms of fertilization; this is a restrained and reasonable account which forms an effective conclusion to a book which is outstanding for its clarity and simplicity.

To make the book more readable each of the chapters has subheadings which are valuable in organizing the information. In addition references are not included in the body of the text. These have been covered by the larger treatises mentioned in the adequate bibliography at the end of the book, which also includes a comprehensive list of the chief monographs, reviews and original papers devoted to the subject of reproduction or more specifically fertilization. Excellent figures are included in the text as well as photomicrographs, many of which are original.

If any critical comment were called for, it would merely be that the text had brought to light disproportionately few new insights into mammalian fertilization. Austin would probably agree. From intent, however, the discussion of this aspect of the problem has been limited so as not to obscure the contributions made by the less commonly investigated species. Where there is a genuine paucity of evidence, thinking such as this, soundly based on what is known, is the one thing most likely to stimulate the research that will produce evidence, either for or against. No student interested in the physiology of the gametes can afford to be ignorant of this gem.

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