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Menez-Dregan (Plouhinec, Far Western Europe): the lithic industry from layer 7 and its Acheulean components

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Abstract:

The Lower Palaeolithic site of Menez-Dregan I (Plouhinec, Finistère), located in Brittany at the very tip of western Europe, has been under excavation since 1991. It is an ancient marine cave where the roof has gradually collapsed, and hence partly protected the archaeological living floors from erosion. The fauna has not been preserved due to the acidic environment at the site, leaving only the lithic industry to show the living style of the human groups who settled there and, notably, mastered the very early lighting/control of fire in late MIS 13 or early MIS 12.

Recent digging of layer 7 has provided a lithic assemblage comparable to that of the upper layers at the site and is representative of the Colombarian techno-typological facies (Monnier, 1996). This Lower Palaeolithic industry is contemporary with the Acheulean but differs from it as the heavy-duty tools are mostly cobble tools (choppers). The raw materials used were directly collected from the site itself or from the surrounding pebble beaches; from this stage of collection the use of two *chaînes opératoires* is clearly evident. The flint pebbles/cobbles are preferentially used for flake production. In most of the cases the "SSDA-Clactonian" (système par surface de débitage alternée) method is applied providing flakes with wide striking platforms seldom faceted, prominent bulbs and open angled ventral faces (Forestier, 1993); sometimes flakes are produced by percussion on anvil; they are never Levallois. The small tool kit mainly includes denticulates and notches with a few scrapers. The heavy-duty tools mostly comprised of various types of choppers are shaped on larger cobbles selected for their rather flat, often elongated shape and for their homogenous nature (sandstone or microgranite).

This paper presents some specimens noticeably yielded by layer 7; although few they are typical and definitely akin to the Acheulean techno-typological facies, especially two cleavers made on flakes (quartzite and microgranite), and two bifacial tools roughly shaped on cobbles (sandstone and quartzite), with a third one from the top of the underlying layer 8. These findings revive the question of the relationship between the Acheulean and the Colombarian. Moreover the position of the site in a setting where the natural rocks are available in the form of pebbles/cobbles, flint only as small pebbles, questions the influence of raw material on technical traditions. This provides arguments for understanding the Lower Palaeolithic variability and contributes to the debate on the definition of Acheulean.

Keywords: Colombanian; Acheulean; Cleavers; Menez-Dregan; Cobble tools.

1. Introduction

The Lower Palaeolithic site of Menez-Dregan I (Plouhinec, Finistère), located in Brittany at the very tip of western Europe, has been under excavation since 1991 (fig. 1). It is an ancient marine cave where the roof has gradually collapsed partly protecting the archaeological living floors from erosion (fig. 2). The fauna has not been preserved due to the acidic environment at the site, leaving only the lithic industry as evidence of the living style of the human groups who settled there and, notably, mastered the very early lighting/control of fire in late MIS 13 or early MIS 12 (Monnier *et al.*, 1996, p.63).

In the current state of research the stratigraphy preserved at Menez-Dregan displays an alternating sequence of levels of human occupation and marine deposits (fig. 3) between ca. 465 and 113 ky (Mercier *et al.*, 2004), and the excavation has yielded more than 200,000 lithics artefacts and millions of knapping fragments. This paper presents the lithic industry of layer 7, notable for its Acheulean components (Gaillard and Ravon, 2014).

2. Regional setting: the Lower Palaeolithic in Brittany

The Lower Palaeolithic in the Armorican Massif consists of two different groups, which are Acheulean *sensu stricto* on one side, and “archaic” lithic industries characterised by cobble tools on the other side. The name “Colombanian” was given to this second group whose type site is Saint-Colomban (Carnac, Morbihan, Brittany) by J.-L. Monnier in the late 1980’s (Monnier and Le Cloirec, 1985; Monnier, 1996).

The lithic industry of the site of Menez-Dregan has been attributed to this “Colombanian group” by J.-L. Monnier (1996) on the basis of its composition: predominance of cobble tools among the heavy-duty tools, retouched light-duty tools on flake-blanks comprising mostly notches and denticulates, and knapping method akin to the “SSDA - Clactonian” (Forestier, 1993). The flakes have prominent bulbs, wide butts rarely faceted and wide open flaking angles, resulting from an alternate flaking of the cores (SSDA – “*système par surface de débitage alternée*”, Forestier, 1993). The Levallois method is lacking, handaxes are absent or extremely rare, and there are very few scrapers. Thus the Colombanian proves to be an industry of the Lower Paleolithic, essentially localised on the south Armorican shoreline, between Crozon and Noirmoutier, contemporary with classic European Acheulean but typologically distinct (Monnier, 1996; Monnier and Molines, 1993; Molines, 1999; Molines *et al.*, 2005). The “Colombanian group” is composed of the sites of St Colomban, la Croix Audran, the island of Groix, Menez-Dregan, Primelin, and Le Bois-de-la-Chaize, plus a large number of isolated finds all along the shoreline (fig .1), and is the subject of a new study that focuses mainly on the Lower Palaeolithic site of Menez-Dregan I (Ravon, in prep.; Ravon and Monnier, 2013; Ravon *et al.*, 2015).

All the Colombian sites are located on the current shoreline, their deposits sheltered in corridors of marine erosion or in collapsed marine caves. Settlements are always found on ancient marine beaches, this position seems to indicate that the human occupation occurred at the transition between interglacial and glacial periods, in rather mild climatic conditions (Monnier, 1996).

The site of Menez-Dregan I has been undergoing excavation since 1991 as part of a multidisciplinary project (Monnier *et al.*, 1996, 2000). The deposit is located within the cliff above the current sea level. In Menez-Dregan the sedimentological evidence is strongly reduced because of multiple episodes of marine erosion in the cave (low sedimentary preservation in terms of sedimentation and erosion process). However, the proximity of a section with a longer sedimentary record (Gwendrez cliff) has allowed for an attempt at correlation between the different deposits by means of a sedimentological study applied to sandy marker beds (dunes). The resulting new data allowed a more precise chronostratigraphy of this site to be drawn up and contributed to further validation of dating (Monnier *et al.*, 2011; Laforge and Monnier, 2011). On the basis of the comparison with the stratigraphy on site and on the Pleistocene deposits preserved at the Gwendrez beach nearby, layer 7 of the site of Menez-Dregan I can be geologically correlated to stage 11 (fig. 4; Laforge and Monnier, 2011; Laforge, 2012).

3. Presentation of layer 7

Layer 7 is a thick humic black layer, that has recorded a dense human occupation. It is composed of an alternation of argillaceous horizons and beds of gravels and sand, rich in humiferous organic materials. The sandy argillaceous sediment is poorly sorted, as shown by the straight aspect of the granulometric curve (Monnier *et al.*, 1996, p.25). The micromorphology shows an abundant presence of phosphatic organic materials, with a variable amount of granitic sand and ashen beds including charcoals of bones and wood, besides small organic debris and poorly humic mycelium (Monnier *et al.*, 1996, p. 25). Some very rolled blocks occur at the base and at the top of the layer, disturbing the stratigraphy. At least three different sublevels of human occupation can be distinguished on the basis of the spacial distribution of the artefacts and remains of hearths. Numerous charcoals were found in layer 7, sometimes quite large (5 cm) and including several taxa in a single sample; they provide interesting information about the different types of wood burnt at the site (N. Marcoux, pers. com.).

