

viruses based on their serological relationships, in a severely critical review of present systems of nomenclature and arrangement. Undoubtedly a classification of viruses based on some such scientific basis as serological relationships would be ideal. Unfortunately the fact that a very large number of viruses cannot at present be studied by serological methods renders such a classification for the time being purely academic.

Mr. Bawden is to be congratulated on a very good book which presents an authoritative survey of the present status of plant virus research.

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<sup>1</sup> *Nature*, 154, 164, 334 (1944).

## INORGANIC NUTRITION OF PLANTS

**Lectures on the Inorganic Nutrition of Plants** (Prather Lectures at Harvard University.) By Prof. D. R. Hoagland. (A New Series of Plant Science Books, Vol. 14.) Pp. xii+226 (28 plates). (Waltham, Mass.: Chronica Botanica Company; London: Wm. Dawson and Sons, Ltd., 1944.) 4 dollars.

THE present volume embodies the texts of seven lectures, five of which were originally delivered at Harvard University under the Prather Lectureship. It is fortunate that these lectures have been printed, for this is undoubtedly a valuable contribution to the literature of the subject. It carries, of course, the limitation of the form of presentation. Prof. Hoagland explains in the preface that "this small volume cannot have any of the characteristics of a monograph or a text"—and such it has not. But it does provide a discursive survey of a field of investigation in which cohesion is frequently obscured by the rich variety of topics that the subject is commonly held to embrace, and in which, therefore, such a survey is particularly valuable.

The variety of content probably makes the subject difficult to discuss comprehensively, and to this, no doubt, must be attributed the fragmentary character of the discussion. But the difficulty is not relieved by the particularly generous view that the author takes of the implications of the term 'inorganic nutrition of plants'. The book begins with a discussion of soil conditions in relation to nutrient absorption, deals then with micronutrient elements, the absorption and accumulation of salts by plant cells, the translocation of inorganic solutes, exudation and root pressure, the growth of plants in artificial media, the relation of salt absorption to organic acids, and concludes with a chapter on potassium nutrition. In different connexions extensive reference is made both to the crystalline structure of soil colloids and to the synthesis of amino-acids. Inevitably within a text which is restricted to a hundred and eighty small pages of comparatively large print, the treatment of even the majority of these topics cannot be extensive, and must, in many instances, be unduly cursory. Moreover, in certain connexions the emphasis is unusual. The metabolic significance of potassium, nitrogen and zinc receives considerable attention, but there is little discussion of, for example, phosphate nutrition; and whereas the effects of individual elements are described, the interaction of the several nutrients in metabolism and growth is not treated in any detail.

These criticisms, however, are in any event not important, and may be irrelevant, since Prof. Hoagland writes: "the assumption was made that in lectures of the present type and objective the writer should emphasize the work with which he has had most direct contact". That work represents a distinguished body of contributions, and the prominence that it receives necessarily emphasizes certain recent important developments both in the elucidation of the mechanisms of well-recognized phenomena, and in the elaboration of new techniques. The author and his school have devoted considerable attention to the processes of salt absorption, accumulation and translocation, and in relation to these the importance of the metabolic situation is developed in some detail; the particular implications of absorption from the soil are discussed; and valuable summaries are provided of the results of investigations based on the use of radioactive isotopes as tracers.

The text is adequately illustrated with figures and plates; it is also supplied with a number of tables which are difficult to decipher, the print and numerals being distressingly minute. Otherwise the print and lay-out are admirable.

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## LOCAL GOVERNMENT FINANCE

### The Problem of Valuation for Rating

By J. R. Hicks, U. K. Hicks and C. E. V. Leser. (National Institute of Economic and Social Research, Occasional Papers No. 7.) Pp. vii+96. (Cambridge: At the University Press, 1944.) 7s. 6d. net.

THIS paper is the second part of a study of the incidence and effects of local government taxation, the first part of which, "Standards of Local Expenditure", has already appeared and the third of which will round off and complete a work of great interest and considerable importance for those who are, or shall be, occupied in local planning and reconstruction. It may well be the most significant of the three; for it examines and discusses the key problem of local finance—the variation in the burden of rates from one area to another due to the absence of uniformity in the standards employed for valuing rateable property. It is an old problem, the essentials of which were being studied by a Departmental Committee on Valuation for Rating set up in 1938 which had not completed its task at the outbreak of war. The authors were fortunate in having been permitted access to returns collected for the use of this Committee. They are, in consequence, able to offer reliable evidence confirming conclusions hitherto based on surmise or impression only.

Briefly, the conclusions are that rating valuations are inaccurate, that, therefore, they are not an index of the true wealth of an area, and the anomalies resulting from this stand in the way of effective assistance by means of grants to the poorer areas. As at present administered, rates are a bad tax. On the other hand, their abolition and replacement by an alternative would involve a fundamental alteration in the whole basis of local government. This is not practical; but some measure of reform is imperative, and a beginning might be made with the regularization of the assessment of rateable values. It is generally understood that the Rating and Valuation Act of 1925 had this, among other aims, in view; but the uniformity in valuation practice which was anticipated was not realized. In 1938,