

The earlier Mousterian in westernmost Iberia: geoarchaeology of the Cobrinhos site, in the Tejo River terrace staircase of Vila Velha de Ródão (Portugal)

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Introduction

The beginning of the Middle Palaeolithic in western Eurasia corresponds, in general terms, to a replacement of handaxes and cleavers by Levallois. We believe the arrival of populations in Iberia during the Pleistocene to have been via the Pyrenees and the main rivers of the region to have worked as preferential pathways of penetration and dispersal. The Tejo may have been attractive due to its large basin crossing towards the western coast, through different settings. This may have favoured the creation of ecological niches capable of supporting long-term human occupation. In its Spanish sector, Mousterian appears in the middle of T19 along with Acheulean that disappears in the upper deposits; Mousterian without Acheulean occurs within the sequences of T20 and T21. In Portugal, the Lower Tejo valley has a staircase of six terraces (T1 to T6) with Palaeolithic only between the T4 and the T6. T4 (dated as ca. 340 - 155 ka) has Acheulean in the basal and middle levels and Mousterian in the top, with the transition occurring probably at ca. 220 ka.

Cobrinhos is a Mousterian site found during factory construction. It is located in a colluvium that, by geomorphological correlation, links to the top of T4.



Fig. 2. Lithic assemblage. Levallois recurrent, Levallois preferential, discoidal, centripetal, Kombewa cores, Levallois flakes, pseudo-Levallois points, denticulates, notches and side scrapers.

