THE ANTHOCYANIN PIGMENTS OF PLANTS

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BY

MURIEL WHELDALE ONSLOW, M.A.

FORMERLY FELLOW OF NEWNHAM COLLEGE, CAMBRIDGE, AND RESEARCH STUDENT AT THE JOHN INNES HORTICULTURAL INSTITUTION, MERTON, SURREY

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PREFACE

OF the various investigations which have been made upon the anthocyanin pigments along botanical, chemical and genetical lines, no complete account has yet been written. It is the object of this book to provide such an account of the work which has been done. Although it is only within recent years that any very notable researches have been made upon these pigments, I feel that consideration is due to the many workers who, in the course of the last century, have paved the way for their successors. This I offer as my excuse for dwelling in the following pages upon some researches which are now almost entirely superseded.

I do not pretend to claim that anthocyanins will ever have a great significance from the strictly botanical point of view. Even when the obscurity which surrounds their physiological functions is elucidated, it can scarcely be expected that they will have a significance in the least comparable, for instance, to that of chlorophyll. From the strictly chemical standpoint, as chemical compounds, they have a certain interest. But I believe it to be in connection with problems of inheritance that they will provide a great and interesting field for research.

We have now ample evidence that the development in plants of many and various anthocyanin pigments affords an almost unlimited supply of material for the study of inheritance. It must also be patent to those who have been working on the subject of Genetics that a proper conception of the inter-relationships and inheritance of the manifold characters of animals and plants will be greatly facilitated by a knowledge of the chemical substances and reactions of which these characters are largely the outward expression. Herein lies the interest connected with anthocyanin pigments. For we have now, on the one hand, satisfactory methods for the isolation, analyses and determination of the constitutional formulae of these pigments. On the other hand, we have the

Mendelian methods for determining the laws of their inheritance. By a combination of the two methods, we are within reasonable distance of being able to express some of the phenomena of inheritance in terms of chemical composition and structure. There can be little doubt that exact information of this kind must be at least helpful for the true understanding of the vital and important subject of Heredity.

In the preparation of this book I gratefully acknowledge the help afforded to me by many of my friends, and I am especially indebted to Mrs E. A. Newell Arber for kindly correcting my proofs.

To Professor Bateson, F.R.S., my sincerest thanks are due for the great interest he has taken in much of my work which is included in this volume, and for his many valuable suggestions and criticisms. I wish also to record my thanks to Dr F. F. Blackman, F.R.S., for criticisms and assistance with the manuscript.

I regret that some of the most recent and important work on the subject has not been altogether successfully incorporated in the book, owing to the difficulty I have experienced in learning, at the earliest opportunity, of the results obtained by scientists in other countries during this and the preceding year.

M. W.

CAMBRIDGE,
May, 1916.

PREFACE TO SECOND EDITION

SINCE the appearance of the first edition the publications of greatest value on the subject of anthocyanin pigments have been in connection with the chemistry and biochemistry of these substances. This later work has now been included, and the present state of our knowledge of the significance of the pigments in relation to plant metabolism has, as far as possible, been indicated.

The consideration of the more recent investigations on Genetics in which the anthocyanin pigments are involved has presented difficulties, in view of the large number of papers published. An attempt has been made to record the majority of these publications, but it has been impossible, within the size and scope of this book, to give detailed accounts of the researches on the inheritance of soluble pigments. Such curtailment, however, should not be serious, for many of the results indicated have not greatly increased our special knowledge, either of the inter-relationships of the pigments, or of the bearing of their chemical constitution on the inheritance of colour.

Recent work on Genetics, nevertheless, has considerably broadened our general conceptions of Mendelian factors and has prepared the way towards that elucidation which, unquestionably, in the course of time, will be found of the relations between the chemistry and biochemistry of the anthocyanin pigments and the factors for colour-inheritance.

M. W. O.

CAMBRIDGE,
April, 1925.

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