4. The lithic industry from layer 7

Since the beginning of the excavation, 15377 artefacts bigger than 3 cm have been recorded in layer 7; their composition is shown in table 1. All the different stages of the chaîne opératoire are represented in this layer, as in all the other layers of the site, from the cores to the smallest knapping fragments. Two distinct chaînes opératoires are used in coexistence and are evident right from the stage of raw material selection: the debitage is preferentially made on flint (ca. 80%), then quartz (ca. 15%) and quartzite or glossy sandstone. By contrast the cobble tools are made on sandstone (ca. 80%) or microgranite. All these raw materials are available in the form of cobbles on the beaches near the site, except the glossy sandstone, of which outcrops are known some 20 km away.

In layer 7, the lithic assemblage is composed of 77.3% of flakes and flake fragments, resulting from the *débitage* of flint (63.3%) or quartz (16.9%) and from the *façonnage* of cobble tools in sandstone (10.2%) or microgranite (6.5%).

Only 4.6% of the light-duty tools are retouched, the majority on flint (82.1%) and glossy sandstone (7.2%). They comprise mostly of denticulates, scrapers and notches.

The cores represent 9.5% of the assemblage, and are mainly made on flint (81.6%) or on quartz (16.1%). They are very rarely reduced to exhaustion, and they most frequently result from alternate flaking (fig. 5).

The heavy duty tools (4.5% of the assemblage) are mainly composed of choppers (28%), pebble fragments (23%), cobbles with single removals (17%), chopping-tools (5%), and some few bifacial pieces (1.7%). These bifacial artefacts, rare but typical, are indicative of the Acheulean technical tradition. In layer 7, 3 handaxes, 4 cleavers and 3 unifaces were found during the recent excavations (Gaillard and Ravon, 2014). Some biface thinning flakes in flint were noticed recently too, and attest to the shaping of handaxes at the site in this layer, although handaxes made in flint are totally absent in the lithic collection.

5. Presentation of the Acheulean artefacts

Some artefacts from the layer 7 at Menez-Dregan I are considered as Acheulean on the basis of their typology and underlying technology: they correspond to handaxes and cleavers.

Handaxes, also called bifacial pieces, are tools showing a bilateral symmetry, with rather elongated shape, convergent edges, a bifacially shaped edge exceeding 50% of the perimeter, and a *façonnage* covering more than 50% of the surface of the blank.

These bifacial pieces are considered as belonging to the Acheulean technical tradition for they are worked on both faces, but they do not always result from typical bifacial *façonnage*. However the cleavers are very characteristic of this technical tradition.

Cleavers are large cutting tools made on flakes, with a transversal edge kept unmodified while the lateral edges are shaped either unifacially or bifacially. It is to be noted that the direction of the transversal edge varies from strictly perpendicular to the long axis of the tool to notably diagonal, thus forming a point at one of the distal corners. This variability blurs the typological limit between handaxe and cleaver and therefore the type cleaver has to be understood *sensu lato* (cf. Tixier, 1956; Fiedler, 1998; Mourre, 2003; Chevrier, 2012).

The raw materials used at Menez-Dregan I to make these Acheulean artefacts are the same as the ones used for the cobble tools: quartzite, quartz, microgranite and sandstone, from cobbles or boulders available on the local beaches. Their blanks are large flakes, split cobbles, broken cobbles if not undetermined.

In order to complement the illustrations (figs. 6 to 8), the bifacial pieces yielded by the layer 7 at Menez-Dregan 1 are described here in terms of raw material, blank, overall shape, shaping sequence and finally interpretation, indicating what are the “transformative” and the “prehensile” parts (Lepot, 1993) and whether the artefact can be considered as “bifacial piece as a tool” or as “bifacial piece as a blank for a tool” (Boëda, 1991, 1997; Boëda *et al.*,

1990) with alternative terminology: “shaped piece as a tool” or “shaped piece as a matrix” (Chevrier, 2012).

The bifacial pieces in layer 7

- MDI.2011.7.115085: Handaxe or pick (fig. 6).

Raw material: Fine grained sandstone.

Blank: Cobble with an irregular fracture perpendicular to its main plane, forming a medio-proximal back / steep side, and with a large preliminary removal. Cortex remaining on both faces.

Overall shape: Triangular in front view; trihedral section with a median ridge on the upper face; two adjacent converging cutting edges forming an acute point at the tip.

Dimensions: 148 x 73 x 58 mm.

Façonnage: Lower face (= flattest face) shaped first: three transverse removals, struck from the cortical sector of the upper face, the distal one crossing the entire breadth of the tool; from the distal end of this invasive removal one direct removal shapes the trihedral point. Then at least one removal is struck from the lateral fracture and reduces the median ridge. The base of the tool is then shaped by a series of small inverse removals used as striking platform for a large direct removal that thins the upper face, and for five smaller removals of which two on the left of the proximal part create the only bifacial shaping of the tool.

Interpretation: “Bifacial piece as a tool”. The transformative part comprises the trihedral point and both the adjacent lateral edges, total on the right side but only distal on the left side. The prehensive part corresponds to the back in medio-proximal left position and to the base (bevel-edge) of the tool, clearly opposed to its tip.

- MDI.2011.7.115337: handaxe (fig. 6).

Raw material: microgranite

Blank: split cobble.

Overall shape: Oval front view, plano-convex profile, trapezoidal section; the apex is convex, not pointed, and quite sharp.

Dimensions: 116 x 86 x 43 mm.

Façonnage: First, four invasive flakes remove half of the cortex on the upper face, then one abrupt removal is made on each side of the lower face. Some direct retouches occur on the convex distal edge without modifying its already acute angle (about 30°).

Interpretation: “Bifacial piece as a blank for a tool”. The transformative part is the apical sharp convex edge with both adjacent convergent edges on the distal half of the tool. The proximal half is the prehensive part, with cortex on the upper face and proximal side, and with abrupt removals on both sides.

MDI.2013.7.125555: handaxe (fig. 6).

Raw material: Quartzite

Blank: Undetermined, but probably from a quartzite cobble although no neocortex is visible.

Overall shape: Globally oval in front view with slightly concave lateral sides; biconvex profile; upper face hardly more convex than lower face; apex convex and sharp.

Dimensions: 108 x 67 x 33 mm.

Façonnage: The distal facet on the lower face is not easy to locate in the processing sequence: it probably the earliest. Transversal removals on the upper face are prior to those on the lower face: one on the left side, two on the right side, covering the entire width of the

tool. They are used as striking platforms for two inverse invading removals that create the lateral convexities, and four smaller removals on the distal part of the left edge. The lower face is further shaped by a few proximal removals, especially on the left corner. Finally a large removal thins the proximal part on the upper face. Finer shaping occurs in the form of direct thin retouches on distal convex cutting edge, which is quite sharp (30° to 45°).

Interpretation: "Bifacial piece as a blank for a tool" or "shaped tool as matrix", the preferentially active part being the end scraper-like distal edge. The lateral edges may also be considered as transformative: the right edge is completely shaped to be cutting, unlike the left side, yet more concave and possibly meant to have a special function (cf. notch). The prehensive part is the proximal third of the tool; it has been thinned and turned convex by a series of removals that are longer than those of the active part.

