



Loess Sequences of Upper Austria

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1. Introduction Investigations on paleopedology and Quaternary stratigraphy were carried out in the area of fluvioglacial terraces of the rivers Inn and Traun/Enns. Research projects have been financed by the German Research Foundation (DFG) and the ICSU Grant Programme. This research has been performed in close cooperation with the Geological Survey of Austria (Vienna). Detailed studies were carried out on paleosols and loess sequences of different ages. The investigations of the research group were focussed on loess/paleosol sequences located on top of Riss terraces (OIS 6 and older) as well as in areas with Mindel and Günz terraces.

2. Results Loess records of the last glacial/interglacial cycle can be well observed in the study areas. Generally, the Eemian soil (O/S 5e) is developed as a reddish Bt-horizon in fluvioglacial gravels. U/Th-datings of calcites in the fluvioglacial sediments are indicating that soil formation took place in the catchment area about 113.000 ± 4.400 ka (Terhorst et al., 2002). The interglacial paleosol was truncated in the upper part and a redeposited colluvial layer was deposited on top of the Bt-horizons containing charcoal with characteristic relicts of coniferous trees. After this land surface destabilisation phase, sedimentation of loess became the predominant process. Pedogenesis in form of a humic brown paleosol occurred, which partly has been redeposited. The pedosediment is characterized by intense bioturbation of steppe animals. Therefore it is supposed, that this part of the sequence correlates with the Mosbach Humic Zones according to Semmel (1968, 1999) which belong to the Early and lower Middle Würmian stage. Luminescence ages of the sediments are providing a more reliable chronological framework of the sequence. The humic soil sediments are covered by thick younger Würmian aged loess deposits. These are designated to represent the last glacial period. Well-developed Tundra Gleysols subdivide the loess deposits. The uppermost soil corresponds to the recent Holocene Luvisol that includes hydro-morphic properties.

Older fluvio-glacial terraces of Mindel and Günz age (in the classical stratigraphy) show a completely different structure of the covering layers (c.f. Kohl, 1999). In this case, several thick interglacial paleosols are embedded within records of loess loam and redeposited material. However, five to six interglacial paleosols are developed inside the studied sequences. Paleomagnetical investigations are leading to the assumption that different Middle Pleistocene excursions could provide chronological data in the future.

3. References

KOHL, H. (1999a): Das Eiszeitalter in Oberösterreich. Teil III - Das eiszeitliche Geschehen in den nicht vergletscherten Gebieten Oberösterreichs und die Entwicklung im Holozän, Jahrbuch Oberösterreichischer Museal-Verein, 144/1: 250 - 429, Linz. SEMMEL, A. (1968): Studien über den Verlauf jungpleistozäner Formung in Hessen. - Frankfurter geogr. H., 45: 133 p., Frankfurt a. M. SEMMEL, A. (1999): Loess section of Mainz-Weisenau. In: Weidenfeller, M. & Zöller, L. (Eds.). Loess in the Middle and Upper Rhine area. Field Guide Loessfest '99, 57-69. TERHORST, B., FRECHEN, M. & REITNER, J. (2002): Chronostratigraphische Ergebnisse Aus Lößprofilen Der Inn- Und Traun-Hochterrassen In Oberösterreich. - Z. Geomorph. N.F., Suppl.-Bd., 127: 213 -232, Berlin, Stuttgart (Gebr. Bornträger).