



**Lower and Upper Palaeolithic settlements in Irikaitz (Zestoa, Basque Country, Spain).
Deconstruction of a Pleistocene archaeological site in the Eastern Cantabrian range.**

*Ocupaciones del Paleolítico inferior y superior en Irikaitz
(Zestoa, País Vasco, España). Deconstrucción de un yacimiento arqueológico del
Pleistoceno en el extremo oriental de la Región Cantábrica*

Arrizabalaga, A. ⁽¹⁾ and Iriarte, M.J. ⁽¹⁾

(1) Área de Prehistoria. Universidad del País Vasco, Facultad de Filología y Geografía-Historia,
C/ Tomás y Valiente s/n, 01006 Vitoria, España. alvaro.arrizabalaga@ehu.es

Abstract

Archaeological excavations began at the open-air site at Irikaitz (Zestoa, Basque Country) in 1998, as a result of the imminent enlargement of local sports facilities which threatened the deposit. They have continued since then, with the only exception in 2006, when a technical break was taken. The two main sectors that have been excavated are known as Geltoki (1998-2003) and Luebaki (2002-2009). While in the first area, practically all the remains recovered belonged to the Lower Palaeolithic (levels G.IV, G.V and G.VI), in the Luebaki sector Gravettian materials are well represented, percolated since the Prehistory among the Lower Palaeolithic remains.

Keywords: Pleistocene, Lithic industry, Postdepositional Processes, Gravettian, Lower Palaeolithic.

Resumen

Desde 1998 viene excavándose el yacimiento arqueológico al aire libre de Irikaitz (Zestoa, País Vasco), debido en parte a la amenaza del depósito por el plan para ampliar una infraestructura deportiva próxima.



Excepto durante una pausa técnica en 2006, todos los años se han desarrollado las excavaciones. Denominamos los dos principales sectores excavados como Geltoki (1998-2003) y Luebaki (2002-2009). Mientras en el primer sector la práctica totalidad de los materiales arqueológicos corresponde al Paleolítico inferior (niveles G.IV, G.V y G.VI), en el sector Luebaki existe también una buena representación de materiales gravetienses, si bien estos están percolados desde un periodo prehistórico y físicamente se ubican “entre” los restos del Paleolítico inferior, en una circunstancia tafonómica poco común.

Palabras clave: Pleistoceno, Industria lítica, procesos postdeposicionales, Gravetiense, Paleolítico inferior.

1. Introduction

The archaeological excavations at Irikaitz¹ began in 1998 in the context of documentation and rescue of a deposit that was in serious danger, in view of municipal plans to enlarge the local football ground. Irikaitz is located within an area (Fig. 1) of great wealth of archaeological heritage, with significant sites nearby, such as Ekain (Altuna and Merino, *dirs.*, 1984) or Amalda (Altuna et al., 1990). The existence of the deposit had been reported some months earlier by Antxieta Archaeological Group, from Azpeitia. Right from the start of the first season we were able to identify the existence of a large area with an open-air Palaeolithic deposit. Until 2002, we opened a surface area of 48m² in the Geltoki sector (stratigraphical sequence at Fig. 2), very close to the old spa resort of Zestoa, over the Urola railway line. The work in this sector was provisionally concluded in 2003, when attention was focused on the excavation of the Luebaki sector, which began in 2002 and has continued to the present. This large site (archaeological material has been collected over an area of some eight hectares) is outstanding because of its primary character and the presence of techno-complexes attributable to the Lower Palaeolithic. Several reports have been published on the

study of the stratigraphy, archaeobotany and lithic techno-complexes found in the Geltoki sector (Arrizabalaga and Iriarte 2002, 2003, 2005a, 2005b; Arrizabalaga et al., 2003), but the present paper is our first approach to the characterization of the sequence in the Luebaki sector, which is much more complex for reasons to be explained below.

2. The Luebaki Sector at Irikaitz (2002-2007)

During the excavation in 2002, as usual we opened a small trial dig in the periphery of the Geltoki sector, in order to verify the extension of the deposit and the sequence in different areas. In this case, we selected a point about 75 metres to the north-east of the Geltoki sector, very near the cutting of the old Urola railway line. Some years before, a number of sections had been dug by members of the Antxieta Group on the side of this cutting, and it was thought that the Upper Palaeolithic record might be better conserved in this area. When the first quadrants were opened (T16 and T18) we were able to see that the density of finds was thirty times greater than in the Geltoki sector. Work was intensified in this sector in 2003, and the excavated area has been steadily increased to the present 27m². The stratigraphic sequence in the Luebaki sector is as follows (Fig. 2):

¹ This site is placed in the municipality of Zestoa, district of Gipuzkoa, in the Iberian side of the Basque Country. The UTM geographic coordinates of Irikaitz (Zone 30) are: X.560505, Y. 4787235, Z.55.