The cleavers in layer 7

MDI.2013.7.125568: cleaver (fig. 7).

Raw material: Quartzite

Blank: Large flake, technically short ("side stuck") with a width almost twice the length. Dihedral butt, making a medium angle with the upper face; point of percussion slightly out from the ridge of the dihedron. Three dorsal removals including two longitudinal-unipolar and one undetermined.

Overall shape of the tool: Trapezoidal front view, plano-convex profile; double edge, diagonal in distal position, perpendicular in proximal position.

Dimensions: 73 x 126 x 33 mm.

Façonnage: On the left edge (striking platform), unsymmetrical bifacial removals, thick on the upper face, thin and marginal on the lower face, the latter also extending on the distal cutting edge. These are followed by a large invading direct removal thinning the proximal part of the tool but not encroaching on the proximal cutting edge. The left edge (distal side of the flake) is bifacially shaped by thick marginal removals, the direct ones also extending on the proximal cutting edge.

Interpretation: Double cleaver with both cutting edges partly retouched on the upper face. These are considered as the transformative parts of the tool. The acute distal left angle probably contributed to enhance the efficiency of the distal cutting edge by forming the classical functional unit "edge-point" (Boëda 1997). The prehensive parts are supposed to be both lateral edges of the tool, but the left edge shows some crushing marks and might have been used too.

MDI.2011.7.116167: Cleaver (fig. 7).

Raw material: Quartz (saccharoid).

Blank: Large, technically short flake. Dihedral, open angled butt, with striking point on one facet, not on the ridge of the dihedron. The upper face shows 4 longitudinal-unipolar removals and remaining cortex on the left side and distal left corner.

Overall shape of the tool: Rounded rectangle in frontal view, biconvex in sagittal view. Two transversal edges, the distal one being broader and sharper than the proximal one and thus considered as the main active part of the tool.

Dimensions: 111 x 79 x 41 mm.

Façonnage: Two direct removals and four inverse thin invading removals shape the left side into an abrupt back. The right side is rather steep (striking platform of the flake) and bears

bifacial marginal removals further extending, but on the upper face only, on the right proximal corner.

Interpretation: Double cleaver with the main transformative edge, in distal position, showing damage in the form of chip and flake removals on both faces. The proximal edge, cortical on the upper face, shows crushing marks. The prehensive part corresponds to both lateral sides of the tool.

MD1.2011.7.115638: Cleaver (fig. 7).

Raw material: Fine grained quartzite

Blank: Technically short quartzite flake, with upper face almost entirely cortical, apart from two incomplete flake negatives. Butt missing due to shaping.

Overall shape of the tool: Rounded diverging triangle in front view, biconvex, slightly asymmetrical in profile view. The ventral face of the flake being more convex (and more worked) it becomes the upper face of the tool. The distal edge is slightly diagonal.

Dimensions: 142 x 89 x 48 mm.

Façonnage: For the two removals on the cortical face, it is difficult to know whether they were made before the detachment of the flake-blank or after, as part of the shaping process.

Anyway, these are used as striking platforms for the shaping of the other face by a series of removals and retouch along the left edge of the tool (proximal side of the flake). These removals are invasive in the middle sector and gradually turn to marginal in the proximal and distal parts. The opposite edge is similarly worked by marginal unifacial removals on the median and proximal parts. The proximal end is a convex bevel-edge (medium angled), entirely cortical on the lower face. The distal cutting edge is unworked but shows small accidental removals on both faces. The shaping of this tool is almost strictly unifacial.

Interpretation: Cleaver belonging to the type 0 of Tixier (1956). The main transformative part is the large distal cutting edge. Presented upside down, the same tool can be seen as a large cutting tool with convergent edges and rounded tip. Is there any prehensive part on this tool which cannot be also transformative part?

MD1.2014.7.129366: Cleaver (fig. 7).

Raw material: Sandstone

Blank: Large cortical flake, technically long ("end-struck").

Overall shape of the tool: Rounded rectangle with a cut corner in front view, plano-convex profile. The distal edge is broader than the proximal side, which is steep.

Dimensions: 153 x 101 x 28 mm

Façonnage: The right side alone is shaped, bifacially, by two direct abrupt removals and then two inverse thin removals. The other sides are blank and the upper face is almost completely cortical.

Interpretation: Cleaver of Tixier's type 0 (Tixier, 1956). The transformative part is the distal edge and possibly the lateral left edge which is almost as sharp. The prehensive parts must be the steep sides, unmodified and cortical in proximal position, partly shaped, partly cortical in lateral right position.

These Acheulean artefacts do not occur only in layer 7. Some handaxes were also found in the immediately underlying layer 8b, especially in the top of it, which can be interpreted as the beginning of the human occupation recorded in layer 7 (Gaillard and Ravon, 2014).

The bifaces in layer 8b

- MDI.2013.8b.125302: Handaxe (fig. 8)

Raw material: Microgranite

Blank: Technically short flake with a cortical butt (at least the remaining part of it) probably knapped from the split face of a cobble/boulder or from the flat ventral face of a large flake ending with an S-fracture. This forms the upper face of the flake-blank, without any dorsal removal.

Overall shape of the tool: Oval, almost rhombic in front view, plano-convex in profile. The upper face of the flake is the flattest and therefore the lower face of the tool.

Dimensions: 111 x 67 x 27 mm

Façonnage: Lateral edges are shaped in the sector where they are converging, i.e. the distal 2/3 of the tool, by thin to large removals, bifacial on the right and distal left edges, otherwise direct only. These contribute to shape the apex into a very convex cutting edge. The proximal part is unmodified: blank cutting edge on the left and cortical (upper face) bevel-edge on the right, both converging in a very convex but not pointed proximal end.

Interpretation: "Bifacial piece as a blank for a tool". The active part may be the converging edges, as they are shaped and as they are adjacent to a nearly pointed tip (edge + point), but the unretouched edges in the proximal part of the tool also show the same morphological features.

- MDI.2014.8b.128886: Handaxe (fig. 8).

Raw material: Quartz

Blank: Undetermined; irregular fracture planes; no cortex visible.

Overall shape of the tool: Oval with a straight base in front view; thick profile suddenly thinner in the distal fifth of the tool.

Dimensions: 119x71x44 mm

Façonnage: The shaping nearly extends on the whole perimeter, starting with a few large removals on each face, and continuing with a second generation of smaller removals all around except on most of the right steep side (back). The left side is a bevel-edge (medium angled) in proximal and median position, a cutting edge in distal position. The distal cutting edge forms an angle but not a proper point. The opposite base is abrupt.

Interpretation: "Bifacial piece as a blank for a tool" as the cutting edge can be retouched or transformed without modifying the general shape. The distal, sharper edge is obviously the main transformative part, opposite to the comfortable prehensive base of the tool, but the left edge is probably transformative too, especially as it is opposed to a back on the right side.

These large cutting tools are rather simple as far as their *façonnage* is concerned. Handaxes are not really bifacial, except n° 125555, shaped by very few large removals, possibly belonging to the blank itself. The cleavers are more characteristic of the Acheulian tradition, although this type is rare in the European Acheulian and much more common in Africa or in western and southern Asia. Compared with the choppers, the configuration of these large cutting tools suggests that they are less specialized, not only in the manner of being handled but probably also in the manner of being used: transformative parts often appear as multiple with their corresponding prehensive parts. On the contrary the choppers usually offer one transformative part only, associated to a wide prehensive (and receptive?) cortical area.

