world's pioneer locality in studies of recently so popular lherzolite nodules (Farsky 1876). The average amount of these xenoliths sized over 1 cm is $35/m^2$ which corresponds to 2% of the total volume of the basaltoid. The biggest nodule ever found here was 70 cm long.

The interest of countless mineral hunters has been focused exclusively on nice olivine crystals some of which are of a gemstone quality. Besides lherzolite nodules, however, there are xenoliths of another lithology present here, too. Of course, most of them are unattractive, substantially less frequent, less striking and therefore mostly ignored. Nevertheless, even these different lithologies provide and complete the information on the composition of the Earth's pile below the volcano in the section underneath the Moho and above it as well.

Following petrographic categories of xenoliths (comp. Fediuk 1973) have been distinguished here:

A) Ultramafic rocks
   a) peridotites (mainly spinel lherzolite, scarcely garnet lherzolite, but also dunite, wehrlite and harzburgite)
   b) pyroxenites and hornblendites (clinopyroxenite, less frequently websterite and orthopyroxenite, sporadic px-hornblendite)
B) Gabbroic rocks (cpx and cpx-hbl gabbro, gabbronorite, rarely anorthosite)
C) Granitoids:
   c) charnockitic rocks,
   d) biotite granite and granodiorite
D) Crystalline schists (usually metapelites)
E) Sedimentary rocks (sandstone and conglomerate)
F) Single xenocrysts (olivine, orthopyroxene, clinopyroxene, hornblende, feldspar, quartz).Based on the above listed set of xenoliths, supplemented by geobarothermometric calculations, geophysical data and some deep boreholes, following model of the vertical profile for the SW periphery of the Jizerské hory and Krkonoše Mts. is proposed:

0 - 1.5 km	Cretaceous and Carboniferous sediments
1.5 - 3.0 km	weakly metamorphosed Early-Palaeozoic sediments and volcanics
3.0 - 8.0 km	medium metamorphosed volcanosedimentary sequence of presumed age with intrusions of cataclastic granites and metagranites
8.0 - 17.0 km	undeformed granite perhaps of Variscan age
17 - 33 km	gabbroic and charnockitic layer
	Moho
33 - 50 km	ultramafic layered cumulate complex composed mostly of pyroxenite
50 - 250 km	spinel lherzolite
250 - 350 km	garnet peridotite

Source of alkali-basaltic "squash", ascending volcanic plume.

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Heavy Minerals in the Wałbrzych Formation and the Biały Kamień Member (Upper Carboniferous, Intra-Sudetic Basin, SW Poland)

Elżbieta FELICKA

Uniwersytet Wrocławski, Instytut Nauk Geologicznych, ul. Cybulskiego 30, 50-205 Wrocław, Poland

The Intra-Sudetic Basin, a Variscan intra montane trough in the central Sudetes, is filled with Carboniferous, Permian, Triassic and Upper Cretaceous deposits. The oldest sediments display considerable lateral and vertical facies variations which reflect intense tectonic and volcanic activity, largely influencing sedimentation in the basin in that time. The sedimentary material was transported from various sources, a good indicator of which, apart from the lithology of pebbles, may appear heavy minerals (Felicka, 1997 b).

The Wałbrzych Formation

The Upper Carboniferous sediments crop out in the NE part of the basin. The Wałbrzych Formation (Lower Namurian), up to 320 m thick, is represented by mudstone-sandstone deposits, with light-grey conglomerates containing mainly quartz and quartzite pebbles (quartz conglomerates) at the bottom, and by series of mudstones and claystones with coal seams at the top (Bossowski and Ihnatowicz, 1994). The Wałbrzych Formation cannot be correlated with any stratigraphic unit in the Czech part of the Intra-Sudetic Basin.

Two samples representing the Wałbrzych Formation were collected for heavy mineral analysis along a profile line in the eastern part of the basin (prolongation of the Lower Carboniferous profile, see Felicka 1997 a, b). In sample AKL, representing the lowermost part of the formation, white mica is the most abundant mineral (> 60 %); apart from that, biotite, epidote, sphen and occasionally zircon and amphibole are found. The heavy mineral spectrum of sample W1 representing the uppermost part of the formation is different and comprises white mica (flaky aggregates of muscovite and chlorite - 30 %), garnet (24 %), epidote (17 %), biotite (6 %) and minor turmaline, zircon, apatite and sphene.

The Biały Kamień Member

The Biały Kamień Member (Upper Namurian and Lower Westphalian) belongs to the Žacleř Formation. These deposits, up to 300 m thick, are represented in their bottom part by conglomerates and sandstones with few interlayers of mudstones and claystones containing two coal seams.