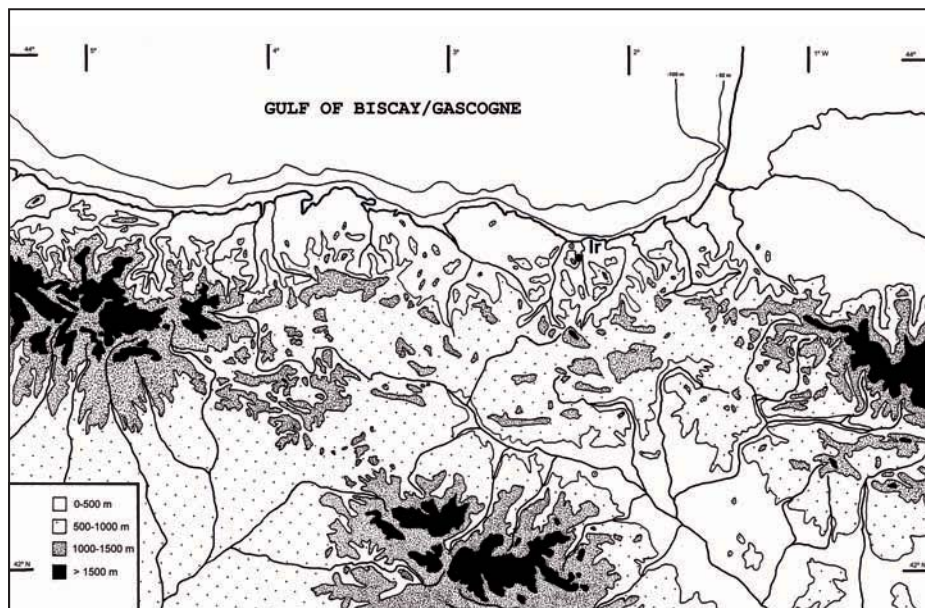


Figure 1. Map of the Gulf of Biscay/ Gascogne with the place of the site of Irikaitz.
 Figura 1. Mapa del Golfo de Vizcaya, con la posición del yacimiento de Irikaitz.

- L.I. Anthropic layer. Barren. 30 cm.
- L.II. Orange-coloured clay. Lithic assemblage. About 15 cm.
- L.III. Yellow clay with some small grey patches. Lithic assemblage. 20 cm.
- L.IV. Light brown clay with small iron and manganese mineralization. Lithic assemblage. About 35 cm.
- L.V. Plastic clay with occasional iridescence and hydromorphic appearance. Highly weathered sandstone cobbles. At least, 170 cm.

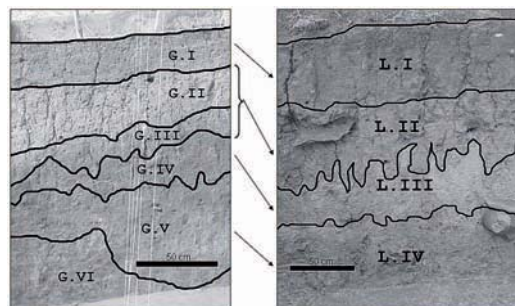


Figure 2. Stratigraphical correlation between sequences in Geltoki and Luebaki areas.
 Figura 2. Correlación estratigráfica entre las secuencias de las Áreas Geltoki y Luebaki.

Although the archaeological materials are quite different from those recovered from the Geltoki sector, the sedimentary characterization of the stratigraphic sequences are very similar, except that Luebaki is missing one of the archaeological levels in the Geltoki series (G.I= L.I; G.II + G.III= L.II; G.IV= L.III; G.V= L.IV; G.VI= L.V). The other notable difference is that in the Geltoki series, the top of Level G.VI has an average depth below the surface of 1.7m, whereas the roof of the equivalent level, L.V. is reached about 0.8m

beneath the surface. Therefore, these are two comparable stratigraphic sequences (as could be expected for two sectors in topographic proximity), although the Luebaki sequence appears to be compressed much more (especially in its upper units) than the Geltoki series, which may also explain the higher density of materials.

A final observation which appears relevant refers to the present topography of the te-

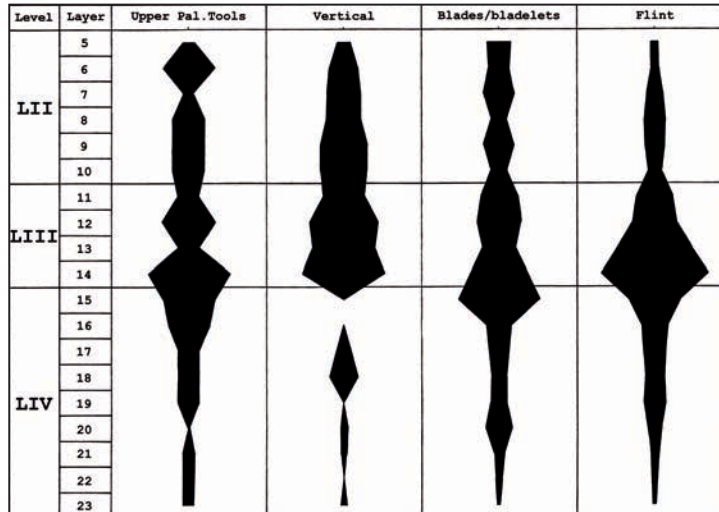


Figure 3. Vertical distribution of likely gravettian elements on Luebaki Area.

Figura 3. Dispersión vertical de los probables objetos gravetienses en el Área Luebaki.

rain. Although we do not know for certain the reason, the Geltoki sector is located in the bottom of a small depression, approximately one metre below the average height of the land surface in the Luebaki sector. This fact seems significant because the sequence in the Luebaki sector seems to have been more exposed to alterations of all types in the upper part of the sequence, whereas the levels in the Geltoki sector have been preserved better owing to their lower position.

