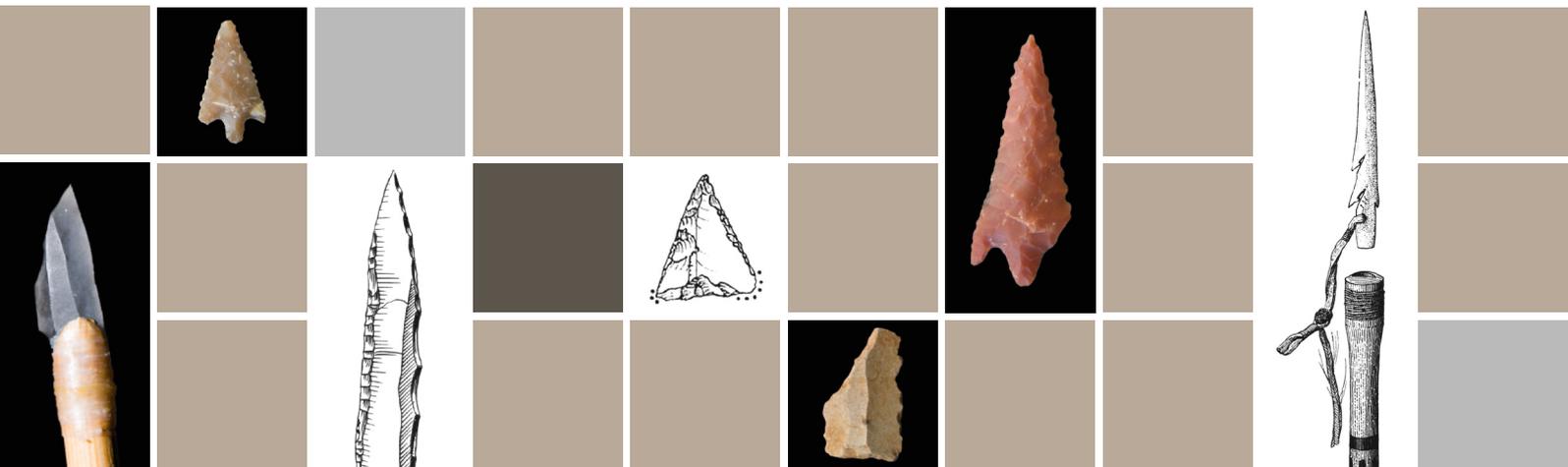


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**PROJECTILE WEAPON ELEMENTS
FROM THE UPPER PALAEO LITHIC TO THE NEOLITHIC**
Proceedings of session C83



Review published by the P@lethnologie association, created and supported by the TRACES laboratory, the Ethnologie Préhistorique laboratory, the University of Liège and the Ministry of Culture and Communication.

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This event and its proceedings received support from



A GRAVETTIAN KNAPPING WORKSHOP AT TERCIS (LANDES)

A PROBABLE CASE OF APPRENTICESHIP IN THE FABRICATION OF LITHIC WEAPON TIPS

Aurélien SIMONET

«When we'll finally understand [...] that a rich culture with no educational system will bring much more to its children than a poor culture with the best educational system in the world, the solution to our educational problems will start appearing. » (Mead M., 1973, p. 219-220).

Abstract

The site of Tercis, in the Adour Basin, contains several distinct artefact concentrations. It consists of a vast open-air knapping workshop where the production of lithic weapon tips in Tercis flint was a significant activity. Some of the lithic concentrations can be attributed to the Gravettian culture. However, the degree of technical investment varies from assemblage to assemblage, contrasting this probable cultural unity. This paper presents a study of the apprenticeship process revealed by these assemblages in order to stress the high degree of technical investment devoted to projectile tips, and consequently, their significant role in the evolution of lithic production systems.

