

S2. Lithic assemblages from the Aranbaltza III sequence

Unit 1

The clast lags excavated in Unit 1 mainly comprise lithic artefacts, mixed together with natural flint and sandstone fragments (Table 1). Although altered by transport and atmospheric exposure, most of the assemblage is well preserved. In 2014, the whole of Unit 1 was excavated, whereas the following year three sub-units were differentiated. There are some minor differences between these sub-units, but the basic features of the three lithic assemblages remain very similar, so for this reason we have considered all the material from Unit 1 as a single assemblage. We are of course aware of the transported nature of some of this material, but there is no evidence of any significant heterogeneity. The sediment was dry-screened at the site so this could explain the relative low quantity of debris.

The assemblage comprises 901 artefacts (Figure 1). The huge majority of pieces are made on ultra-local (Flysch) flint, while other materials made on quartzite, trachyte or mudstone are anecdotal. Tested cores and fully exploited flake cores are very abundant. Among them, Levallois cores (recurrent centripetal, bidirectional) are the most representative (Figure 1: 1-2), followed by Discoid (Figure 1: 3) and Multipolar cores. Cortical flakes, complete and partial, are also very abundant, suggesting the introduction of little or no exploited blocks to the site. The presence of *oultrepassé* flakes is also noteworthy. These flakes are linked to a particular development of the Levallois technique where cortical laterals are preserved and *oultrepassé* flakes are obtained from them. Among the simple flakes, some display clear Levallois features, such as prepared platforms, straight profiles, low knapping angles, centripetal negatives and relatively low thicknesses (Figure 1: 4-8). Although a thorough techno-economic analysis needs to be undertaken to fully understand the nature of this assemblage, all of these data suggest the presence of a complete Levallois *chaîne opératoire* at the site entailing the acquisition of raw materials, full débitage and transformation of blanks into tools.

Retouched tools are quite abundant (Table 2). The most abundant type are side scrapers, most of which are not extensively re-sharpened (Figure 1: 4-6). Slightly retouched flakes and natural bases are also very abundant: Local flint often appears naturally in the shape of parallelepiped fragments (tectofragments), which are usually retouched to adapt the natural shapes of the pieces or to create new functional areas. Denticulates and notches (Figure 1: 9) are also quite abundant. The presence of becs and borers is noteworthy. Some borers are quite small, while some becs are quite large. Other tools appear less frequently; for example, backed knives are quite atypical in the assemblage, although one of them could be classified as an Abri Audi knife. End-scrapers, burins, truncations and splintered pieces are also atypical and cannot be confused with true Upper Palaeolithic tools. There are also some flakes (Levallois flakes N=8; Levallois points N=1; Pseudolevallois points N=4), none of which are retouched. The presence of asymmetrical flakes with natural backs is also quite remarkable (N=16). Lastly, there are six pebbles, five of which are made on quartzite and one on mudstone. They all bear percussion marks and therefore can be classed as hammers. Three other small pebbles, one in sandstone and two in quartzite, also display percussion marks and can be interpreted as representing retouchers or striking platform preparers.

The features of the lithic assemblage recovered in Unit 1 of Aranbaltza III are very similar to those excavated at Aranbaltza I (Units D and E), and fit perfectly well with a Late Middle Palaeolithic open-air occupation scenario. It is difficult to compare the lithic assemblages obtained from open-air sites with the assemblages from nearby caves such as El Cuco (Gutierrez-Zugasti et al. 2017), or more distant ones like Axlór, where Flysch flint, obtained close to Aranbaltza, is quite abundant. Differences in function and raw material availability originate very different assemblages, albeit some technological features can be traced among them. At El Cuco the Late Middle Palaeolithic levels have a Levallois-based technology with a prevalent ramified microlith production. In Axlór, the lower levels have been poorly described, but also possess Levallois features (Rios-Garaizar 2012, 2017).

Table 1. Technological composition of Aranbaltza III, Unit 1.

	Sandstone	Basalt	Quartzite	Mudstone	Flint	Total
Tested cores					14	14
Flake cores			2		35	37
					<i>Levallois</i>	21
					<i>Discoid</i>	7
					<i>Multipolar</i>	7
Cortical flakes					33	33
Partially cortical flakes			1	109		110
Partially cortical blades					3	3
Oltrepassé flakes					81	81
Overpassing flakes					13	13

Reflected flakes				4	4
Simple Flakes	1	2		79	82
Blades				10	10
Kombewa flakes				3	3
Resahrpeneing flakes				4	4
Splints				2	2
Irregular fragments				297	297
Fragments and debris <10 mm				179	179
Used natural bases	2	7		1	7
Flaked natural bases				12	12
Total	2	1	11	2	885

Table 2. Typological composition of Aranbaltza III, Unit 1.