3. Stratigraphic observations: integrity and taphonomy of the deposit

The first sign that made us suspect the problems for interpreting the stratigraphy of the Luebaki sector was the heterogeneity of the materials. At Irikaitz, only macroscopic remains of the lithic assemblage have been preserved, due to the acid soil conditions, which have made all bone objects disappear. However, among the lithic industry we found remains that, according to typological, typometrical and technological criteria, belong to Upper Palaeolithic occupations (the Gravettian, to be precise) and others that clearly co-

respond to the Lower Palaeolithic. This is not all, because many of the artefacts that can be attributed to the Gravettian (manufactured in flint, on blades or bladelets, sometimes forming characteristic typological groups, like burins, scrapers or backed blades) are found at a vertical or oblique angle with the modern floor. This mixture of objects begins to appear at the start of semi-spit 5, which opens the level L.II, and continues through L.II, L.III and L.IV. As to its horizontal distribution, the percolation effect is clearly more evident in the eastern quadrants of the excavated trench than in the western ones, although it does not disappear completely even in row L, the western-most part of the excavation.

The sedimentary granulometry at Irikaitz (fine silts, where practically all the large fraction elements have been brought by human activity) still today causes vertical movement of sedimentary matter and small objects. The cycle of dehydration/rehydration of the clay opens fissures that are used by plant roots, moles and other animals to penetrate in the ground, causing vertical movements of sediment and small lithic objects. These

Table 1. Likely gravettian elements on Luebaki Area.

Tabla 1. Probables elementos gravetiense en el Área Luebaki.

Semi-spit	U.P. Types	Verticals	Blade+bladelets	Flint
SS 5	1	2	7	12
SS 6	5	4	6	11
SS 7	1	5	9	24
SS 8	3	5	5	31
SS 9	3	7	9	29
SS 10	3	7	5	20
SS 11	2	6	11	54
SS 12	5	10	13	68
SS 13	2	9	10	112
SS 14	8	12	17	164
SS 15	5	0	24	79
SS 16	4	0	8	41
SS 17	2	2	6	34
SS 18	2	4	5	30
SS 19	0	0	5	34
SS 20	2	1	8	19
SS 21	1	1	3	12
SS 22	1	0	2	9
SS 23	1	1	1	5
Σ	51	76	154	788

problems of the integrity of the deposit are much more acute in the Luebaki sector than in the Geltoki sector, which is possibly better protected because of its greater depth.

Three hypotheses may initially explain these circumstances in the Luebaki sector:

1. It is a derived level, which has accumulated remains from deposits with diverse chronologies.
2. All the lithic remains belong to a single coherent context, which should be dated in the Gravettian as these are the most recent *chaînes opératoires* that have been identified in the deposit.
3. Part of the remains are located in their primary position (in this case the oldest ones, ascribed to the Lower Palaeolithic), while others (belonging to the Gravettian) are found in a derived position, having percolated among the older artefacts as a result of vertical movements.

We believe that the first possibility can be discarded immediately, for several reasons,

including the existence of clear evidence that the assemblage is located approximately where it was knapped (re-fits, absence of objects eroded or fractured by movement, absence of classification by size, absence of longitudinal orientation of the objects with respect to the slope axis, etc.). The lack of characteristic typological evidence for the intermediate phases between the main occupations that we have identified, such as the Mousterian, is another factor in this respect. We also consider the second hypothesis to be improbable, due to the great typological and technological difference between the techno-complexes we have differentiated. It is theoretically possible – and it does happen – to find a certain number of objects, tools or cores corresponding to older forms of lithic debitage and knapping in an Upper Palaeolithic series (Arrizabalaga, 1995). More so, when in these cases a different raw material from the local flint or siliceous rock is used, as occurs at Irikaitz, which may condition the results of the knapping process. However, the presence in the Geltoki sector of three levels (G.IV, G.V and G.VI) unaffected

by the percolation of Upper Palaeolithic elements, and two higher ones (G.II and G.III) in which this same mixture occurs – albeit to a lesser extent – is an argument against this possibility. In the same way, the quantitative and qualitative significance of the artefacts associated with the Lower Palaeolithic is a further reason.

In our opinion, the third hypothesis is the most probable and consistent one, in view of the circumstances at Irikaitz. The only artefacts that are commonly found in a vertical or oblique position are those made from flint, in the form of blades and frequently used to manufacture burins, borers, backed implements or endscrapers. Despite the high number of these objects (over 6000 flint pieces have been recovered in the Luebaki sector), we have not been able to discover any re-fits, whereas re-fits of pieces are relatively frequent for the other types of raw materials. However, this disturbance of Gravettian artefacts must have taken place in a low energy environment, as the flint remains display hardly any post-depositional physical alterations.

It has already been noted that a certain gradient can be seen in the horizontal dispersion of the percolation of Gravettian artefacts. In order to verify if a vertical gradient also exists, six quadrants have been analysed (L16, L18, M16, M18, N16 and N18; the only ones to which we have access to the totality of the finds at this moment). Table 1 gives the distribution in successive semi-spits of the lithic elements thought to belong clearly to the Upper Palaeolithic, in different degrees of certainty and increasing numbers: primary types characteristic of the Upper Palaeolithic, objects found in the deposit in a vertical or oblique position, blades and bladelets and, finally, all the objects manufactured from flint. In figure 3 we have shown the relative percentages of each category, according to

the different semi-spits. This figure shows that the stratigraphic units that have been used are pertinent, with the corresponding safeguards for any open-air site, insofar as the inflections in the different curves accumulate around the contacts between levels. Equally, it enables us to observe the great coherence of the different columns, which is proof of the percolation (remains in vertical position), even for the set of flint remains. This circumstance allows us to give this group of remains an equivalent treatment, i.e. it leads us to believe that the largest sub-sample susceptible of discrimination (the remains made from flint) can be attributed together (if not as a whole) to the percolation of the Gravettian occupations. We are aware that this is not a perfect procedure of filtering information, following an orthodox interpretation of archaeological method, but it appears sufficient for now, at the same time as it is coherent with the empirical perception we have obtained of the phenomenon during our fieldwork.

