



The Scandinavian Caledonides: new results and highlights

T.B. Andersen

University of Oslo, Geology/PGP, Oslo, Norway (t.b.andersen@geo.uio.no)

The Scandinavian- and East-Greenland Caledonides formed by collision of 2 main continental plates, Laurentia and Baltica-Avalonia. The Greenland-Scandinavia segment of the orogen experienced a near orthogonal continental collision after long-lasting intra-oceanic subduction and island-arc formation, until the final closure of the Iapetus Ocean at ~430 Ma. Vestiges of the oceanic lithosphere and island-arcs (490 to 430 Ma) now constitute a major nappe-complex emplaced onto the Baltican margin during the collision. The collision produced far-travelled nappe complexes in both Baltica and Laurentia, and continued for approximately 30 M.yr. into the Lower Devonian. The interpretation of the 'layer-cake' tectonostratigraphy in the Scandinavian Caledonides has remained mostly unchallenged for the past 30 year. Recently, however, several problems with the traditional interpretation have been pointed out and revisions, particularly related to the Lower and Middle Allochthons are discussed in this presentation.

The Scandian collision produced one of the world's largest high- to ultra-high-pressure (U)HP metamorphic provinces. The coesite UHP domains in Norway are part of a regional metamorphic field gradient that can be mapped continuously across the Western Gneiss Region (WGR). The regional structural, metamorphic and thermochronological data can be used to constrain both the burial (subduction) and exhumation (exhumation) of the coesite-UHP rocks. It can be demonstrated that the exhumation occurred by a combination of pure- and simple shear extension, combined with deep erosion along the hinterland of the orogen. Contrary to most other UHP rocks worldwide, the WGR examples constitute the lowermost structural levels exposed in the orogen, as demonstrated by the coincidence of UHP occurrences and young Ar-mineral-cooling ages.

Superimposed on the regional metamorphic field-gradient in the WGR, are a number of localities with extreme UHP minerals, including diamond, opx-eclogites and majorite-bearing peridotites within the coesite-eclogite domains. These extreme UHP occurrences are anomalous in the sense that they represent very local (outcrop- -scale) doubling of the pressures from ~2.8 to ~5 GPa, without any structures that can explain their juxtaposition. These extreme UHP occurrences cannot be explained by the regional metamorphic burial gradient and alternative models for generation of such extreme local pressures will be discussed.