

The Ice Age in Detail

The Quaternary Ice Age

By W. B. Wright. Second edition. Pp. xxv + 478 + 23 plates. (London: Macmillan and Co., Ltd., 1937.) 25s. net.

WHEN the first edition of the "Quaternary Ice Age" was published in 1914, it took its place at once as the standard English text-book on the subject. Since then our ideas concerning the Glacial Period have undergone a profound change, for the monoglacial theory, after a comparatively brief tenure, has had to give place to the older view of successive ice-advances, alternating with milder, or even warm, interglacial episodes. A new and revised edition of this well-known book has, therefore, been looked forward to for some long time.

To review all the evidence that brought about such a change in ideas was indeed a formidable task, for mere revision of a text-book published in 1914 would obviously be inadequate. Nothing less than a largely rewritten edition would meet the case; and on the whole the author has accomplished this difficult task in an admirable manner. Of the 24 chapters of the second edition, only a few are reprinted in their original form; most have been expanded and brought up to date, and some are new. A considerable increase in size of the volume is the result; many new illustrations and the useful bibliographies now added to each chapter will be a great help to students.

The general chapters on glaciers and ice sheets, glacial deposits, theories of the Ice Age, the mammals of the time and earth movements during and since the Glacial Period remain much as in the earlier edition, but there are minor revisions. More attention has been given to the phenomena of glacial retreat, so clearly demonstrable in north-western Europe, and to the wind-borne loess, now believed to be intimately connected with the phenomena of ice-advance. But much rewriting has been necessary, because we now realize the inevitable effects on the contemporary fauna and flora of successive glaciations and interglacial phases—particularly as they affected the history of early man. As a result of this realization, geology and prehistoric archæology have become overlapped to such an extent that the glacialist, to be on safe ground, must be well versed in the study of prehistoric man, if not actually a specialist in that branch. A large mass of literature had, therefore, to be summarized in the preparation of

this new edition, and the author has succeeded fairly well in his brave attempt.

The treatment of the details of the geology and archæology of the east of England gives the impression of being insecure and rather below the high standard of the rest of the work. A strange omission is that of the story of events in the valley of the Lower Thames (although a new chapter has been added on the river gravels of the south of England) from the deposits of which we have recently gained our most substantial knowledge of human occupation in relation to late glacial history (*vide* W. B. R. King and K. P. Oakley's useful summary and J. P. T. Burchell's work). Also, a few pages might have been spared for a review of the remarkable disturbances of soft strata, which, although they have given rise to much speculation and argument, have thrown valuable light on glacier-motion and the behaviour of englacial and subglacial material. These omissions, however, are but slight blemishes in a work which, taken as a whole, is a masterly summary of existing knowledge in a subject admittedly of wide range and crowded with detail. Mention only can be made, for example, of admirable chapters on the older and newer drifts of the British Isles, the glaciation of northern Europe, the Alps, and North America, and on raised beaches and submerged forests.

At the end of the volume are accounts of the author's isokinetic theory of oscillations of sea-level and of the post-glacial changes of climate in Europe. As the author regarded this theory as his most original contribution in the first edition of the book, it is perhaps only fair to quote his own words in the second edition: "...the demonstration that isostatic movement alone", that is, the reaction of the earth-crust to loading by and unloading from the ice-masses, "was an inadequate explanation of the quaternary oscillations of shore-line, but that it became completely adequate when coupled with eustatic change of ocean-level due to the return of the water bound up in the ice-sheets. This theory, which was then [in 1914] quite novel, has received ample confirmation from recent researches, and, being now completely established, is given the name Isokinetic, from the fact that shore-lines are cut when the two motions are equal and in the same sense".

A word of appreciation is due to the publishers for the obvious care taken in producing this handsome volume.