6. Menez-Dregan: between Colombarian and Acheulean

In the past few years, the Lower Palaeolithic site of Menez-Dregan I has been attributed to the Colombarian by J.-L. Monnier and N. Molines, on the basis of the composition of the lithic industry and environmental conditions. The Levallois method is lacking, handaxes are absent or extremely rare, and there are very few scrapers. The Colombarian was known to be a facies of the Lower Paleolithic, essentially localised on the south Armorican shoreline, between Crozon and Noirmoutier, contemporary with classic European Acheulean but typologically distinct (Monnier, 1996; Monnier and Molines, 1993; Molines, 1999; Molines *et al.*, 2005). However, recent finds on the site reveal that the lithic industry always includes some Acheulean components; they are few but they occur in all the layers of human occupation, except in layer 9, the first archaeological level of the site. Some bifacial artefacts were found in layers 4, 5, 6, 7, and 8, showing that the lack of bifaces was not a criterion to define the Colombarian. This led Monnier *et al.* (2007) to propose the concept of "Acheulean of Saint-Colomban type". In this respect it is to be noted that the layer 7 of Menez-Dregan 1, with 1.7 % of large cutting tools among the heavy-duty tools, is typologically not far from Terra Amata, where this proportion of large cutting tools varies from 3 to 5 % and whose status of Acheulean site was never questioned (de Lumley (dir.), 2015), although the cleavers do not fit into the strict definition of cleavers (on flake; Tixier 1956). The only common features between all the Colombarian sites are their position on the south Armorican shoreline, the high proportion of cobble-tools within the assemblage, and the occurrence of two distinct *chaînes opératoires* in all the sites, one for the *débitage* and the other one for the *façonnage*, with two distinct uses of the local raw materials (Ravon *et al.*, 2015). The high proportion of cobble-tools on sandstone and microgranite can be explained by the total absence of flint in the geological ground in the Armorican Massif (fig. 9). The closest cretaceous outcrop is located 40 km offshore in the Audierne bay (Lefort *et al.*, 2007), providing flint only in the form of small marine pebbles and small cobbles. These were used by the Paleolithic populations to make their *débitage* products, but they were too small to produce heavy-duty tools. On the contrary, sandstone, quartzite and microgranite are naturally available around the site in the form of much larger cobbles, regularly oval in front view and rather thin in profile view, especially those in sandstone. This can be seen as an adaptation to the environment, explaining in some way that Palaeolithic craftsmen used to take advantage of the natural shape of the cobbles to make their heavy-duty tools by shaping one edge only, with a minimal number of unifacial removals. In this context the handaxes and cleavers witness more technical investment, at least in obtaining the blanks of the tools. Besides they may be multi-functional tools while the cobble tools look more specialized.

7. Regional perspective: isolated finds

The Acheulean in Brittany is mostly characterized by the presence of isolated finds, often without context, except for the site of La Ville-Mein, in Planguenoual (Côtes-d'Armor) where some handaxes made on glossy sandstone were found in ploughed fields (Lamotte et Monnier, 1997).

However, in all the Colombarian sites, at least one Acheulean component is present, such as in St Colomban where a quartzite handaxe was found, in La Croix Audran which displayed an armorican sandstone handaxe, in Groix where some cleavers were noticed, and of course in Menez-Dregan (Ravon, in progress). However, the Acheulean elements in Brittany are mostly found out of context, without any stratigraphy (Monnier, 1980).

In Menez-Dregan II, located further west from the site of Menez-Dregan I, a bifacial piece has been recently found (Summer 2015). Furthermore, just near the site, a quartz cleaver

was found within the Pleistocene deposits preserved in the Gwendrez cliff (fig. 10), and is typologically very similar to the cleavers found in Menez-Dregan. These finds show that the Acheulean elements, although rare, are present in the region, and contemporary with the Colombarian records.

8. Conclusion

Although the definition of the Colombarian suggests that the large cutting tools or bifaces are absent in the lithic assemblages, some bifacial pieces and moreover some typical cleavers are found in all the Colombarian sites. The Colombarian does not seem to be typologically distinct from the Acheulean anymore, and appears to be an adaptation to an environmental constraint where flint is only available in the form of small size nodules, leading the Palaeolithic knappers to select other raw materials on the fossil beaches surrounding the site for the manufacture of their heavy-duty tools.

The Colombarian proves to be a regional facies where all the sites are sheltered in corridors of marine erosion, along the current shoreline, but from a typological point of view there are no clear differences with the Acheulean in the region.

The site of Menez-Dregan I is an example of the variability of the lithic industries in the Lower Palaeolithic, and highlights the importance of the environment on technical traditions.

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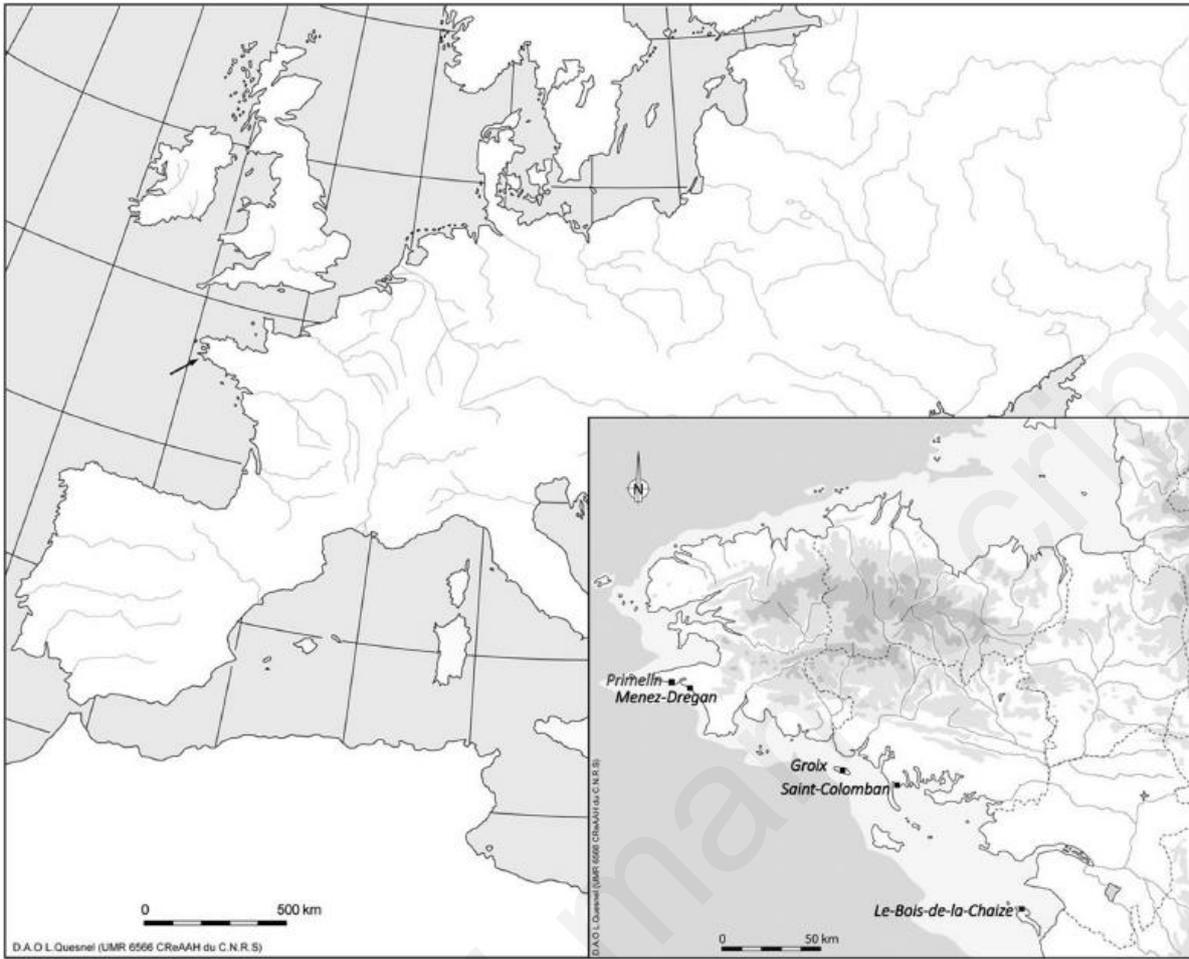


