Tectonic Position of the Pre-Flysch Sequence in the Central Part of the Drahany Upland

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The Drahany Upland belongs to the Rhenohercynian belt of the Middle European Variscides. The Drahany Upland is mostly composed of the Lower Carboniferous flysch formations - graywackes and shales (Culm). In the central part of the Drahany Upland the Lower Paleozoic rocks (shales, basalts) are incorporated in the flysch complex. Few isolated outcrops of the Devonian and Silurian rocks between Ptenský Dvorek and Repechy are called the Repechy Belt.

A tectonic position of the pre-flysch rocks was first explained by Kettner (1966). Pre-flysch sequence outcrops in the core of the Culm anticline. Dvořák (1966) suggested that the pre-flysch sequence is bordered by two subparallel dislocations situated in the limb of the anticline.

Based on structural data (dip direction, and dip of the bedding), the tectonics of the whole area seems to be cylindric with an axis plunging to the south in the northern part of the Repechy Belt. In the southern part of the Repechy Belt the cylindricity axis dips to the north. The pre-flysch sequence in the central part of the Drahany Upland is thus situated in the axial depresion.

Tectonics of the Repechy Belt was examined in a number of natural profiles in deep valleys. It was found that the pre-flysch formation is, contrary to previous views, situated in the core of the syncline. The syncline seems to be a part of the folded thrust plane along which the pre-flysch sequence was thrust onto the flysch complex.

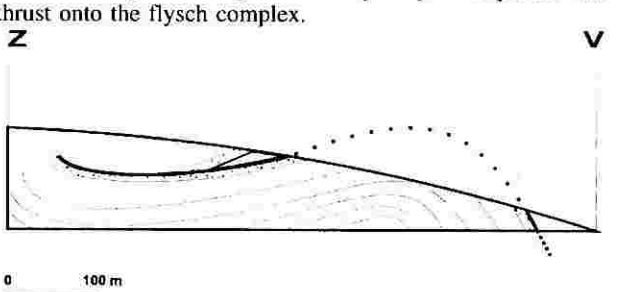

Fig. 1. Profile along the Repechy Valley, central part of the Drahany Upland.

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New Paleontological Finds in the Western Part of the Krkonoše - Jizerské Hory Mts. Metamorphics and their Impact on Stratigraphical and Tectonical Concepts

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New finds of a richly diversified ichnofossil assemblage with stallate, spiral and other types preserved in the roofing phyllites of the Železný Brod area, point to a deep-water environment and most probable Ordovician age of the rocks (Chlupáč 1997).

The re-examination of former fossil finds in the graphitic layers associated with limestones at Koberovy SW of Železný Brod allowed the conclusion that the unique crustacean specimen may be possibly conspecific with *Silesicaris nasuta* Gürich, whilst the nature of the accompanying remains, formerly regarded as graptolites, is doubtful (ichnofossils or metamorphosed graptolites). In both interpretations, however, the remains indicate a younger age of limestones than Cambrian (possibly Silurian or Devonian). This raised doubts about the Cambrian age of the Wojcieszów Limestone at Lipa Górna (the Kaczawa Mts., Poland) which yielded *Silesicaris nasuta* Gürich and also supposed *Cambrotrypa* (Gunia 1967), the latter regarded by the present author as indeterminable remains of tabulates or other doubtful fossils, not proving the age.

New finds of corals, common branched stromatoporoids (*Amphipora, Stachyodes* etc.) in the limestones of the Ještěd Mts., which represent the westernmost part of the West Sudetes metamorphic rocks on the territory of the Czech Republic, markedly enlarged the extent of demonstrably Devonian rocks in this area, particularly in its southern part near Světlá pod Ještědem and other localities in the SW surroundings of the town of Liberec (Chlupáč and Hladil 1992, Chlupáč 1993, 1998).

All these finds allow the conclusion on Variscan folding and metamorphism of probably Lower Carboniferous age (Visean, "Sudetic" movements) and point to absence of formerly presumed Early and Late Caledonian unconformities (the Ještěd Quartzites are integral part of the phyllite sequences, the Upper Devonian rocks are not transgressive). The

Alpine-type deformations with isoclinal and nappe structures (e.g. thrust of the presumed Ordovician complex over the Devonian-Early Carboniferous one in the central part of the Ještěd Mts., as interpreted already by Gallwitz, 1930) seems to be most probable.

