19.4, 18.9 and 26.5, 0.2 and 17.4 eq. wt.% NaCl, respectively. The eutectic temperatures (Te) of the inclusions in both quartz and sphalerite ranging between –71 and –51 °C indicate the H_2O-NaCl-$CaCl_2$ system (Goldstein and Reynolds 1994). The same fluid system has been trapped in inclusions of calcite II. The Te of the fluid inclusions in calcite generations I and III is between –22 and –38 °C suggesting other salts in addition to NaCl in the aqueous solution. Inclusions containing liquid hydrocarbons are sometimes present in all mineral phases. They fluoresce white-blue indicating a presence of higher hydrocarbons (Stasiuk and Snowdon 1997).

Three calcite generations precipitated from a fluid with oxygen isotopic composition +1.9, +8.0 and +0.6‰ SMOW, respectively (calculated from the $\delta^{18}O$ values between –8.2 and –11.3 ‰ PDB), suggesting mixing and/or pulses of different fluid flow systems. Such changing and similar conditions during the mineralising process have also been reported from MVT deposits in Poland. Here, for instance, inclusions in sphalerite exhibit nearly the same range of temperature from 80 to 158 °C and salinities from 0 to 23 wt.% NaCl eq. of the same fluid systems, even with the presence of liquid hydrocarbons (Kozlowski 1995). Thus, the nature of discussed mineralizing fluids indicates a comparable origin to the world-class MVT deposits within the Silesian-Cracow district, which are situated only a few tens of kilometers further to the NE. Moreover, the geological setting of both mineralizations is nearly identical.

The nature of fluids and their volume suggest that they have been derived as basinal fluids from the thick sedimentary sequences under the Outer Carpathians. The number of occurrences suggests a large fluid flow that might have been driven by significant geological event (Slobodník et al. 1999). With respect to new facts from the Ostrava region and palaeomagnetic dating of the MVT mineralization in Poland (Symons et al. 1995), the emplacement of the Carpathian nappes is interpreted to be the common driving mechanism for migration of the mineralising fluids in the whole area considered (Kozlowski 1995) and could explain the similarities observed. The important faults, known in the area, trending more or less perpendicular toward the Alpine front, made the migration of fluids possible.

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Paleoenvironmental Changes in the Western Carpathian Basins across Eocene–Oligocene Boundary: Onset of TA4 Euxinity and Catastrophic Eutrofication

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Upper Lutetian transgression in the Central-Carpathian Paleogene Basin (CCPB) led to the shallow-marine deposition of nummulitic banks, developed in two 3rd order cycles. Nummulitic ecosystems were adapted to clear-water and oligotrophic conditions, being highly sensitive to even small increase in nutrient availability and primary productivity. During the Upper Eocene the CCPB underwent a progressively widespread eutrophication, which is consistent with climatic cooling. Therefore, the Nummulitic cycles of the CCPB, like a large foraminifera demise, disappeared due to the inversion of the Middle Eocene warm climate to cooler climate in the beginning of the TA4 supercycle. Climatic changes culminated in the "Terminal Eocene Event", which corresponds to the global cooling and glacio-eustatic regression related to the Antartic cryosphere expansion. Consequently, a carbonate factory turned off during the Zone P16 (latest nummulites – Köhler 1998), being eutrophicated and suffocated by terrigenous deposition. Cool-water influx and continental runoff into the CCPB led to fundamental paleoenvironmental changes. The water mass became stratified, developing a shallow termocline and chemocline. The water-colum stratification facilitated an oxygen deficience due to organic carbon oxidation and eutrofication of surface water. This process resulted in bottom-water anoxia (fertility crisis) and surface-water nutrification favorable for phytoplankton (*Wetzeliella, Deflandrea* – Gedl 2000), shallow-water ichnofauna (*Clu-*

peidae, Serranidae – Chalupová 2000) and glauconization of exfoliated foraminiferal tests (e.g., glaucony-rich layers near the Prosiek Valley). A small-scale intercalation of non-calcareous black shales with Globigerina Marls indicates a short pulses of carbonate productivity during the terminal Eocene fertility crisis. The fluctuations in productivity provide the evidence of climatic changes driven by precessional cyclicity (cf. Leszczynski 1997).

