

PREAMBLE TO CHAPTER 2

Chapter 1, Part 2, outlined some general considerations which flow from the growth of seed plants in soil-free culture media. Chapter 2 is focused upon the requirements for specific elements, the symptoms incurred by their deficient supply, and the evidence that a given element is to be considered to be an essential one. Although at first the criteria upon which these judgments were based were, and often still are, visual, the trend is now increasingly toward the additional use of metabolic criteria to characterize the plants which are grown at different levels of nutrient supply.

It will be evident from Chapter 2 that still further discoveries on the role of mineral nutrients and of the essential elements are fraught with increasing difficulty; they require ever more fastidious control over the chemical environment in which the plants are grown, and they involve an ever wider recognition of the interactions of nutrient elements with each other and with features of the environment during the growth of the plants. Thus to comprehend all the possible effects of nutrient supply, or deficiency, and to assess the specific effects of any or all of the prospective essential nutrients and their interactions may require information so detailed that it may become tantamount to understanding growth and metabolism in all its aspects.

This clearly raises the question, what does normal nutrition really mean? How far is the maximum growth best determined by the exogenous nutrient supply, and how far is it preconditioned by endogenous genetic factors? These considerations are necessary in the interpretation of what determines the *maximum* yield of agricultural plants. The essential first step, however, is to know which elements are necessary for the growth of plants and which, by lack, cause abnormalities. Chapter 2 furnishes this information in detail.