

Four contributions deal with the production of economically valuable mutations by the use of radiations. Although much of the work reported on this subject is not convincing, the demonstrations by D. Lewis of the disruption of the breeding system in self-incompatible species, and by C. F. Konzak of the induction of resistance to Victoria blight in susceptible oat varieties, illustrate that mutagenic agents have definite possibilities in plant breeding. The success of both attempts at achieving valuable mutations depend on their well defined genetic objective and on an efficient screening technique for the isolation of the mutant genotype.

The symposium achieved what it set out to do, namely to highlight recent developments in genetic research which are of potential value to plant breeding. These are impressive and one hopes that readers will find it no longer necessary to cite "hybrid corn" as the sole contribution of genetics to agriculture.

WATKIN WILLIAMS.

CHROMOSOME ATLAS OF FLOWERING PLANTS. 2nd Ed. By C. D. Darlington and A. P. Wylie. London: George Allen and Unwin. 1955. Pp. 519+xix. 60s.

CHROMOSOME BOTANY. By C. D. Darlington. London: George Allen and Unwin. 1956. Pp. 186+xii. 16s.

The second edition of the invaluable *Chromosome Atlas of Cultivated Plants* has been widened in scope to include all flowering plants, hence the change of title. It covers the chromosome numbers of nearly double the number of plants represented in its predecessor. The genera with uniform chromosome numbers have been abbreviated, the variable ones being given in detail, including reference to the presence of B chromosomes. The families, numbered and in the order of Hutchinson's *Families of Flowering Plants*, are divided into 25 groups of orders, each being preceded by an illustration of the chromosomes of a member of the group. The rich data convey to systematists the value of chromosome numbers for classification, suggest to plant breeders the breeding system and the limits within which interspecific crosses might be attempted, and show cytologists what has been done and what remains to be done.

Issue may be taken with the reasons given for omitting authors' names from the species listed. These are part of the name of the abstract taxonomic concept embodied in a diagnosis. Truly the type specimen's chromosome number is only conjecturally that of the specimens observed, but presumably these resemble, *i.e.* conform to the diagnosis of, the taxonomic species whose name is used in the Atlas. We surely need to know in whose specific taxonomic sense the name is used.

The interpretation of the material in the Atlas, formerly in its introduction, is incorporated in the companion volume on *Chromosome Botany*, which discusses the laws of chromosome variation. It is a stimulating book, which treats the chromosomes of plants as broadly as possible, consistent with the omission of the reciprocal connection with formal genetics. The intricacies are avoided partly by a descriptive treatment and partly by pointing to problems, rather than expounding their solutions. This method of presentation is undoubtedly well suited to students of botany, accustomed to descriptive analysis, who should study this book closely. Nevertheless the description is sometimes so couched as to suggest that no problems

remain, as in the chemical structure of chromosomes or the mechanism of crossing-over.

The material is presented in seven chapters (1) structure of chromosomes and their behaviour in division, structural and numerical change and the nature and behaviour of B chromosomes, (2) systematics, the kinds of natural species, their modes of reproduction and mechanisms of variation, (3) the ecology and geography of cytological variation, (4) chromosome number and individuality and their directions and rates of change as a function of time, (5) the evolution of cultivated plants, embodying the introduction to the first edition of the Atlas, (6) the modes of evolution of cultivated ornamental plants, ranging from mutation in the sweet pea, through aneuploidy in the hyacinth to the complex hybridisations to which we owe our roses, (7) lessons.

A few errors should be noted. The statement (p. 24) that pollen grains with more B chromosomes accomplish fertilisation more quickly, is presumably founded on the competition between male nuclei with differing numbers of B chromosomes, but this competition occurs between nuclei in the same pollen grain. *Lilium perenne* (p. 100) is *Lolium p.* The Palestinian form of *Trifolium subterraneum* (p. 101) is morphologically distinct and recognised as var. *telavivensis* in Post's Flora.

The principles of classification are sketched somewhat tendentiously in Chapter 2. No clear distinction is drawn between natural and taxonomic species, and this philosophic omission is probably responsible for much of the impatience of the experimenter with classical taxonomy. Taxonomic species are abstract concepts arising out of the attempts to describe the natural species, assumed to exist in nature. The latter are essentially mating groups, but in erecting taxonomic species the taxonomist necessarily relies mainly upon practical rules based upon differences of form and spatial distribution. Cytology serves to show the existence of distinct mating groups where previously they were unsuspected.

These defects do not detract from the excellence of this book which is an original and distinctive contribution to biological knowledge. Its principles indeed are applicable, as we would expect and as E. B. Ford shows in an appendix, to animals.

D. G. CATCHESIDE.

A SYMPOSIUM ON THE CHEMICAL BASIS OF HEREDITY. Edited by William D. McElroy and Bentley Glass. Johns Hopkins University Press and Oxford University Press. 1957. Pp. xi+848. £5.

This is a report of twenty-seven papers connected with the chemistry of chromosomes, genes or viruses or the mechanics of their propagation or recombination. There are discussions of sixteen of the papers which make the work as a whole more disconnected, and an 80-page summary by Dr Bentley Glass which attempts to make it more connected. Some of the papers treat their subject in a general way with copious bibliographies, others in unrelieved and unreferenced detail. The field is somewhat too wide for this heterogeneous method of treatment and the value of the whole work lies in certain outstandingly useful contributions on bacterial and phage genetics. There is a useful index.

C. D. D.