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Kamermans, Hans; Velde, Pieter van de; et al., ; Velde, Pieter van de

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EDITED BY
PIETER VAN DE VELDE

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3 Geleen-Janskamperveld – landscape and soil conditions

Leendert P. Louwe Kooijmans

The site of Geleen-Janskamperveld is part of the well-known Graetheide cluster of Bandkeramik settlements, located at the northern edge of the South Limburg loess covered hills and forming the northernmost outlier of the LBK distribution. The specific conditions of the landscape have been described on several occasions (Bakels 1978; Modderman 1958-'59a, 1970, 1985) and are summarized here before focusing on the conditions at the site itself.

3.1 The South Limburg landscape

The South Limburg loess region stands out against the wider and more undulating loess plains of the Rhineland to the east and of Belgium to the west. It is a relatively narrow zone of the Middle European loess belt, where the loess covers the distinct terrace landscape of the river Meuse. There the river breaks out of the narrow gorge cut through the Ardennes, and enters the wide North European Plain to the north of it. The Cretaceous and Tertiary deposits in this region have been uplifted and tilted as a result of the gradual uplifting of the Ardennes Massif in the course of the Pleistocene. At the same time, the Meuse has alternately cut itself into these deposits, widened her valley or (in cold phases) deposited her coarse gravel deposits on the valley floors. Parts of the old valley floors were left as 'terraces' and were subsequently dissected by tributaries of the Meuse and her branches, like the Geleenbeek to her right side and the Jeker/Geer and the Heeswater to her left side. The formation of numerous small tributary valleys has been ascribed to cold phases with permafrost and solifluction. They are deeply cut into the very permeable Cretaceous subsoil and are nowadays without flowing water or have only a very modest stream. Dust was blown from the glacial tills of the northern plain and deposited as blankets of loess over this landscape in the same pleniglacial cold phases. In the intermediate temperate periods, these covers were eroded or preserved in the less exposed, flatter or protected parts of the terraces. The main preserved loess deposit is that of the last or Weichselian glacial stage.

The glacial-interglacial cycles of landscape genesis came to a stop for the time being by the formation of the Lower Terraces during the final incision of the Meuse. The small Late Glacial erosion valleys were fossilised in the early Holocene in the form of dry valleys. The final stage, dated to post-Bandkeramik times, is formed by the slope wash or colluviation, resulting in the infilling of the valleys and the raising by several metres of the valley floors of the main rivers.

These landscape formation processes have resulted in a more dissected and broken geomorphology of the Upper Terraces in the southeastern and central parts of South Limburg, where hardly any flat landscape forms occur, except for the valley floors. The northern fringe of this Upper Terrace landscape belongs mainly to the Pietersberg Terrace stages, correlated with the earlier stages of the Sterksel Formation, dated to the Middle Pleistocene. They rise to 55 m above the valley floor of the Geleenbeek, a difference of about 40 m compared to the Graetheide Plateau.

The wide and rather flat Middle Terraces contrast with this hilly landscape. They are found along the present-day Meuse valley floor and South Limburg's northern fringes, with the Graetheide Plateau as its most prominent feature. In geological terms, this plateau belongs to the Terrace of Caberg, correlated with the sands and gravels of the Veghel Formation, as distinguished in the sandy district farther north. This plateau still has the very level appearance of a valley floor, with slopes of less than 1°, except for some wide 'valley-like depressions' with slopes of up to 2°. Both the considerable difference in age and the extension of the plateau explain the contrast with the geomorphology farther south. Adding to this contrast, the Geleenbeek has cut its valley at the rear side of the terrace, so isolating the plateau from the hills farther south. It is this plateau that attracted the first Bandkeramik settlers and has remained a remarkable core region in the subsequent centuries.

The present-day occurrence (recovery) of LBK archaeological remains is very closely linked to this differentiation of the landscape. Hardly any remains have been recovered from the hilly Upper Terrace district. This may be partly explained by post-Bandkeramik erosion and a more limited prospection, but the main reason must be the primary site location choice made by the Bandkeramik peoples themselves. The same holds for the valley floor of the river Meuse, where not erosion but alluviation hampers the recovery of sites. In recent years sites have however been discovered at the fringes of the Upper Terrace landscape and on the valley

Fig. 3.1 Map of the Geleenbeek with LBK sites/AHN/Geology (after Van Wijk/Van de Velde 2007).

floor, both adjacent to the LBK settlement cluster. They are dated to the final stages of the LBK and demonstrate firstly that sites *are* preserved in these zones and, secondly that the occupied space was extended from the preferred territories on the Middle Terrace into these zones, which were only traversed and occasionally visited before.

