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.

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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.

At the beginning of the Late Miocene, the sedimentation has been changed and the brackish Lake Pannon developed. Between 11.6 and 9.7 Ma the former basin highs were progressively inundated and the surface and volume of the lake increased. Since 9.7 Ma onwards clastic input via extensive fluvial networks progressively filled the lake, large scale normal regression took place.

Late Miocene deposition pattern, facies relationship and coeval structural geometry and kinematics, as well as their influence on sedimentation was studied by the help of surface structural, sedimentological and palaeontological observations, by 2D and 3D seismic reflection data sets. Our research extended into the Transdanubian Range (TR), the largest high in the Miocene, and sub-basins W, S and SE of it.

The transgressive phase resulted in in a spatially variable facies pattern. Deep lacustrine marls of large thickness accumulated in the deep sub-basins and condensed marls in the less than 100 m deep waters covering the basement highs. This lithofacies is characteristic along the western margin of the TR during 9.5–9 Ma. The clastic input reached the western Pannonian basin from the NW and N. As rivers entered the lake deltas of ca. 20–50 m thick coarsening upwards successions were formed. These shelf deltas prograded towards basin-margin-slopes of several hundred meters high in the deep sub-basins, and also towards flooded basement highs where slopes were missing. Deltas were prograding across both type of areas, but above deep basins deltaic successions has a large thickness, while on highs a reduced sequences.

Systemathic mapping of shelf-to-basin clinoforms clearly indicate the influence of basement highs which deflected slope progradation into a direction sub-parallel to highs. These basement highs were partly inherited from the syn-rift deformation, however, seismic sections clearly demonstrate active syn-sedimentary faulting during the transgressive phase and partly during slope progradation, ca. between 11.6 and 8.5 Ma. Fault-controlled abrasional gravels and fault breccias are found along the margins of TR, were most likely coeval with the flooding of highs and and might have occurred between 9.5 and 8.8 Ma. Surface measurements suggest an E–W to ESE–WNW extensional (transtensional) stress field in agreement with seismic fault mapping. South from the TR, thickness of basinal marls decreased above E–W trending active transpressional ridges between ca. 12 and 9 Ma. After the ceasion of deformation during slope progradation between 9 and 8 Ma, growing of E–W trending anticlines started from 8 Ma. However, regional subsidence counterbalanced anticlinal growth and deltas overstepped folds.

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Garnet systematics of a polymetamorphic basement unit: Evidence for coherent exhumation of the Adula Nappe (Central Alps) from eclogite-facies conditions

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The Adula Nappe in the Central Alps is derived from the former continental margin of the European Plate that was subducted beneath the Adriatic Plate during the Alpine orogenic cycle. It consists of pre-Mesozoic basement (various gneisses with layers of garnet-micaschist, and bodies of mafic and locally of ultramafic rocks) and few Mesozoic cover rocks. High-pressure and ultra-high-pressure conditions are preserved in eclogite and ultramafic rocks but are apparently not recorded in the gneisses that build up the bulk of the nappe. It is unclear whether the unit constitutes a tectonic mélange that is compiled of rocks