Fig. 1: Geographic location of the Lower Palaeolithic site of Menez-Dregan I (CAD: L. Quesnel).



Fig. 2: The site of Menez-Dregan I, view from the south (Photo A.-L. Ravon).

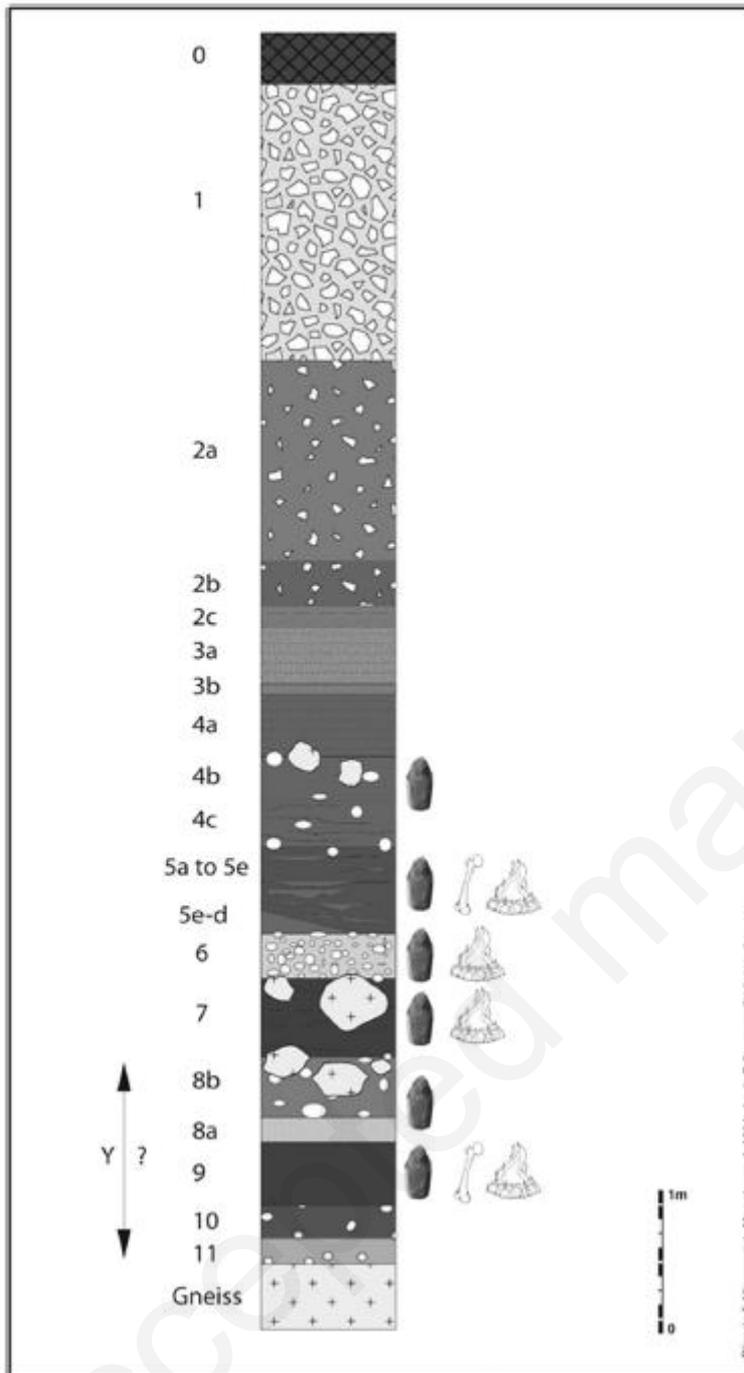


Fig. 3: Stratigraphy of the Lower Palaeolithic site of Menez-Dregan I. Drawings: T. Paterson, CAD: A.-L. Ravon. (After S. Hinguant, in Monnier *et al.*, 1996, modified). 0: present-day soil; 1: coarse head which filled up the deep (this is the last cold period recorded at the site); 2a: large blocks and flagstones, from the final collapse of the marine cave; 2b: arenaceous head; 3a: flaky and argillaceous sand (littoral dune); 3b: Set sandy crust; 4a to 4c: flaky head mixing marine sand and pebbles, with palaeolithic tools (mainly 4b) and strained black layers at its base (4c); 5a to 5e: anthropic soils alternating black (presence of charcoals) and brown layers, very rich with lithic industry, with the presence, at the top of 5c, of a structure of combustion; 5e-d: disturbed ash-bearing layer with structure of combustion arranged at the top of the underlying pebble beach; 6: pebble beach; 7: alternation of Paleolithic layers and dark organic layers, with rounded and smoothed blocks from the collapsed cave, and presence of pebbles at its basis; 8b: raised beach with rocks from the collapsed roof; 8a: sandy layer from the raised beach (8b); 9: sandy-loamy layer, with lithic tools, bones and charcoals, presence of a structure of combustion in a pit; 10: raised beach; 11: raised beach; gneiss: bedrock.

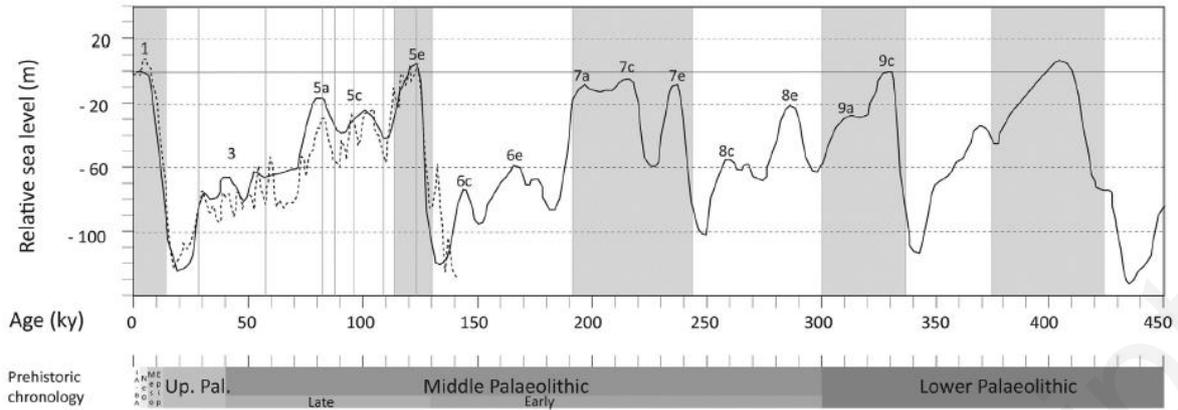


Fig. 4: Relative sea levels and chronological distribution of the isotopic stages for the last 450 ky, after the work of Waelbroeck et al., 2012; Shackelton, 1987; Lisiecki and Raymo, 2005. (In Laforge, 2012, p. 94, modified).