The loess landscape with its hills and terraces is bordered to the west by the fluvial plain of the Meuse and the Pleistocene (cover)sand deposits of the Kempen, the same cover sands that are found on both sides of the Meuse north of the Greatheide Plateau.

3.2 The location of Janskamperveld in the landscape

The site of Janskamperveld is situated at a height of 64-64.5 m, at the eastern margin of the Graetheide Plateau. To the southeast the surface gently slopes down to the valley floor of the Geleenbeek at *c*. 51 m NAP, over a distance of about 800 m. A minor tributary, called 'Keutelbeek', flows into the Geleenbeek to the south of the site. The original relief in Bandkeramik times must have been slightly more pronounced in view of the post-Bandkeramik colluviation and alluviation processes mentioned above. In the other

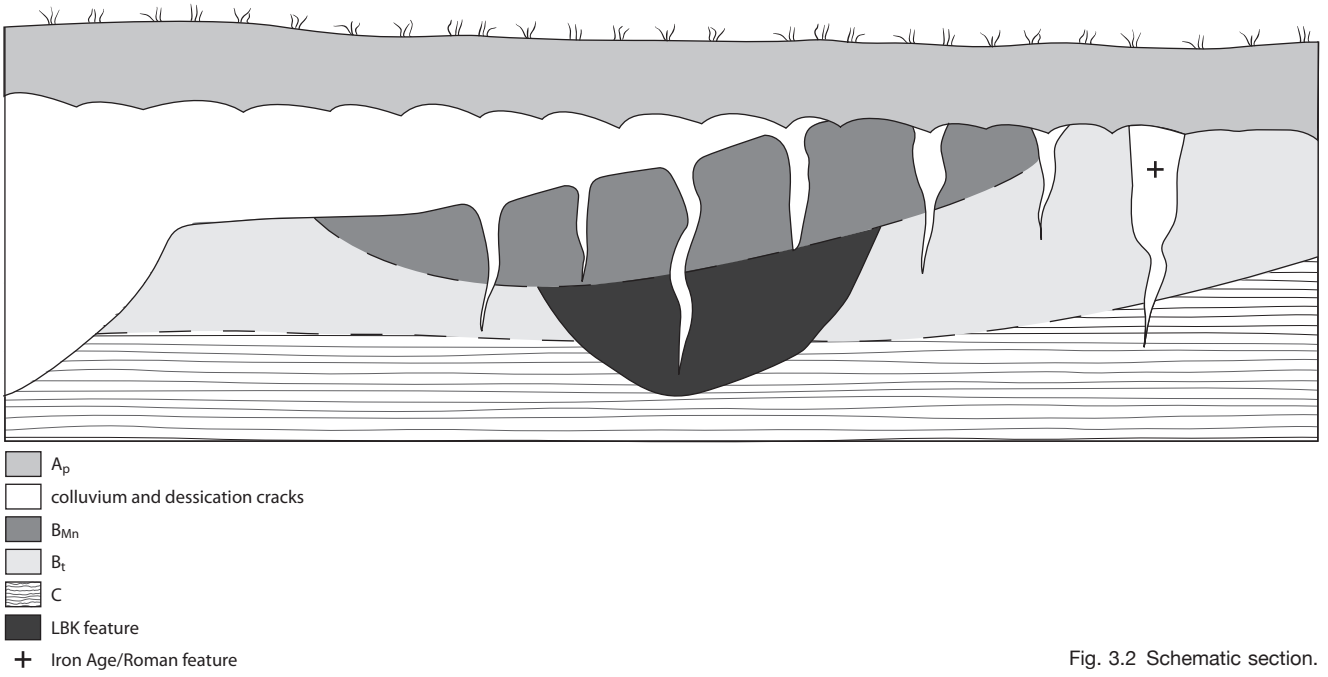

Fig. 3.2 Schematic section.

direction – to the north and northeast – the site is separated from the plateau itself by a wide and shallow depression, with a depth of a few metres below the site and the plateau farther to the north. The depression must have been several metres deeper in Bandkeramik times in view of similar alluvial deposition as assumed for the Geleenbeek valley. No research to establish the rate of these processes at this location has however been carried out. The location implies that the site was surrounded by gently sloping terrain at three sides and that an (almost) level surface, considered as optimal for crop farming, was restricted to the west over a distance of more than 1 km and covering roughly 50 ha. Water will not have been available from closer by than the Geleenbeek valley at *c*. 800 m and 15 m lower than the settlement. We assume, in contrast to Modderman (1970: 5), that the shallow valley to the north of the site, like most or all of the smaller Late Glacial valleys, will have been dry in Bandkeramik times, and not drained by an active brook. The subsoil is permeable and the valleys were filled by some metres of colluvium in the course of time. These small valleys will not have been a reliable source of water, especially not in periods of drought, without additional measures, like artificial water holes or wells.

