



The problem of information overload, selective memory and memory blanks in rocks of high-grade terrains: the case from Lofoten-Vesterålen, Norway

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The Lofoten-Vesterålen islands of northern Norway have been shaped in the course of a long and complex evolution beginning in the Archean, followed by major Paleoproterozoic (1.90-1.75 Ma) metamorphic-magmatic reworking, and by metamorphic overprints during the Caledonian orogeny. These diverse events have left a heterogeneous and capricious record that can be difficult to read.

Zircons in Vesterålen granulites commonly exhibit the classical complex and multi-shell zoning, but, in different rocks, the analysis of various zircon subdomains can reveal dramatically different ages. This reflects local variations in the rate of mineralogical reactions and in the availability of fluids and of critical cations (Zr) during different events. Similarly, monazite and titanite preserve either Archean or Paleoproterozoic records and have been variably affected by the Caledonian events. Because of the sluggishness of the (re-) crystallization processes in high-grade terrains, and the resulting disorder, it is difficult to constrain the distribution and type of metamorphic-tectonic processes very well. This has also implications for the classical granulite-amphibolite transition described in the region by earlier workers. In fact the now available data suggest that, rather than a crustal cross-section, this transition probably represents a younger, sharp tectonic boundary. The situation is further complicated by the fact that the metamorphic parageneses in rocks across the transition can be unrelated having formed during separate metamorphic events.

To resolve this sort of complexity it is crucial to have a good textural control of the mineralogical reactions at the microscopic scale. It is, however, equally important to have a good understanding of the large scale tectonic context in order to arrive to

correct and balanced interpretations.