a hundred species. For most plants, however, edaphic factors are decisive, and the effects of these are dealt with in great detail. Finally, there is a chapter on plants the distribution of which cannot be related to any one dominating factor, and, here, suggestion is accompanied by indications of problems needing further research. The general treatment is throughout pointed by reference to a selection of individual species, and is illustrated by thirty maps. Readers of Prof. Good's "Geography of the Flowering Plants" will recognize in all this the foundation of chapter 13 of that work.

It is clear that this admirable treatment could not have been based on the older type of record. It has been made possible only because the author himself undertook a systematic survey which lasted over nine seasons. In the course of this the occurrence of more than 600 species was recorded for 7,500 stands —an average of seven to nine stands to the square mile. This was a great task, and its effects are seen in the number and spacing of the dots on the distribution maps. From all this has come the present book. It includes the customary plant lists. It is also an original and valuable contribution to plant geography and a signpost to new pastures for the field botanist.

M. SKENE

PROGRESS IN BIOCHEMISTRY

Annual Review of Biochemistry

Edited by J. Murray Luck, Hubert S. Loring and Gordon Mackinney. Vol. 17. Pp. ix+801. (Stanford, Calif. : Annual Reviews, Inc. ; London : H. K. Lewis and Co., Ltd., 1948.) 6 dollars.

WHEN the "Annual Review of Biochemistry" first appeared in 1932 it was born almost at its present size, for the first volume, of 724 pages, was little smaller than the latest. Nourished by an increasing diet of publications, the "Review" might have grown alarmingly ; but, partly by feeding portions to the newer "Annual Reviews" of physiology and microbiology, the editors have successfully kept it down. The exuberance of biochemistry is such, however, that further procrustean treatment is necessary, and, in 1950, plant material will be removed into a new "Annual Review of Plant Physiology". The wisdom of this decision is perhaps confirmed by the article on plant hormones in the present volume, which contains quite a long section on the control of weeds.

The service rendered by the "Review" to biochemistry is widely appreciated and frequently acknowledged ; nevertheless, the present writer cannot forgo the privilege of offering his own grateful thanks. The function of the reviewer of these volumes is limited ; he is in danger of preaching to the converted ; and he can serve best by trying to attract the attention of uninitiated workers in related fields. He can also indicate what, in his opinion, are the strengths and weaknesses of the volume under review. This volume follows the familiar pattern, with articles on enzymes and on the chemistry and metabolism of the fundamental biochemical substances, with the addition of chapters on more specialized topics. This time the latter include the chemistry of the immunopolysaccharides, X-ray crystallographic studies of compounds of biochemical interest (showing the help given in the elucidation of the structure of penicillin), clinical applications of biochemistry (serum potassium, phosphatases, blood iodine, liver function), metabolism of drugs and toxic substances, clinical aspects of vitamins, biochemistry of carcinogenesis (including the metabolism of carcinogenic substances, factors influencing carcinogenesis and tissue changes in neoplasia), terpenes (especially of the genus *Pinus*), alkaloids, photosynthesis, mineral nutrition of plants, plant hormones, chemistry of penicillin (a 'brief' summary of 41 pages and 216 references), ruminant digestion (tracing the formation and utilization of the volatile fatty acids) and physiological aspects of genetics (featuring the obliging *Neurospora*, viruses and many other organisms, including man). Despite the existence of the "Annual Review of Microbiology", there is an article on bacterial metabolism, a welcome provision for macrobiological chemists wishing to keep in touch. Lack of space prevents the present writer from describing the contents of all these articles, but the titles indicate the importance and fascinating nature of the subjects reviewed.

Reduction in size could be accomplished by stricter editing and control of the scope of each review. Thus, xanthine oxidase is considered in "Nonoxidative Enzymes" as well as in "Biological Oxidations and Reductions" ; catalase is discussed in two articles and acetate metabolism in four. "Clinical Aspects of Vitamins" contains matter and formulæ more suitable for a text-book, shows the structural formula of pteroylglutamic acid twice, and contains such statements as, "We must know more of the mechanism of the carcinogenic action of all the factors promoting and retarding the production of tumors", and "In deficiency of vitamin A, certain specific pathologic changes are observed in the epithelial structures. Eventually they give rise to what can be termed vitamin A deficiency."

The subject index is regrettably inadequate. Whereas the author index extends to thirty three-column pages, the subject index consists of only nineteen two-column pages. It occupied fifty pages in 1945. A really comprehensive subject index would add enormously to the value of the work, and if it involved delay in publication, this would be justified. Few textual errors were noted, but "Staphlocoagulase [*sic*], an enzyme from pathogenic streptococci" (p. 38), one misprint on p. 21, two on p. 35 and one on p. 209 may be cited.

Perhaps the greatest problem of the contributors is that of welding brief references to large numbers of papers into readable accounts. This year they have been particularly successful. In addition, combining wise saws with their modern examples, many have made profound remarks designed to clear up current muddled thinking, or have warned against the abuse of modern techniques by the unskilled and the unwary. A discussion of nomenclature is a valuable feature of at least two articles.

Finally, the deft touch is not lacking ; we are informed that the blood group enzyme acts not only on Negro erythrocytes but also on those of diseased Caucasians ; while the statement that "tocopheryl phosphate removes the calcium that activates the nucleotidase that destroys the coenzyme that catalyzes the oxidation of malate to oxaloacetate", although it may have to be modified slightly in view of later work by Pardee and Potter, brings back happy memories of a childhood spent when life, and biochemistry, were so much simpler.

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