

Tectonostratigraphy, event horizons, subduction cycles and plate rotations in the development of the Scandinavian Caledonides

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The tectonostratigraphic mosaic which constitutes the Scandinavian Caledonides embraces shelf and miogeoclinal sequences indigenous to Baltica, and imbricated, outboard, suspect and exotic terranes comprising fragmented ophiolitic and arc complexes and their sedimentary accoutrements. Separation into disparate terranes, each with discrete tectonometamorphic histories, is being continually refined by geochronology and revealing the complexity of orogenic evolution. Following a "westward" subduction, locally to eclogite-generating depths, in earliest Ordovician time, ophiolite obduction and early nappe development occurred during the Tremadoc/Arenig, possibly with temporal and geographic separation along palaeotransforms. Uplift and erosion of the ophiolites and early thrust-sheets preceded a second major magmatosedimentary cycle characterized by terrane-linking unconformities and important event horizons. Developing marginal basins with, in places, second-stage ophiolite generation, as well as significant arc and batholithic constructions in some regions, also characterize this Mid Ordovician to Early Silurian period. Taconian-equivalent deformation is registered in some terranes prior to batholith

emplacements. It has been suggested that Ordovician deformation, including the early subduction/obduction cycle, may relate to Baltica-Siberia plate movements rather than to a Laurentian connection.

The events leading up to the Mid Silurian/Early Devonian, Scandian, Baltica-Laurentia subduction and collision are quite neatly explained in the context of palaeomagnetic data that favour an anticlockwise-rotating Baltica which gradually drifted northwards towards lower latitudes through Ordovician-Silurian time. Exotic terranes caught between the southward-drifting Laurentia and rotating Baltica were sinistrally sheared (strike-slip) just before participating in the violent Scandian collision which first affected what is today southern Norway. The collision and subduction are recorded in eclogite generation and ultra high-pressure metamorphism in western areas. Northwards, the diachronous collision was somewhat less violent, and eastward thrusting occurred there simultaneously with orogenic collapse and Devonian extensional/transensional basin sedimentation in the south.