

## Diachronous Paleozoic accretion of peri-Gondwanan terranes in the Caledonides and northern Appalachians

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Reconstructions of the Caledonides and northern Appalachians go back 50 years to the original “Wilson Cycle”. Subsequently published reconstructions differ in the positioning of the North American and European components and in the correlation of major sutures between these components. Using gravity data, it is possible to restore Mesozoic stretching of the Atlantic margins; the resulting reconstruction places Ireland significantly closer to Newfoundland than has been previously proposed.

In the original Wilson Cycle, the northern Appalachian - Caledonide orogen resulted from the collision of two continental masses separated by a single ocean. One of these continental masses corresponds to the modern concept of Laurentia, but the colliding continent to the east has been variously subdivided into many smaller terranes and domains, including Ganderia, Avalonia, and Megumia. Using published stratigraphic evidence and detrital zircon provenance data from units of known depositional age, the timing of arrival of these units at the Laurentian margin between the Early Ordovician and Early Devonian can be constrained. Several of the accreted terranes do not extend over the entire length of the orogen, with the result that the lines separating them change character along strike from terrane-bounding sutures to simple accretionary thrust faults. The domain Ganderia consists of at least four separate terranes that share a common origin on the continental margin of Gondwana, but were separated by back-arc oceanic crust as they crossed the Iapetus Ocean and collided diachronously with the Laurentian margin.