This would be our current hypothesis for the reconstruction of the sedimentary process in the Luebaki sector; while we cannot yet be sure about the primary position of level L.V., which contains few, highly altered lithic remains. The group of levels L.IV, L.III and L.II (both the sedimentary matrix and the lithic materials manufactured in raw materials other than flint, *grosso modo*) were deposited during the Lower Palaeolithic; in addition we suppose that above these was situated another sedimentary series on which the Gravettian human groups settled. In our opinion this sedimentary series, centred in the Upper Palaeolithic, has been affected by erosive processes (probably slope solifluction). This affected the structures of the hunter-gatherers' camps, as well as much of their archaeological materials and the sedimentary matrix: our only perception of the importance they may have had comes from the numerous lithic artefacts that have per-

Table 2. Lithic objects from the Lower Palaeolithic assemblage in Luebaki sector.
 Tabla 2. *Objetos líticos del Paleolítico inferior en el sector Luebaki.*

Semi-spit	Cores	Sandstone flakes	Quartz-Quartzite flakes	Vulcanite-lave flakes	Ferric-Lutite Flakes	Hammer	Side scrapers	Cleaver	Burin	Retouched Pebbles	Pebbles with extractions	Denticulates	Abroupts	CT	Σ
SS 5	1	10	1	1		1	1			2					17
SS 6	2	2		6		4	2			1		1			18
SS 7	3	4		1	1	1			1						11
SS 8		2	1	1	3	1	1				1				10
SS 9		16		2		7	2			1				1	29
SS 10	3	20				8	1			1	1	1			35
SS 11		8	1	3		5	1			1		1		1	21
SS 12		27	1	6	2	1						1			38
SS 13	1	21		3	2	1								1	29
SS 14	3	54		4		3				3		1		2	70
SS 15		14		3	3		3			1	1	2			27
SS 16	1	9	1	6	4	2	4			5	4	2	1	1	40
SS 17	5	7		4	1	3	1		2	1	5	1	1		31
SS 18	13	13	1	7			6	1	1					1	43
SS 19	4	28	2	3			1			1	4	1			44
SS 20	6	19	1	5	2		3			2		1		2	41
SS 21	4	2	1		1	1	3					2			14
SS 22	1	7		1		1	3			1					14
SS 23					1				1						2
SS 24					2										2
Σ	47	263	10	56	22	39	32	1	5	20	16	14	2	9	536

colated towards lower levels and which we have been able to recover in part. We consider that the Pleistocene erosion could have reached practically to the surface of our unit L.II, where the presence of the large cobbles of the most recent Lower Palaeolithic level formed a more resistant surface for the low energy erosive vector. The existence of a large number of cobbles and boulders on the surface of Level II, directly beneath the ploughed level – non-archaeological – makes us believe that the first farmers who settled in the area must have added a certain amount of humus to the land, in order to use the terrain economically (our Level L.I).

4. The Lower Palaeolithic in the Luebaki sector at Irikaitz

Whereas the Gravettian assemblage at Irikaitz has acquired greater importance since excavations commenced in the Luebaki sector (with the difficulties described above), the most attractive aspect of the site was originally the Lower Palaeolithic occupation. We excavated and described in different reports (Arrizabalaga and Iriarte 2002, 2003, 2005a, 2005b; Arrizabalaga et al., 2003) the characteristics seen in the Geltoki area, but to date no summary has been made of the much more abundant Acheulian material in the Luebaki sector. We must point out that we have analysed a sample from six quadrants (the same as indicated below) to which we have access, since at the time of writing (and for the last two years) for different reasons we have not been allowed to study the materials that we ourselves had recovered.

First we would like to highlight a fact that makes these levels at Irikaitz exceptional: we possess direct and indirect proof that these Lower Palaeolithic materials are found at Irikaitz in their primary position, although we need to establish a protocol in

the Luebaki area to distinguish the Gravettian remains from the rest of the assemblage. We have discovered numerous re-fits, not only of flakes or fragmented cobbles, but also of different phases of debitage or retouch of the same core or tool, respectively. We have identified complete *chaînes opératoires* in different raw materials, from cores and matrices to the smallest flakes, without noting any kind of classification by size or topographical orientation. Therefore, having isolated the approximately 95% of the assemblage in the Lower Palaeolithic levels (subtracting the equivalent presence of 5% flint, still very difficult to discriminate from the Gravettian assemblage), we have available a series with a very large density of remains. In these six square metres we have counted several thousand lithic remains brought by humans, among which at least 536 show clear signs of anthropic activity (Table 2). They form, as in the Geltoki sector, a very simple *chaîne opératoire*, with cores and matrices, percussors (some anvils), multiple flakes and a series of stone pieces, some massive (Fig. 4), others flakes, with retouching to form different types. In any case, a density of nearly 100 knapped artefacts per square metre is noticeably greater than that found in the Geltoki sector (about eight remains per square metre for the Lower Palaeolithic levels) and at most of the classic Lower Palaeolithic sites in western Europe.

