

That a volcanic dust mantle hung over much of East Africa (and probably over other parts of the earth when and where volcanicity occurred) in Pleistocene time there can be little doubt ; much of this may have been precipitated by rain, and the high content of almost unweathered volcanic material, particularly tiny sanidine crystals, in the pluvial lake deposits of the Eastern Rift valley, may perhaps be thus explained. It is to be noticed, too, that these fine-grained sediments extend right to the rock escarpments in many places, a fact which argues against an arid or semi-arid climate during the days of this subaqueous deposition.

To summarize : one may say that the time is passed when lack of information permitted one to ascribe a single dominating cause to the ice age. To-day we must speak of causes in this regard. We are, I think, advancing toward a clearer understanding of these, and the resuscitation and restatement of the volcanic contribution is not a retrograde step, but one which, when fully assessed, will further that advance.

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GABERONES,
BECHUANALAND PROTECTORATE.
20th March, 1948.

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LONGMYNDIAN STRATIGRAPHY

SIR,—Mr. Challinor's demonstration, in his article in the *Geological Magazine* for March–April, 1948 (p. 107), that, on the evidence of graded bedding, the eastward dipping Eastern Longmyndian rocks in a quarry on Haughmond Hill are right way up is of considerable interest.

His conclusion that " in Haughmond Hill the Eastern Longmyndian both actually and also stratigraphically overlies the Western Longmyndian " by no means necessarily follows, however, and, indeed, would increase rather than otherwise the difficulties of interpretation of Longmyndian stratigraphy.

On Haughmond Hill the " Green Sandstone Group " is in contact with the Western Longmyndian. On the Longmynd the probable equivalent of the " Green Sandstone Group " (the Burway Group) is separated from the Western Longmyndian by three of Charles Lapworth's subdivisions of the Stretton Series, representing six or seven thousand feet of beds. If the Eastern Longmyndian overlies the Western Longmyndian stratigraphically, the absence of these beds on Haughmond Hill must presumably be due to overlap and the Eastern Longmyndian must be unconformable to the Western (the reverse of J. F. Blake's view). A much more likely explanation is that of Callaway (*Quart. Journ. Geol. Soc.*, vol. xlvii, 1891, p. 112) that the green (Eastern Longmyndian) beds of Haughmond Hill are separated from the purple (Western Longmyndian) by a fault. T. C. Cantrill's inability to find evidence for such a fault (Shrewsbury Memoir, p. 43) is understandable, as at the time he mapped Haughmond Hill he was unfamiliar with the succession on the Longmynd.

Mr. Challinor's further inference that in the Longmynd itself the succession is an inverted one seems equally unjustified as far as the Eastern Longmyndian is concerned. Cobbold and Whittard (*Proc. Geol. Assoc.*, vol. xlvi, p. 348) have shown that the Stretton Shales, the easternmost member of the Eastern Longmyndian, pass down eastwards into the Helmeth Grits. Unfortunately the discussion in the Shrewsbury Memoir (pp. 11-12) to which Mr. Challinor refers was written before the appearance of Cobbold and Whittard's paper, a reference to which had to be inserted in proof, and on that account perhaps undue weight was given to the possibility that the Eastern Longmyndian might be inverted on the Longmynd. Other lines of evidence (e.g., the attitude of fracture-cleavage and the position of planes of pene-contemporaneous erosion) confirm that the westward dipping Eastern Longmyndian beds near Church Stretton are not inverted. It is the Western Longmyndian, not the Eastern, which shows signs of inversion near the Longmynd (Shrewsbury Memoir, p. 11; see also Whitehead in discussion of Cobbold and Whittard, *op. cit.*, p. 358).

That Eastern Longmyndian rocks dipping eastwards on Haughmond Hill and westwards on the Longmynd should in both cases be right way up, need, of course, cause no surprise. The structure and stratigraphy of the pre-Cambrian rocks of Shropshire still present unsolved problems. Mr. Challinor's new evidence, interesting though it is, does not, by itself, carry us much further towards their solution.

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