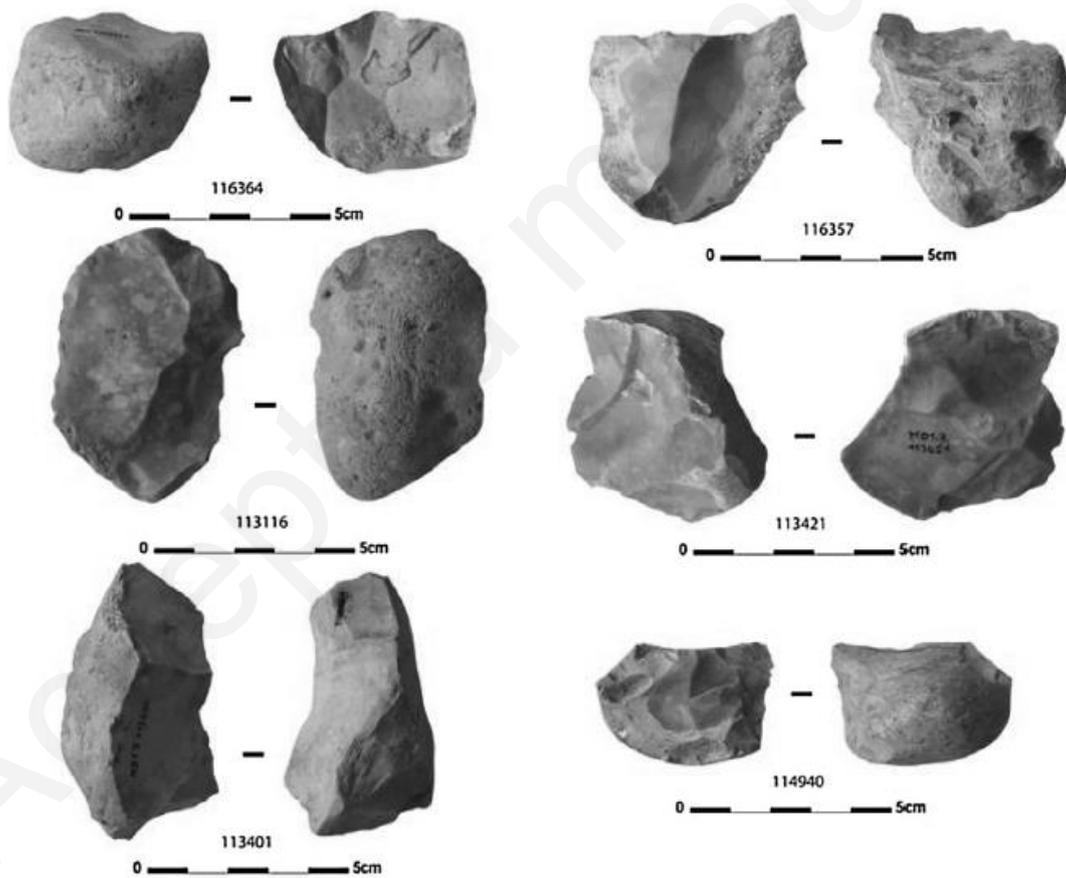


Fig. 5: Lithic industry from Menez-Dregan I, cores in layer 7 (Photos & CAD: A.-L. Ravon).

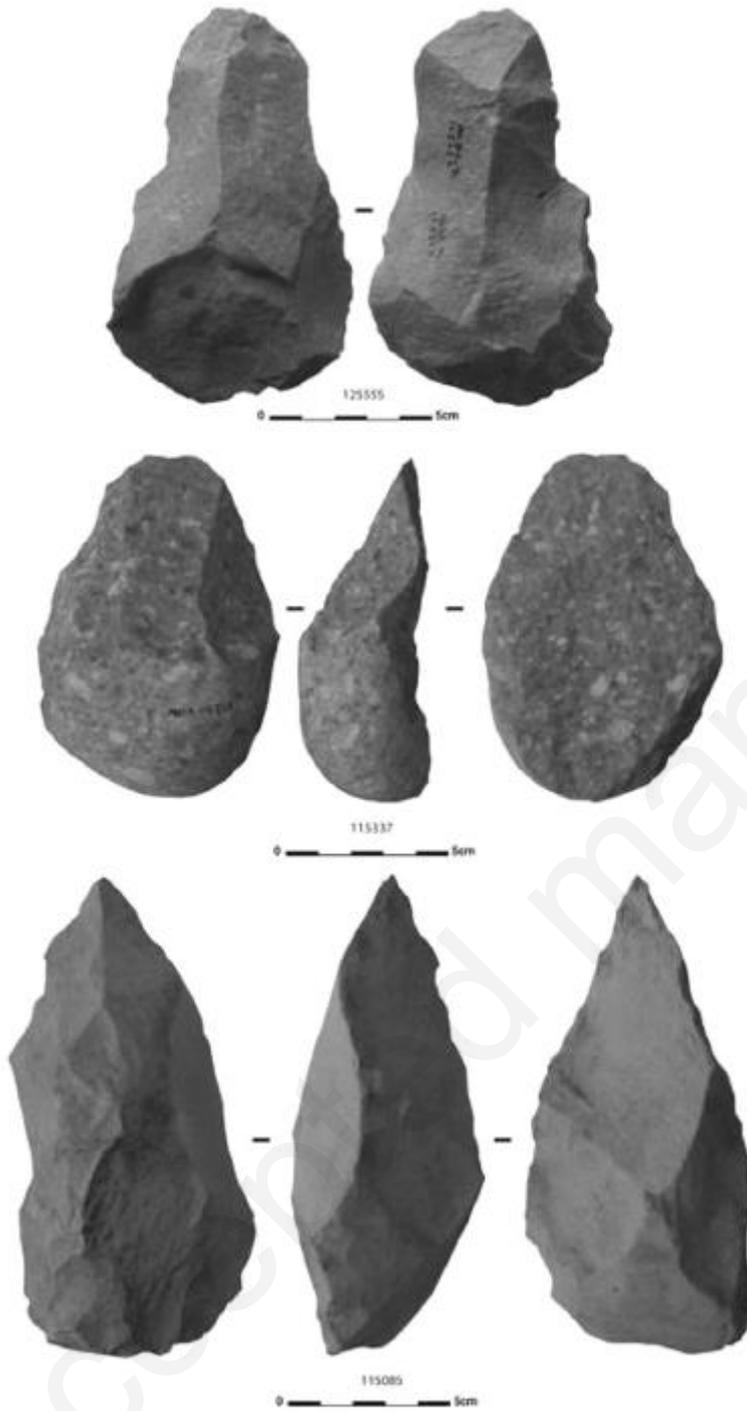


Fig. 6: Lithic industry from Menez-Dregan I, bifacial elements in layer 7 (Photos C. Gaillard & A.-L. Ravon, CAD: A.-L. Ravon).