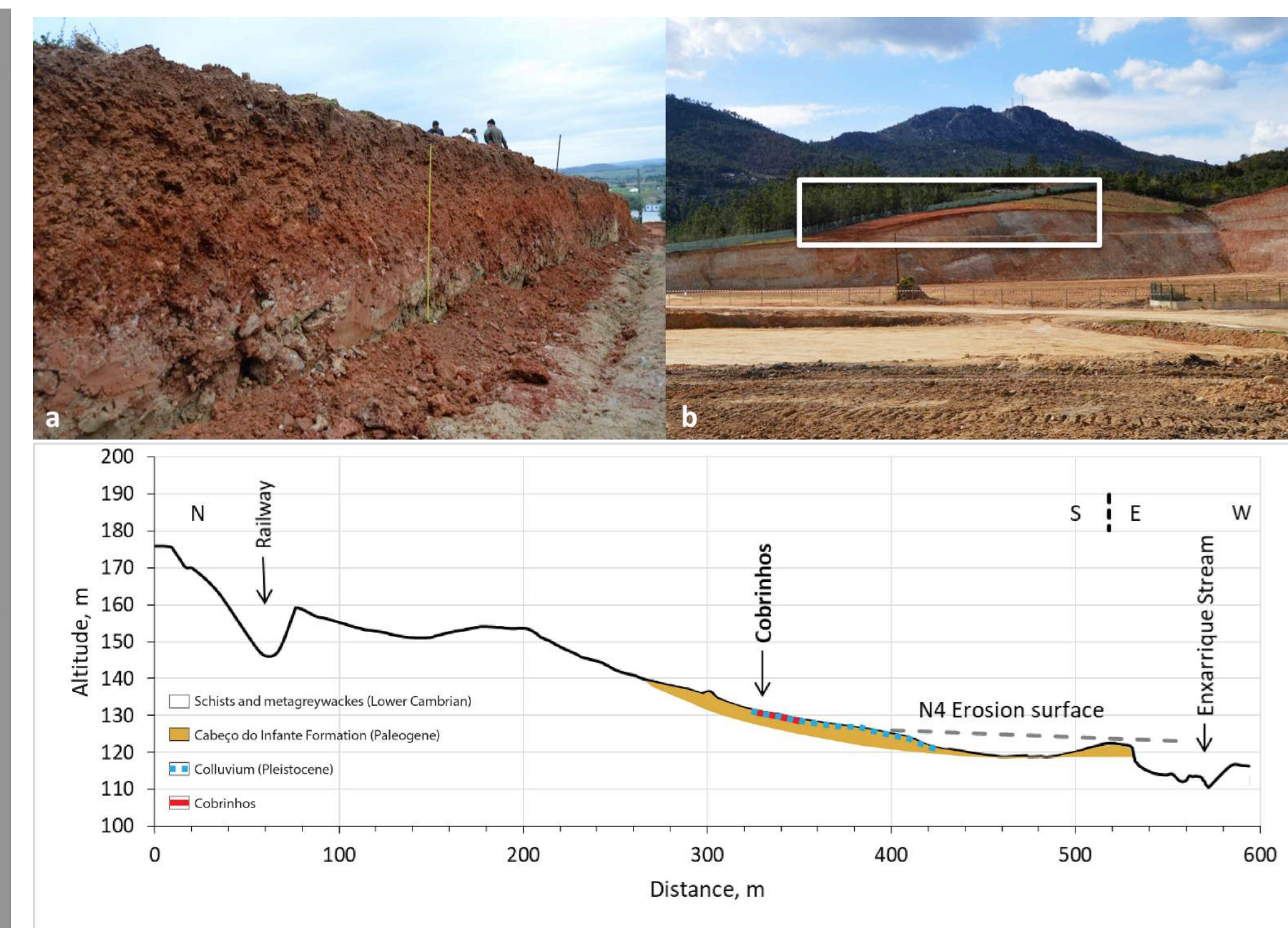


Fig. 3. Top: Profiles: a) trench; b) cut made by the construction works. Bottom: Profile made using GPS-RTK showing schists and metagreywackes (Lower Cambrian) bedrock, Cabeço do Infante Form. (Paleogene), the N4 erosion surface, the colluvium (Pleistocene) and Cobrinhos site.

Conclusions

Despite disturbance by ploughing, we can establish the following from Cobrinhos:

- 1) It is in its original geomorphological/geological context;
- 2) The colluvium and associated artefacts are coeval with the deposition of the uppermost deposits of the T4 terrace (with a possible age of ca. 200-155 ka and most probable ca. 165 and 155 ka);
- 3) It has internal coherence, is consistent with a Mousterian without Acheulean influence and considering the setting it may result from a palimpsest rather than from a single episode.

Data from the Lower Tejo indicate that Middle Palaeolithic industries, and coeval occupation by Neanderthals, were already established during MIS 6, using a full Mousterian technology without Acheulean influence. River terrace contexts gains renewed interest with the possibility of absolute dating set within the stratigraphic framework provided by multiple terrace levels.