From the site one has a view to the south across the Geleenbeek onto its southern valley slope, which rises relatively steep up to the Upper Terrace levels, intersected by a series of dry valleys. On one of the promontories, a few kilometres to the south, the la Hoguette site of Sweikhuizen is situated, within view of the early LBK settlements along the other valley slope. The contrast in site location combined with the absence of contact finds has been used as an argument for a difference in age, and is supported by the *ältesten* LBK contexts of similar la Hoguette material in the Frankfurt region.

The subsoil of the Upper Terraces consists of gravels deposited on Tertiairy sands, which outcrop in the upper parts of the valley slopes and may have been a nearby source of pebbles. At a distance of *c*. 13 km farther south, the subsoil changes into Cretaceous chalks with flint nodules, with Valkenburg and its eponymous flint in the southern valley slopes of the Geul as the nearest occurrence, but only incidently exploited by the Bandkeramik communities, who preferred the Rijckholt type, found at a distance of *c*. 20 km in the same, southerly direction.

3.3 Site location, cultural

Geleen-Janskamperveld is one of the many sites which together form the Graetheide cluster, and is part of the string of sites along the western slope of the Geleenbeek valley and its Keutelbeek tributary. The site lines up with well-known sites like Geleen-de Kluis (Waterbolk 1958-'59), Geleen-Haessselderveld (Vromen 1982) to the southwest, and Sittard (Modderman 1958-'59b; Van Wijk and Van de Velde 2007) to the northeast. The whole stretch of this valley slope – in

Fig. 3.3 Overview of the excavation from the west, from the roof of hotel Riche.

essence the southeastern edge of the Graetheide Plateau – is however dotted with finds and minor sites, giving the impression of an uninterrupted ribbon of occupation along the Geleenbeek and the small Keutelbeek. But we should be cautious in developing such a vision for the time when Janskamperveld was founded, in view of the differences in age of the individual sites. Truly synchronous with Janskamperveld are Geleen-De Kluis and Sittard in its first phases, which together make up a spatial arrangement of distinct settlements, separated by stretches of untouched woodland in this early stage, and continued to the west with the sites of Elsoo and Stein.

3.4 Local soil formation processes

The soil profiles in the sections of the excavated terrain reflect several stages of landscape evolution which can be dated in outline by the interconnections with dated archaeological features.

Similar soils have been the subject of intensive discussion on the occasion of earlier excavations of LBK sites. The arguments have been brought together and critically reassessed by Bakels (1978: 20-21).

At the base is the loess deposit, dating from the last glacial period. This loess is decalcified to a level deeper than the Bandkeramik features, which implies that all bone material has decayed. It must be assumed that the Bandkeramik farmers were confronted with this decalcified loess as well, since this decalcification will have started immediately after its deposition, at least five millennia earlier.

A gray brown podzolic soil, Dutch: *Bergbrikgrond*, German: *Parabraunerde*, (De Bakker and Edelman-Vlam 1976: 63) has been formed in its top as result of percolation and downward replacement of *lutum*.

This gave rise to a dense and tough B_t horizon, well known from all over southern Limburg and other LBK settlement sites in the region. There has been some discussion about the age of formation of this ‘argillic horizon’, summarized by Bakels (1978: 21). She is in favour of the arguments put forward by Scheys (1962) which are based on sections in nearby parts of Belgium, where he observed that LBK pits

Fig. 3.4 Field photo of a typical soil section, showing the arable, the colluvium and the B_t.

were dug through the A2-horizon into the clay illuviation horizon. Similar observations were made by Schalig (1973) in the adjacent German Rheinland. The earlier opinion of Van den Broek (1958-'59), that the illuviation continued through the filling of the LBK pits, should at least be adjusted. Bakels (1978: 121) concludes that "... the clay illuviation horizon in South Limburg was already present, at least to some extent, in the period in consideration" and that "... it is not inconceivable that the clay illuviation continued after this period".

It is obvious in Geleen-Janskamperveld as well that this soil is pre-Bandkeramik in origin, since all LBK features had been cut through it. The formation must have started when the glacial permafrost had disappeared and may have continued for some time after the Bandkeramik times. The present surface is almost perfectly horizontal and flat at a height of 64-64.5 m, but the local relief must originally have been slightly more undulating than it is now, as the upper horizons of this soil had disappeared at some places, bringing the B_t horizon to the surface, directly below the present arable layer. Modern plough furrows had cut into its top, affecting the depth and quality of the LBK features.

