=st+bt+grt+H_2O. Garnet-biotite and garnet-staurolite thermometry locates the PT-position of this rock into the lower amphibolite facies and very low pressure range 500-525°C/2kb.

Between the two rock sequences described above, muscovite-biotite-chloritoid gneisses occur and contain plagioclases of two different basicities. Larger grains (up to 1 mm) are inversely zoned (An_{23} in core - An_{31} in rim). Smaller grains (0.X mm) are composedof pure albite (An_{01}). Accessory calcite in the intergranular space witnesses of Ca-saturation of this bulk rock chemistry. Therefore these gneisses could be regarded as a Moldanubian equivalent of the "Bündner Schiefer" originally described in the Alps where metamorphic zonal pattern on plagioclase basicity was provided. Such a basicity of up to An_{30} , was mapped in the Alps from the "Bündner Schiefer"-facies still below the staurolite isograde (i.e. below approximately 500°C). An upper pressure field of chloritoid-biotite assemblage is 4.2±1.9 kb. Similarly to the Stonehaven sequence (Scotland) such an assemblage requires very specific bulk rock chemistry Mg/Fe = 0.55, X^{Mn} = 0, and conserves intermediate MP/LP metamorphic conditions, as this rock does also in the temperature range. Hence the KHU recorded not only Barrovian and low-pressure metamorphic episodes, but also an intermediate stage.

Structural Investigation in the Root Zone of the Magura Nappe (the Middle Váh Valley NW Slovakia)

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The area studied consists of two lithotectonic units - the Rača Unit and the Bystrica Unit. These units reveal a thrust structure which was produced in a compressional regime. Both units are formed mainly by the so called Paserbiec sandstones which are characterised by bedding planes dipping steeply to the SSE. Hieroglyphs occurring on the upper side of bedding planes indicate that the Paserbiec sandstones are in an overturned position. Sandstones are consist of quartz and glauconite, less frequently contain also feldspar, calcite and mica.

At a macroscale, a conjugate set of faults penetrated the Paserbiec sandstones forming an asymmetrical system of slickensides dipping predominantly to the south. The slickensides are oriented in the same direction as the bedding planes, but they are not present throughout the studied area. The slickensides are covered with calcite fibres giving a good possibility to measure the sense of moving. Similarly, the sense of moving is well documented by drop-shaped clay grains. The slickensides as well as drop - shaped clay grains indicate a normal fault. The slickenside surfaces are intersected by micro/meso-shear zones, which penetrated surrounding rocks. Shear zones are composed of more fine-grained and lighter coloured material in comparison with surrounding sandstones. Using the cathodoluminescent method of petrographical analysis the shear zones contain 95% of quartz and 5% of feldspar grains. The presence of fractured quartz grains confirms the existence of normal fault structures which are also evidenced by delta-type rotated mica grains.

The studied area is dominated mostly by thrust faults. Therefore, there is possibility that the present normal faults in overturned Paserbiec sandstones developed from pre-existing thrust faults being lately reactivated and rotated. This is evident from palaeostrain diagrams: coefficient values of palaeostrain ellipsoid are close 0, which is typical of a compressional regime resulting in thrust fault structures. Steeply dipping beds of the Paserbiec sandstones represent the limbs of kink folds overlapping the ramps of horse duplexes. We suppose that at present the subhorizontal parts of ramps were eroded. It is also possible that the steep dip of these sandstones indicates the rooting of the nappe units in the Magura - Klippen belt junction area.

Amphibolites of the Polish Part of the Staré Město Zone

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The Staré Město Crystalline Unit is a narrow NE-SW trending belt separating the Lugicum and the Silesicum. The Staré Město Unit consists of several tectonically separated NE-SW trending structural belts. These are: partly molten leptino-amphibolite complex with spinel peridotites at the base; tonalite-granodiorite sills; mylonitic gabbros; retrograde schists and volcanite belt (Štipská et al. 1995).

A small part of the Staré Město Crystalline Unit is located within the area of Poland, in the vicinity of Bielice (Fig. 1). It consists mainly of banded amphibolites in the north and of amphibolitic schists in the south. Amphibolitic rocks contain numerous intercalations of gneisses and mica schists. Several concordant intrusions of syntectonic tonalites and granodiorites are present within the Polish part of the Staré Město Unit (Wierzchołowski 1966).

