transect across the Mallnitz Synform. Also, $^{87}Rb/^{86}Sr$ white mica ages range from 30-26 Ma to 25-20 Ma and apatite fission track data young in the same direction. A SE-ward increase in the intensity of mylonitic shearing along strike of the Mallnitz Synform is interpreted to be a manifestation of stretch faulting that was kinematically linked to top-E to–SE directed normal faulting along the central part of the Katschberg Shear Zone System (KSZS, SCHARF et al., 2013). We attribute the SE-ward decrease of the $^{87}Rb/^{86}Sr$ biotite cooling ages to an increased component of tectonic unroofing towards the eastern and southern margins of the Tauern Window. Moreover, new $^{40}Ar/^{39}Ar$ laser ablation data on individual mica grains in a transect oriented perpendicular to the central part of the KSZS yields ages between 31 and 13 Ma in the footwall. Nine samples were analyzed and their microstructural setting brackets the ending of rapid exhumation. The ages lead to the conclusion that ductile shear along the KSZS started sometime before 20 Ma at a temperature of more than 470°C and ended no later than 17 Ma at the contact of the KSZS with the Austroalpine unit above.

The consideration of structures in the Tauern Window combined with our new garnet age constrains duplex formation to have occurred before 25 Ma. Moreover, there is no difference in the cooling histories of the Hochalm and Sonnblick domes, indicating that the Eastern Tauern Dome was exhumed as a single unit during doing and coeval extensional exhumation in the footwall of the KSZS. Shearing along the KSZS started no later than 20 Ma and ended at about 17 Ma. The onset of rapid cooling related to fast exhumation is still poorly constrained, but probably began no earlier than 21 Ma according to stratigraphic criteria in the Giudicarie Belt of the Southern Alps (SCHMID et al., 2013).

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Jurassic to Early Cretaceous basin evolution of the northern Transdanubian Range: structural influences of two oceans

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The northern Transdanubian Range (TR), Hungary occupied a paleogeographical position between the Neotethys and Alpine Tethys during the late Jurassic and early Cretaceous. Structural events in the two oceanic domains strongly controlled the basin evolution.

We used field structural measurements, mapping, sedimentological and stratigraphical analysis to date the succession, reconstruct the basin geometry and structural evolution. To place structural data in Alpine frame, an 80–50 counterclockwise Cenozoic rotation should be considered.

Jurassic basin evolution started with differentiation of the Triassic carbonate platform in the Sinemurian. Syn-sedimentary dykes and faults prove extensional deformation related to early rifting events of the Alpine Tethys. The direction of extension was NNE–SSW at present position. Different Jurassic successions indicate map-scale faults: WNW–ESE trending normal, and N–S striking transfer faults with oblique-slip. As the revival of Early Jurassic faulting, nodular “Ammonitico rosso” and Bositra limestones deposited in syn-sedimentary half-grabens.

In geodynamic models, late Middle to Late Jurassic times were marked by the subduction of the Neotethys Ocean. For the TR, such models would mean N–S to NE–SW directed compression. However, direct structural observations indicate extensional or transtensional deformation. Observations can be consistent with a model that Late Jurassic extension could form on the bended part of the slab subducting to N or NE. The obducting Neotethyan oceanic crust and related nappes thrust over this downbended slab.

Long-lasting carbonate sedimentation stopped in the late Berriasian. The following Valanginian to Aptian basin evolution was dominated by clastic input from the approaching Alpine–Carpathian–Dinaridic nappe pile containing Neotethyan ophiolite and accreted passive margin rocks. The subsidence of the basin was caused by the increasing load of the emerging orogenic wedge. The TR remained on the southern side of this flexural basin during the Valanginian-Hautrivian. The instable slope was deformed by large slides with northern or north-eastern vergency. The more southerly located forebulge was marked by strongly reduced carbonate sequence.

In the Barremian to Aptian coarse clastics dominated over the marl deposition. Sedimentation took place in form of submarine fans. The orogenic wedge approached but still did not reach the TR clastic basin. After sedimentation ceased, the northern TR was gently folded and faulted by N–S or NE–SW compression in the earliest Albian.

As a major change, the whole TR was deformed by NW–SE compression. Large-scale NE-trending folds and thrust faults were completed from Albian to Coniacian (113–86 Ma). As part of this phase, the TR thrust over different Alpine nappe units and integrated to the Austroalpine system.

This structural evolution suggests that the TR changed completely its structural position: it was on the lower plate in the Jurassic–early Cretaceous and became the highest unit in the “Mid-Cretaceous” phase. This needs a major reorganisation of the subducting and overriding plates. We follow earlier suggestions that a major strike-slip fault operated during this time. The large shift placed the TR and its Neotethys-related foreland-type Early Cretaceous basin in the rear of the subduction, in the highest position.

Acknowledgements: The research was supported by the grant OTKA K 68453.

Late Miocene depositional units and syn-sedimentary deformation in the western Pannonian basin, Hungary

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The Pannonian Basin system is due to late Early to Mid-Miocene lithospheric extension and related crustal faulting between 19 and 11.6 Ma. The faults bounded more or less isolated sub-basins with few hundred meters of marine sediments while the intermittent basin highs were marked by a reduced sedimentation or erosion.