

CORRESPONDENCE

The Swansea Valley Fault, Wales

SIR – The recent letter from Dr Tunbridge (*Geol. Mag.* 117 (5), pp. 497–8) concerning a possible Devonian movement along the Swansea Valley Fault presented evidence on the sub-Old Red Sandstone geology of the area. He described conglomerates within the Brownstones containing angular clasts of acid volcanics, lithic arenites and vein quartz and indicated a likely local easterly derivation. The source of the exotic clasts was problematic, though they might, he suggested, be from the local lower Palaeozoic rocks.

I believe that it is possible to gain a further insight into the sub-Old Red Sandstone floor of the area, by considering evidence other than that from contained fragments in one local suite of conglomerates. Under this heading I would include clasts in other conglomerates, extrapolation from known outcrops and geophysical information. When all this evidence is considered, a regional picture of this sub-Old Red Sandstone floor emerges, albeit somewhat tentative.

The NE–SW trend of the Swansea Valley Fault, in common with that of the Neath Valley and the Carreg Cennen/Llandyfaelog line, strongly suggests a Caledonian, or even earlier, initiation of these belts. Like the Church Stretton Fault they all appear to be fault lines along which there may have been repeated movements during Palaeozoic times. Because the fault lines run along the outcrops of the Old Red Sandstone and various Carboniferous formations, their pre-Variscan history is often not readily demonstrable.

In the Carmarthen area the Precambrian age of some rhyolites at outcrop has now been substantiated (Cope, 1977) and these rocks appear to correlate with a high-velocity layer underlying the Old Red Sandstone to the south (Bayerly & Brooks, 1980). It may thus be that the Precambrian floor lies close beneath the Old Red Sandstone in the region of the Swansea Valley Fault.

Other considerations suggest that a Precambrian source lay in the vicinity. The extraordinary amount of detrital mica in the newly discovered Upper Cambrian Merioneth Series rocks of the Carmarthen area (Cope, 1979) and in the Downtonian Long Quarry Beds further to the east (Potter & Price, 1965) suggest a source area in metamorphic basement nearby, and in the latter case to the south or southwest (Owen, 1967). The basal conglomerate of the Downtonian Green Beds of the Carmarthen area contains clasts of rhyolite, vein quartz and minor metamorphic constituents, again suggesting a Precambrian source.

The palaeocurrents of the sediments in the Brownstones described in Dr Tunbridge's letter suggested a source area east of the outcrops he described and limited eastwards by the Swansea Valley Fault. The source lies thus within an area defined by the lines of the Swansea Valley and Carreg Cennen/Llandyfaelog faults. This is precisely the area over which Precambrian floor seems close to the surface. Even if there is a thickness of Cambrian and Tremadoc rocks locally between the Old Red Sandstone and the basement, as I earlier suggested (Cope, 1979), it would seem probable that in some places Old Red Sandstone does rest directly on the Precambrian. The Precambrian could supply acid volcanics and vein quartz: the Cambrian the lithic arenites described by Dr Tunbridge.

Evidence for movement along the Carreg Cennen/Llandyfaelog line in lower Old Red Sandstone times is present in the Llanstephan area (to the southwest of Carmarthen), where facies differences across the fault suggest a fault-controlled influence on sedimentation during that time (Cope, 1979). The evidence suggests that the 'positive' area lay to the south of the Llandyfaelog Fault – i.e. in the area bounded southeastwards by a westward extension of the Swansea Valley Fault.

Thus the interesting letter from Dr Tunbridge is another piece of evidence on the history of this fault line, supporting the view of Owen (1967) that the Caledonoid faults in this part of South Wales are indeed fundamental fractures with a long history of movement.

References

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J. C. W. COPE

Department of Geology
University College
Swansea SA2 8PP
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