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The Parndorf- and Seewinkel gravel beds - implications of Middle Pleistocene uplift and neighboring subsidence in the Northern Burgenland (Austria)

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The Pleistocene terraces in the Alpine foreland of Austria are characterised by a succession of oldest terraces at highest positions stepwise followed up by younger terraces in deeper positions down to the recent bed of River Danube and its tributaries. Based on this principle (regarding loess cover, palaeo-soils, soil successions, cryoturbation and fossils if any), several terraces in Lower Austria with a basement ranging between 60 and 120 meters above river Danube are supposed to be of Upper Pliocene/Early Pleistocene age. Terraces with a basement at 45 meters above River Danube in general date as Günz, and at 17-30 meters above this river as Mindel. Around Vienna the so-called Hochterrasse (high terrace; Gänserndorf terrace) with its base at about 16 meters above the River Danube is of Riß age, and the Niederterrasse (low terrace; Prater terrace), which is situated about 8 meters above this river, is of Würmian age.

This method of indirect dating of terraces according to their height above River Danube cannot be applied, however, when terraces were tectonically tilted or when gravel beds were deposited in regions of Pleistocene subsidence such as the Little Hungarian Plain (Kisalföld). A new approach of paralleling Pleistocene terraces of the Northern Burgenland (Parndorfer Platte - Seewinkel) with Pleistocene deposits in Northwestern Hungary promotes discussion of Middle Pleistocene palaeogeography related to fault tectonics. This region consists of a slightly folded Upper Pannonian basement, which is unconformably overlain mainly by Pleistocene fluvial deposits.

Today the Parndorfer Platte is a plateau, which is tilted few degrees to the southeast, and covered with Pleistocene fluvial deposits. As the basement of the Parndorf gravel beds - close to the uplifted Leitha Mountains - crops out 17-30 m above River Danube, the gravels are dated as Mindel. Probably from Pliocene up to Mindel, the

Palaeo-Danube run through the Bruck gate (termed after Bruck/Leitha) along a former Parndorf valley to the southeast.

During the Mindel/Riß Interglacial the River Danube shifted 10 kilometres to the north then cutting down the pre-Tertiary basement at Hainburg/Devin. Due to the new discharge of River Danube through the Hainburg gate, Riß terraces incise the Mindel terrace of the Parndorfer Platte, and the gravels of Riß-Danube were widespread in the Seewinkel region, there overlying the older gravel beds. As the direct continuation of the Seewinkel gravel beds was mapped as Riß deposits in Northwestern Hungary, the former Würmian age of the Seewinkel gravel in Austria must be revised. The basement of the Seewinkel gravel beds is not known in the Seewinkel area, because they are underlain by gravels of probably Mindel age. Nevertheless, the basement of the Seewinkel gravel can be assumed approximately at about 100-110 meter altitude from bore hole drilling, which is 20-30 meter below the recent bed of neighboring River Danube.

Pleistocene gravel deposits of in total 10-30 m thickness in the Seewinkel area continuously increase in thickness towards the southeast up to some hundred meters, indicating Pleistocene synsedimentary subsidence of the Little Hungarian Plain. Thicker local accumulations of Seewinkel gravels in the Northern Burgenland can be interpreted as a result of mini pull-apart basins along well known (reactivated) northeast trending faults.

In total, the southeastern Parndorfer Platte acts as a hinge linking the uplifted crystalline basement of the Leitha Mountains (with classic succession of Pleistocene terraces) in the west with the subsided Seewinkel area in the east, where Mindel gravel deposits are overlain by Riß gravel beds, as proved by numerous borehole-sections of the Little Hungarian Plain. This contribution highlights new results of Middle Pleistocene palaeogeography of the Austro-Hungarian border region focusing on the dependency of River Danube sedimentation upon tectonic processes.