

## (Middle) Palaeolithic finds from the Argex quarry at Kruikebe (East Flanders, BE)

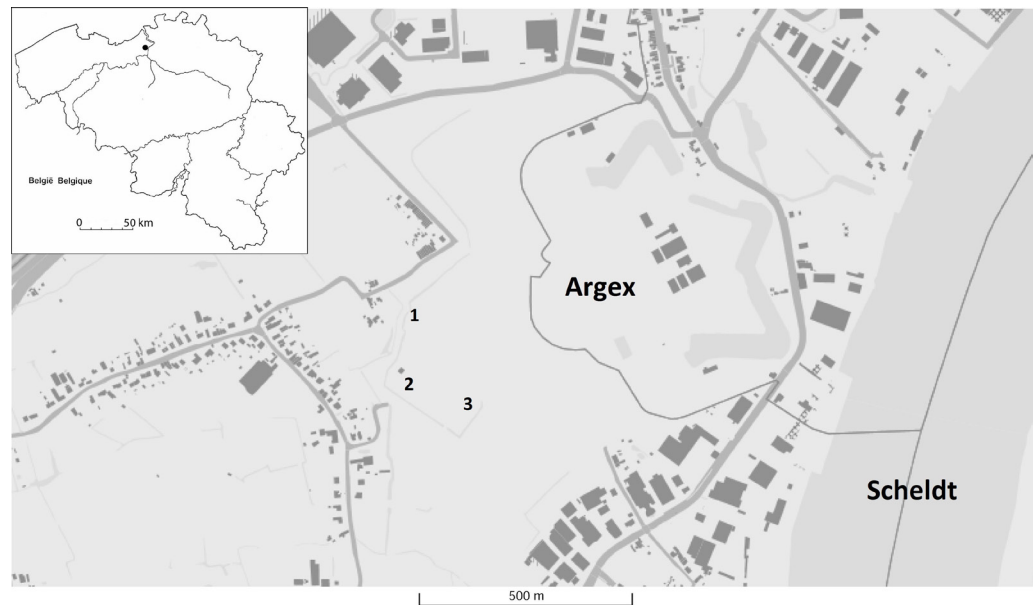
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### 1. Introduction

During geological excursions organized by the *Werkgroep Tertiaire en Kwartaire Geologie* (WTKG) and the *Belgische Vereniging voor Paleontologie* (BVP) in the clay quarry of Kruikebe-Argex in the Lower Scheldt basin (Fig. 1), two lithic artefacts and some remains of Pleistocene fauna were discovered in stratigraphic position. This short paper reports on these finds and explores the potential of the site.

Fig. 1 – Map showing the position of the site within Belgium and the Lower Scheldt basin (based on *Geopunt Vlaanderen*).

1. Mammoth tusk and atlas vertebra;
2. Lithic artefacts;
3. Mammoth mandible.



### 2. Site stratigraphy

The stratigraphy at Kruikebe-Argex is well understood thanks to several geological studies, e.g. by Prof. N. Vandenberghe, Prof. S. Louwye, among others, and consists from top to bottom of (Fig. 2, 3).

1 – A several meters thick deposit of Pleistocene coversands.

2 – A few cm to 40 cm thick layer of rolled gravel of mixed consistency, sometimes interrupted by layers of sand and clay. Predominantly Neogene shark teeth and other vertebrate remains are found reworked in this layer, intermixed with poorly preserved terrestrial and fluviatile mollusks. The most common species in this association are: *Succinella oblonga* (Draparnaud, 1801), *Succinea* sp., *Pupilla* sp. and *Planorbis planorbis* (Linnaeus, 1758). As no typical early or middle Pleistocene species have been found in this association, a late Pleistocene age seems most likely. However, this requires further study.



Fig. 2 – Photo of the main stratigraphy at the Argex-quarry. Photo T. Bulteel.



Fig. 3 – Detail of the stratigraphy at the Argex-quarry. Photo T. Bulteel.

