



Evidence for a subglacial drainage system at the Salzach Foreland Glacier (Austria)

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As suggested by Weinberger (1952) the area of the Wuermian Salzach Foreland Glacier (Innviertel, Upper Austria) is one of the few subglacial drainage systems that are known in the alps. In the area, which is situated very close to the former ice margin, multiple about 40 - 50 m, up to 400 m wide and some kilometres long, subparallel valleys incised into glacial sediments of the last glaciation. These sediments are mostly conglomerated gravel, which were declared as advance gravels ("Vorstoßschotter"), and often covered by diamictic, consolidated lodgement till and unsorted ice decay sediments. The subparallel valleys start to converge after some kilometres to the north and then constrict to narrow, more than 10 m deep channels which were ending abruptly in the broad sandar plains (Niederterrasse) that were built in front of the former wuermian glacier. The fact that they are in obvious connection with the sandar plains corroborate the theory that water led to the truncation into the glacigenic sediments. The convex up long profiles of the overdeepened valley floors indicate that there was erosion by water under pressured conditions (Sjogren et al., 2002). Several small lake basins within the subglacial system are proposed to be potholes which initiated by moulins under such conditions (Weinberger, 1952) and were important former water input resources. However such a pressurized milieu can only be produced under subglacial conditions.

The narrow channels, in which the valleys converge, do not show convex up profiles but a small dip to north like the sandar plains in which they lead to. These channels are cut into the ice decay sediments and are supposed to be the subaerial part of the drainage system. The fact that the channel cut into this late glacier deposits demonstrate that the drainage system had to be active for a very long time- as long as the glacier was in this position. Some terraces in this area are blind ending in hummocky

moraine, respectively in kame and kettle topography, suggesting that not all parts of the drainage system were as long active, but became inactive and were covered with ice decay sediments.

The surveyed subglacial drainage system is a main area for groundwater renewal in this region. The exploration is sponsored by the Government of Upper Austria.

References

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- Sjogren, D.B., Fisher, G.T., Taylor, L.D., Jol H.M., Munro-Stasiuk, M.J. 2002. Incipient tunnel channels. *Quaternary International* 90, 41-56.