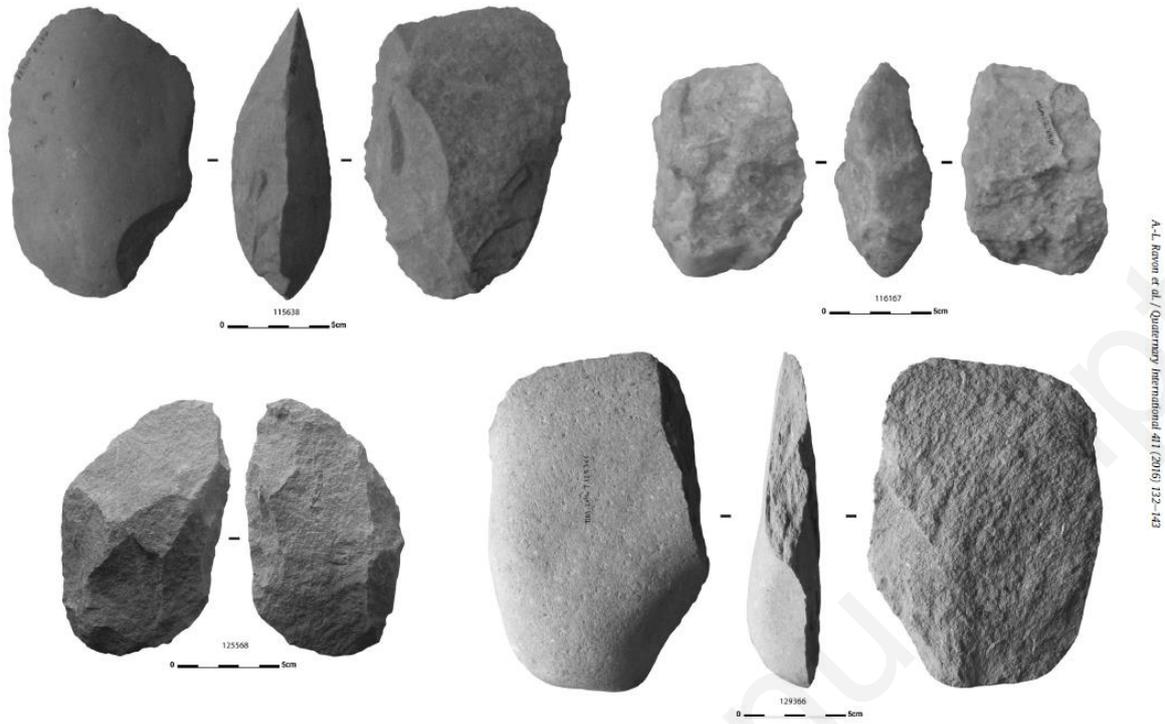


Fig. 7: Lithic industry from Menez-Dregan I, cleavers in layer 7 (Photos R. Cheruel, C. Gaillard & A.-L. Ravon, CAD: A.-L. Ravon).

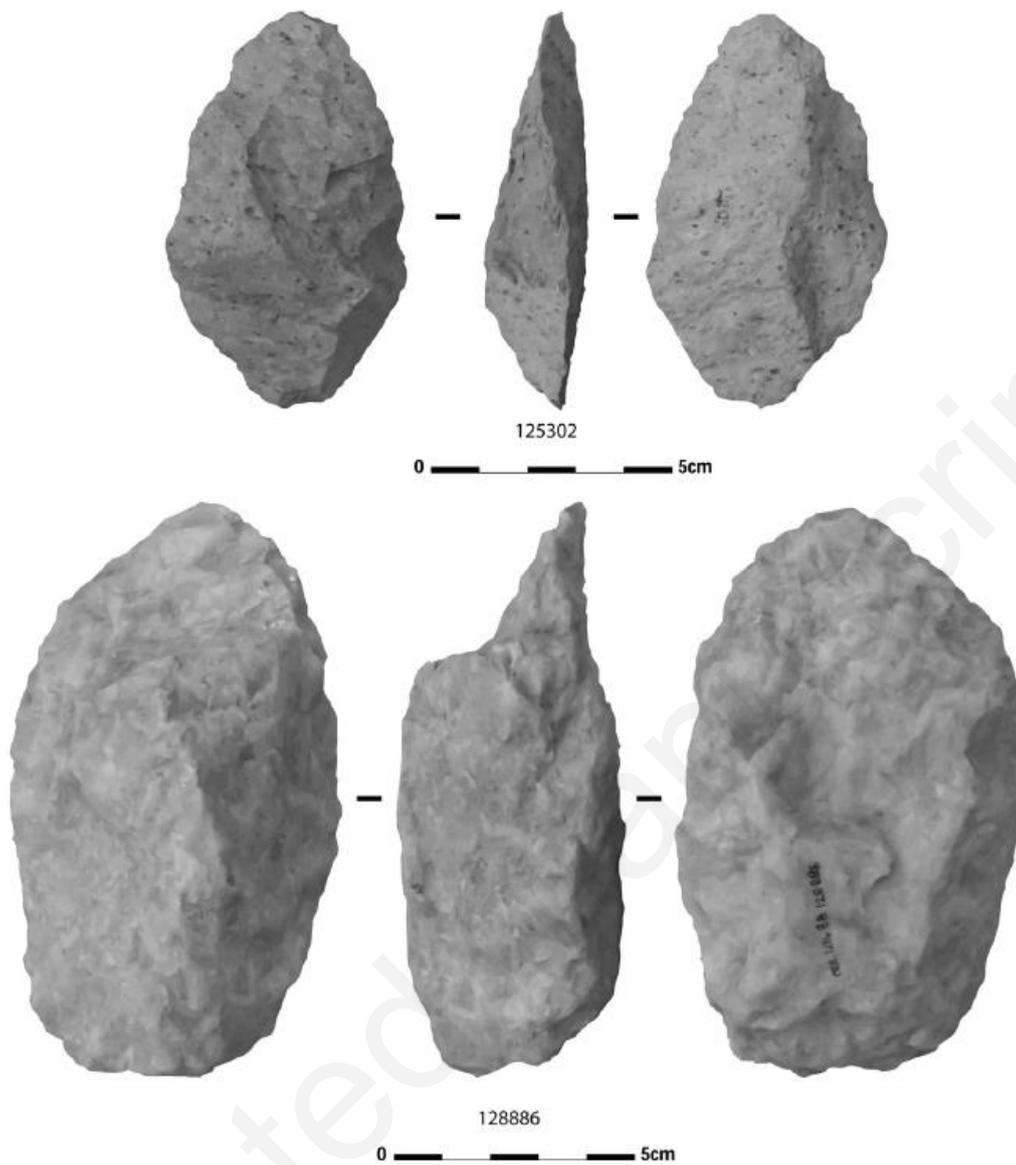


Fig. 8: Lithic industry from Menez-Dregan I, handaxes in layer 8 (Photos: R. Cheruel & A.-L. Ravon, CAD: A.-L. Ravon).

