

The last 400 ka in loess-palaeosol records from Northern France: Environmental background and dating of the Palaeolithic

P. Antoine¹, S. Coutard^{2,1}, J.-L. Lochet^{2,1}, E. Goval³, D. Hérissou⁴, O. Moine¹,
J.-J. Bahain⁵

¹UMR 8591 CNRS-Université Paris I, Laboratoire de Géographie Physique, Environnements quaternaires et actuels, Meudon, France; ²INRAP Nord-Picardie, Amiens, France; ³Service Régional de l'Archéologie des Hauts de France, Amiens, France; ⁴CNRS-UMR7041, MAE, Nanterre, France; ⁵UMR 7194 CNRS - IPH, Paris, France

DOI: 10.18154/RWTH-2019-10416

In Northern France, Quaternary loess-palaeosol sequences represent the main deposits in which Palaeolithic sites are generally recovered. The oldest loess deposits, dating from the Middle Pleistocene, are generally preserved in sedimentary traps formed by the junction between the chalky slopes and the alluvial formations of the Somme River fluvial terrace system or by deep sinkholes (3-5 m) resulting from the dissolution of the chalky substratum on the plateaus. They are mainly resulting from local deflation processes reworking the top of sandy fluvial deposits. A large extension of typical calcareous loess over the whole landscape is only observed from the end of the Saalian (\approx 150-135 ka). The heavy mineral content of these aeolian deposits testifies to a distant transport from the polar desert areas of the dried Eastern Channel (\geq 100 km). Following the last Interglacial (Eemian), the Last glacial (Weichselian) is represented by a sub-continuous loess cover rising up to 7-8 m in thickness in the best locations as leeward slopes. In this large area, pedostratigraphic sequences from the last Interglacial-glacial cycle have been intensely studied, especially in the frame of rescue archaeological programs that have provided hundreds of individual sequences from test-pits or excavations and numerous archaeological layers.

The pedostratigraphic sequences from the last Interglacial-glacial cycle exhibit a regular pedosedimentary pattern including well identified pedological and periglacial marker horizons that can be followed towards the East, at least in Belgium and Germany. This approach leads to a detailed pedostratigraphic and chronostratigraphic scheme that represents a unique database to discuss the relations between Palaeolithic occupations and environment in Europe. It can be summarised by the succession of four main chrono-climatic phases following

the erosion of the Eemian brown leached soil during MIS 5d: (1) Early-glacial (112-72 ka) including a phase with grey forest soils (Early-glacial A: ≈MIS 5d-5a) and a phase with steppe-like soils (Early-glacial B: end of MIS 5a), (2) Lower Pleniglacial (≈70-58 ka): erosion, colluvial deposits then first typical homogeneous loess deposits marking the first occurrence of typical periglacial conditions, (3) Middle Pleniglacial (≈58-30): intense and short erosive episode (thermokarst) / deposition of bedded colluviums reworking the whole underlying units/development of a brown soil complex and weak aeolian deposition during most of MIS 3, (4) Upper Pleniglacial (≈ 30-15 ka): main network of large ice-wedge casts/drastring increase in loess sedimentation including tundra-gley horizons and large Ice wedge casts. In this context, the data show that Human occupation of Northern France was discontinuous during the Last glacial, with a clear concentration of Palaeolithic remains during the Early-glacial in forest-steppe contexts under continental climate. Only a few occupations were attributed to the Lower Pleniglacial and to the course of the Middle Pleniglacial and a gap is attested between ~ 25 and ~15 ka mainly during the period of maximal loess deposition. It thus appears to be a strong relationship between the intensity of human occupation and the climatic and environmental context. This could be conditioned by the relative abundance of large fauna, itself linked to vegetation density, as indicated by the extremely sparse biomass contemporaneous with the Upper Pleniglacial loess. Even if data are much more scattered for the Middle Pleistocene, a markedly concentration of Palaeolithic occupations is observed during the Early-glacial transitional phases (Early-glacial MIS 11/10, 9/8 and 7/6).

References

- Antoine, P., Coutard, S., Guerin, G., Deschodt, L., Goval, E., Loch, J.-L., Paris, C., 2016. Upper Pleistocene loess-palaeosols records from Northern France in the European context: environmental background and dating of the Middle Palaeolithic. *Quaternary International* 411, 4-24.
- Coutard, S., Antoine, P., Hérissou, D., Debenham, N., Spagna, P., Pirson, S., Balescu, S., Barré, M., Forget-Barrison, L., Chantreau, Y., Giros, R., Lamothe, M., 2018. La séquence loessique pléistocène moyen à supérieur d'Étrécourt-Manancourt (Picardie, France): Un enregistrement pédo-sédimentaire de référence pour les derniers 350 ka. *Quaternaire* 29, 311-346.