The inventory of the raw materials from which the flakes in our sample were produced (Fig. 5) enables us to outline some general trends that are valid for the three levels being studied. In order that the exclusion of flint from the Luebaki levels does not distort their comparison with the levels G.IV and G.V, we have introduced a false 5% of flint pieces in the three levels. In contrast with our estimates obtained from our impressions in the field, sandstone reaches



Figure 4. Lithic material from the Lower Palaeolithic settlements: a chopper.
Figura 4. Industria lítica adscrita al Paleolítico inferior: un canto tallado unifacial.

the same high level of representation as in the Geltoki sector, with mean percentages of 70% of the objects. In second place, volcanic rocks (vulcanite and lava) make up 14% of the total, and thirdly the ferruginous material and lutite, with a mean of about 5%. These two groups of raw materials inter-change their position compared with their representation in the Geltoki sector, but they maintain quite similar levels of presence. Finally, quartz and quartzite are represented in symbolic numbers, with a mean of about 2.5%. Obviously we are working with a restricted sample and the estimate of flint changes the real values slightly, as it would if all the knapped remains were included and not only the unknapped stones in the sample. However, we can conclude that at this level of provision of raw materials, both sectors at Irikaitz are very similar.

The main differences between the Lower Palaeolithic series in the Geltoki and Luebaki areas lie in the volumetric and typometric composition of the assemblages. At Geltoki, the concept of *manuport*

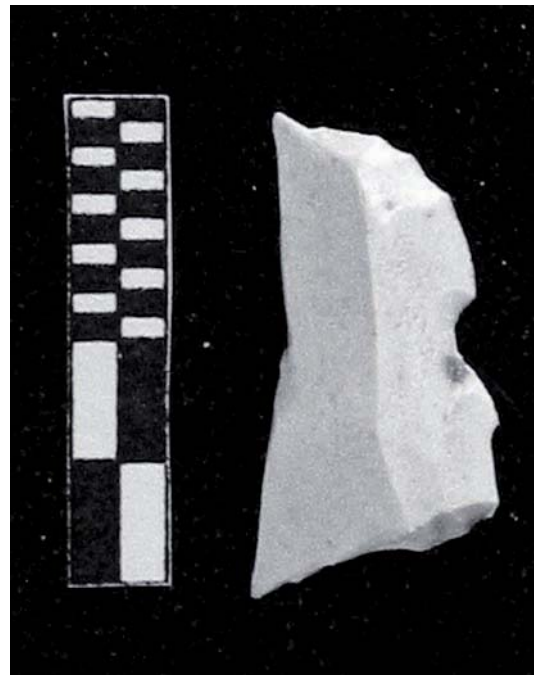


Figure 5. Lithic material from the Gravettian settlement: a Noailles burin.
Figura 5. Industria lítica adscrita al Gravetiense: Buril de Noailles.

hardly applies; almost all the few lithic remains display signs of human modifica-

tion and the predominant types are large or very large flakes. In contrast, the excavated area in the Luebaki sector fits the profile of a knapping site, located near the river, where the prehistoric groups collected certain amounts of cobbles (of determinate morphologies, with a preference for very flat, average-sized stones) which they carried to the deposit. However, only some of them (between a third and a quarter) show positive evidence of human manipulation. Furthermore, this manipulation has been selective, according to the raw material: Almost all the quartzite, quartz, limonite and vulcanite rocks have been knapped, whereas much of the sandstone and lava has been rejected for knapping.

Again, in reference to the preferred techno-typological items for knapping in the Lower Palaeolithic levels, great similarity can be seen between the different levels in the Luebaki area (L.II, L.III and L.IV), as well as between this assemblage and the levels

G.IV and G.V in the Geltoki area. The Luebaki level that is most similar to the two Geltoki levels is apparently the lowest one (L.IV). In the five levels being analysed (Fig. 6) similar categories are found, with no great differences in the percentages, although Geltoki matches the profile of a settlement or established site, and Luebaki tallies better with a knapping site (where there is more unknapped raw material, more blanks, and cobbles used as percussors, and a significantly lower proportion of almost all the categories of retouched pieces). If we go down to the level of the detailed description of techno-typological groups, the similarities are great, except that in the levels in the Geltoki area, the most common type of simple retouch for large pieces and flakes is denticulate, while at Luebaki it tends to be continuous, giving rise to an inversion of the morphothemes identified as D and R, respectively. It is also striking that they coincide in the knapping of certain morphothemes for which we have found no parallels in other deposits, such as the type known as B; large dihedral pieces

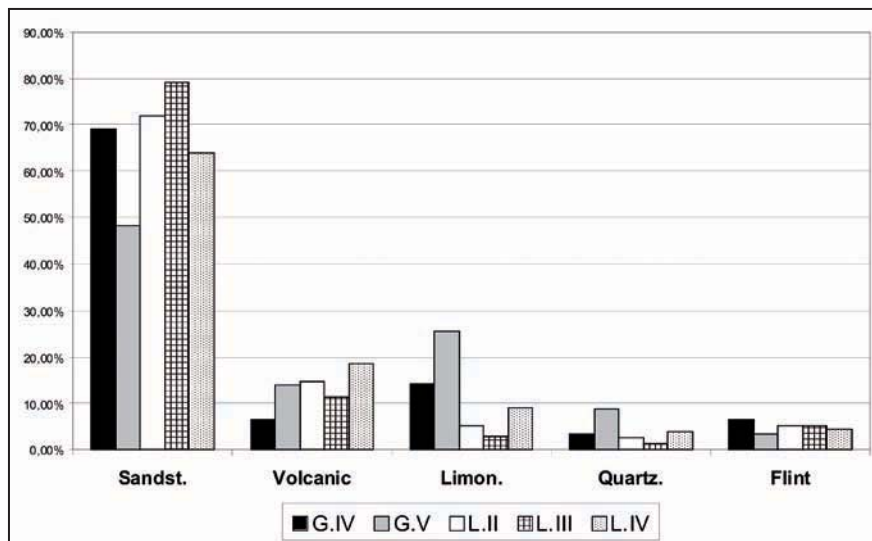


Figure 6. Comparison between Lithic Raw Materials in the Lower Palaeolithic levels. Geltoki (G) and Luebaki (L) areas.

