THE PALAEOZOIC ASSEMBLY OF THE CALEDONIDES

J.F. DEWEY

Department of Earth Sciences, Oxford University, Parks Road, Oxford, OX1 3PR, England, U.K.

The terrane 'concept' has been useful only in drawing attention to the likelihood of major strike–slip motions in the history of orogens and the consequent braiding of orogen/continental margin parallel transform faults that excise or repeat earlier formed assemblages and collages to continuously generate new assemblies and collages. It has been useful, thus, in de–emphasising earlier cross–sectional approaches to orogenic evolution. The Caledonides of the British Isles, Scandinavia and Greenland have been intensively studied over a century or more and are a prime orogen for serious in–depth tectonic studies. However, there is yet an enormous amount of critical work needed in the orogen before reasonably definitive solutions can be offered. The Caledonides of the British Isles and of Scandinavia have quite different histories, structures and kinematics resulting from the interposition of the North Sea 'triple junction' and the Polish Caledonides.

The Scandinavian Caledonides evolved mainly from the roughly orthogonal convergence of Laurentia and Baltica resulting in early Silurian ophiolite obduction, midSilurian intense continental collision, convergence, and the development of a very thick crust followed by late Silurian/Devonian extensional collapse that drove frontal thrusting. Scandinavia is dominated by nappe followed by extensional detachment tectonics roughly orthogonal to the belt with no evidence of substantial orogen parallel strike–slip motion,

The British Caledonides are polyphase. The early Palaeozoic Grampian orogeny involved continental margin deformation and metamorphism with an uncertain relationship to early Ordovician ophiolite obduction and arc collision. Sinistral oblique subduction during the Ordovician and Silurian led to subduction–accretion and the beginning of sinistral terrane excision, arc–parallel motion and 'docking' (e.g. the Connemara Dalradian terrane). The oblique sinistral closure of lapetus during the late Silurian led to major sinistral strike–slip motion and the motion of terranes for up to 1000 km. Terrane excision (e.g. along the Highland Boundary and Southern Uplands Faults) and terrane repetition (e.g. Connemara) is judged principally by comparing and contrasting cross sections with the basic 'template' of the Newfoundland Appalachians where 'pre–terraning' relationships are clearest. Major terrane boundaries are linear/arcuate fundamental lineaments across which palaeogeographic/palaeotectonic continuity did not exist for a particular time period in question and along which an eclectic assemblage of exotic slivers can be seen.

Palaeotectonic plan–view reconstructions are challenging and fraught with diffiiculties because plate–slip vectors are difficult to deduce except in the most general sense; dykes and fracture zones in large ophiolites (e.g. in Newfoundland) and transpressional structure (e.g. in western Ireland) offer the best data.

Lastly, it is critical to be aware of the pitfalls and dangers in the blind acceptance of geochronological and palaeomagnetic data and their consequent direct application to make major palaeotectonic statements. Such data is only as good as the fundamental mapping and observational framework in which it is collected. This will be illustrated by reference to zircon ages from the Ben Vuirich Granite and palaeomagnetic data from western Ireland.

PALAEOGEOGRAPHIC AND GEODYNAMIC EVOLUTION OF THE SOUTFHWESTERN RHENISH MASSIF, MID–EUROPEAN VARISCIDES

U. DITTMAR

Institute for Geology, University of Würzburg, Pleicherwall 1, D–97070 Würzburg, FRG

Across the southwestern Rhenish Masssif (Mosel Syncline, Hunsrück) a balanced cross section was constructed. Its strain–corrected palinspastic restoration yields the synsedimentary basin–configuration and enables a more detailed reconstruction of the palaeogeographic and geodynamic evolution of this part of the Rhenohercynian Zone:

In the southern Hunsrück, N of the town Kirn, Gedinnian conglomerates and adjacent Cadomian gneisses exhibit a sedimentary contact. This proves that the development of the southwestern Rhenohercynian basin started relatively late, at the beginning of the Devonian. Since the Siegenian