Sandstones are medium-grained, locally fine-grained, parallel-laminated. The basal contacts of sandstone layers are mostly sharp. The bodies of sandstones are present through the entire profile. The sandstone beds within the conglomerate bodies display amalgamation, sometimes with inversed graded-bedding and erosional lower contact.

Mudstones (fine-grained laminated facies) are in the upper part of the quarry. It comprises millimetre-scale parallel-laminited fine- to very fine-grained sandstones, silstones and mudstones.

The whole described complex represents slope deposits of coarse-grained fan delta system.

The following parts were recognized:

Proximal part, characterized by coarse clastic sediments of gravity flows within channels and lobes (debris flows).

Medial – distal part is characterized by sediments of high density turbidity currents. Sheet sandstones were deposited in the medial part and rhythmites and laminites of sandstones, mudstones and shales in the distal part of the complex.

Imbrication of pebbles and cobbles, ripple marks and cross--bedding indicate statistically most usual transport directions from WSW to ENE. Paleoslope and channel inclination is predominantly of the same direction.

The analyses of pebble composition and detrital garnets indicate some differences between conglomerates of the Olšany and Luleč brachysyncline, nevertheless it could be caused by different erosional level.

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Magnetic basement complexes in the outside of the West Carpathians and of the Eastern Alps

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National research programs involving the airborne geophysical mapping revealed remarkable large-size magnetic areas in Central Europe that continuously pass over the frontiers of individual states.

Almost 450 km long and 60–70 km km wide magnetic belt was found in Austria. It is developed between Innsbruck (W) and Vienna basin (NE). Its western part is widened to Germany – – SE Bavaria, too. Farther to the NE, the magnetic belt continues to the both Czech and Slovak Republics reaching the total length over 200 km in the Czech territory and almost 240 km in the Slovak territory. Its easternmost part is situated in the Carpathian area of the southern Poland being finished in the Cracow region. It means that the total length of the so-called Alpine-Carpathian magnetic belt is about 700 km (Gnojek and Heinz 1993). The next long-wave extensive anomalous area begins behind a narow interruption (magnetic minimum) in the northern Moravia and in the Czech part of Silesia. It continues to the Polish territory covering the whole Upper Silesic basin area.

The wave-length of the individual anomalies of this belt mostly reach tens of kilometers that disclose the depth of their sources in the middle interval of the crust (10–20 km). Below the Berchtesgaden anomaly – which represents the top part of the Austrian/German part of the belt – the magnetic source rocks are expected in the depth interval 8–22 km (Bleil and Pohl 1976). Also in the central part of the Vienna basin area, the source rocks are interpreted to be in the depth exceeding 7 km.

The location of the anomalous belt shows the position of the magnetic rocks below the Alpine Molasse basin, the Flysch belt and the Helveticum unit, as well as below the Mesozoic of the Northern Calcareous Alps.

The source rocks of this magnetic belt, however, are closer to the surface in the southern, central and eastern Moravia. They even outcrop in the Dyje, in the Brno and partly also in the Olomouc Massifs. Similar magnetic complexes (plutonites with a mantle of metamorphites) are situated below the Carpathian Foredeep in the depth about 1 km and below the Outer Flysch Nappes in the depth interval 2–3 km in Moravia. Similar depth position of this source rocks about 2–4 km was also proved by drill holes in the Carpathian part of Poland.

These magnetic complexes dip from this level to the SE and S; beneath the outer margin of the Central Carpathians are supposed to be in the depth about 10 (15) km. The rock composition of the source was well recognized in the southern and the eastern Moravia where 157 drill holes reached the source complex. Magnetic property studies carried-out on the drill-cores of these holes proved that the Neogene, Paleogene, Cretaceous, Jurassic, Carboniferous and Devonian formations covering the crystalline basement are not able to create these strong and extensive anomalies. On the contrary, the crystalline basement rocks both plutonic and metamorphic ones showed the magnetic susceptibilities enabling the origin of these anomalies. This basement complex, thus, is regarded to be fully responsible for the existence of these extensive anomalies.