The B_t horizon had a soil structure of angular elements, into which it easily falls apart. The surfaces of these elements were covered with a dark film of *lutum*, which must reflect the last stage of eluviation. A second process of soil formation is the accumulation of (presumably) manganese and iron oxides in dark brown patches measuring from a few up to some ten metres in diameter and in places reaching deep below the lower limit of the B_t and as such obscuring the LBK features. Some of these patches were moreover clearly connected to large LBK pit fills, which because of their different texture and porosity may have been favourable for this process. Consequently, the process must be later than the LBK occupation. This 'browning' of the soil has in places seriously hampered the visibility of the traces left by the LBK occupation, which in general showed up as dark patches at 5-10 cm below the top of the B_t. The top itself was disturbed over some depth by recent burrowing of animals like moles which obviously had a preference for this level.

Fig. 3.5 Field photo of desiccation cracks.

The B-horizon *and* the LBK features were intersected by a polygonal pattern of linear features, to be interpreted as the leached fills of dessication cracks. These are in particular very pronounced in the sections of larger LBK pits. The cracks show a pale light gray, leached fill similar to those of the Iron Age and Roman period features, which at some locations seem to be part of this pattern. This would imply a stage of desiccation in or around that period (final prehistory), possibly related to the initial stages of the wide scale reclamation in that period. Similar observations have been made earlier by Modderman (1970: 6): " We have numerous times attested that the very characteristic *Trockenrisse* cut through the Bandkeramik features", and then very cautiously: "They originate also partly certainly from after 4000 B.C. (read: 4900 cal BC, LPLK)". The date could be more precise at Geleen-Janskamperveld thanks to the related features of later occupation phases. Modderman noticed that new cracks were formed in the excavation trenches at exactly the same locations, an observation which was not made, however, at Geleen-Janskamperveld forty years later.

The higher (A_1 and E) horizons were not preserved at Geleen-Janskamperveld in the (originally) lower parts of the terrain either, but transformed there into a pale yellowish and homogeneous deposit, relatively poor in lutum with a leached appearance and a depth of up to 30 cm, in places containing small particles of coal and brick. The youngest features covered by this deposit were the Roman burials, which showed up at the same level as the LBK features. Consequently, the deposit should be interpreted as a horizon of historical age, in which all original horizons (A_p and E) have been mixed up. Two processes may have played a role in its formation: colluviation and – in view of the very slight slope at most places – bio-homogenisation as well. A similar deposit was found as the fill of a large and deep feature in the centre of the excavated area, interpreted as a historical loess quarry, opening into the hollow road called 'Janskamperveldweg', which intersects the area from the southwest to the northeast, and was found in some comparable minor disturbances. These quarries could not be dated through

Fig. 3.6 Section across a deep complex of LBK pits, feature 34065, showing the laminated loess below the B_t.

the lack of datable material, but they may be of considerable historical age in view of the possible age of the sunken road. This road may date back to Roman times in view of its relationship to the Roman cremation cemetery, which lines up along its northwestern side, while it separates this cemetery from a small group of burials with relatively rich grave gifts at the other side.

Van den Broek (1958-'59: 12) made similar observations at nearby Sittard and concluded that the "... soil material above the B-horizon mainly consisted of a colluvium, as far as could be attested, with a depth of 30-150 cm" He suggested a date between 1500 BC and medieval times based on circumstantial evidence. Modderman (1970: 5), however, assumes in Elsoo an undisturbed A-horizon in view of the absence of indications for colluviation at the very flat terrain, but our observations at Geleen give some reason for doubt.

The youngest phenomena at Geleen-Janskamperveld are infrequent pale features with a dark core and an orange or black outline. They have been interpreted as disturbances in historical times, mainly by natural phenomena like roots, but some features along a line point to man-made fences.

The top of the sections is formed by the modern arable horizon (A_p) with a depth of 20-35 cm.

The historical colluviation processes, the quarrying of loess, the incision by the sunken road 'Janskamperveld-weg', and the accumulation of manganese and iron in a distinct patchy soil horizon all add up to a critical attitude to the original idea that the Janskamperveld site would have been preserved in mint condition. These processes, together with the modern buildings at its southern fringe, will pose some restrictions on the analysis of its history.

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L.P. Louwe Kooijmans
Faculty of Archaeology, Leiden University
PO Box 9515
2300 RA Leiden
The Netherlands
l.p.louwe.kooijmans@arch.leidenuniv.nl