spheric thinning to about 80 km, as well as with a gradual change of the pattern of P residuals marked by rays propagating from the south and north. The region south of the lithospheric thinning may correspond to a hypothetical thinned and weakened rift lithosphere in the Early Paleozoic (Schulmann et al. 2000), underthrust beneath the Moldanubicum after ocean closure in the Late Paleozoic (Franke and Oncken 1990). The south-oriented underthrusting or subduction of a mature Saxothuringian deep lithosphere beneath the younger and softer Moldanubian block in the westernmost part of the BM, modelled from our data, is in accord with many geological and geophysical observations in this region.

Studying the deep structure across the S/M contact, we have observed the thinnest lithosphere as well as a major change in the anisotropy pattern in the direct continuation of the Ohře Graben west of its limits. We can thus assume that the Variscan S/M suture was a predisposition of the Tertiary rift structure, which developed along the northern margin of the Teplá-Barrandian Unit.

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Pannonian Zone E Basin-Margin Parasequences (Danube Basin, Slovakia)

Ivan BARÁTH

Geological Institute, Slovak Academy of Sciences, Dúbravská 9, 842 26 Bratislava, Slovak Republic

Sandy-clayey sediments of the Pannonian biostratigraphic zone *E* in the Pezinok clay pit at the eastern margin of the Danube Basin are well known paleontologically. The aim of this work is to reconstruct the history of changes in sedimentary environments in terms of sequence stratigraphy.

The new sedimentological and paleontological data reveal interrelationships between different sedimentary paleoenvironments and allow to distinguish seven facies associations (FA) within the 35-m thick exposed sedimentary succession: back-barrier transgressive FA, transgressive sand sheet FA, shallow offshore FA, beach-ridge FA, marsh FA, lagoonal FA and alluvial plain FA.

Both the vertical and horizontal changes in facies associations reflect the relative changes in standing water level. Six lacustrine cycles were interpreted in the lower part of the key sedimentary log. The upper part of the section is dominated by alluvial sediments, where the recognition of cyclicity is rather complicated due to many erosional events, and more data are needed.

In the lowermost part of the key log, medium-grained cross-stratified sands are interpreted as upper wave-dominated delta-front beach-ridge deposits. Their upper surface, acting later as a transgressive surface, is rippled and bioturbated by fossil plant roots.

The overlying composite back-barrier transgressive facies association marks the beginning of the first recognized sedimentary cycle. The facies consists of grey to green laminated silty clays and homogeneous clays with an organic-rich black horizon. A sandy washover-related intercalation is also visible in these clays. The upper surface of the back-barrier transgressive sediments is truncated by a transgressive sand sheet. The truncation plane is interpreted as a ravinement surface, which is covered by a 3–10 cm thick, shell-rich sandy layer, representing a transgressive winnowed lag, marking a unconformity due to shoreface retreat.

The following transgressive unit consists of silty sands to very fine sands with regular intercalations of clayey silts, deposited in the lower-shoreface environment. This facies is gradationally overlain by coarser sands of upper-shoreface origin, representing the beach-ridge facies association with abundant carbonised roots.

This cycle is topped by a lignite layer with up to 1 m thick tree trunks, originated in a forested marsh environment, documenting the initial transgressive unit of the second cycle. The overlying greenish-grey laminated sandy clays, rich in roots, wood and plant fragments are interpreted as originated in back-barrier landward position, in freshwater swamps and ponds, during the initial transgression phase. The upper portion of these sediments is truncated (ravinement surface) by a fossil-rich lag with sandy matrix, which is abruptly overlain by hummocky cross-stratified fine sands of lower-shoreface origin, representing a transgressive facies association.

The upper part of the cycle is missing due to the interpreted subaerial erosion phase, documented by distal root remnants on the upper surface of the transgressive sand sheet.

Above the erosional flooding surface, the third cycle starts with a lag comprising thin sandy clay rich in molluscan fauna.

An abrupt onset of shallow offshore facies is visible above the molluscan lag. It consists of grey laminated silty clays, coarsening upwards into silts and sands of beach-ridge facies association. The cycle is topped by lagoonal grey silty clays with mixed freshwater and brackish molluscan fauna. The top of this unit is organic-rich and contains small rootlets.

The fourth cycle starts with rapid flooding and sedimentation of shallow offshore greenish-grey laminated silty clays, passing gradually upwards into lower and upper shoreface sands, representing a prograding beach-ridge facies association.

The fifth cycle starts with very thin (3–15 cm) back-barrier transgressive facies of sandy clays rich in plant fragments. The transgression culminated by a thin layer of green clay, which we interpret as the maximum flooding surface. The overlying laminated offshore silty clays show slight coarsening upwards. The sedimentary succession continues with yellow, well-sorted fine sand with abundant shell material. It represents a beach-ridge facies.