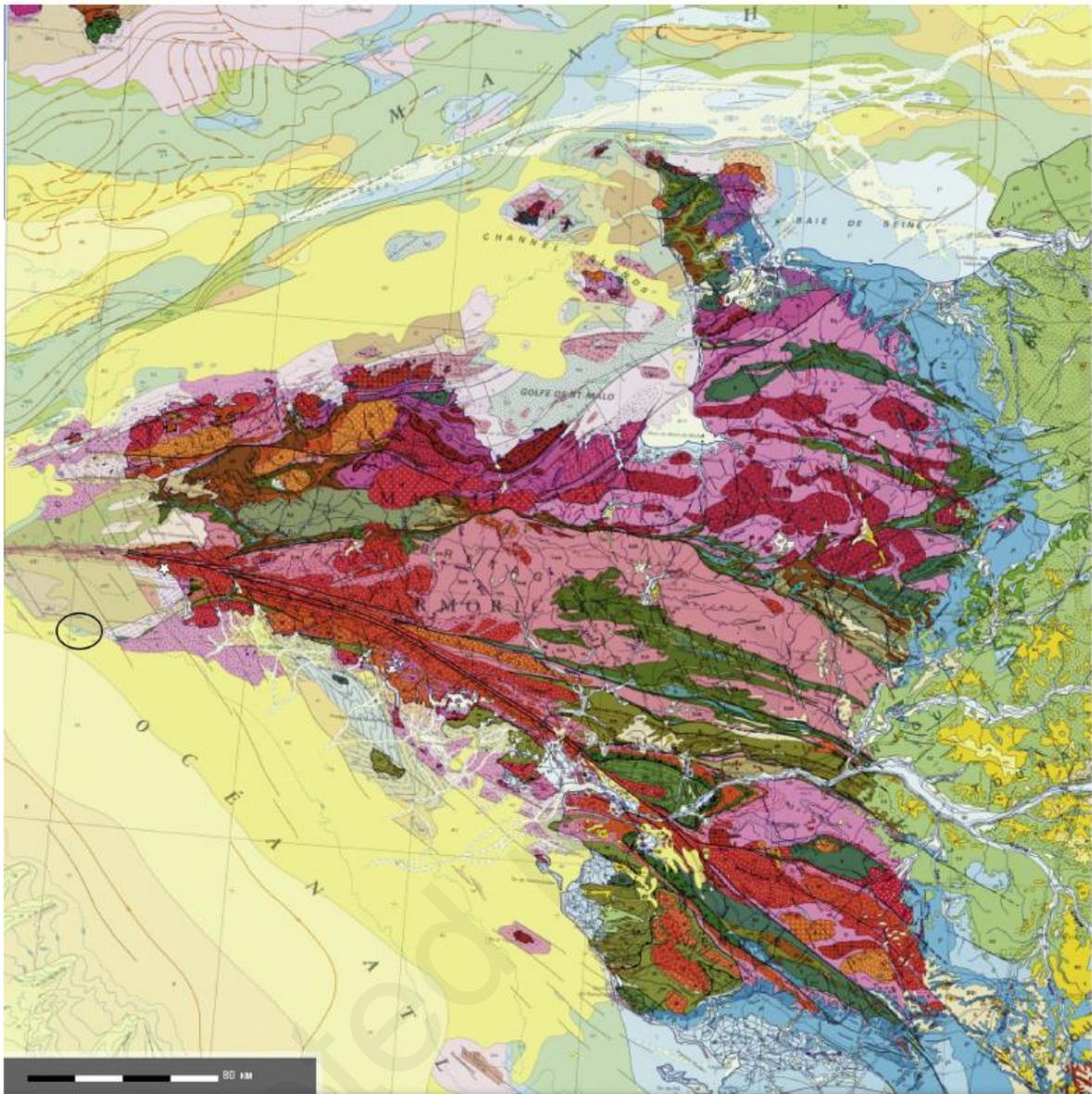


Fig. 9: Geological map of North Western France, showing the location of the site of Menez-Dregan I (white star) and the location of the nearest cretaceous flint outcrop (in black circle). Extrait de la carte géologique de France au 1/1 000 000ème, éd. B.R.G.M., Orléans. CAD: A.-L. Ravon.

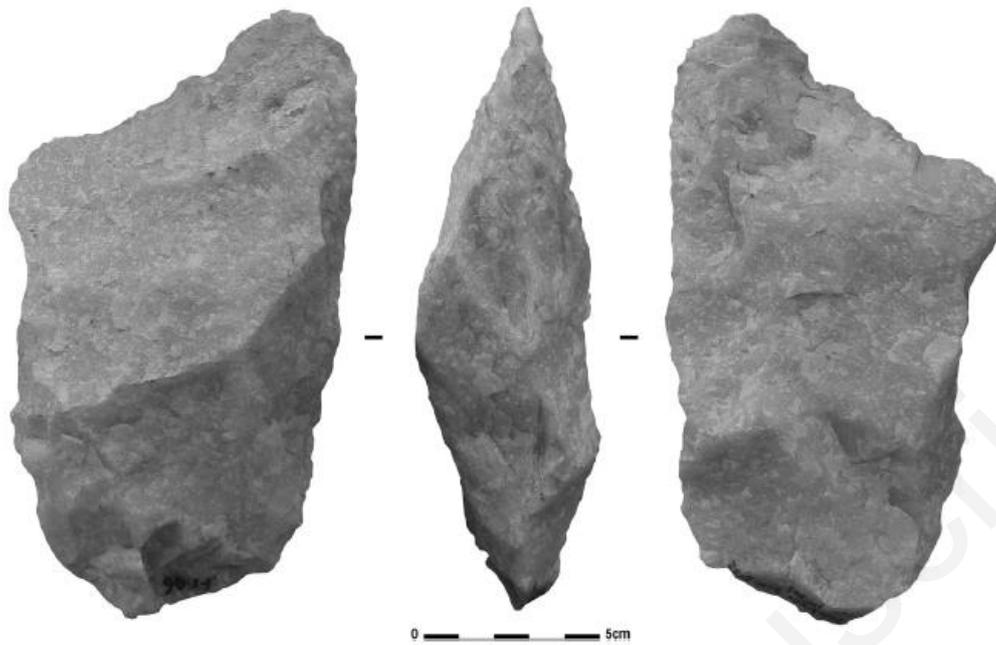


Fig. 10: Quartz cleaver found in the Gwendrez cliff (Photo & CAD: A.-L. Ravon).

Layer 7	Cores	Flakes (incl. broken)	Retouched tools	Cobble tools	Hammerstones / anvils	Miscellaneous heavy-duty tools	Miscellaneous pieces	Total	%
Flint	1187	7531	579	-	-	-	72	9369	61%
Quartz	234	2009	25	22	27	21	59	2397	15,60%
Sandstone	4	1210	23	342	200	136	112	2027	13,20%
Microgranite	6	773	20	77	111	81	31	1099	7,10%
Quartzite	10	198	7	10	10	6	11	252	1,60%
Grès lustré	13	167	51	-	-	-	2	233	1,50%
Total	1454	11888	705	451	348	244	287	15377	100%
%	9,45%	77,30%	4,60%	2,90%	2,30%	1,55%	1,90%	100%	

Tabl. 1: Composition of the lithic assemblage in layer 7.