Finally, I would like to stress, as Professor King does in his last paragraph, that the description of the Barrington sections was intended to give a relative dating of local deposits, as links between the plateau boulder clay and the valley gravels are uncommon.

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16th August, 1952.

MALVERN TECTONICS

SIR,—I have read Dr. Blyth's recent contribution to Malvern tectonics (*Geol. Mag.*, lxxxix, 1952, p. 185) with great interest. From my own experience of mapping in the south Malverns, one or two points arise, which may be worth adding to Dr. Blyth's account.

I am in agreement with Dr. Blyth's interpretation of the Malverns as a segment of the PreCambrian basement brought up along lines of fracturing; also with his conclusion that the Malvern mass has been forced westward over the adjacent Palaeozoic rocks, rather than the latter driven beneath the PreCambrian by eastward reflected Hercynian movements. In either case, however, the most remarkable feature in this area is surely the moderate nature of the folding in Palaeozoic sediments immediately west of the thrust mass. Here Silurian beds show an open and fairly summetrical folding, modified by slight overturning against the Hereford Beacon. Not only the narrowness of the affected belt of sediments, but the degree of disturbance also, supports Dr. Blyth's contention that the Malvern block is better related to localized movement in the basement, than to crustal shortening on a regional scale. Traced westward this open folding of the Palaeozoic strata passes into a north–south belt of more intense folding and faulting, lying just east of Ledbury. This was demonstrated in the Ledbury tunnel section, and is clearly expressed at the surface from Hope End to Clenchers Mill Wood, south of Eastnor—a distance of four miles. Thus there is the anomaly of gentle folding immediately adjacent to the Malvern thrust mass, with a parallel zone of more intense deformation further away. The latter may perhaps be the superficial expression of a second and equally localized disturbance in the concealed PreCambrian basement.

A second more obvious point is briefly mentioned by Dr. Blyth, but would seem to warrant greater stress. The principal and latest group of movements contributing to the present Malvern range is probably of Carboniferous age; but the Malverns have been a line of recurrent disturbance through very long periods of geological time. The nature and physical conditions of the Pre-Cambrian rocks exposed in the Gullet and Hollybush quarries for example, confirm their lengthy and complex history. The occurrence of fragments apparently derived from these same rocks in the basal conglomerates of both Cambrian and Llandovery beds hereabouts, the presence of included slices of Silurian strata caught up within the thrust PreCambrian, and the occurrence of Warren House pillow lavas at Clutters cave, suggest a repeated elevation and submergence long before Carboniferous times. The present structural pattern of the Malverns represents the cumulative effects of a series of long-sustained disturbances, each early phase contributing in varying degree, but now largely masked by the overriding effects of Hercynian movement.

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