3 – Up to 30 cm of a discontinuous layer of greenish sands is present below the Pleistocene gravel. The presence of *Angulus benedeni benedeni* (Nyst & Westendorp, 1839), *Neptunea angulata* (Harmer, 1914) and *Euroscaphella lamberti* (Sowerby, 1816) among other species indicate a Pliocene age (Marquet, 1998). This assemblage needs to be studied more extensively, but the presence of *A. benedeni benedeni* (Nyst & Westendorp, 1839) indicates that it belongs to or is younger than the Oorderen member of the Lillo Formation (Marquet, 2004).

4 – A several meters thick layer of plastic, dark grey clay belonging to the Boom Formation of the Rupelian (Vandenberghe et al., 2014).

During previous studies, Lower Miocene glauconitic sands of the Edegem Member (Berchem Formation) were found between the Boom Formation and Pliocene deposits at Kruikebeke as well (Hoedemakers & Dufrain, 2021). In the current situation this layer is absent.

All archaeological and paleontological finds were retrieved directly above the layer of glauconite sand (layer 3), some clearly embedded in the thin gravel layer (layer 2) at the basis of the Pleistocene coversands. The lithic artefacts were found just a few meters apart from each other. The faunal remains were collected in a radius of 200 to 300 m around these finds (Fig. 1).

### 3. Lithic artefacts

Two artefacts were recovered from the quarry, but they could be more common as they are often not recognized. Hence it can be assumed that more artefacts can be found at the location.

#### 3.1. Typo-technological description

The first artefact (64 x 41 x 8 mm) (Fig. 4-1) is a distal fragment of a rather large elongated flake or blade with a slightly convex profile. The dorsal negatives are multi-directional, potentially related to a centripetal preparation of the core, prior to the removal of this elongated flake or blade. The limited dimensions and poor visibility of the ripples on the distal facet, however, hamper its readability and render its interpretation uncertain. Both edges of this artefact, characterized by their angular to sinuous shape, moreover show macroscopically visible traces of edge-damage from their medial to distal parts. On top of this, the left edge is slightly notched, in its medial part, right above the break.

The second artefact (44 x 25 x 10 mm) (Fig. 4-2) is a shorter flake, knapped from a frost-fractured and heavily rolled nodule, affected by a pronounced (wind-?) gloss. With the exception of a single facet (?), the dorsal side is entirely made up of natural surfaces. While it therefore seems that this flake was rather opportunistically knapped from an un-

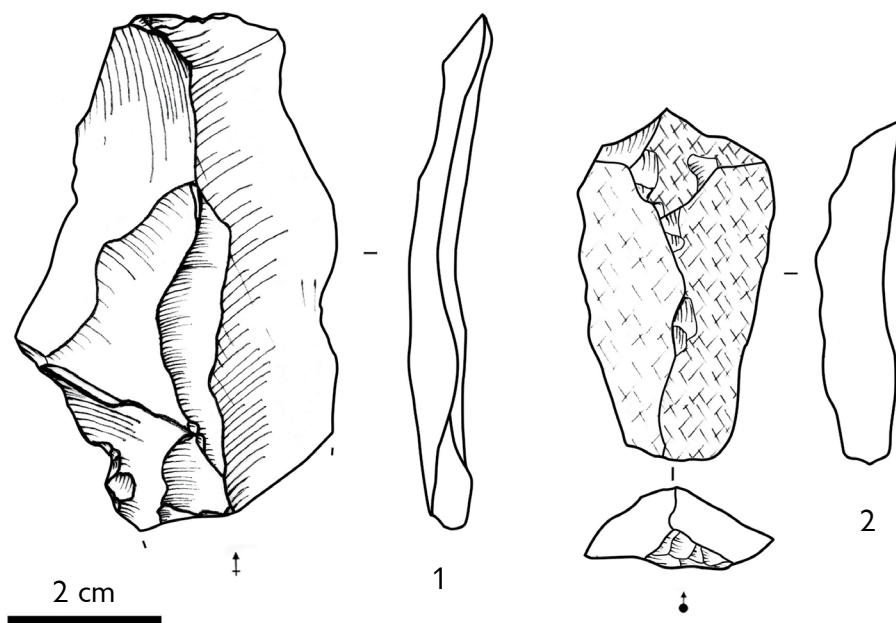


Fig. 4 – Flint artefacts found *in situ* at the Argex-quarry.  
Drawing H. Vandendriessche.