Key-words : lithic weapon tips, Gravette Point, apprenticeship, Gravettian, flint economy, technical investment, Tercis, Isturitz

Introduction

The site of Tercis provides an opportunity to study isolated lithic concentrations, which together are related to one or several distinct occupation zone(s) (relationships with the sites Isturitz and Brassempouy have been demonstrated through petrographic analyses). One of the concentrations contains a set of poorly made Gravettian weapon tips associated with a flint reduction sequence whose economic objective is unclear. This particular workshop, which can be interpreted as being at least partially linked to the apprenticeship of lithic weapon tip manufacture, is currently unique. This site, replaced in its regional context, can contribute to an understanding of the skill necessary for the fabrication of Gravettian backed weapon tips. Comparisons with another concentration of the knapping workshop showing a different level of competence, and comparisons with the weapon tips found in one of the probable habitat sites (Isturitz), emphasizes the interest of this assemblage in the context of questions relative to technical investment. This approach contributes to the debate concerning the necessity of qualitative descriptions and the need for greater objectivity in notions as difficult as competence level, with all that is implied in terms of typological designations. In this way, lithic weapon tip assemblages will become more coherent, some of their variability will rapidly be explained and the pertinence of weapon tips in the context of reflections concerning human-environment relationships and the characterization of cultural facies will be refined.

General Presentation

History

The importance of the site of Tercis—and of the Chalosse ensemble in general—was understood by local scholars (Daguin, 1948; Du Boucher, 1877, 1878, 1879; Pottier, 1872) as early as the end of the 19th century. It is therefore rather paradoxical that the site was then neglected for most of the second half of the 20th century. The work of R. Arambourou (1963), and especially the doctoral thesis by Cl. Thibault on the quaternary terrains of the Adour Basin (Thibault, 1970), are the only scholarly

studies that mention Tercis. Cl. Thibault provides precise stratigraphic and sedimentological information, including the stratigraphic profile of the Vignès slope. He hints at the richness of the site in blade cores, burins and unretouched blades and presents some of the Gravette Points of the Emile Daguin family collection. He proposes an attribution to the evolved Perigordian. We owe all the most recent data to the work of Christian Normand who collected several assemblages attributed to the Aurignacian and Gravettian. For the Gravettian, he also published the assemblage designated as “with backed pieces” (Normand, 1987, 1993).

The site

The archaeological site of Tercis (Chalosse) is located on the southern slope of an anticline on a hill rising 60 meters above the Adour River. Many flint outcrops were exposed due to this geological resurgence. The site is a gigantic flint knapping workshop used by numerous Middle and Upper Palaeolithic human groups. Many of its concentrations were fortuitously discovered during the mining of a large quarry or the excavation of test trenches. All the concentrations are distributed from west to east along a crest more than one kilometre long. It is highly probable that other occupations remain to be discovered in unexplored sectors. The Gravettian is the best represented technocomplex with several concentrations already discovered. However, this particular context makes any precise chronocultural attribution rather delicate. One concentration contains an assemblage of irregularly backed weapon tips associated with a poorly executed flint reduction sequence. A confrontation of this assemblage with other well executed ones that likely have identical chrono-cultural attributions raises interesting questions concerning the notion of technical investment, a notion that is poorly documented in the archaeological record, and the care taken in the production of lithic weapon tips.

The assemblage

Most of the archaeological objects originate from surface collections lacking any stratigraphic and/or archaeological context and are therefore cannot be exploited. In the context of lithic weapon tips, three Gravettian assemblages,



each corresponding to a non exhaustive collection of a concentration, are particularly interesting despite the loss of some data. One assemblage was collected by Emile Daguin at the beginning of the 20th century and two concentrations were partially collected by Christian Normand at the beginning of the 1980's. The assemblage collected by Daguin and one of the two concentrations collected by Christian Normand contain backed pieces. The latter was rapidly collected near "Les Vignès" in July 1982. For four days, Christian Normand conducted an emergency excavation, taking advantage of the postponement of construction work due to violent thunder storms. About 750 pieces were collected, though the size of the initial concentration is still unknown. This assemblage is particular in that it reveals a poorly executed flint reduction sequence associated with around twenty backed pieces that are either unfinished, failed or "atypical". The Daguin assemblage is probably the result of a selective collection carried out during several excavations conducted between 1911 and 1920. This assemblage, conserved at the Musée d'Aquitaine, was discovered near the Vignaux farm around 500 metres east of the assemblage collected by Christian Normand (fig. 1). It is characterized by a poorly executed rectilinear blade reduction sequence similar to that of the first assemblage.

