

PREFACE TO VOLUME III

With Volume III, on mineral nutrition, the Treatise on Plant Physiology enters upon its second section, which deals with the nutrition and metabolism of plants.

In Volume II plants were considered in their general relation to water and to solutes. Photosynthesis and respiration, starting from and returning to carbon dioxide and water, have been discussed in Volumes IA and IB, and the manifold processes of intermediary metabolism will be taken up in Volume IV. Therefore, Volume III is now concerned solely with the role of those elements of the periodic table, other than carbon, hydrogen, and oxygen, which are essential to, or used by, plants in their vital processes.

In the subject of mineral nutrition, plant physiology bears a close relationship to agriculture. The practical importance of the mineral nutrition of plants, through manurial practices or fertilizer programs, gave to the emerging science of plant physiology much of its early impetus; this debt to agriculture has been amply repaid. This volume, then, briefly traces the history of mineral nutrition of plants, and, as it summarizes the present status of knowledge, the intention is that it will also point to the challenge of the future.

The plan of the treatise remains as previously announced, and its aims and general style have not changed. Again the subject matter could only be covered by a selected group of authors, each an authority in his own field. While each chapter of Volume III is complete in itself, the volume as a whole should present a philosophy of plant nutrition. In the difficult attainment of these ends, the individual authors have rightly exercised a large measure of discretion in their respective chapters, and the value of the volume thus rests upon their scholarly work. To all these contributors the editor is greatly indebted.

Although the various chapters in this volume are conveniently grouped together, this is nevertheless a somewhat arbitrary device, for, in their role, the mineral elements also touch all aspects of plant behavior. Thus hardly a physiological topic can be considered without at some point disclosing a connection with, or a decisive role for, some essential inorganic element. In fact, it is these interactions that give much of the current impetus to the subject of mineral nutrition.

The now familiar form of the indexes is preserved in this volume of the treatise. Subject and Author Indexes and an Index of Plant Names are again included. In the over-all plan of the entire treatise the same

conventions concerning the use of plant names are applied in this as in the previous volumes, and the application of these conventions has again been supervised by Dr. W. J. Dress, who has also prepared the Index of Plant Names. The Subject Index for Volume III was compiled by Mr. Richard D. Holsten. For all this help the editor is also grateful.

Since the authors completed their manuscripts for this volume, the rules on nomenclature of enzymes and coenzymes have been reviewed by a Commission of the International Union of Biochemistry. The recommendations of this commission are summarized in *Science* (1962) 137, 405-408. According to these recommendations, such time-honored names as cozymase; coenzyme I (Co I); coenzyme II (Co II); diphosphopyridine nucleotide (DPN); triphosphopyridine nucleotide (TPN) should no longer be used, although, for lack of a suitable alternative, coenzyme A (CoA) is still permissible! Therefore, in this volume the older and well understood practices have of necessity been retained, although it is apparent that plant physiologists must now learn to recognize these familiar enzymes and coenzymes under their new and approved names.

Wherever possible, the text is illustrated by figures and tables which are reproduced from original sources. The purpose of this is to present enough of both the evidence and the analysis of it to reduce the need continually to consult the original sources, which are also cited. Each author has obtained prior permission to include in his chapter the previously published material which he has used, and the form of citation in the text and in the bibliography is held to convey the acknowledgments and the thanks of both authors and editor for the use of these materials. To list separately all such cases in a work of this sort would be a formidable task indeed.

Finally, the editor again wishes to acknowledge the very real help he has received from the personnel of Academic Press.

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