GLACIER STUDIES OF THE PLEISTOCENE OF NORTH AMERICA. W. H. HOBBS. Ann Arbor (Michigan): J. W. Edwards, 1947, maps and illustrations, p. 109.

IT is always a matter of interest when well-documented scientific papers by prominent authorities appear other than in the standard journals. This publication comprises two lengthy papers by Professor Hobbs on "The Glacial History of the Scabland and Okanogan Lobes, Cordilleran Continental Glacier," and "The Glacial History of Iowa and Neighboring Portions of Minnesota and Missouri." In a foreword to the first paper the author explains how this glacial study came to be made, and why it was not published in the Bulletin of the sponsoring Geological Society of America. From his preface it appears that the Society's officers disregarded Professor Hobbs' expression of opinion with regard to the unsuitability of certain references. He concludes with the sentence, "this study is being mailed to geologists rather generally."

Faced with the characteristically formidable selection of references to American papers, one's first impression is that it would be hard work on this side of the ocean to discuss the manifold details of Professor Hobbs' publication; and his vigorous clarity of expression in this well-produced volume is noteworthy. Readers of this *Journal* however may be assured that they will find interesting exercise in spotting in the text contentions from which many will be likely to differ in principle, and in such matters they must be left to decide for themselves how far to accept Professor Hobbs' views.

From the second paper on the glacial history of Iowa the concluding sentences may be cited: "From continental glaciers the issuing melt water should have been conceived to have been of near oceanic proportions, and along its course to the sea it must have accomplished profound changes, both erosional and depositional. This however does not seem to have occurred to either the Iowan glacialists, or to those of the United States Geological Survey."

The reviewer has not space to enter upon a lengthy commentary on Professor Hobbs' views. Suffice it to quote from p. 95: ". . . it is possible that the loess deposits, then known only in connexion with desert areas, may have given rise to these conceptions," a phrase which in its context begs the question whether the classical European work cited for example by Woldstedt has been overlooked. And however does Professor Hobbs reconcile, for example, his reiteration of the statement "all strong winds blow outward" from his ice caps, with the south-easterly gales blowing directly up-slope at Watkins' ice cap station in Greenland?

There is an obvious misprint, unless it is a misquotation or a careless calculation on p. 31. In place of "2 cubic miles per hour" should be read "0·13." It is a pity that so many of the maps are not provided with a scale.

The reviewer would suggest that this publication should not be brought to the notice of students without some warning; but it is always good for them to learn that there are men bold enough to maintain unorthodox views against the stream of orthodox thought, and Professor Hobbs is not the only eminent authority to have done so. GORDON MANLEY

FISSURATION DE LA CRAIE PAR LE GEL. ANDRÉ CAILLEUX. *Bull. Soc. Géol. France*, sér. 5, Vol. 13, 1943, p. 511–20.

THE Normandy chalk is highly fissured and shattered within 3–8 m. of its ground surface. The author suggests that this structure has resulted from frost-heaving during Quaternary glaciation.

There is little doubt that English chalk was mainly fissured at the surface in the same way. The old solifluction is well known, and during the 1946–47 winter frost-heaving was encountered on the chalk downs to a depth of 30 cm. Chalk is particularly susceptible to frost-heaving (see photograph on p. 176). W. H. WARD