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### Abstract only

The Appalachian–Caledonide orogen records protracted Paleozoic convergence during Iapetus Ocean closure. Grampian–Taconian arc-continent collision at the Laurentian margin and subduction polarity reversal were followed by Ordovician to Silurian subduction-accretion beneath the Laurentian margin, culminating in continental collision in the Scandinavian Caledonides, and soft collision along the Solway–Navan–Silvermines line in Britain and Ireland. Laurentia-derived detrital zircon crossed this boundary, commonly regarded as the main Iapetus suture, upon collision at ca. 430 Ma. Calc-alkaline magmatism continued into the Devonian on both sides of the supposed suture, producing the “trans-suture suite” of magmatic rocks that extend south as far as a boundary, here termed the Ynys Môn line, separating the Lakesman terrane from the Monian belt of North Wales. South of this line, Laurentia-derived detritus is absent from Silurian samples, but appears in Emsian Old Red Sandstone. Laurentia-derived detritus was held up at the Ynys Môn line for at least 12 Myr. This boundary is interpreted as a previously unrecognized suture, recording obliquely sinistral north-dipping subduction of a remaining tract of Iapetus, leading to magmatism north of the boundary and eventual Acadian collision.