The overlying structureless fine sands to silty sands contain freshwater and continental molluscan fragments as well as wood and plant debris. The sedimentary paleoenvironment is interpreted as the landward margin of beach ridges, on the margin of lagoonal/paludal areas.

The cycle is covered by 10–40 cm thick marsh-related lignite seam with roots, penetrating more than 3 m deep into the underlying sediment. This initial transgressive unit of the sixth cycle is followed by the onset of greenish-grey laminated offshore clays. 18 cm above its base, a thin (4 cm) layer of grey pure clay is developed with nodular central part. We suggest that it was deposited under sediment-starving conditions and interpret it as a small-scale cycle maximum flooding surface. The overlying clays coarsen upwards into laminated silty and sandy clays and, across flaser-laminated portions, they gradually pass into sands interpreted as a prograding beach-ridge facies association on a wave-dominated delta front. At the base, the sands are horizontally laminated, passing upwards into hummocky cross-stratified and rippled portions. The sandy facies is covered by lagoonal silty clays with freshwater molluscan fragments, interpreted as a low-energy delta plain.

The lacustrine cycles are overlain by a composite alluvial plain facies association, which includes an alternation of four different lithofacies, related to floodplains, levees, channels and crevasse splays.

The generalized stacking pattern of the recognized cycles (parasequences) in the studied sedimentary succession in Pezinok clay pit displays a relatively rising water level from the first cycle upwards in the section. These results suggest that most of the studied succession belongs to one 3rd-order sedimentary sequence. Based on the stacking pattern trend, a 3rd-order maximum flooding surface can be interpreted at the boundary between cycles 4 and 5. The upper two cycles and the alluvial-plain facies association may represent a highstand sedimentary systems tract. The presence of a thick fluvial channel fill in the uppermost part of the section may indicate a 3rd-order sedimentary sequence boundary at its base. This estimate may correlate with such sequence boundary recognized in the upper part of the Pannonian zone *E* in seismic sections.

Metamorphism of Amphibolites from the Polish Part of the Staré Město Zone

Wojciech BARTZ

Institute of Geological Sciences, University of Wrocław, Pl. Maksa Borna 9, 50-204 Wrocław, Poland

The Staré Město Unit (Sudetic part of the Bohemian Massif) separates East Sudetes and West Sudetes. It consists of several NE–SW-trending belts of different lithologies. The base of the Staré Město Unit is characterised by the occurrences of spinel peridotites. Above, banded amphibolites intruded by a Variscan tonalite sill are present. Mylonitic gabbro occurs at the top of the sequence (Parry et al. 1997). Small part of the Staré Město Unit lies in the area of Poland, in the vicinity of Bielice village. This area is formed chiefly by banded amphibolites (northern part) and amphibolitic schists of the Velké Vrbno Dome (southern part). Concordant intrusions of syntectonic tonalites and granodiorites are present in the banded amphibolites (Wierzchołowski 1966).

Banded amphibolites are medium- to coarse-grained and often have stromatitic migmatite structure. The amphibolites consist of dark amphibole-rich layers alternating with light, tonalitic ones, rich in plagioclase and quartz. The amount of opaques is significant. Accessory apatite and titanite are common. Sparse K-feldspar, garnet and biotite are locally present. Amphibole has a composition of tschermakite or, rarely, Mg-hornblende. The Mg/(Mg+Fe) ratio ranges between 0.55–0.75. Amphibole grains are zoned; their cores are enriched in silica relative to the rims. Plagioclase is oligoclase or andesine; few albite and K-feldspar grains are present. The anorthite content most often decreases towards the rims. Plagioclase grains with inverted zoning are rare. The cores of garnets have a composition close to $Alm_{66}Spe_{6}Py_{15}Gr_{13}$ and rims $Alm_{62}Spe_{3}Py_{19}Gr_{16}$. Opaques are represented mainly by ilmenite or iron hydroxides. Some amphiboles in banded amphibolites are replaced by secondary chlorite, plagioclases are strongly sericitized. Prehnite occurs locally, filling fissures or replacing plagioclase.

The amphibolitic schists of the Velké Vrbno Dome are fine- to very fine-grained and foliated. They consist of green amphibole, plagioclase and quartz, plus subordinate opaques, chlorite, prehnite and pyroxene, epidote. Accessories are apatite, titanite and biotite. The amount of opaques strongly differs at the individual exposures. The rock is locally markedly rich in pyroxene and epidote, which form layers separated from the amphibolitic part of the rock. Amphibole is not zoned and has the composition of ferrotschermakite, tschermakite or rarely Mg- or Fe-hornblende. Plagioclase is characterised by anorthite content increasing towards the rims. Opaques are mainly ilmenite