

to the analysis of coal, proximate and ultimate; these, compared with the preceding sections, are remarkably full and evidently based upon personal experience. It would have added to the comprehensiveness of the account if a description of the methods of determining arsenic had been given. Owing to legislation arising out of the arsenic-in-beer scare the value of coal, especially anthracite, for kilning purposes is greatly affected by the presence of even small quantities of arsenic. The method of determining the calorific value of coal would have been rendered more intelligible if the description had been accompanied by an illustration of the calorimeter. Lastly, we deprecate the practice of placing the bibliographical references in the text at the end of the book. This method, at least as regards chemical literature, seems to have originated in Germany. We fail to perceive that it has a single redeeming feature. On the contrary, it produces the maximum amount of inconvenience. It involves constant turning backwards and forwards, which is apt to become tiresome and to lead to error. It is far preferable to embody the references in the text, or at least to place them as foot-notes to the pages on which they occur.

A Standard Book on Soils.

The Soil: An Introduction to the Scientific Study of the Growth of Crops. By Sir A. D. Hall. Third edition, revised and enlarged. Pp. xv+352. (London: John Murray, 1920.) Price 7s. 6d. net.

IT is pleasant to see that Sir Daniel Hall's book on the soil has now reached a third edition. It will have a permanent place in British agricultural literature as the first book on the subject in the modern period. Its distinguishing feature, which marked it off from its predecessors, is its clear recognition of the complexity of the soil problem, emphasised in the opening words and maintained throughout: "In the scientific study of soils, chemical, physical, and biological considerations are involved." Successive generations of earlier workers had regarded soil fertility as essentially chemical, physical, or bacteriological. This book was the first to show British readers that all these different views had a basis of truth, but that each by itself was too narrow. The study of the soil, in short, cuts across the conventional divisions of science and brings together such apparently diverse workers as the physicist and the protozoologist, the mathematician and the plant physiologist, and others who in an ordinary scientific laboratory would be supposed to have nothing in common.

NO. 2639, VOL. 105]

To write an adequate review of the book, comparing it with the preceding editions, would be to write a history of the development of modern soil science, and could not be done in a short notice. The leading advances have been in our knowledge of the constitution of the soil and of the population inhabiting it. In both directions recent investigations have revealed greater complexity and emphasised still further the need for "team" work to supplement the indispensable, but limited, individual work.

Ten years ago there was only one soil biologist at Rothamsted; now there are nine, and others, it is hoped, will soon be added. Bacteria were at first supposed to be the only organisms concerned; now it is realised that fungi, actinomycetes, algæ, and protozoa are all present in the soil, and probably all concerned in some way in the great changes going on.

Sir Daniel stimulates a living interest in the subject and makes constant reference to the experience of farmers, gardeners, and others in soil management and in the behaviour of plants in different soil conditions. These serve to show the student how much remains to be done in spite of all the advances of recent years; in this way also the book acts as a valuable corrective to the tendency showing itself in certain modern textbooks of regarding the soil as a physico-chemical system the properties of which are expressible in mathematical terms. These analytical methods have their uses, but they would become dangerous if they were allowed to obscure the complexity of the problem.

There is a valuable section on soil types containing much information of interest to the ecologist as well as to the agriculturist. The section on land reclamation is of particular interest at the present time and has a breadth of view and a freedom from extravagant anticipations rarely found in discussing this important subject. Altogether the book keeps up its reputation and will prove invaluable to the serious student of the subject.

E. J. R.

Savages of the Far Past.

An Introduction to Anthropology: A General Survey of the Early History of the Human Race. By the Rev. E. O. James. Pp. ix+259. (London: Macmillan and Co., Ltd., 1919.) Price 7s. 6d. net.

MR. JAMES aims at introducing the student not so much to anthropology in general as to prehistoric archæology interpreted in the light of the study of primitive man, modern as well as ancient. After an introductory chapter outlining