marly and flysch sediments, as well as due to long-termed deformation progressing in several stages, including nappe-thrusting, extension and transpression.

The constructed cross-sections show that various PKB sectors record all these complex tectonic movements very irregularly, especially as far as the presence and distribution of tectonic units and overstep complexes are concerned. On the other hand, all sectors are dominated by the stage 5 dextral wrenching that finally shaped the PKB units. In many cases the stage 5 wrench faults juxtapose segments with fairly different collections of units, their thickness, pre-5 structure and erosional level. The fan-wise transpressional belt attains its maximum breadth of about 20 km in the middle Váh Valley near Považská Bystrica due to accumulation of at least 5 subvertical strike-slip duplexes developed within the Klape and underlying units. Relics of older thrusting stages are variably recorded, sometimes totally obliterated by wrenching. Nevertheless, if present, the superposition and lithostratigraphic content of units with different affiliation helps much in deciphering complicated tectonic history of this worldwide unique tectonic phenomenon.

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Late Jurassic to Early Miocene Tectonic Evolution and Palaeogeography of the Western Outer Carpathians

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The recent contribution aims to discuss tectonic processes, controlling the late Jurassic to early Miocene evolution of the Western Outer Carpathian (WOC) sedimentary basins and their source areas. In particular it attempts to compile in a coherent model constraints obtained from analysis of tectonic subsidence history of sedimentary basins (Poprawa et al. 2002), uplift history of source area based on analysis of deposition rate (Poprawa et al. 2006), as well as geochronology of basement of the sediment source area based on isotopic and chemical dating of crystalline pebbles (Ślączka 1998, Poprawa et al. 2004, 2005, Kusiak et al. 2004, Michalik et al. 2004, Malata et al. 2005). The model was confronted also with other data, like general facies evolution of the WOC basins (e.g. Książkiewicz 1963, Koszarski 1985), structural data (e.g. Świerczewska and Tokarski 1998, Nemčok et al. 2001) as well as geochemistry and petrology of igneous rocks (e.g. Narębski 1990, Dostal and Owen 1998).

At the end of Jurassic and beginning of Cretaceous in the WOC a rift-related extension led to development of the deep marine gabens with flysch and pelagic sedimentation, the elevated horsts, supplying the basins with sediments, and the zones of shallow marine carbonate sedimentation. Syn-rift extension tectonics is concluded mainly from characteristic pattern of tectonic subsidence (Poprawa et al. 2002) and sedimentological model for the Cieszyn beds in the Silesian subbasin (Słomka et al. 2002). Transition to the Early Cretaceous and Cenomanian post-rift thermal sag stage was responsible for general ceasing of subsidence of basins and tectonic activity in the source areas. Extension related to the late Early Cretaceous development of the basic volcanics (Narębski 1990, Dostal and Owen 1998, Nemčok et al. 2001) is regarded here as a minor reactivation of the previous rift structures. In the Barremian-Albian northern, external sources for sediments were uplifted due to compression (Poprawa et al. 2006), which was caused by the orogenic collision to the west and north of the Central Carpathians, related to subduction of the Penninic ocean (Vahicum), and/or by the orogenic collision in the Middle and Outer Dacides. This was coeval in time, and possibly genetically related to uplift and erosion of the SW and NE parts of the Polish Basin (particularly area of the Fore-Sudetic Monocline).

The Silesian ridge, rapidly elevated and eroded during the Late Cretaceous and Paleocene and supplying vast amount of detritus to the Silesian subbain, is interpreted here as a thick-skinned collision zone, composed of individual thrust sheets. Convergence, thrusting and stress transmission towards foreland caused flexural subsidence of the proximal zone of foreland (the inner Silesian basin) and uplift in the distal zone (including: the outer Silesian subbasin, the Subsilesian facies zone, the Skole subbasin and the northern sediment source areas). Concept of nappe structure of the Silesian ridge is derived from presence of contrasting types of detritus eroded from this isolated, intra-basinal source area. Sedimentary rocks, including cannibalised Lower Cretaceous flysch of the Silesian basin, are eroded from the Silesian ridge together with metamorphic rocks of low grade and high grade (e.g. granulites) metamorphism. The Late Paleocene–Early Eocene intensification of supply of the upper-most Jurassic to lower Cretaceous carbonates from the Silesian ridge is explained by thrusting of an another nappe onto the ridge. Coexistence of the Carboniferous to Permian metamorphic rocks together with unmetamorphosed sedimentary rock of the Devonian-Carboniferous age within the Silesian ridge also stands for presence of individual nappes with contrasting geological setting (Poprawa et al. 2004, 2005). Collisional uplift of the Silesian ridge allows to explain very high rates of deposition for the sediments derived from the source area (Poprawa et al. 2006). At the same time sediment source area north of the WOC also was compressionally uplifted. The late stage of Late Cretaceous-Paleocene compression, inversion and uplift of the WOC is coeval in time with compression, inversion and uplift of the Polish Trough. This confirms a concept of strong tectonic coupling between basement of the northern Tethian domain and European plate (peri-Tethian domain).