Figura 6. Comparación entre las materias primas empleadas en los niveles del Paleolítico inferior. Áreas Geltoki (G) y Luebaki (L).

made by the convergence of two blows at the end of a large rock, in the form of a huge burin. We have been surprised by these circumstances, common to both sectors, as they do not correspond to our impressions of the assemblage in the field, and encourage us to enlarge the sample to be studied. In addition, they are an extra factor to verify that the procedure being followed to filter the Lower Palaeolithic assemblage does not add any great biases to the analysis of these units, despite the stratigraphic conflict observed at Luebaki as described above.

5. The Gravettian in the Luebaki sector of Irikaitz

It has already been explained how the circumstances of the deposit in the Luebaki sector have induced us to take precaution in describing and studying the series at Irikaitz. Therefore, even though the mechanism for filtering the information appears to be operative and allows us to differentiate two very different lithic assemblages (from the perspectives of management of the raw materials, typometry, technology and techno-typology), two imponderable factors should be taken into account. In the first place, flint should be represented, even if only symbolically, in the Lower Palaeolithic assemblage (in the Geltoki area, an average of 5% of the artefacts are manufactured from flint), and secondly, it is possible that some of the large cobbles, in local raw materials, were used and knapped in the Gravettian, although in barely significant amounts. Having said this, we can appreciate that both assemblages (Gravettian and Lower Palaeolithic) are coherent among themselves (between levels L.II, L.III and L.IV) to a high degree, which we can calculate at about 95% of the pieces, once we assign all the flint artefacts to the Gravettian. It is obvious that this is not the best possible circumstance of conservation

for an archaeological site, but at this stage in our research on the samples, it seems sufficiently refined to be able to propose some provisional observations.

It has already been pointed out that this is a quite large assemblage, in any case much larger than we had first imagined, even subtracting that 5% of possible uses of flint in the Lower Palaeolithic levels. Taking into account the derived character of the Gravettian series, over 700 remains in a surface area of six square metres is an appreciable density of finds. For obvious reasons, it is not possible to discriminate the use of alternative raw materials to flint in this level, although we can confirm the presence of the different varieties of flint that are usually recognized in Basque assemblages (coastal flysch, Urbasa and Treviño, Tarrío, 2006) to which can be added, in very small percentages, some raw materials from north of the Pyrenees (at least, in all certainty, from Chalusse). Following technological criteria, the assemblage consists of a high proportion of blades, with mean percentages of nearly 60% in each of the three levels. This situates the series in a late phase of the Early Upper Palaeolithic, although it could also be compatible with other contexts such as the early or late Aurignacian. In any case, it should be stressed that this variable is not too reliable for a biased, percolated assemblage, in which complete segments of the *chaîne opératoire* could have disappeared as a result precisely of criteria of size or shape.

According to empirical techno-typological criteria, the assemblage tallies with the proposed chronology. A total of 51 retouched pieces have been found in this surface area, of which nearly half are burins, including eight characteristic Noailles burins (Fig. 7); one *busqué* type; one with tertiary modification of edge (Le Raysse type); and the rest are equal proportions of burins on trunca-

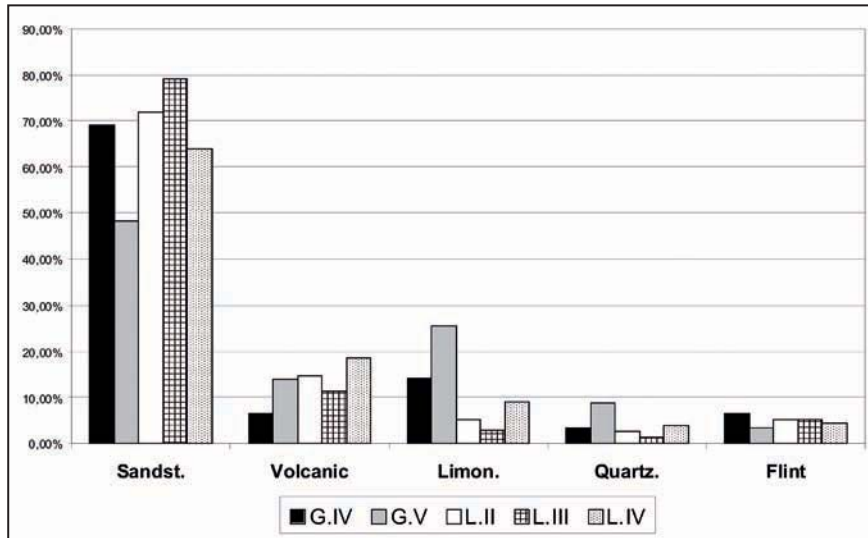


Figure 7. Lower Palaeolithic lithic objects in both Geltoki (G) and Luebaki (L) areas.
 Figura 7. Objetos líticos del Paleolítico inferior en las Áreas Geltoki (G) y Luebaki (L).

ted and dihedral blades. The backed elements are the second most numerous group (9), including three points (a broken one is very probably of the Font-Robert variety), and six bladelets. The other artefacts in the sample consist mainly of the Écaillés typological group (7), followed by smaller numbers of objects with simple retouch (3), truncated pieces (3), scrapers (2), becs (2), denticulates (2) and a burin-scraper. The only anomaly in comparison with other assemblages attributed to the Gravettian (some of which are in the vicinity, such as Amalda), is the low number of endscrapers and relative over-representation of burins.