Banded amphibolites are medium- to coarse-grained and

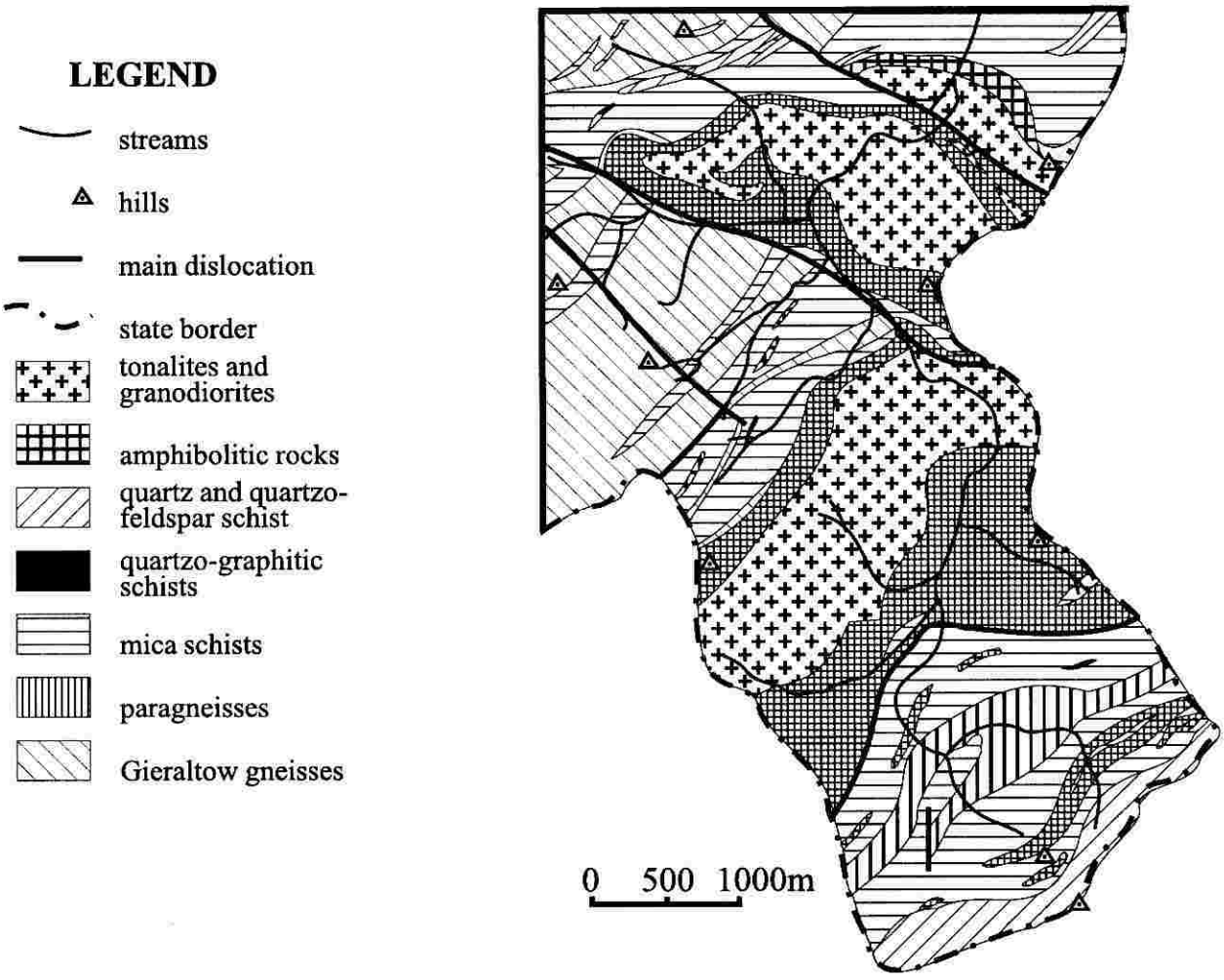

Fig.1. Geological sketch map of the Polish part of the Staré Město Zone with the adjacent geological units (after the maps Kasza 1958, Cymerman and Cwojdziński 1984, simplified).

often have a stromatitic migmatite structure. The amphibolites consist of dark amphibole-rich layers alternating with light, tonalitic ones, rich in plagioclase and quartz. The amount of opaques is significant. Accessory apatite and titanite are common. Locally there occur sparse garnet, pyroxene and K-feldspar. The amphibolites occurring within the northern part contain two kinds of unzoned plagioclase. One of them contains 6-10 % anorthite and is strongly sericitised, the other contains 24-32 % anorthite. The amphibole has composition of tschermakite or rarely Mg-hornblende. Their cores are impoverished in Al_2O_3 and enriched in SiO_2 and MgO relative to the rims. The grains of garnet are unzoned and rich in almandine (62 %). In places secondary chlorite replaces amphibole. Locally there occur prehnite, filling the fissures or replacing plagioclase.

The amphibolitic schists are usually very fine grained and strongly foliated. They consist of pale-green amphibole, plagioclase and quartz, plus subordinate opaques, pyroxene and epidote. Accessories are apatite, titanite and biotite. The amount of opaques strongly differs among the individual exposures. Locally the rock is significantly enriched in pyroxene or epidote.

The banded amphibolites and amphibolitic schists are affected by ductile deformation and exhibit mylonitic structure. The non-coaxial character of deformation is evidenced mainly by S-C fabric, asymmetric tails of porphyroclasts or asymmetric pressure shadows. Heavily mylonitised amphibolitic rocks consist of amphibole porphyroclasts in very fine grained matrix composed of sericitised plagioclase and chloritised amphiboles.

The peak metamorphism conditions of amphibolites are estimated to be close to or slightly above their solidus, under medium crustal pressures. This metamorphism was followed by uplift and cooling under the conditions of greenschist facies.

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