

LOESS STRATIGRAPHICAL RESEARCH AT THE PALAEO LITHIC SITE MAASTRICHT-BELVÉDÈRE

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ABSTRACT

Four representative loess sections in the Belvédère pit were investigated on their mineralogical content in the loess fraction (30-63 μm). Only lithostratigraphical units, containing real loess, were in-

corporated in this research. By means of the percentage of green amphibole (in fraction 30-63 μm) the lithostratigraphical Units 5 and 6 could be placed in a loess stratigraphical model, Unit 6 being deposited in the Weichselian, Unit 5 in the Saalian loess cycle.

INTRODUCTION

Until now the loess deposits of The Netherlands could only stratigraphically be divided into a Weichselian (Formation of Twente) and a pre-Weichselian part (Formation of Drenthe). Since a short time it has been tried to precise this rough division by means of new research methods. In 1980 for instance the traditional stratigraphical model had to be changed according to new findings of macro- and microscopic tephrostratigraphical research (Meijs, 1980, Meijs et al., 1983). Besides this, mineralogical research of the loess fraction brought new perspectives for a more detailed loess stratigraphy (Mees and Meijs, 1984).

For the palaeolithic site Maastricht-Belvédère the latter kind of research was used to obtain a loess stratigraphical framework.

The investigation of the mineralogical composition of the grainsize fraction 30-63 μm of loess samples started in France, Belgium and Germany by Lautridou and Juvigné. They found that Weichselian loess contained a greater percentage of amphibole than pre-Weichselian loess (Lautridou, 1968; Juvigné, 1978; Thieme et al., 1981). The research of Mees and Meijs (1984) revealed that this was also the case in the loess deposits of The Netherlands. On the basis of recent mineralogical research of major loess profiles of The Netherlands it was found that also the pre-Weichselian loess deposits could stratigraphically be divided by means of this method (see figure 1).

In loess sections, containing several interglacial palaeosols, each packet of loess lying between two interglacial soil-formation periods seemed to have a rather uniform percentage of green amphibole. The older the loess the lower that percentage. In calling the loess packet between two interglacial soil-formation periods a loess cycle, the following loess stratigraphical model could be composed.

Holocene soil		green
LOESS CYCLE I (Weichselian)	6.5 - 35	% amphibole (30-63 μm)
Interglacial paleosol A (Eemian)		
LOESS CYCLE II (Saalian)	3 - 6.5	%
Interglacial paleosol B		
LOESS CYCLE III	1.5 - 3	%
Interglacial paleosol C		
LOESS CYCLE IV	0.7 - 1.5	%
Interglacial paleosol D		
LOESS CYCLE V	0 - 0.7	%

Grouping of the green amphibole percentages in the different Weichselian lithostratigraphical units justified the following subdivision of loess cycle I.

PLENIGLACIAL B	}	10 - 35%
Horizon of Nagelbeek (Interstadial paleosol)*		
PLENIGLACIAL A	}	6,5 - 10%
EARLY WEICHSELIAN		

* According to Haesaerts et al. (1981) the tundra-gley palaeosol, called Horizon of Nagelbeek is dated around 22.000 years BP.

A condition for this type of research is that the samples should consist of real loess. In soliflucted and washed loess samples the possibility of contamination with underlying material is to great.

METHODS

The heavy and light minerals were separated by means of a centrifuge. The heavy mineral fraction was sucked up with a micropipet. From each sample 200-300 transparent heavy minerals were counted according to the ribbon-counting method, as described by Van Harten (1965).

RESULTS

In the Belvédère pit four loess sections (including those at the archeological sites B and E) have been examined on their mineralogical content in the loess fraction (30-63 μm) (see figure 1). In comparing the green amphibole values with those of the above mentioned loess stratigraphical model the following conclusions can be made.

The lithostratigraphical Units 6 and 7 belong to loess cycle I and Unit 5.2 to loess cycle II. The Units 1, 2, 3, 4 and 5.1 are all of non-aeolian origin and so cannot be incorporated in the loess stratigraphical research.

Although material of Unit 6.2 consists of soliflucted and washed sediment, it still has been investigated on its mineralogical composition in the loess fraction. This because of its archeological and paleontological importance. The green amphibole percentage of this unit ranges from 7 to 21%. The reason for this can be contamination with the older underlying sediment material. So it is more probable Unit 6.2 was deposited in Pleniglacial A than in the Early Weichselian.