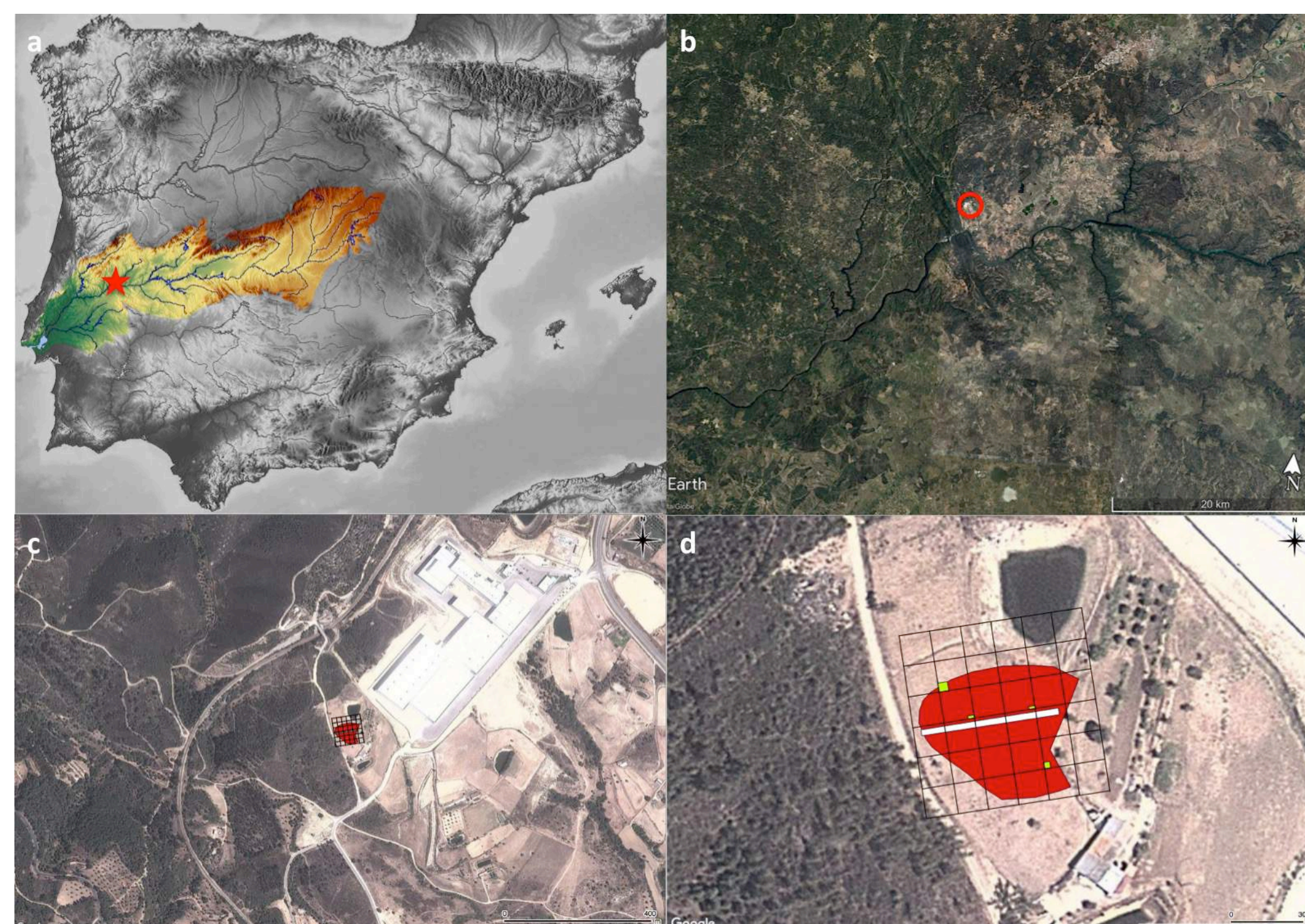


Fig. 1. Cobrinhos location a) in Iberia and in the Tejo River; b) in Lower Tejo reach I; c) in relation to the factory before the works; d) Concentration of artefacts (red) test pits (green) and trench (white).

Materials and methods

For horizontal control, an 10x10 m grid covered 3500 m². For vertical control, a trench 45 m long x 2 m wide x 2.5-1 m deep was mechanically excavated. A perpendicular profile was exposed by the construction. Four manual test pits were excavated and the sediments were wet-sieved using a 5 mm mesh. Since it was impossible to perform a manual excavation of the entire area, the archaeological layer was mechanically excavated in the richest 1600 m² using a toothless bucket. All sediments were wet-sieved. Samples were not collected for luminescence dating because complete bleaching before deposition could not be guaranteed. The mineralogical composition of the sand was estimated using a stereoscopic binocular microscope (50x). The mineralogical composition of the <2 µm fraction was obtained by X-ray diffraction of oriented samples, before and after treatment with ethylene glycol and heating up to 550°C. The percentages of clay minerals in each sample were determined through the peak areas of the mineral present, using specific correction parameters.

The Cobrinhos assemblage is composed solely of lithic artefacts. These were studied using standard technological and typological criteria. The total inventory is 15,779 specimens but, to characterize the site, 16 squares were sampled, providing a total of 5,965 artefacts, 37.8 % of the total.

