

static, being affected by internal changing circumstances such as technological developments, and also by external events. Man-power policy can never be finally determined. It must be reviewed continually in the light of the needs of the day, and with the fullest possible informed public discussion, if the Government is to be sure of the public support without which no man-power policy can succeed.

Vital as it is to secure maximum productivity, neither industry nor the nation can afford to accept the view that the distribution of its workers does not require continuous, rigorous and impartial scrutiny. Before embarking on a policy of continued expansion of the Government services, the Minister of Labour should satisfy himself—and also industry and the universities—that there are weighty reasons for it. In view of the general restriction of research activities outside the Government service, due to the present shortage of scientific man-power in Great Britain, the case for increased staffs in Government establishments and the Service departments requires careful consideration.

101/2 CHEMISTRY OF THE CAROTENOIDS

Carotinoide

Von Paul Karrer und Ernst Jucker. (Lehrbücher und Monographien aus dem Gebiete der exakten Wissenschaften, 17: Chemische Reihe, Band 3.) Pp. 338. (Basel: Verlag Birkhäuser, 1948.) 43 Swiss francs.

POSSIBLY no better example can be found of astonishingly rapid development of the chemistry of a widely distributed and exceedingly complex group of natural compounds, following upon the introduction of micromethods and specially devised processes, than is afforded by the carotenoids. The first monograph devoted to this topic, "Carotenoids and Related Pigments" (by L. S. Palmer; New York, 1922), contained virtually no detail of structural significance, though this was soon to appear (see, for example, "Carotinoide", by F. Meyer in Meyer-Jacobsen's "Lehrbuch der organischen Chemie", first and second editions, vol. 2, chapter 5; 1929). The adoption of micromethods of oxidation and reduction, the recognition of light absorption of the carotenoids as a valuable characteristic, and, above all, the timely revival of chromatographic analysis, without which the development of carotenoid chemistry might well have been delayed for years, resulted in a surprisingly swift revelation of the main outlines of the chemistry of natural polyenes.

For fifteen years L. Zechmeister's "Die Carotinoide" (Berlin, 1934) has been the sole text dealing exclusively with this detailed carotenoid chemistry. These years, despite the attention of chemists in many countries having been directed elsewhere, have seen much in this field beyond the normal addition to what was known of structural detail. This growth has certainly been notable, for there are now some seventy known naturally occurring carotenoids, the structure of about 50 per cent of which is now fairly precisely elucidated, together with a very large number of stereoisomerides and polyene degradation

products. The carotenoids are no longer, however, of interest solely to the academic chemist concerned with the structural patterns of natural molecules. Connexions with vitamin A, visual purple, phototaxis, and even fertilization in micro-organisms, among other topics, afford them outstanding biochemical interest, and it may be said at once that in the volume under review this old and new material has been surveyed and mostly reproduced in all essential detail in masterly fashion.

All that the chemist can reasonably expect in respect of historical data, occurrence, preparative detail, physical and chemical characteristics, derivatives, and original references to individual pigments is set out with exemplary clarity and, it seems, accuracy, in the special section of this book. Readers will be specially grateful to the authors for having withstood the temptation to abbreviate the necessarily cumbersome structural formulæ, as well as their lavish use of tables and the inclusion of representative spectral curves and coloured plates of carotenoid crystals.

General occurrence, determination of structures, physiological significance, and, among other features, distribution of the carotenoids are summarized with scholarly precision, often in tabular form, in a general part; all information such as the organisms producing specific pigments and the pigments produced by specific organisms is made almost instantly accessible, and few facts only (for example, work on vitamin A) seem to have escaped inclusion, obviously because of their recent discovery.

This is in every way a finely produced and very timely work which, so far as can be foreseen, will be the standard text and largely meet the needs of workers in the field of carotenoids for some considerable time ahead.

A. H. COOK

101/3 GEOLOGY AND GLACIOLOGY OF THE PLEISTOCENE PERIOD

Glacial Geology and the Pleistocene Epoch

By Prof. Richard Foster Flint. Pp. xviii+589+6 plates. (New York: John Wiley and Sons, Inc.; London: Chapman and Hall, Ltd., 1947.) 36s. net.

PROF. R. F. FLINT'S distinguished work in the broad field of glacial geology has been prominent for a generation, and his book is important for that and for other reasons. It deals with the Pleistocene period from the points of view of a geologist and of a glaciologist. Characteristically, perhaps, the author has used stream-terrace data as little as possible, and indeed much of the field work in North America lends itself to the successful pursuit of other methods. Correlation, perennially a difficult subject, is treated so far as possible on geological evidence, not on archaeology. The author strives to avoid deduction from any theory of climatic fluctuation which sets up a fixed chronology; he incorporates with his own wide knowledge and experience a considered opinion of an enormous amount of literature, of which a formidable list occupies some forty pages. Significant is the author's introductory statement that "a continuous effort has been made to discriminate between reasoning by induction from field evidence and reasoning by deduction from assumed general conditions"; and there, in a sentence, lies the duty of every scientific worker in the field, laboratory and library.