The Eocene alternating shallow marine deposition and exposition for erosion of the Silesian ridge is interpreted as controlled by both episodic tectonic activity and eustatic sea level changes. At this time a new collision zoned developed south of the Magura subbasin, which supplied vast amount of detritus to the Magura beds. The Eocene collision and development of the accretionary prism caused flexural bending of its broad foreland, subsidence, relative facies unification and decrease of activity of the source areas located north of the Magura subbasin. The Oligocene progress of plates/microplates convergence, and relocation of the zone of tectonic shortening towards the north, led to compressional uplift of the source area located both to the north of the WOC basins and source area located to the south of the Silesian facies zone, the later composed of crystalline basement and sediments of the partly deformed Magura unit. This sources supplied with detritus the upper Oligocene-lower Miocene Krosno Beds, being diachronic continuation of synorogenic deposition of the Magura Beds.

According to results of 'exotic' pebbles analysis the WOC developed on the basement, being the south-western prolongation of the Trans-European Suture Zone, composed predominantly of the Variscan and 'Cadomian' terrains (Poprawa et al. 2004). The contact zone of the Silesian basin and Silesian ridge is coinciding with palaeoboundary between basement of Variscan and 'Cadomian' orogenic consolidation to the south and north respectively. Therefore Silesian ridge developed on the suture of two tectono-stratigraphic terranes. The other suture of terrains, i.e. border between southern prolongation of the Brunovistulicum and Małopolska blocks/terrains, is expressed in detritus derived to Skole subbasin from the north.

During the Late Cretaceous-Paleogene-early Miocene an important tectonic shortening across the WOC took place, accommodated mainly in the source areas (Poprawa et al. 2004, 2006, Malata et al. 2005). This indicates that palaeogeographic relations between the Silesian subbasin, the Magura basin and the Central Carpathian Paleogene Basin were changing during the Cretaceous and Cainozoic. In the time span of the Albian to Oligocene in the zone palaeogeographically located between the Magura subbasin and the Central Carpathians three separate source area were active, each characterized by different geological setting. These sources were replacing each other in time, suggesting significant collisional and/or strike slip reorganisation of the zone during that period. The collision in the WOC evolved with time from thick-skinned mode during the late Cretaceous-Paleogene to thin-skinned one during the Miocene.

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Geochronology of the Crystalline Basement of the Western Outer Carpathians' Source Areas – Constraints from K/Ar Dating of Mica and Th-U-Pb Chemical Dating of Monazite from the Crystalline 'Exotic' Pebbles

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The Western Outer Carpathians (WOC) are composed of several major tectonic units, partly characterised by individual facies development. The units are composed of sedimentary fill of individual basins/subbasins. The basin-fill was detached from the original basement, deformed and thrusted over the European plate. The WOC sedimentary basins were supplied with detritus from several source areas, both external with relation to the WOC, like its northern rim, and internal, like e.g. Silesian ridge and Southern Magura ridge (e.g. Książkiewicz 1965). Judging from composition of pebbles deposited in the WOC flysch basins, often referred to as 'exotics', the source areas were build of broad variety of sedimentary and crystalline rocks (e.g. Książkiewicz 1965, Wieser 1985). Contribution of the later one to understanding of the WOC evolution is still rather limited, mainly due to lack of geochronological constraints.

Only during the last years geochronology of crystalline 'exotic' pebbles become a subject for systematic studies. First single K/Ar datings of mica from crystalline rocks derived to the WOC