or only slightly prepared surface, its faceted striking platform bears witness to the greater care taken regarding this aspect of its removal. The exterior angle of this flake, situated between the striking platform and its dorsal side, is finally close to  $90^\circ$ .

### 3.2. Use-wear and residue analysis

The largest artefact displays clear traces of use and residue (Fig. 5). It is not affected by any alteration process, the surfaces are fresh and traces are well-preserved. Microwear analysis on this artefact followed the combination of low-power and high-power use-wear approach. For the low-power an Olympus SX7 microscope was used on 8-56x magnification, for the high-power approach an Olympus BX53M microscope was used on 50-500x magnification. In addition, the residue analysis was carried out employing a Zeiss AxioZoom 1.6.

Both edges display extensive multi-level edge scarring with rounding. There is moderately developed to developed polish on both the dorsal and the ventral side in a thin band along the edge and somewhat spread in the background on the higher parts of the surface on a microscopic level. The polish is smooth, flat, greasy, and bright, pitted, and has a transversal directionality. These characteristics are in line with the ones associated with hard animal material (*i.e.* bone or antler) working. The tool was interpreted as used to scrape/shave bone or antler.

There is a considerable amount of white-coloured residue on both the edges and some depressions on the surface of the tool. The residue is connected to microtraces on the edges, trapped in edge scars developed during use, therefore it might be connected to use. In the near future, these residues will be further analysed using Fourier-transform infrared spectroscopy (FTIR).

Unfortunately, the glossy surface of the second artefact makes it impossible to conduct microwear analysis. Visible residues were not detected on this specimen.



