

(what is usually called radio astronomy) is, by comparison, less impressive. It naturally takes the form more of a catalogue of the work of others, without much attempt at criticism, but it is an excellent and readable catalogue.

The clear and precise introductory chapters on positional astronomy and on radar technique and aerials could well be read by anyone interested in these subjects, quite apart from their application to radio astronomy. I feel that it is unfortunate that the excellent chapter on radar methods is marred by the quoting of particular units after algebraic expressions which are correct in all system of units. Although I know that this failing is common to those who use m.k.s. systems, I nevertheless consider it is wrong in principle and wish to make my protest against it.

J. A. RATCLIFFE

SOIL PHYSICS IN AGRONOMY

Soil Physical Conditions and Plant Growth

Compiled by the Joint Committee on Soil Tilth, American Society of Agronomy, American Society of Agricultural Engineers. Byron T. Shaw, Editor. (Agronomy, a Series of Monographs, Vol. 2.) Pp. xv+491. (New York: Academic Press, Inc., 1952.) 8.50 dollars.

FOR want of a better definition, agronomy can be regarded as agricultural technology in which the emphasis in research is on "How?" rather than on "Why?". This monograph, written by ten authors and dealing with five aspects of the interrelation of soil conditions and plant growth, conforms easily to such a definition, for it presents detailed surveys of existing knowledge supplemented by extensive lists of references that enhance the value of the book. The sections differ in length and quality. The first, on the soil as a physical system (forty-two pages), gives a background for those who need it; the second, on mechanical impedance and plant growth, fills thirty pages—more than enough to reveal our complete ignorance of the topic. Then comes an admirable survey of soil water (a hundred and eighty pages), which, though based mainly on American experience, remains aware that there are water problems elsewhere in the world and that much useful work has been done toward solving them. The section on soil aeration (fifty pages) satisfies an important need for a dispassionate survey of an aspect of soil physics that is usually discussed in somewhat mystical terms; and the long final chapter on soil temperature (a hundred and seventy-eight pages) very reasonably brings in discussions of the effect of air temperature too. Many aspects of the problem are considered; but, whereas the length of the chapter on soil water is a measure of the importance of water in plant growth, the length of this chapter is probably a result of the ease with which soil temperature can be measured.

There is much to criticize in the book, but nearly all such criticism is of the primary authors and not of the compilers; and this is the cause of a slight feeling of disappointment. Though the personal touch does appear here and there, it is too infrequent, possibly because the compilers have had behind them a panel of twenty-five experts who reviewed the manuscript and offered comments on all or parts of it. Some day, perhaps, out of this book and from among these compilers another book may grow, a

more single-minded book based on ideas rather than on facts, with a title "Soil Conditions in the Physics of Plant Growth".

Printing and binding are good, but the price is high. A copy—or copies, for it will be well used—should be in the library of every institution that encourages research or teaching in agricultural science.

H. L. PENMAN

TABLES OF PERCENTAGE COMPOSITION OF ORGANIC COMPOUNDS

Prozenttabellen organischer Verbindungen (Tables of Percentage Composition of Organic Compounds)

C—H—O, C—H—N, C—H—O—N, C—H; C—H—S, C—H—O—S, C—H—N—S, C—H—O—N—S. By Dr. H. Gysel. Pp. xxii+637. (Basel: Verlag Birkhäuser, 1951.) 125 francs.

THE ancillary services provided by the microanalyst, the spectroscopist (ultra-violet and infra-red) and the X-ray crystallographer have made the life of the modern organic chemist seem featherbedded by comparison with that of his older colleagues. Dr. H. Gysel's tables supply a further aid which, although not of the same quality as the services mentioned, will effect a considerable saving of time spent on purely mechanical processes. Apart from a short explanatory preface, in three languages, the book consists entirely of tables. The percentage composition to 0.001 per cent has been calculated for about seventy thousand formulæ. The figures have been rounded off to two decimal places, and the molecular weights are also given. At a rough estimate the figures represent upwards of a quarter of a million calculations. It is easy to accept the statement that "this book involved a considerable amount of work".

The tables relate to CH compounds up to C₈₀, CHO compounds to C₅₂, CHN compounds to C₅₀, and CHON compounds to C₄₀. It is not easy to follow the logic of the decision to include C₄₀–C₅₀ compounds "only insofar as they have already appeared in the literature". The chemist who uses these tables will often be more interested in compounds which have not been described previously. For the compounds included in the tables, it is possible to determine, by inspection, the percentages of the elements, including oxygen. To assist in the calculation of the composition of compounds containing other elements (except sulphur, which can be dealt with from the simple relationship of its atomic weight to that of oxygen) supplementary tables give multiples of the atomic weights of common elements and of the weights of simple atomic groups. There are also tables of the specific gravity of nitrogen at various temperatures and pressures, and of the logarithms of these values.

By the use of these tables I have been able to detect typographical errors that have crept in during the various stages of drafting and typing papers, and some errors have been found even in composition figures published in the chemical journals. Whether the tables are "almost free from errors" as claimed can only be determined by much more prolonged use. It is unfortunate that the high price of the tables will restrict their availability. J. W. COOK