

book: "the lecturer and his two gallant volunteers in turn passed their hands to and fro through the stream [of white-hot lead], and the final experiment of the 113th course of Christmas Lectures adapted to a juvenile auditory to be given at the Royal Institution was carried to a successful conclusion".

This absorbing account of youthful achievement in the realm of chemistry cannot fail to arouse and hold the interest of readers of all ages. The volume is attractively produced and copiously illustrated with plates and figures. It contains references to many of the experiments and

exhibits of the original lectures, and each chapter is provided with a useful bibliography. The book gives rise to sundry interesting reflections. What was the spark causing the tinder of each youthful genius to burst into flame? Is there still scope in science for the youthful pioneer, in these days of intense specialization and team work? Would Faraday, with his meagre formal education and elementary knowledge of arithmetic, have been able in this exacting age to break his birth's invidious bar? These are some of the intriguing questions to which the intelligent reader must supply his own answers.

JOHN READ

GENETICS OF COTTON

The Genetics of Cotton

By Dr. Sydney Cross Harland. Pp. 193. (London: Jonathan Cape, Ltd., 1939.) 10s. 6d. net.

THE great economic importance of the world's cotton crop has led to marked advances in the genetics of cotton since 1924, when the most valuable New World species of cultivated cotton were found to be tetraploid. The researches of Dr. Harland have occupied a leading place in this development, and the present book is a fitting summary of knowledge regarding the genetics and cytology of the genus *Gossypium*.

The first chapter, which is devoted to the taxonomy of the group, recognizes eighteen species, while ten others recognized by some authors are reduced to variety rank and two are assigned to other genera. In addition, *Gossypium Robinsonii*, of Western Australia, is insufficiently known and recent efforts to find it in the wild condition have been unsuccessful. Numerous specific names of cottons in the West Indies and South America are regarded as local races of *barbadense* or *purpurascens*.

The fact that four American and three Polynesian species are tetraploids with 52 chromosomes is of fundamental importance for the genetics of the cultivated cottons. The existence of five wild American diploid species, as well as other diploid species in Africa, Asia, and Australia, shows not only the great age of the genus (regarded as Cretaceous in origin) but also serves as the basis for various views regarding the origin and history of the valuable American tetraploids (Sea Island, Upland, etc.). It is evident that these form a younger section of the genus, having been derived, probably as allotetraploids, from diploid ancestors.

The cytological chapter presents the available evidence from chromosome morphology as well as number, and particularly from chromosome pairing

in F_1 interspecific hybrids. Supposed constant differences in chromosome size between the Old and New World species have led to the view that the American tetraploids have resulted from chromosome doubling in sterile hybrids between species from these respective original sources. The chromosome sizes in these presumed amphidiploids do not apparently support this view, and Upcott's reinvestigation of the case of *Aesculus carnea* does not show (as is stated on p. 44) that this amphidiploid has 40 large chromosomes derived from one parent and 40 small ones from the other. Nevertheless, although the evidence of chromosome size gives little support to the view that the American tetraploid species came from crosses between Asiatic and American diploids, yet the pairing in F_1 hybrids does support such a conclusion, for certain crosses between Asiatic species and New World tetraploids give thirteen pairs and thirteen single chromosomes. The evidence is not final, but the existence of tetraploids in Polynesia suggests that this condition goes back a long way in the history of the cottons.

The bulk of Dr. Harland's book is naturally devoted to the numerous results of breeding experiments. Several series of multiple allelomorphs are known, some members of which belong to different species, as in red pigmentation, leaf shape and seed fuzz. Several cases of linkage groups have been found, but with the large number of chromosomes it will be a long time before adequate chromosome maps can be constructed.

This book will be indispensable to all those concerned in cotton breeding, and to geneticists, especially for the work on interspecific modifying genes in a group of species the age of which can only be measured in geological time.

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