The regional context as an elementary archaeological unit

Tercis, and generally speaking, the entire Chalosse and South-Aquitaine region are very rich in prehistoric occupations. Prehistoric industries were discovered very early and the region has been explored for quite a long time. Human occupations attributed to different techno-complexes have been found there. In our current state of knowledge, sites related to the Gravettian period are, however, less numerous than those attributed to the Magdalenian, for example. The principal Gravettian sites in the South-Aquitaine region and the Atlantic part of the Pyrenees are Brassempouy and Isturitz, respectively located at 50 and 70 kilometres from Tercis as the crow flies. Other than these two famous sites, which have yielded an exceptional quantity of archaeological material, almost no small, limited occupations (stopover

site, hunting station, knapping workshop) have been recognized or reported near these super-sites on the French side. For the moment, we know only Lezia, Hareguy and Gatzarria. Secondary occupations have until now been recognized mainly on the Spanish side. It is too early to specify the reasons for this difference in human occupation density, but it is likely due more to scientific deficiencies and historiographic consequences (incomplete surveys and/or conservation problems) than to a prehistoric reality. In many respects, Tercis represents an isolated example in the French literature. On one hand, it is the most northern site in this French-Cantabrian zone, and on the other it is, as we shall see below, a particular case. Tercis currently offers the only scientifically exploitable secondary occupations in France (perhaps with Gatzarria), providing us with a particular perspective on the larger collections of Isturitz and Brassempouy. The Tercis occupations—and all secondary occupations in general—represent frozen snapshots of the daily lives of human groups. This type of site is essential to obtaining a more paleoethnological and paleoecological view than that offered by long sequences excavated long ago, whose value is essentially diachronic. Only a dialectic study of both these types of prehistoric occupations—from a long and short term perspective—can allow us to progress in our understanding of Upper Palaeolithic societies. A dialectic perspective thus functions in a delicate balance that could be qualified as a field of antagonisms: what we examine in detail in order to have a clearer view prevents us from grasping the whole picture, but at the same time, details are necessary to a characterization of the whole.

The Gravettian assemblages of Tercis

Table 1 presents the counts of the lithic industry of the three Gravettian concentrations at Tercis. The backed piece assemblage and the Daguin assemblage contain lithic weapon tips, each with a very different degree of technical investment. The assemblage with long blades was treated in a university thesis (Simonet, 2004) that will not be presented here as it consists of a study of objects with large dimensions that does not include the operational sequence (reduction sequence) of weapon tip fabrication.