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Different Geodynamic Setting of Subunits in the HP/LT Metamorphosed Bôrka Nappe (Inner Western Carpathians): Evidence from Basic Rocks Geochemistry and Petrology

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The newly defined Bôrka Nappe (Mello et al. 1990) is located in the northern part of Slovenský kras Mts. and in the western part of the Spišsko-gemerské rudohorie Mts. It represents a HP/LT metamorphosed part of an ancient accretionary prism formed by closing the Meliata-Hallstatt ocean during the Jurassic time. The Bôrka Nappe is recently stratigraphically divided into three formations: (l) Jasov and (2) Bučina Formations, probably Permian in age, composed of metamorphosed clastic sediments and acid volcanoclastics, and (3) Dúbrava Formation, supposedly Mesozoic in age, containing metamorphosed sedimentary and basic magmatic rocks. Relic primary textures and geochemical and petrological characteristics of these basic magmatic rocks have been studied. Obtained data indicate that following five group of HP/LT metamorphosed basic rocks, which differ in protolith, geochemical signature and metamorphic evolution, can be recognised in the Dúbrava Formation:

(1) Basalts, dolerites and gabbros with BABB (back-arc basin basalt) to N-MORB (normal oceanic-ridge basalt) affinity transformed into epidote-glaucophane rocks with variable amounts of Na-pyroxene (acmite), clinozoisite, albite, white mica and garnet. Basalts, originally forming lava flows with glassy or lava breccia rinds, experienced a progressive metamorphic evolution from prehnite-pumpellyite trough greenschist to epidote blueschist facies conditions. Vestiges of latter ocean-ridge type metamorphism have been found in the dolerites and gabbros.

(2) Dolerites and less amount of basalts still preserved doleritic or ophitic texture geochemically close to BABB, formerly metamorphosed in epidote blueschist metamorphic conditions and latter retrogressed to greenschist conditions. Actinolite, chlorite, albite and octaeder-forming magnetite is a typical mineral assemblage.

(3) Basalts, rarely dolerites with CAB (calc-alkaline basalt) affinity. Relic porphyritic or ophititic texture is rarely preserved. The oldest metamorphic phase, probably in HP/MT conditions (high-Al amphibole relics) was overprinted by HP/LT metamorphic stage producing blueschist with variable amounts of glaucophane, garnet, omphacite, clinozoisite/epidote, white mica, chlorite and rutile. These blueschists were largely retrogressed to greenschists composed of actinolite, epidote, chlorite and albite.

(4) Banded basaltic pyroclastics with a calc-alkaline signature retrogressed from blueschist metamorphic conditions to greenschist of actinolite-chlorite-epidote-albite composition with magnetite octaeders.

(5) Phyllonitised (under greenschist facies conditions) amphibolites geochemically close to N-MORB with a HP/LT metamorphic overprint and mostly retrogressed again under greenschist facies conditions.

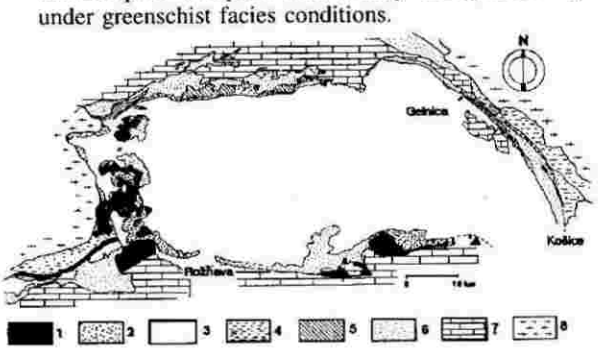

Fig. 1. 1-2 Bôrka Nappe: 1-Dúbrava Fm. 2-Jasov and Bučina Fm. 3-6: Palozoic of Gemeric Unit: 3-Early Paleozoic fomrtions 4-clastic Carboniferous formations 5-Zlatník Fm. 6-Gemeric Permian formations 7-Mesozoic formations of Silica and Stratená Nappe and Meliata Unit; black triangle - Rudník (Dúbrava Fm.)

The basic magmatic rocks of all the above-mentioned groups occur in the Bôrka Nappe separately in the association with specific types of metamorphosed sedimentary rocks. This implies that the Dúbrava Formation is, in fact, composed of several individual lithostratigraphic formations in a form of slices with mutual tectonic contacts. The supposed formations,