deformation and pressure decrease (upwelling) in the lithospheric mantle before alkaline basaltic volcanism. The inferred P-T-path of the Persani Mts. garnet pyroxenites agrees well with the previously studied former garnet peridotites (Falus et al. 2000).

The estimated paleogeotherm (older than the Plio-Pleistocene) beneath the region, shows slightly higher temperature than the present day heat flow calculations and, therefore, indicates significant cooling of the upper mantle after the cessation of the alkaline basaltic volcanism in the Persani Mts.

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Neotectonic Character of the Horná Nitra Depression

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The Horná Nitra Depression is situated in the western part of the Central Western Carpathians, and it is the elongate Upper Miocene to Quaternary structure in the N-S direction. This depression is bound by fault structures which were observed and measured during the neotectonic research. The aim of this work is to identify and define the main fault structures on the basis of the relevant tectonic geomorphology and structural geology methods used. The next step was the dating of fault activity during the Plio-Quaternary Period, and testing its ability to generate seismic events. The faults observed in the Horná Nitra Depression have been divided into three categories.

The first category consists of neotectonic active faults. In the Horná Nitra Depression, these consist of the Malá Magura fault and the north-west segment of the Pravno fault. These are faults whose activity during the Plio-Quaternary Period was able to be independently determined using several methods. The Malá Magura fault is the tectonic structure which divides the Tatric crystalline basement of the Malá Magura Mts. from the sedimentary fill of the Horná Nitra Depression. It is a typical mountain-front fault with a N-S striking and a dipping to the east. The dominant component of the movement on the fault plane is a normal slip, and the length of the fault is 16.71 km. The neotectonic activity is shown by the superposition of the Quaternary alluvial fans, by the value of the mountain-front sinuosity, by the mountain-front faceting, by the valley floor-to-height ratio, by the valley cross-section ratio, by the interpretation of aerial photographs and satellite images, and also by the geophysical measurements. The north-west segment of the Pravno normal fault is also neotectoni-

cally active, and it divides the sedimentary fill of the Horná Nitra Depression from the Pre-Tertiary rocks. This segment of the fault measures 4.71 km and it is in a NW-SE direction with an inclination towards the SW. The neotectonic activity is shown by the relationship with the Quaternary alluvial fans which are cut by this fault, by the considerable change of morphotectonic parameters (e.g. relief slope and segmentation, etc.), and the aerial photograph and satellite image interpretation.

The second category consists of faults which may possibly still have been active during the neotectonic period. In the studied area, these consist of the Nedožery, the Brezany, and the Hájske faults. These are faults whose activity during the Plio-Quaternary Period was not able to be unambiguously determined. The Nedožery fault is a N-S intra-depressional normal fault structure with a westward dipping and a visible length of 13.77 km. It separates the extent of the Pliocene Lelovce Formation on the east from the Quaternary alluvial fans on the west. This fault influences the Nitra river pattern, and it is identified in aerial and satellite images. The other methods of tectonic geomorphology do not reflect its activity during the Plio-Quaternary Period. The Brezany fault is also a N-S intra-depressional fault structure dipping towards the west. The dominant component of the movement on this fault plane is a normal slip, and the fault has a visible length of 10.86 km. This fault system divides the Lelovce Formation from the Biely Potok Formation (Oligocene), and it breaks the south-eastern segment of the Pravno fault. The relationships between the fault and the Quaternary sediments have not been definitely determined. Other methods of tectonic geomorphology do not reflect its activity during the Plio-Quaternary Period. The Necpaly fault is a NE-SW intra-depressional fault structure dipping towards the SE, with a visible length of 6.42 km. This fault structure breaks the volcanic sedimentary formations of the Upper Miocene (Sarmatian), and it cuts the south-eastern segment of the Pravno fault. This fault also limits the extent of the Lelovce Formation towards the Quaternary alluvial sediments, and it probably influences the size of the Holocene alluvial fans. The Hájske fault is a NE-SW normal intra-depressional fault dipping towards the NW with a length of 8.75 km. This fault limits the extent of the Lelovce Formation towards the south-east and it breaks the volcanic sedimentary formation of the Upper Miocene (Sarmatian), and it evidently cuts the south-eastern segment of the Pravno fault. The fault influences the Handlovka river and its Quaternary sediments, and it is clearly visible in aerial and satellite images. Other methods of tectonic geomorphology do not dipict its activity during the Plio-Quaternary Period.

The last category consists of neotectonically inactive faults in the Horná Nitra Depression. These are the Šútovce fault and the south-eastern segment of the Pravno fault, whose activity during the Plio-Quaternary Period, has been unambiguously eliminated. The Šútovce fault is a NW-SE polygenetical strike-slip structure with a subvertical dip. This fault is 9.51 km and it divides the Mesozoic and Paleogene sediments from the Tatric crystalline basement of the Malá Magura Mts. The last tectonic activity on the Šútovce fault was probably in the Middle Miocene age. Younger tectonic activity was not detected by any geological, tectonic or morphotectonic methods. The fault is not identified on the satellite images. The south-eastern segment of the Pravno fault separates the Tatric crystalline basement of the Žiar Mts. from the Mesozoic and Paleogene sediments. The fault length is 15.13 km with NW-SE striking and it dips towards the south-west. The dominant component of movement on the fault plane is a normal slip. The last tectonic activity on the fault probably occurred during the Upper Miocene age. Younger tectonic activity was not detected by any geological, tectonic or morphotectonic methods. Its NW end is covered by the Lelovce Formation, and the fault is clearly visible and identifiable on the satellite images.

The present-day stress in the Horná Nitra region Earth's crust was determined by paleostress analysis and tectonic geomorphological criteria. The principal maximum horizontal compressive stress SHmax was computed to be in a NNW-SSE direction, and the principal minimum horizontal compressive stress Shmin is perpendicular to this direction. This stress-field orientation may generate movement on the Malá Magura and the north-west segment of the Pravno faults. This data may be useful in compilation of a seismotectonic model of the area.

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Tectonics of Variscan Foreland Coalbearing Basin on Example of Karvina Subbasin – Upper Silesian Coal Basin

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The Upper Silesian Coal Basin (USCB), the part of the Moravo-silesian area, could be classify as the foreland basin located in the toe domain of the European Variscan accretion wedge (Grygar and Vavro 1995, Dopita et al. 1997, Grygar et al. 2000). The Karviná sub-basin represents the most eastward transverse structural depression (Grygar et al. 1989) of the USCB. The coal-