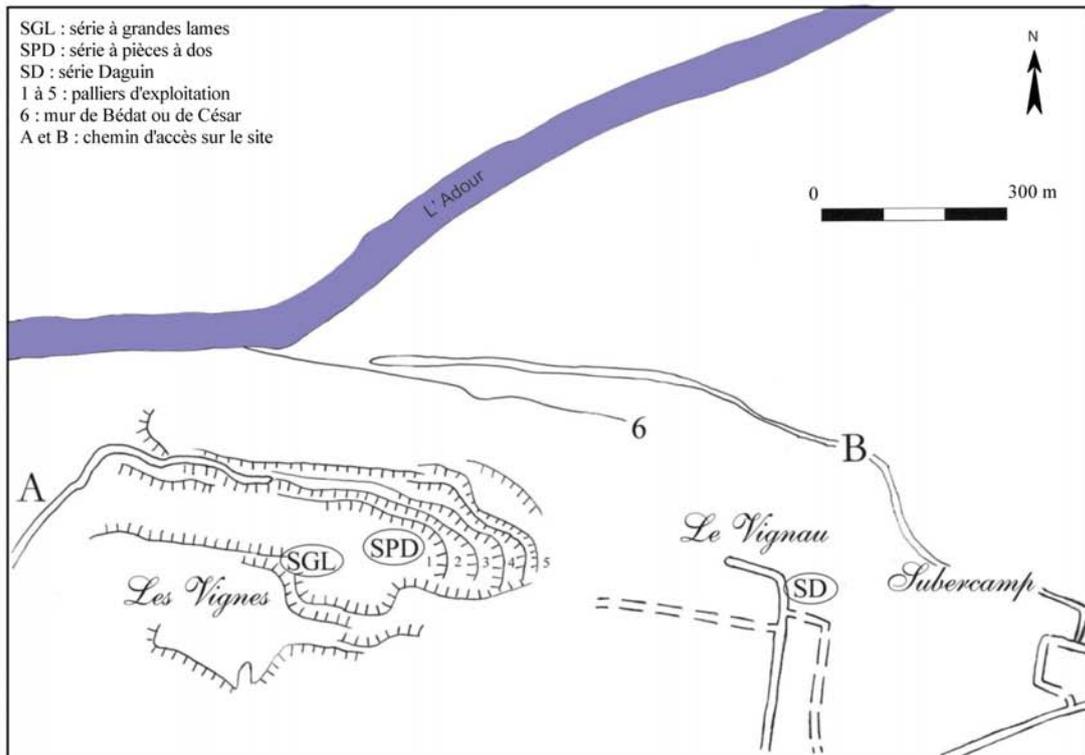
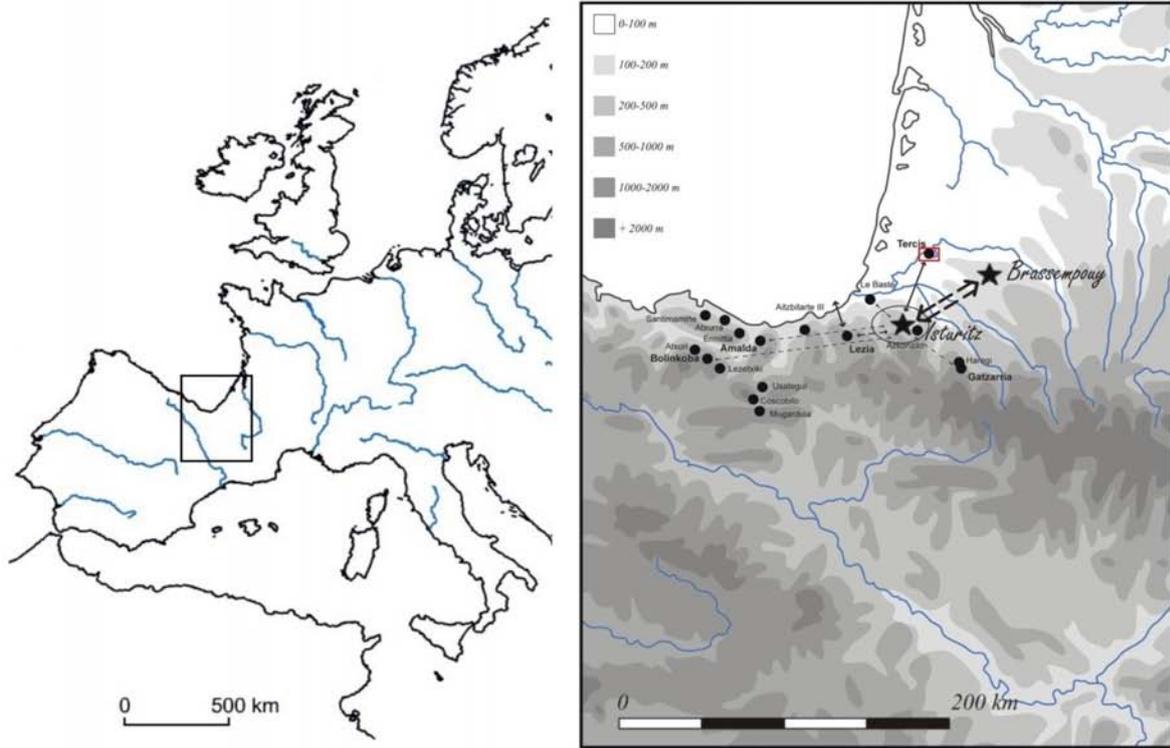


fig. 1 : The Tercis quarry and its geographic location in the context of the Gravettian sites of southern Aquitaine and the Basque country.