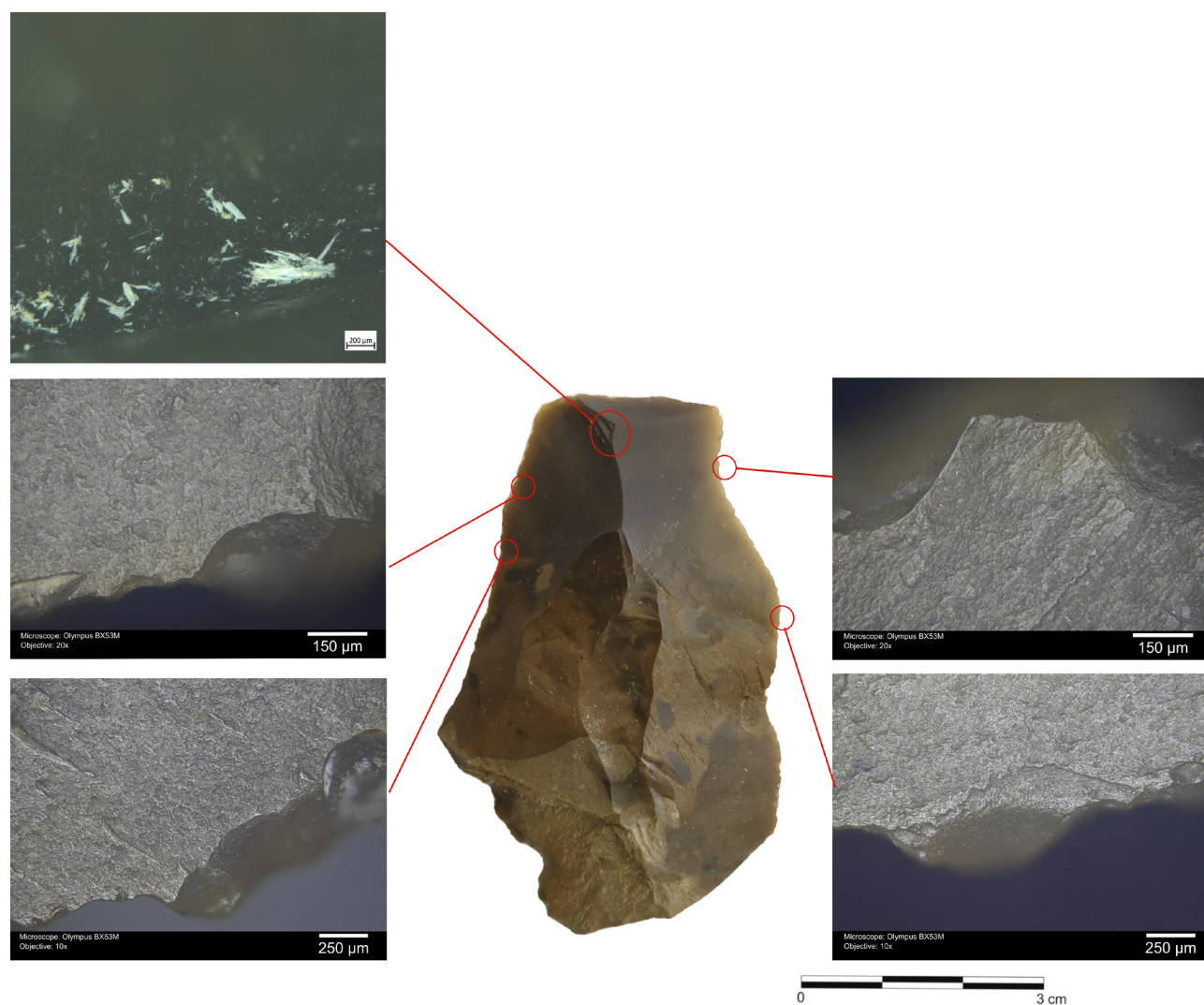


Fig. 5 – Residue remains (top left) and microwear traces (left and right middle and bottom) on the largest flake from the Argex-quarry. Photo's Éva Halbrucker.

#### 4. Faunal remains

Several skeletal remains of large Pleistocene terrestrial mammals have been recovered at the Argex quarry within the same stratigraphical context as the flint artefacts. Almost all recoveries belong to the mid to late Pleistocene woolly mammoth, *Mammuthus primigenius* (Blumenbach, 1799) and the woolly rhinoceros, *Coelodonta antiquitatis* (Blumenbach, 1799). Both are large grazers well documented in Pleistocene contexts from Northwestern Europe.

The most prominent find from this quarry is a mandible with the left and right m3 of an adult woolly mammoth (Fig. 6, collection T. Bulteel). Based on the stage of wear on both m3's, the individual age at time of death could be determined at 40 AEY (African Equivalent Years). The mandible was damaged by an excavator and the poor preservation on the left side is explained by the ramus being exposed for a long time.

Other finds include fragments of a mammoth tusk and an atlas vertebra belonging to a juvenile to sub-adult animal (Fig. 7, collection N. Alberts).

So far, only two remains could be attributed to the woolly rhinoceros, a proximal half of a metatarsal (Fig. 6) and a molar fragment (both collection T. Bulteel).

## 5. Discussion

The discovery of Palaeolithic finds in stratigraphical position is rather exceptional within the Flemish Valley of the Lower Scheldt basin; except for a few fortuitous discoveries of flint artefacts and faunal remains in quarries, e.g. at Uitbergen (Crombé & Vanderhaegen, 1994, 126-129) and Zemst (Van Peer & Smith, 1990), Palaeolithic finds are usually found in secondary contexts, e.g. dredged sediments or the plough-layer (Crombé & Van der Haegen, 1994, 105-130; Ryssaert *et al.*, 2021; Di Modica, 2011; Di Modica *et al.*, 2016).