Bordes List Type	Total
Splintered piece	6
Bec	15
Borer	4
Handaxe	1
Burin	1
Backed knife	4
Denticulate	18
Notch	6
Retouched flake and natural bases	21
Mousterian point	1
Side-scraper	22
End-scraper	4
Truncation	3
Raclette	1
Retouched tool fragment	2
Total Result	109

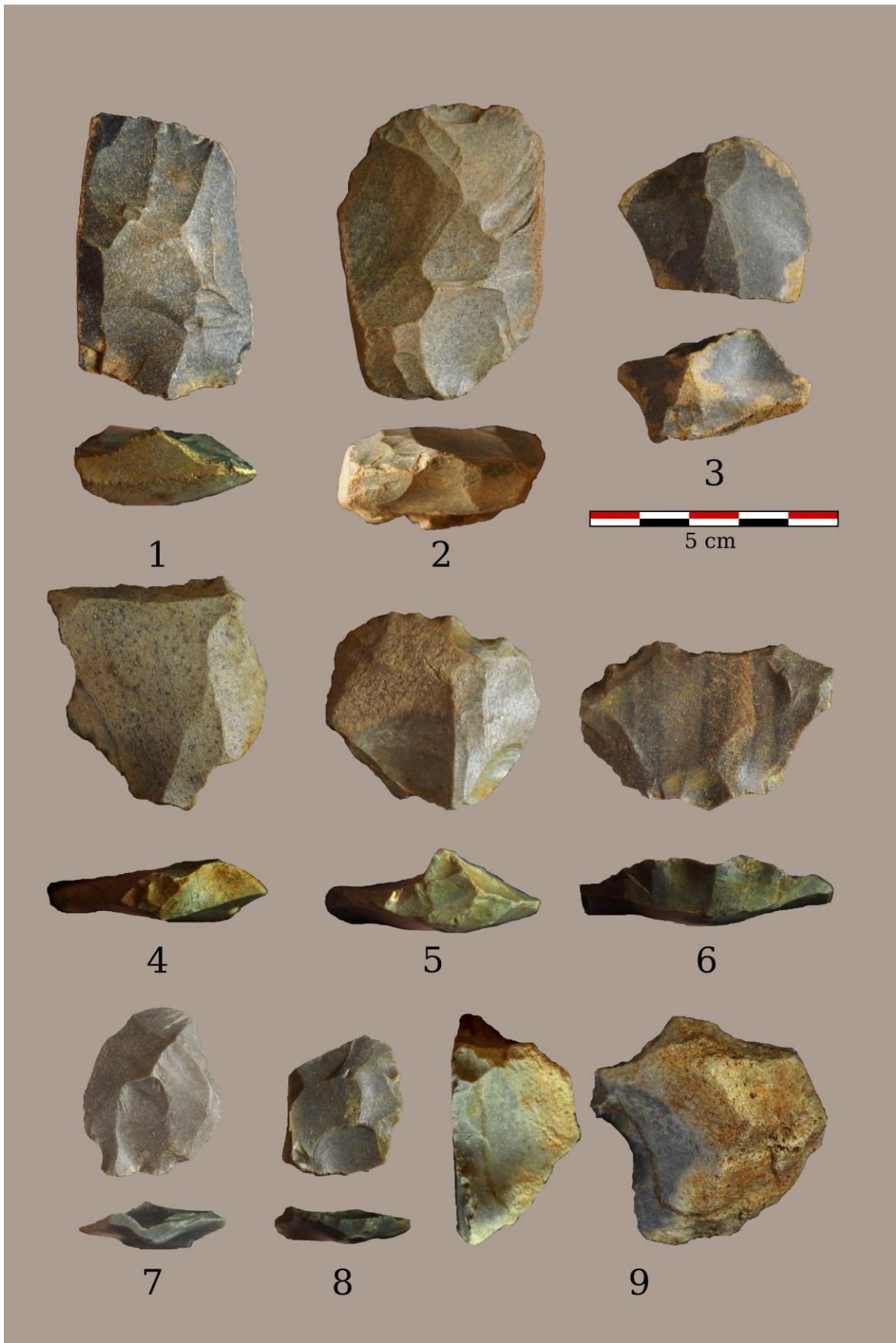


Figure 1. Lithic assemblage from Unit 1

Units 4-5

A single flake was recovered from Unit 4. It is a cortical flake with a distal non-modified concave and acute edge. It has unifacial macro-wear caused by transversal scraping or peeling (S2 Figure 2: 1).

In Unit 5 two cores and five flakes (S2 Figure 2: 2-4) were recovered, alongside several natural flint fragments, and sandstone and quartzite pebbles and fragments, probably manuports. The most interesting feature is the presence of a discoid core (S2 Figure 2: 2) and a discoid flake with use-wear traces of wood cutting (S2 Figure 2: 4), attesting to the use of discoid technology.

