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Upper Middle Pleistocene climate and landscape development of Northern Germany

B. Urban

LEUPHANA University Lüneburg, Water, Soil and Resources Engineering, Faculty of Environmental Sciences and Engineering, Suderburg, Germany (brigitte-urban@t-online.de, +49 5826 8661)

The Pleistocene sequence of the Schöningen lignite mine contains a number of interglacial and interstadial limnic and peat deposits, travertine tuff, soils, tills and fluvioglacial sediments as well as loess deposits. The complex Quaternary sequence contains six major cycles with evidence of four interglacials younger than the Elsterian glaciation and preceding the Holocene.
The sequence begins with Late Elsterian glacial and three interstadial deposits formed in shallow basins. Cycle I is assigned to late parts of the Holsteinian interglacial. A strong cooling is recorded by a significant increase of Artemisia and grasses during the following Buschhaus A Stadial, which is considered to mark the onset of the Saalian Complex sensu lato (penultimate glacial-complex).
The lacustrine sediments of Cycle II, Reinsdorf interglacial sequence (Urban, 1995), have been found to occur at archaeological sites Schöningen 12 and 13 (Thieme,1997). Recent investigations give evidence for at least 13 Local Pollen Assemblage Zones showing a five-fold division of the interglacial and a sequence of five climatic oscillations following the interglacial (Urban, 2006). From the relative high values for grasses and herbs in the inferred forested periods of the interglacial, a warm dry forest steppe climate can be deduced. The
stratigraphic position of throwing spears (Thieme, 1997), can clearly be allocated to Reinsdorf Interstadial B (level II-4) characterized by an open pine-birch forest. Uppermost parts (level II-5) represent the transition into a periglacial environment indicating the definite end of cycle II.
The Schöningen Interglacial (Cycle III) represents the youngest of the pre-Drenthe (Early Saalian Stadial) interglacials (Urban, 1995). In summary, it can be concluded that the Middle Pleistocene terrestrial pollen record of the Schöningen sequence represents tentative correlatives of MIS 7, 9 and 11.
North of Leck (North Friesland, Schleswig-Holstein) sediments of the centre and the margin of a 286 m deep channel, subglacially eroded during the Elsterian, have recently been investigated by 9 counter flash or cored drillings (Stephan et al., in press). Studies focussed on the uppermost 50 m, made up of a series of approximately 9 m thick fluviatile sediments (“Leck-Folge”) with intercalations of organic sand layers and a gyttja band, up to 1.5 m thick. This sequence is overlain by several metres of mainly decalcified groundmoraine, that, itself, is overlain by glaciofluvial and periglacial sediments. The palynological investigations of the gyttja reveal a floral development of interglacial character (“Leck-Thermomer”).
Compared to other Middle Pleistocene warm periods in North Germany, correlations of the Leck-Thermomer with the Holsteinian and with the warm periods of the Reinsdorf and Wacken (Dömnitz) interglacials are precluded or appear rather implausible. The Leck-Thermomer is most likely a correlative of the marine oxigen isotope stage 7 c (MIS 7).

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