Fig. 2 Tectonic model for South Australia, showing the present sense of movement.

movements of only a few tens of kilometres may have been sufficient to produce vertical movements of several kilometres and much of the known geology of the region¹.

Right-lateral shear may have been just as important as left-lateral movement in the Adelaide Rift Zone, while dip-slip faulting may have been prominent in parts of the geosyncline. An interpretation of fold patterns should therefore allow for possible variations in the orientation, style and sense of faulting. The extent of shear movement across the whole system may also need revision.

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Large scale Palaeozoic shear zone in Australia

HYPOTHESES invoking large scale horizontal displacements¹, fracture zones and the movement of plates², then ideas rejecting 'megashield'³, and now a revival of the large scale Palaeozoic shear zone concept⁴ have been generated to explain the pattern of geological structures observed in the Adelaide geosyncline of South Australia. The latest attempt⁴ has curiously ignored reference to earlier discussions¹⁻³ which I believe are strongly relevant to the basic argument of whether a Palaeozoic shear zone is a tenable hypothesis. It would seem that the whole spectrum of concepts has now been covered; sinistral movements⁴, dextral movements¹ and no relative movement³. Although Coward's case⁴ is rather difficult to assess, the idea seems to have appealed to Sutton⁵ who cited Coward's model as a possible example of deformation within continental plates.

Crawford and Campbell's model¹ supposed that, "The Adelaide geosyncline originally extended meridionally along the line of the present Flinders Ranges . . .", whereas on Coward's model⁴, "a regional pattern of folds on north-east-south-west axial planes was modified by a sinistral shear couple . . .".

Palaeomagnetic evidence from the Precambrian of South Australia was cited⁶ to disprove the extension of the Crawford-Campbell model to involve regions of the Gawler Block; this has since been acknowledged⁷. We made it quite clear, however, that the data obtained earlier from the southern part of the Adelaide geosyncline⁸ were inadequate (because of metamorphic effects), to permit comment on whether that region had suffered 'rotation' from shearing. The only region of the Adelaide geosyncline to yield acceptable palaeomagnetic data was the central region of the Flinders Ranges⁹. Those data, by comparison with late Precambrian-Ordovician data from Western Australia, central and northern Australia, are consistent with the principal axis of the geosyncline having maintained a meridional trend. The data are not consistent with originally north-east-south-west trending axial planes.

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