Early Oligocene is considered a time of catastrophic eutrophication of the West Carpathian basins, which culminated in mass expansion of diatoms (Menilite cherts in upper NP 23 – – Nagymarosy 2000). Early Rupelian sediments still reveal the cool-water influence, salinity decrease and semi-isolation, as indicated by wetzeliellacean dinoflagellates, diatom oozes, brackish nectonic fish and small gastropods. Higher in the section, the carbonate-free sequence reveals the first pulses of nannofossil blooms, characterized by reticulofenestrids of NP 23 Biozone (Tylawa-like limestones), which became flourished due to sea-level rising and renewed circulation. The TA4 supercycle tended toward to highest sea-level in time at of 32 Ma, which restored the Paratethyan circulation (Baldi 1984). Consequently, the CCPB became reoxygenated, which led to the increase in carbonate precipitation, productivity and fertility. The maximum flooding of this sequence falls into horizons of manganese layers, which represent a condensed section of the marine transgression. Successive formation of mud-rich deposits indicates a low-energy environment of highstand phase. Next supercycle TB1 was introduced by the Intra-Oligocene regression. It is in accordance with an abrupt sea-level fall at around 30 Ma (Mid-Oligocene Event), determined as a distinctive drop in sea-level during the major glaciation in Antartica and subsequent cooling in the Northern Hemisphere. At this time, the CCPB started to fill up by sand-rich submarine fans, as a frequency of related turbidite currents essentially increased during glaciation. The Late Oligocene regression in the CCPB is indicated by shallowing and decrease in salinity with appearance of braarudospherids in nannofossil associations and brackish dinoflagellates in phytoplankton. Therefore, the deposition of the Upper Oligocene submarine fans in the CCPB appears to have been forced by glacio-eustatic regression.

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Geochemistry and Composition of the Middle Devonian Srbsko Formation in Barrandian Area, Bohemian Massif: A Trench or Fore-Arc Strike-Slip Basin Fill with Material from Volcanic Arc of Continental Margin?

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Kukal and Jäger (1988) emphasised the tectonic significance of an abrupt termination of long-term, open-sea carbonate sedimentation in the Barrandian area. The deposition of Givetian Srbsko Formation was considered as a signal of Early Variscan orogenesis. The authors of the above mentioned paper made conclusions that these last sediments are distal turbidites and contains, besides fine-grained siliciclastic material also much of carbonate component. However, the prevailing meaning continued that Srbsko Formation is a normal siliciclastic wedge deposited in moderate depths, which might be best explained as a delta to pro-delta fan connected with uplifted and erosionally dissected continental margins. An uncertain range of medium depths was also suggested according to scattered occurrence of nine ichnofossil genera, incl. *Chondrites* and *Zoophycos* (Mikuláš and Pek 1996). An oblique collisional docking (Hladil et al. 1999) having been coupled with short-lived burial and consequent rapid exhumation (Hladil 1998; Mann et al. 1999) was recently suggested, but nothing was made for understanding provenance of this latest sedimentary material.

The major part of sediments in the Srbsko formation, having been studied in thin sections, contain an evident component of pelagic carbonate sediment in form of “pelagic ooze” which was partly dissolved during processes of compaction and lithification. Deformation of fossils indicates compaction ratios up to 7, on same places > 20. Small biomorphs are dacryoconarids (ecologic analogue of present pteropods) and radiolaria. Siliceous sponge spicules and rare echinoderm microfragments locally occur. Several horizons of fine-grained calciturbidites were found. The grains of upper-silt to fine-sand size are mostly derived from relatively fresh bioclastic material (crinoid tissues) which first had been collected in upper part of the slope and then transported in turbid gravitational flows. The distal tur-