If we examine the vertical distribution, grouping these artefacts by levels, we can see there are no significant differences, apart from a higher density of finds and greater concentration in Level L.III. Such significant palaeo-ethnographical elements as the Noailles burins are found in all three levels, as well as the other burins and backed pieces (including the points, one in each level). The flint assemblage is therefore coherent, both in terms of the material in the different

levels and as a whole, with the proposed chronology.

6. General discussion

We have worked in two different sectors, called Geltoki and Luebaki, at the Irkaitz archaeological site, since 1998. Geltoki has yielded far fewer remains, although they have the advantage of being situated in a more dilated stratigraphy with fewer problems of the percolation of later lithic artefacts. In contrast, the collection at Luebaki has a very high density (nearly 100 knapped Lower Palaeolithic remains) but this sector has the very serious problem of the discrimination of Lower Palaeolithic and Gravettian archaeological materials. Until now we have followed our perception in the field of the dimension and circumstance of this problem of mixed archaeological assemblages. On this occasion, for the first time we have attempted to clarify these aspects, with results that were to a certain extent unexpected.

We have analysed a sample of six square metres, selected according to a criteria of hori-

zontal distribution of the main stratigraphic anomalies. In the first place, we have aimed to establish whether there is any sure way to distinguish the Lower Palaeolithic remains, apparently in a primary position, from the later objects. Based on the vertical dispersion of the clearly percolated remains (objects in a vertical or oblique position, corresponding to characteristic Upper Palaeolithic types or manufactured on blades), we have been able to prove the pertinence of the defined stratigraphic units and determine that the vertical distribution gradient of the previous variables is very similar to that of the remains made from flint. Together with the different distribution of the Lower Palaeolithic remains, this allows us to deduce that a very significant part of the flint artefacts (if not all of them) can also be considered percolated Upper Palaeolithic elements. In this way, two approximate assemblages can be discriminated, which enables us to address the descriptions of the Upper Palaeolithic and Lower Palaeolithic in the Luebaki sector. In the first place, the Upper Palaeolithic assemblage is striking because of its high internal coherence, and the consistence of the series with the proposed hypothesis that it corresponds to occupations of a Gravettian knapping site. Although this hypothesis requires a full, detailed study of the industry, in order to locate missing segments of the *chaîne opératoire*, possible re-fits and complementary studies (such as some TL dates), the collection is more numerous than was expected and seems to be relatively complete, in the current phase of study of the sample. Thus, to give an example, we have located very different forms of the most frequent primary type, burins, at the same time as we have recovered numerous burin cuts, also of multiple sizes. The discovery, over the last twenty years, of several open-air Gravettian sites in the region, such as Pelbarte (Sáenz de Buruaga, 1996, 2004) and Prado (Sáenz de Buruaga, 2004; Sáenz

de Buruaga et al., 2005) in Alava; Mugarduia Sur (Barandiarán, 1988a, 1988b, 1996, 1997; Barandiarán et al., 2007) in Navarra; or Ametzagaina (Tapia, 2007; Tapia et al., 2009) in Gipuzkoa, provide a context for these occupations that would have been unsuspected a short time ago.

Regarding the Lower Palaeolithic occupations in the Luebaki sector, it is hardly necessary to insist on how unusual these are in Cantabrian Spain (Rodríguez-Asensio and Arrizabalaga, 2004; Arrizabalaga, 2006). Scarcely a handful of sites in the different regions of Northern Spain display the conditions of a primary Lower Palaeolithic deposit (e.g. Bañugues and Cabo Busto in Asturias; Cueva del Castillo, La Garma A exterior and La Verde in Cantabria; Lezetxiki in the Basque Country), and besides, these have yielded collections with fewer pieces. In these circumstances, without wanting to state a truism, we will find that there is a very high statistical probability that each of these sites will basically resemble itself. However, our first field observations of the assemblage recovered in the Luebaki sector inclined us to suppose that great differences existed in comparison with the two most representative levels (G.IV and G.V) in the Geltoki sector. However, the first results of the study that has been undertaken in this respect are different from what had been foreseen. The similarities between the Lower Palaeolithic assemblages in the Geltoki and Luebaki sectors at Irikaitz are quite striking, from the viewpoints of the management of lithic raw material, certain *chaînes opératoires*, and the techno-typological items produced. The complementary information we possess about the sedimentological context suggests that a certain chronological gap exists between the two series at the site, but we are still unable to determine which is the earlier of the two. In any case, apart from the provisional considerations derived from this study, we believe that the most interesting po-

ints are the methodological approach and the work undertaken to solve the taphonomic problem affecting the Irikaitz site, particularly in the Luebaki sector. We have occasionally wondered if it was worth continuing to excavate new areas in a part of Irikaitz where the interpretation would at least be difficult. We believe that this approach has given meaning to the field work we have carried out, and that significant information can be gathered to reconstruct and interpret the deposit as a whole, and at the same time contribute to finding ways of comprehending depositional and post-depositional phenomena in the area. In consequence we will understand better what Irikaitz was for human groups of hunter-gatherers in the Pleistocene.

Acknowledgements

This research has been partially funded by the Consolidated High Performance Prehistory Research Group of the University of the Basque Country (IT-288-07) and by the project HAR2008-03976/HIST of the Ministry of Education and Science.