According to the green amphibole values Unit 6.1, 6.3 and 6.4 belong respectively to the Early Weichselian, Pleniglacial A and Pleniglacial B periods.

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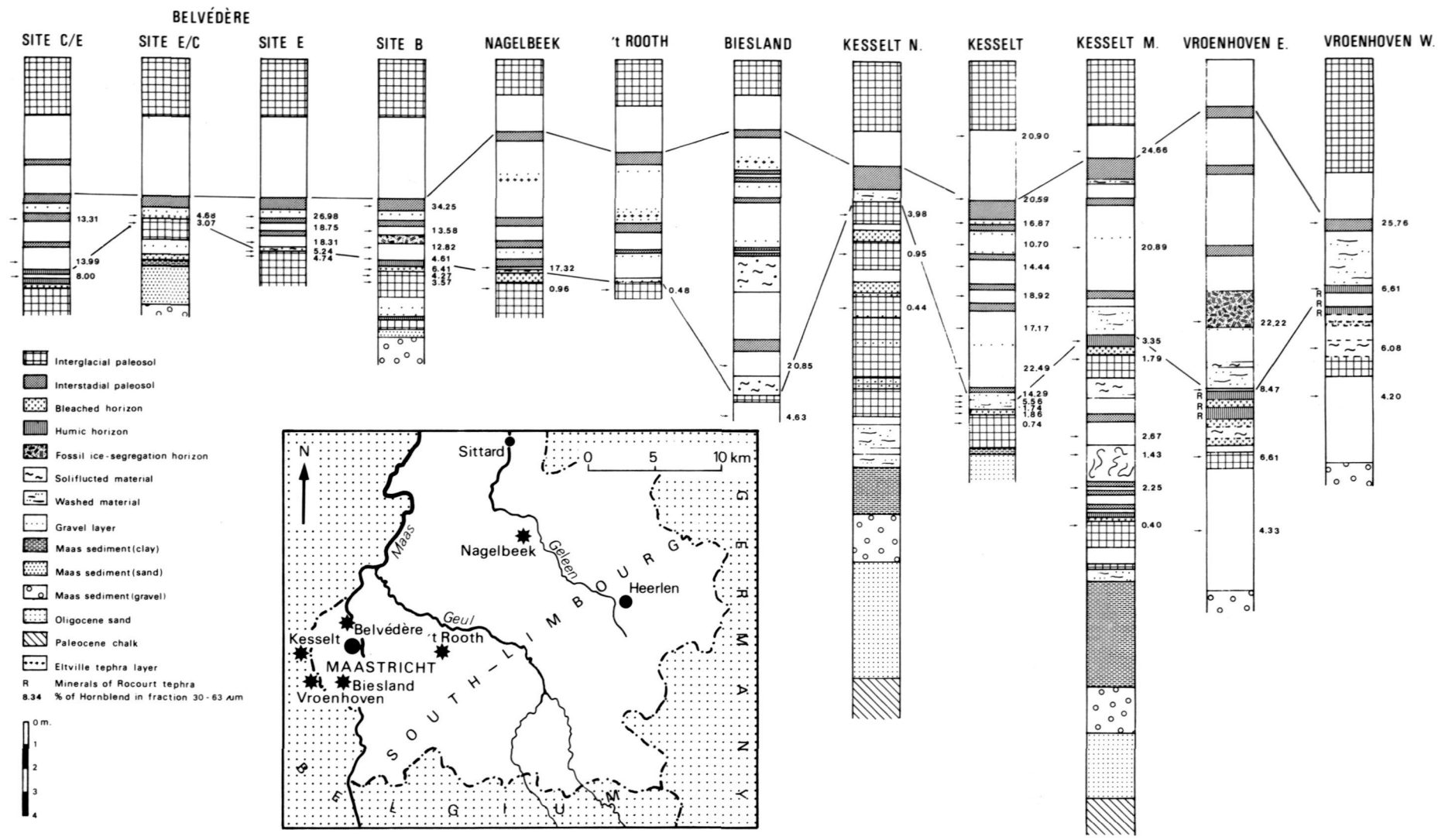


Fig. 1. Mineralogical investigation of the major Dutch loess profiles. On the right side of the profiles the percentages of green hornblend (amphibole) in the loess fraction of the samples are indicated.

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