younger and indicate rapid uplift and cooling during the late Visean (340 Ma to 325 Ma).

Ductile deformation is terminated at the end of the Lower Carboniferous. In the Upper Carboniferous the boundary of OMZ and SPZ forms an intra-continental shear zone with left-lateral displacement of up to 100 km.

The Variscan evolution is characterised by the progressive change from compressional to left-lateral strike-slip movements and the anti-clockwise rotation of previous Variscan structures.

VARISCIAN AND POSTVARISCIAN FLUID SYSTEMS AND THERMAL HISTORY IN THE NORTHERN PART OF THE LINKSRHEINISCHES SCHIEFERGEBIRGE

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In the northern part of the Linksrheinisches Schiefergebirge five distinct fluid systems were active during **Variscian time**. In the sense of the geological environment four systems might be similar to specific types of fluid systems:

- Basinal brines (Lower Devonian).
- Magmaticly induced hydrothermal fluids (Middle Devonian).
- Tectono-metamorphic fluids (Upper Carboniferous)
- Tectonic brines (Upper Carboniferous to Permian)
- Hydrothermal fluids I (Permian)

Two fluid systems occur in **Postvariscian time**:

- Hydrothermal fluids II (Postpermian - Prequarternary)
- Hydrothermal fluids III (recent)

Basinal brines (Lower Devonian)

Distribution and shape of quartz and quartz-ankerite-chlorite veinlets and fissures, which are cross-cutting the sedimentary units of Lower Devonian age and the bedding parallel cleavage planes (compaction cleavage), point to a development during extensional movement. These veinlets and fissures are boudinaged, sheared and crosscut by younger enEnchelon tension gash quartz veins, which were formed during the development of the second cleavage and the thrust faults.

Magmaticly induced hydrothermal fluids (Middle Devonian)

The first well established **T-t markers** in the thermal evolution of the Linksrheinisches Schiefergebirge are the intrusions of the granodioritic to dioritic magmas at about 381 m.a. ±16 m.a. (Kramm and Buhl, 1985). These intrusions caused the **contactmetamorphic overprint** of the Cambrian and Ordovician sedimentary rocks in the central region of the Stavelot Venn Anticline.

The magmatic activities initiated the circulation of hydrothermal fluids. Enrichment processes led to the occurence of NE-SW trending veins and porphyry type mineralization. All veins were deformed, boudinaged, sheared and crosscut by younger en-Enchelon tension gash quartz veins during the development of the second cleavage and the thrust faults. Using the alteration parageneses the fluid t.emperature might have been in the rage of 360 °C and 200 °C and a lithostatic pressu re below 2.5±1 kbar (Schreyer & Abraham 1978).

Tectono-metamorphic fluids (Upper Carboniferous)

The development of folds, second cleavage, duplex structures and shear zones took place during Upper Carboniferous time. Together with the structural features quartz veins and fissures occur. Dating of the development of the second cleavage points to an Upper Carboniferous age (308 - 312 m.a. , Kramm et al., 1985).

Tectonic brines (Upper Carboniferous - Permian)

Migration of hydrothermal fluids in the Venn thrust zone have caused the alteration of sedimentary rocks of Gedinnian age. The alteration front is irregular in shape, follows grain size differences, cleavage planes as well as crosscuts the cleavage planes. The original mineralogical composition has been changed from quartz, illite, hematite and minor amounts of chlorite to quartz, chlorite, illite, calcite, albite, pyrite and traces of magnetite.

Chlorite–Quartz–Calcite veinlets occur along younger faults which are displacing the alteration fronts. Wallrock alteration dos not occur. Chlorite grew from both sides of the fault plane towards the center. The growth of chlorite was followed by the growth of quartz. Calcite is the last stage and fills the open spaces.

If the lithostatic pressure was around 1 kbar the **matrix chlorites** would have formed at a temperature of around 300 °C under reducing conditions. At a pressure of 1 kbar the chemical composition of vein chlorites point to a formation temperature of around 250 °C and reducing conditions, too.

Hydrothermal fluids I (Permian)
The 'Graben of Malmedy' is bound by northeast–southwest trending and southeast dipping extensional faults. Small quartz veins and quartz lenses occur along the fault planes. These quartz veins are often irregular in shape. Several stages of brecciation and rehealing of the quartz veins and lenses occur.

Hydrothermal fluids II (Postpermian – Prequaternary)
Two NE–SW trending lead–zinc districts occur in the northern part of the Linksrheinisches Schiefergebirge:
- the Namur–Lüttich–Kerkrade–Stolberg district
- the Wampach–Bleialf Rescheid district.

In general the veins are following NNW–SSE trending faults of Postvariscian age. The **temperature** of the mineralizing fluids have been between 80 °C – 200 °C with maxima at 100 °C, 180 °C, 200 °C. Maxima of the salinity are at 6, 14 and 22.3 wt.% NaCl equiv. $CaCl_2$ and NaCl are the main components of the fluids. The **gas phase** is characterized by the occurrence of CH_4 (Redecke 1992).

Hydrothermal fluids III (recent)
At the surface this fluid system which is still active occurs around Aachen. Migration pathways are the Aachen thrustfault and the limestones of Lower Upper Devonian age (Langguth & Plum, 1984). The surface temperatures variies between 47 °C and 70 °C. The main ion concentration is >4000 mg/l with 33% Na^+, 2% K^+, 1% Ca^+, 38% Cl^-, 19% HCO_3^- and 7% SO_4^{2-}. The **gas composition** (vol. %) is characterized by 77.6% N_2,18% O_2+Ar, 3.5% CO_2, 0.04% H_2S and 0.9% C_mH_n.

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THE SOUTH KRKONOŠE MOUNTAINS: SAXOTHURINGIAN/MOLDANUBIAN BOUNDARY IN THE CZECH SUDETES?

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Large–scale tectonic correlations and the occurrence of blueschists (Guiraud & Burg, 1984) make the South Krkonoše Mts. a possible candidate for the Saxothuringian/Moldanubian plate boundary in the western Sudetes. Geological investigations are being crried out in an area set between the Carboniferous Krkonoše granite to the north and the Intrasudetic basin to the south. The structural record proposed in the geological map of Chaloupský (1989) postulates four angular unconformities in pre–Cambrian and Palaeozoic rocks. Therefore, our project combines biostratigraphic (palynomorphs), geochronological and structural studies. Field work is centered upon coherent outcrops in the Úpa,