References

- Altuna, J., Baldeón, A. & Mariezkurrena, K. (1990). *La Cueva de Amalda (Zestoa, País Vasco). Ocupaciones paleolíticas y postpaleolíticas*, Ed. Eusko Ikaskuntza, San Sebastián, 276 pp.
- Altuna, J. & Merino, J. M. (1984). *El yacimiento prehistórico de la cueva de Ekain (Deba, Guipúzcoa)*, Ed Eusko Ikaskuntza, San Sebastián, 351 pp.
- Arrizabalaga, A. (1995). *La industria lítica del Paleolítico Superior Inicial en el Oriente Cantábrico*. Unpublished Doctoral Thesis. Univ. País Vasco, Vitoria, 1000 pp.
- Arrizabalaga, A. (2006). Las primeras ocupaciones humanas en el Pirineo Occidental y Montes Vascos. Un estado de la cuestión en 2005, *Munibe (Antropología-Arkeología)*, 57, Volumen II, 53-70.
- Arrizabalaga, A. & Iriarte, M. J. (2002). El yacimiento de Irikaitz (Zestoa, Gipuzkoa). Aportación al conocimiento del Paleolítico antiguo en Euskal Herria, In: *XVº Congreso de Estudios Vascos*, San Sebastián, 115-122.
- Arrizabalaga, A. & Iriarte, M. J. (2003). El yacimiento arqueológico de Irikaitz (Zestoa, País Vasco). Descripción del depósito y caracterización industrial de su nivel IV, In: *XI Reunión Nacional de Cuaternario*, Oviedo, 205-210.
- Arrizabalaga, A. & Iriarte, M. J. (2005a). El Paleolítico antiguo en el medio pirenaico occidental, In: *Geoarqueología y Patrimonio en la Península Ibérica y el entorno mediterráneo* (Santonja, Pérez-González & Machado, eds.), Almazán, 219-234.
- Arrizabalaga, A. & Iriarte, M. J. (2005b). Irikaitz (Zestoa, País Vasco). Estudio preliminar del Paleolítico inferior en el sondeo Geltoki, In: *O Paleolítico* (Bicho, ed.), Universidade do Algarve, Faro, 267-275.
- Arrizabalaga, A., Iriarte, M. J. & Ruiz-Alonso, M. (2003). El yacimiento arqueológico de Irikaitz (Zestoa, País Vasco). Contextualización arqueobotánica y en el marco del Paleolítico inferior vasco, In: *XI Reunión Nacional de Cuaternario*, Oviedo, 211-217.
- Barandiarán, I. (1988a). Actividad arqueológica en Navarra. 1986-1987: Yacimiento de Mugarduia Sur (Urbasa). Campaña de 1987, *Trabajos de Arqueología Navarra*, 7, 319-321.
- Barandiarán, I. (1988b). *Prehistoria: El Paleolítico*, Ed. Auñamendi, San Sebastián, 800 pp.
- Barandiarán, I. (1996). Le Paléolithique supérieur au Pays Basque et dans le Bassin de l'Ebre, In: *Le Paléolithique supérieur européen. Bilan quinquenal 1991-1996*, Ed. UISPP, Forli, 319-322.
- Barandiarán, I. (1997). El paleolítico y el epipaleolítico. Arqueología de Vasconia Peninsular, *Isturitz*, 7, 5-21.
- Barandiarán, I., Beneitez, P., Cava, A. & Millán, M.A. (2007). El taller gravetiense de Mugarduia sur (Navarra): Identificación y cronología, *Zephyrus*, 60, 85-96.
- Rodríguez Asensio, J. A. & Arrizabalaga, A. (2004). El poblamiento más antiguo de la región: las ocupaciones previas al IS4. Desde el inicio del poblamiento a *circa* 80.000 BP, In: *Las Sociedades del Paleolítico en la Región Cantábrica* (Fano, dir.), KOBIE (Serie Anejos), 8, Ed. Diputación Foral de Bizkaia, Bilbao, 51-90.
- Sáenz de Buruaga, A. (1996). La antigüedad prehistórica, In: *Alava. Nuestra Historia* (Rivera, coord.), Ed. El Correo Español, Vitoria, 33-56.
- Sáenz de Buruaga, A. (2004). Las primeras manifestaciones del Paleolítico superior antiguo en Araba y la explotación de las materias primas silíceas: algunas reflexiones, *Estudios de Arqueología Alavesa*, 21, 1-16.
- Sáenz de Buruaga, A., García-Rojas, M. & Retolaza, I. (2005). Aproximación a la interpretación tecno-

- tipológica del conjunto industrial de tradición gravetiense de Prado (Burgeta, Araba), *Estudios de Arqueología Alavesa*, 22, 51-68.
- Tapia, J. (2007). Ametzagaña: descubrimiento de un nuevo yacimiento al aire libre en Gipuzkoa, *Aranzadiana*, 127, 133.
- Tapia, J., Arrizabalaga, A., Iriarte, M.J. & Calvo, A. (2009). El campamento gravetiense de Ametzagaña (Donostia, País Vasco). Un avance a su estudio arqueológico, *Munibe Antropología-Arkeologia*, 60, 99-115.
- Tarriño, A. (2006). *El sílex en la cuenca Vasco-Cantábrica y Pirineo Navarro: caracterización y su aprovechamiento en la Prehistoria*. Monografías del Centro de Investigación y Museo de Altamira, 21, Madrid, 263 pp.