The stratigraphical position of the few finds from the Argex-quarry at Kruibeke is very similar to the other find-spots in the Flemish Valley. In most cases flint artefacts and faunal remains are collected from the base of the valley, at the contact between the Paleogene or Neogene sediments and the Pleistocene sediments, often in gravel layers or fluvial deposits. Unfortunately neither the site stratigraphy, nor the lithic and faunal remains from Kruibeke allow a further chronological determination. However, based on some of the typo-technological features of both lithic artefacts, *i.e.* the potential centripetal preparation on the first artefact and the faceted striking platform/orthogonal detachment angle on the second, an overall Middle Palaeolithic age can be proposed. This age also fits with the preliminary results of the Pleistocene terrestrial and fluvial mollusks found at the same level (pers. com. Roosen, 2022). The particularly fresh appearance especially of the first artefact suggests little or no displacement; this also holds for the faunal remains, at least for the mammoth mandible with embedded molars. Hence, the possibility needs to be considered that both lithic artefacts and faunal remains are “associated” and belong to the same “occupational event”, despite the fact that they were not found spatially together but in a radius of 200 to 300 m. Yet they were found in the same stratigraphical context. This hypothesis is supported by the observation that the largest flake was used to work bone or antler, but certainty about a connection can only be achieved after further analysis of the faunal remains and the residue on the artefact. The latter might reveal whether the white residue is organic in nature and could belong to bone.

### Acknowledgment

We would like to thank Prof. N. Vandenberghe (KUL) and Prof. S. Louwye (UGent) for helping us clarifying the geological position of the archaeological finds. Thanks also to Johny Bultheel, CEO of Argex, for granting us access to the quarry.



Fig. 6 – (Left) Occlusal view of the m3's of the woolly mammoth mandible during preparation. Photo T. Bultheel.

Fig. 6 – (Right) Proximal half of a metatarsal of a woolly rhinoceros. Photo T. Bultheel.



Fig. 7 – Atlas vertebra of a woolly mammoth. Collection N. Alberts; photo T. Bultheel.

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#### *Samenvatting*

Deze korte nota bericht over de vondst van twee lithische artefacten en enkele resten van wolharige neushoorn en mammoet afkomstig van de Argex-groeve te Kruibeke (Oost-Vlaanderen). De vondsten werden aangetroffen in een grindvloer op het contact tussen de Boomse klei en de Pleistocene dekzanden. De versheid van het grootste artefact en een mammoetkaak met twee bewaarde kiezen wijst op een minimale verplaatsing van de vondsten en de mogelijkheid van een associatie. Dit laatste wordt versterkt door de aanwezigheid van duidelijke gebruikssporen op een van de artefacten die verband houden met het schrapen van bot of gewei. Het artefact draagt bovendien resten van een witachtig residu dat mogelijk van organische oorsprong is. Toekomstig FTIR onderzoek zal hierover wellicht uitsluitsel kunnen bieden.

*Trefwoorden:* Kruibeke, Oost-Vlaanderen, (BE), Argexgroeve, midden paleolithicum, Vlaamse Vallei, vuurstenen artefacten, pleistocene fauna, gebruikssporen.

#### *Abstract*

This short paper reports on the discovery of two lithic artefacts and some faunal remains of mammoth and woolly rhinoceros from the Argex-quarry at Kruibeke (East Flanders). The finds were retrieved from a gravel layer at the contact between the Boom clay and the Pleistocene coversand at the base of the Flemish Valley. The freshness of the largest artefact and a large fragment of a mammoth mandible with two embedded molars hints at little or no displacement and a possible association. The latter is further supported by the presence of use wear traces related to the scraping of bone or antler and a white residue which might be of organic origin. This will be further investigated by means of FTIR.

*Keywords:* Kruibeke, East Flanders (BE), Argex quarry, Middle Palaeolithic, Flemish Valley, flint artefacts, Pleistocene fauna, micro wear traces.

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