

examples of morphological abnormalities occurring during the development of a mammal, and in this field Dr. Grüneberg is one of the foremost investigators in the world. His account of these aspects of the subject is the fruit of a long and intimate acquaintance with the material, and embodies many original, and to some extent not previously published, observations. It is certain to remain for many years the standard work on the subject.

Grüneberg very justly emphasizes the great interest that many of these developmental abnormalities may have as experimental material for physiological and pathological investigations, in which the purely hereditary side of their behaviour would be of minor importance. His book is, in fact, a storehouse in which biologists of many kinds could find fruitful suggestions for studies in their own fields. The famous example of the pituitary dwarf is an instance which has, of course, already been put to good use by hormone specialists. Similarly, the rodless retina race has been employed in some studies of behaviour, and so have the famous 'waltzer' and 'shaker' strains, though more remains to be done with the numerous pathological variations which are available. There are numerous other types, such as the two forms of hydrocephalus, or the race with a hereditary absence of the corpus callosum, about which we know much less. The extraordinary pathological conditions of the integument in races such as 'naked' and 'rhino', and the lesser abnormalities of hair-growth in the various 'waveds', 'caracul', 'rex', etc., offer another wide field for future investigations; and so do some of the sexual conditions, such as the association of deficient mammary development with hairlessness, the 'imperforate vagina' condition and others. The use of genetical methods in the study of susceptibility to cancer and tumour transplantation in the mouse is, of course, a classical example of such a broadening of the purely genetical outlook. It is the subject of a special section of the book, contributed by two specialists in the field, Drs. Little and Gorer. Unfortunately this is in some ways not so satisfactory as the greater part of the work, perhaps because there is scarcely space to make clear the somewhat complicated situation, or, perhaps, because of war-time difficulties in communication between joint authors on different sides of the Atlantic.

Of all the numerous aspects of biology touched on in the book, that which is closest to the personal interests of the reviewer is the embryological. It would scarcely be possible to better Grüneberg's account of the facts of the development of the various abnormalities; and he can unravel some of the causal sequences involved, such as the consequences of the failure of secondary bone absorption in grey lethals. But on the whole it must be admitted that the genetic abnormalities in the mouse pose many more developmental questions than they answer. Even in so well-investigated a case as the grey lethal, we have no inkling of the relation between the skeletal and the pigmentary effects. Grüneberg, perhaps wisely, makes only a very sketchy attempt to classify the types of developmental abnormality which are encountered. In by far the majority of cases, our knowledge ceases when we have traced the pathological condition back to some developmental process which takes place in a sub-standard way for reasons unknown. In contrast to *Drosophila* (or plants) there are few cases where one organ is replaced by some other organ properly belonging to another region of the body; there is nothing at all closely

corresponding to conditions such as aristopedia, bithorax, tetrapter and the rest. Speaking metaphorically, the members of the mouse orchestra do not tend to come in at the wrong time with the right phrase—their fault is a tendency to play out of tune. Is this difference connected with a lower degree of functional metameric symmetry in a mammal than in an insect? Or with a greater elaboration of the evocators or 'switches', which makes it less easy for the wrong key to open the right door? No answer can yet be given; that is another, and one of the (to me) most fascinating of the stimulating questions raised by Grüneberg's book.

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## KEEPING UP WITH ORGANIC CHEMISTRY

### Dictionary of Organic Compounds

The Constitution and Physical and Chemical Properties of the Principal Carbon Compounds and their Derivatives, together with the Relevant Literature References. In 3 vols. Vol. 1: Abietic Acid—Dypnone. New, revised and enlarged edition. Edited by Prof. I. M. Heilbron and H. M. Bunbury. Pp. xvi+1072. (London: Eyre and Spottiswoode (Publishers), Ltd., 1943.) £6 6s. net; complete, £15 15s. net.

THE original edition of this first dictionary of the kind in the English language was finished at the end of 1937, and it was then hoped to issue revised volumes at regular intervals, beginning in 1939 (*NATURE*, Nov. 17, 1934; Feb. 29, 1936; Feb. 19, 1938). The outbreak of war interfered with these plans, and in the circumstances it is a remarkable achievement to have produced this new edition of volume 1. The plan of the work remains unaltered, and the format is identical with that of the first edition, except that a thinner paper and narrower margins have been used. As a consequence, the new edition of volume 1, comprising 1,088 pages, is lighter and more compact than the old one of 726 pages.

The volume has been completely rewritten. The many new entries cover the literature of organic chemistry to the end of 1940, and there are some references to still newer work published in 1941 and 1942; at the same time, certain omissions from the first edition have been remedied. As an illustration of the considerable increase in the number of entries, the section from "Carene" to "Carvoxime" has grown from 3½ to 7 pages. In a work of this kind it is particularly difficult to maintain a high standard of accuracy, yet this has been done. It is, indeed, something of a feat for a critic to find a formula for  $\alpha$ -cyperone lacking a methyl group, or to discern a certain dubiety in the bracketing of carvomenthinol with piperitol.

It has not proved practicable under war conditions to rewrite volumes 2 and 3. These, of course, are not so far behind the times as the original vol. 1. As they have been out of print for some time, they are being reprinted with supplementary data collected since the original publication. Moreover, vol. 1 contains cross-references to compounds included in the supplements to volumes 2 and 3. Prof. Heilbron, Mr. Bunbury, and their collaborators have once more earned the gratitude of the chemical community through their labours in maintaining and improving this invaluable Baedeker of organic chemistry.

JOHN READ.