Four samples were collected for heavy mineral analysis, all from the eastern profile line. The heavy mineral spectra are represented mainly by opaque minerals, which form individual grains and intergrow transparent phases. The spectra display variations both stratigraphically and laterally and so far it is difficult to see any correlation between them. Generally, samples W7, W8, and W9 from the Wałbrzych area show rather small variations of heavy minerals. They contain white mica (14 %), clinozoisite (14 %), Ti minerals (sphen and rutile 40 %) and, only subordinately, biotite, garnet, apatite and turmaline. Sample J3 from Jedlina Zdrój has a wider spectrum of minerals, including abundant chlorite (50 %), white mica (11 %), clinozoisite (10 %) and minor epidote, biotite, garnet and Ti phases. The difference between heavy mineral spectra in the sediments of the Wałbrzych and Jedlina Zdrój area may reflect the influence of volcanic activity in the vicinity of Wałbrzych at that time.

Summary

The heavy mineral spectra of the Wałbrzych Formation and Biały Kamień Member consist mainly of opaques (hematite and ilmenite), while transparent minerals are represented by white mica (flaky aggregates of colourless and greenish mica and chlorite), epidote, clinozoisite and Ti minerals (rutile, sphene, brookite and occasionally anatase).

Comparing the new results with data coming from the Lower Carboniferous sediments (Felicka 1997 a, b) it appears that the Upper Carboniferous deposits contain more Ti minerals and less mica (white mica, chlorite and biotite), while the contents of epidote-clinozoisite and garnet is generally the same.

Based on the results of heavy mineral analysis, it is difficult to determine the source areas for the analysed sediments because of a rather small number of samples, their considerable variation and the lack of microprobe analyses. Most of the material could have come from the redeposition of Lower Carboniferous deposits and sedimentary rocks similar to those exposed in the Świebodzice Depression; transport from the Sowie Mts. is still unlikely because of the lack of some indicative minerals such as kyanite and sillimanite.

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Fault-propagation Fold and Thrust Tectonics of the Upper Silesian Coal Basin

Radomír GRYGAR[1], Jiří PTÁČEK[2] and Petr WELSER[3]

[1] *Institute of Geological Engineering, VŠB - Technical University Ostrava, 17. listopadu, 708 33 Ostrava, Czech Republic*
[2] *DPB Paskov - Underground Exploration and Mine Safety, Inc., Paskov, Czech Republic*
[3] *Paskov Mine, Paskov, Czech Republic*

From the stratigraphical point of view The Upper Silesian Coal Basin (USCB) sedimentary sequence represents the uppermost (Namurian A – Westphalian B) levels and, from the structural and deformation polarity point of view, the outermost zone of the Moravo-Silesian region of the Bohemian Massif. In this area, the Variscan accretion wedge tapers out and the Variscan collision deformations progressively but slowly disappears. Almost all authors define the longitudinal (NNE-SSW) Orlová fold-thrust structure as an easternmost (which in this case contemporaneously mean outermost) limit of late Variscan "folding" of the Variscan foreland foredeep and coal-bearing molasses. The continental molasses of the Karviná formation, outcropping eastwards of the Orlová structure were, or by some authors still are, considered as the post-erosion and post-deformational sedimentary sequence, affected only by normal faulting.

Our recent structural studies in the Czech part of USCB verified relatively extended thrusting (the thrusts mostly striking NE-SW up to NNE-SSW) more then 7-10 km eastwards from the Orlová fold-thrust structure. These mostly flat lying thrusts, were recorded in the seams of the Saddle member on the 9. květen Mine and also in the stratigraphically identical seams of the 5th. block of the Darkov Mine, more north-eastward from the Karviná graben. In higher seams of the Suchá Member (above all in its upper part) these thrust systems disappear, which together with their listric geometry indicate imbricated upward-blinding thrust systems of the outermost apical domain of the Variscan accretion wedge (Grygar et al. 1996, 1997). The vertical amplitude of these thrusts does not overreach first meters. This structure is clearly related to the major deeper-level detachment fault of the accretion prism.

In a SW part of the easternmost excavated areas of the Paskov Mine we have studied similar fault-related fold and thrust imbricated systems with the NE-SW to NNE-SSW orientation and typical listric geometry (Grygar et al. 1997, Welser 1998). In addition, Foldyna et al. (1982) presented cross-sections with the very similar flat geometry of the Michálkovice fold-thrust structure. Nearly the same is valid for the Polish part of the USCB (e.g. Kotas 1983).

All these systems are genetically related to an extensive layer parallel faulting and flexure-slip deformation mechanism, predetermined by typical lithology of the coal-bearing molasses and flysch foredeep sediments with high layer-parallel anisotropy. Also our studies more westwards in the Upper Visean flysch facies of the Kyjovice Member indicate the same tectonic style of the fault-propagation fold in the sense of e.g. Mitra (1990).

On the basis of the above presented investigations and many others unpublished colliery reports we came to the conclusion, that both main fold-thrust (Michálkovice and Orlová) structures of the USCB correspond to the **fault-propagation fold** type genetically related to the detachment thrusts on the base of the Variscan accretion wedge. This major thrusting was in early stage syngenetic in relation to the coal-bearing