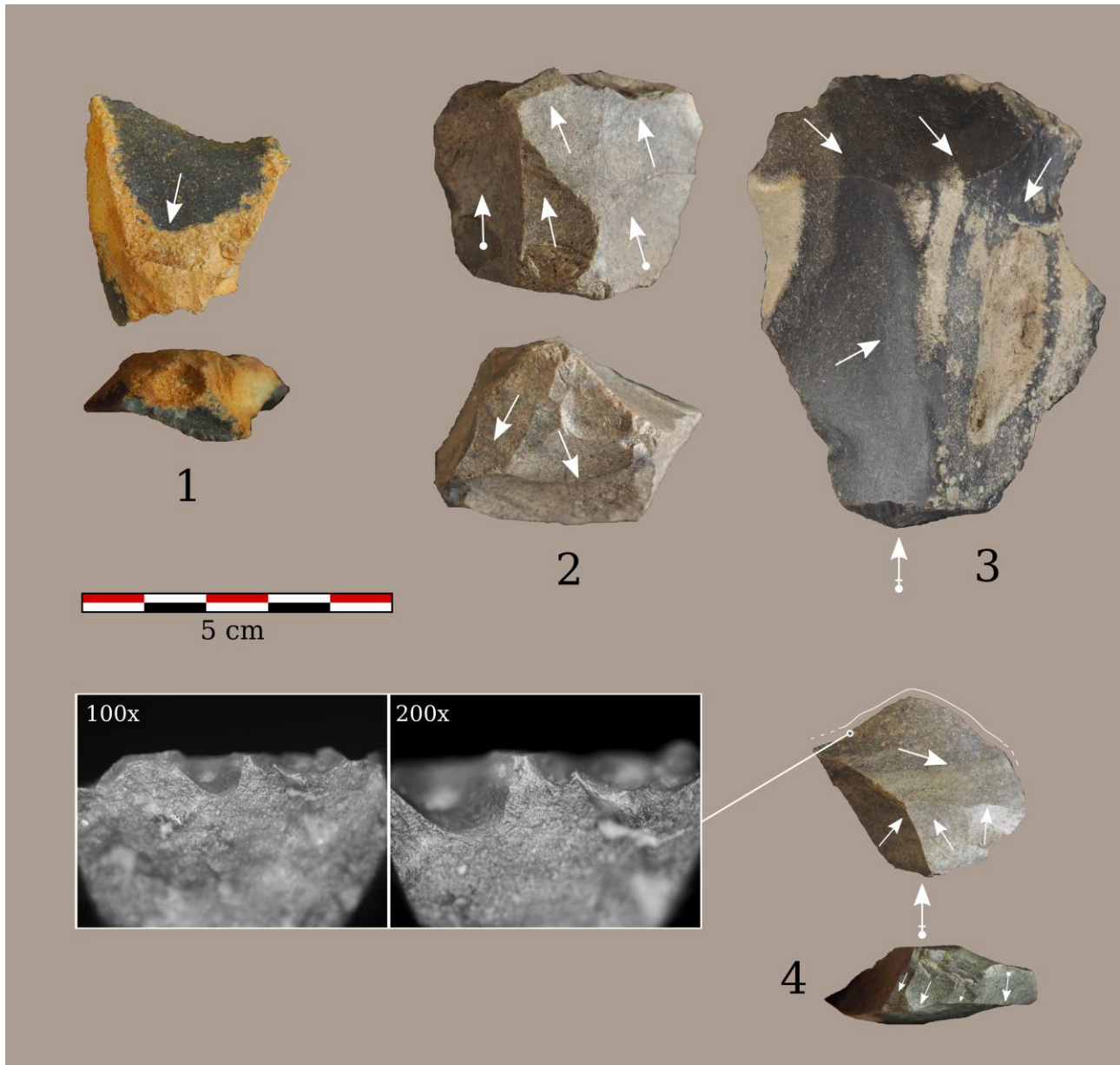


Figure 2. Lithic assemblages from Unit 4 (1), and 5 (2-4). The flake number 4 presents wood cutting wear traces.

References:

Gutiérrez-Zugasti, I., Rios-Garaizar, J., Marín-Arroyo, A.B., Rasines del Río, P., Maroto, J., Jones, J.R., et al. 2017. A chrono-cultural reassessment of the levels VI–XIV from El Cuco rock-shelter: A new sequence for the Late Middle Paleolithic in the Cantabrian region (northern Iberia). *Quaternary International*. doi:10.1016/j.quaint.2017.06.059

Rios-Garaizar, J., 2012. Industria lítica y sociedad en la Transición del Paleolítico Medio al Superior en torno al Golfo de Bizkaia. PUBliCan - Ediciones de la Universidad de Cantabria, Santander.

Rios-Garaizar, J., 2017. A new chronological and technological synthesis for Late Middle Paleolithic of the Eastern Cantabrian Region. *Quaternary International* 433, 50–63. doi:10.1016/j.quaint.2016.02.020