This crystalline basement complex was studied by Dudek (1980). He determined it as an independent tectonic unit of Proterozoic age (580–600 Ma), consolidated by Cadomic orogeny and he named it as a Brunovistulicum. The best accessible and, thus, the best recognized part of the Brunovistulicum is the Brno pluton, the rock composition of which is interpreted as a segment of an ophiolite unit (Hanžl and Melichar 1997). The association of various Brunovistulic granite rocks with ophiolites were compared with another Cadomic terranes by Leichmann et al. (1996) and by Finger et al. (1998). They concluded that the Brunovistulic unit resembles the Pan-African orogenic system found in the NE Africa and in parts of the Arabic peninsula. An origin from Gondwana is, then, ascribed to the Brunovistulicum.

The extension of this predominantly buried magnetic fragment of Gondwana in the central Europe based on the airborne magnetic maps of Germany, Austria, Czech Republic, Slovakia and Poland is suggested in the presented poster. The effect of this Cadomic unit on final shape of European Variscides (especially in the S and E margin of the Bohemian Massif) as well as on the shape of the Carpathian arc seems to be obvious. In addition, Tomek (1996) proposes a hypothesis that a different rheology of the Variscan Europe and the Cadomic Brunovistulicum might cause a different deformation history of the Eastern and Western Alps.

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The Influnce of Carpathian Nappes on Tectonic Structures of the Czech Part of Upper Silesian Coal Basin

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The Upper Silesian Coal Basin (USCB) is situated immediately in the foreland of Outer Carpathian nappes. Its southernmost part forms a tectonic base of those nappes (Subsilesian Unit). The basin forms a part of Variscian basement which was influenced by the load of sediments of Carpathian nappes and by tectonic movement of an accretional wedge during the period of Alpine folding.

In this manner, the subequatorial systems of Variscian faults (of direction ENE-WSW, i. e. fault-systems of Bludovice graben, Janovice graben etc.) were rejuvenated. The movement of Alpine nappes over the basement, in connection with the displacement of the rigid Epihercynian platform (Brunovistulician), initiated systematically the tilting of core segments on the autochthon flexure along the above-mentioned fault systems. This movement could have also evocated the rise of new faults of the second or third order in the USCB.

The Dětmarovice shear zone of subequatorial direction (Grygar et al. 1989) is dominant in the north of the Czech part of USCB. It connects the west of Orlová-structure with the fault systems of the same direction in the western part of USCB and continues as a peripheral fault of Jeseníky as far as the region Opava. The intrusions of neovolcanites and the occurrence of mineral water rich in CO_2 (Dopita et al. 1999) along this regional tectonic zone is an evidence of the Neoidic movement there.

We can observe the tilting in the subequatorial fault zone – – the Bludovice graben analogous to the movement in the Dětmarovice shear zone. The Bludovice graben is most intensively rejuvenated structure in the Czech part of USCB with the exception of some faults immediately under the Carpathian nappes. The results of the morpho-structural analysis carried out so far by Grygar and Jelínek (2000) support this conclusion. The deep tectonic gash is a consequence of a postvariscian erosion. According to Jurková (1971 in Dopita et al. 1997), the paleorelief was formed prior to the Carpathian (mainly at the turn of Carpathian and the Upper Badenian) after the overfault of the Styrian nappe. That erosion was affecting mainly regions of the Ostrava-Karviná ridge and the Příbor–Těšín ridge. The ridges separate the above-mentioned tectonic zones. We cannot agree with the opinion (Dopita et al. 1997) that these structures were formed independently of the structural plan of epivariscian platform. The connection with Variscian fault structures is evident.

It is interesting, that in the Czech part of USCB the faults of NW-SE direction (Sudety structures – dominant in the Bohemian Masiff) occurred sporadically, except of some faults of second order in the Paskov mine (Welser 1998).

That is why we consider the rejuvenation of the fault systems of NNW-SSE, N-S directions occurring between Albrechtice fault and Těšín fault to be of major importance. We can recognised “a copy” of the Variscian Karviná graben in the Alpine structural level too. The zone is morphologicaly very distinct in the Beskydy Mts. georelief.

The above-mentioned structures were in position of radial-tensile faults due to a stress field in the foreland of Carpathian nappes. That is why we argue that these structures “opened” and contributed to the present tectonic structure of USCB.

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