Results

The Cobrinhos colluvium is at an altitude of 130-120 m that links to the N4 erosive surface (a glacis at 120-109 m) that correspondingly links to the surface of the T4 terrace. The colluvium overlies, with an erosive contact (discordance), the Cabeço do Infante Formation (Palaeogene), which is light-green. The colluvium is 15-75 cm thick, ploughed down to 40 cm, as a sandy-silt matrix, dark brown colour on the top (organic component) and gets red and silt-clay towards the bottom. It is dominated by a poorly sorted gravel of sub-angular quartzite pebbles and cobbles. Abundant Mousterian artefacts were concentrated in the top 40 cm. The mineralogical analysis indicates that the colluvium is dominated by illite+kaolinite. The palaeoweathering affecting this old colluvium (rubification due to the presence of goethite and a clay mineral association of illite and kaolinite) is identical to that of the T4 terrace, indicating a warm temperate climate with very strong seasonal contrast.

The lithic assemblage is dominated by quartzite. Many artefacts are coated with red clay, often being impossible to remove. Cores were made on pebbles and flakes. The reduction strategies are discoidal, informal, Levallois recurrent, centripetal, chopper/Chopping-tool, prismatic, Levallois preferential and polyhedral. Flakes are dominant, followed by chips and fragments; preparation and maintenance products, blades and points are rare. The tool assemblage is composed of sidescrapers, Levallois blanks, retouched flakes, denticulates, pseudo-Levallois points and notches. There is no artefact typical of the Acheulean or of the Upper Palaeolithic.

	Other	Quartzite	Black quartzite	Quartz	Total
Pebbles		1			1
Nodule					2
Cores		193	15	5	213
Flake	3	2431	346	46	2826
Blade		50	3		53
Point		13	2		15
Cornices		12	1		13
Crest		6			6
Debordant		18	3		21
Flank		11	3		14
Core front		42	4	1	47
Fragment		592	61	27	680
Core Fragment		82	10	6	98
Chip		1149	1	404	1554
Total	3	4602	449	489	5543

Type	Raw material	Greywacke	Quartzite	Black quartzite	Quartz	Flint	Total
1 Typical Levallois flake			27	6			33
2 Atypical Levallois flake			38	6			44
3 Levallois point			4	1			5
4 Retouched Levallois point			1				1
5 Pseudo-Levallois point			32	5			37
6 Mousterian point			2				2
8 Limace		1					1
9 Single straight sidescraper			9	3			12
10 Single convex sidescraper			26	6			32
11 Single concave sidescraper			10	1			11
12 Double straight sidescraper			2				2
13 Double straight-convex sidescraper			4				4
15 Double biconvex sidescraper			1				1
16 Double biconcave sidescraper			1				1
17 Double concave-convex sidescraper			3	1			4
21 Déjeté sidescraper			1				1
22 Transverse straight sidescrapers			4	4			8
23 Transverse convex sidescrapers			3	1			4
25 Plain face sidescraper			1	1			2
26 Abrupt sidescraper			2	2			4
29 Sidescraper with alternate retouch			1	1			2
34 Typical perforator			1	1		1	3
36 Backed Knife			2				2
38 Natural Backed Knife			9	3			12
39 Mousterian Raclette			1				1
40 Mousterian tranchet				2			2
41 Truncation			7				7
42 Notch			27	1	1		29
43 Denticulate			35	5			40
45 Flake with ventral retouch			31	1	1		33
46 Thick Flake with abrupt retouch			4	1			5
47 Thick Flake with alternate retouch			2				2
48 Thin Flake with abrupt retouch			4				4
49 Thin Flake with alternate retouch			2				2
54 Distally notch			3	2			5
56 Rabot			1				1
61 Chopping-tool			7				7
Total	1	308	54	2	1	366	

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