The Ardennian and Acadian orogenies : successive Early Palaeozoic collisions of Avalonia, Baltica and Laurentia.

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The Rheno-Hercynian tectonic zone of the Variscan orogen, consisting of Devonian-Carboniferous rocks, contains inliers of Lower Cambrian to Middle Ordovician age in the Ardennes and Rhenish Massif. The unconformity separating the inliers from the younger rocks spans the age range Upper Llanvirn to Pridoli. This is similar to the age for the Avalonia-Baltica collision, as constrained from palaeobiological evidence, subduction-type magmatism in Belgium, and absolute age dating of the inferred closure of the Tornquist ocean at Rügen. The accumulated evidence indicates a widespread orogeny of Upper Ordovician to Lower Silurian age, the Ardennian orogeny, that probably affects the whole Rheno-Hercynian from northern France to northern Germany. This terrane was subsequently displaced to the west or southwest with respect to the original location of the inferred collision near Baltica, prior to Upper Devonian sedimentation.

Northwest of the Ardennes lies the Anglo-Brabant Massif, consisting of Cambrian to Silurian (meta)sediments, which were folded during the Acadian orogeny in the Emsian. This fold belt is continuous from Belgium to Great-Britain, southern Ireland and Newfoundland. The Anglo-Brabant Massif was not affected by the Ardennian orogeny, and exhibits almost continuous sedimentation throughout the Caradoc, Ashgill and Silurian.

A new palaeogeographic model was worked out for the Ardennian orogeny, solving the paradoxical absence of folding in the Brabant Massif which at present lies closer to Baltica than the folded Ardennes inliers. A second model was worked out for the Acadian orogeny, explaining the S-shaped fold belt, and allowing for a dextral strike-slip fault displacing the Rheno-Hercynian terrane along the Anglo-Brabant terrane.