	Série à pièces à dos		Série à grandes lames		Série Daguin	
	Nombre	%	Nombre	%	Nombre	%
Eclat et esquille	512	72,2	173	40	environ 60	18,1
Produit lamino-lamellaire	171	23,2	202	46,7	189	56,9
Chute de burin	1	0,1	0	0	?	?
Nucléus	8	1,1	8	1,8	29	8,7
Ebauche de nucléus	0	0	1	0,2	0	0
Casson	1	0,1	2	0,5	0	0
Percuteur	5	0,7	0	0	0	0
Débris	2	0,3	40	9,2	0	0
Total débitage	700	95	426	98,4	278	83,7
Burin dièdre	0	0	3	0,7	1	0,3
Burin d'angle sur cassure	0	0	11	2,5	0	0
Burin sur troncature	0	0	5	1,2	2	0,6
Élément tronqué	0	0	0	0	3	0,9
Pièce à encoche	4	0,5	0	0	3	0,9
Eclat retouché	0	0	9	2,1	4	1,2
Produit laminaire retouché	3	0,4	0	0	17	5,1
Lame appointée	0	0	1	0,2	4	1,2
Total outils	7	0,9	29	6,7	34	10,2
Pièces à dos diverses	29	3,9	0	0	0	0
Pièce à dos semi-abrupte	0	0	0	0	1	0,3
Pointe de la Gravette	0	0	0	0	9	2,7
Lamelle à dos	3	0,4	0	0	1	0,3
Lamelle à dos tronquée	0	0	0	0	5	1,5
Lamelle à dos bitronquée	0	0	0	0	1	0,3
Pièce gibbeuse à bord abattu	0	0	0	0	3	0,9
Pièce à dos partiel	0	0	0	0	0	0
Total armatures	32	4,3	0	0	20	6
Total	737	100%	433	100%	332	100%

tab. 1 : Typo-technological counts of the three main Tercis assemblages.

The backed tool assemblage

In the backed tool assemblage collected by Christian Normand, almost all weapon tips (34 pieces) appear to show a low degree of technical investment (fig. 2 and 3). There are almost no domestic tools. It seems clear that an operational sequence dedicated to the production of blanks for backed tools is represented within the workshop. The “atypical” or imperfect aspect is the common element between most of these backed pieces. We observe a lack of normative criteria in the selection of blanks, which is unlike the usual Gravettian behaviour of selecting regular, rectilinear blanks for the fabrication of lithic weapon tips. Moreover, the retouch of these pieces is almost always unfinished. These are therefore tools in the process of fabrication, but quite particular ones since many of them show a lack of functionality. For this reason, Christian Normand proposed, just after the discovery of these pieces in the early 1980’s, that they could be the result of a learning exercise. Only three pieces (fig. 3 – numbers 1, 2 and 3) are distinguished by the quality of their blank, the regularity of their

retouch and their dimensions. These pieces could have been manufactured by experienced knappers. On the contrary, all of the other backed pieces are imperfect or unfinished. The most striking aspect is the heterogeneity of the blanks selected within a single group of objects that appear to be conceptually identical: Gravette Points. This diversity of blanks is the consequence of an economic choice. The greatest investment was made with knapping waste products, such as: side blades (fig. 2; 3, 4, 5, 16, 17), blade-flakes (fig. 2: 6, 9, 10, 19, 20, 21, 18), a distal partial neo-crest (fig. 2: 23), a blade-flake (fig. 2: 14), blade debitage by-products whose role in the operational sequence is no longer legible (fig. 2: 11 et 12) and full debitage products lacking regularity or straightness, with a marked undulation, for example (fig. 2: 1, 2, 13). Three small flakes were also used. Only four tools (fig. 2: 7, 8, 15 and 22) were made on good quality blanks. Two pieces raise questions concerning the possible link between breakage and back retouching. These pieces seem to have been broken during debitage, thus before the retouching of the back.



They are fragments of full debitage products that were used, and not whole, unworked laminar products. Only two tools would thus have been made from whole, good quality blanks (fig. 2 – Nr. 7 and 8). The blank of tool number 8 is nonetheless very small relative to the average size of the debitage products. Though the ensemble of products thus appears to be unsuitable for the production of backed tools, and consequently, to have been intentionally selected for this unsuitability, they also reveal the competence of the artisan who produced them and his mastery of the management of a high quality debitage sequence, as is shown by: the presence of flank blades to correct the arch (fig. 2: 16 and 17) or to thin the base (fig. 2: 4 and 5) to create naturally pointed full debitage products; the use of a distal neo-crest to maintain the distal longitudinal convexity, and; the use of opposed striking platforms. Negatives of opposed removals are thus visible on pieces 7 and 12. It seems strange that the same artisans could have produced the blanks. The blanks may in fact have been secondary products resulting from an operational sequence requiring a higher level of competence, which were given to an apprentice to learn how to produce a backed tool. This would explain why some un-fragmented backed pieces were abandoned (fig. 2: 3 and 23). The knapper knew very well before he began to shape piece number 23 that it would never be functional as a projectile point. Since there was no shortage of raw material in this context, there was absolutely no reason for these pieces to be collected to satisfy functional needs. The other pieces are of little morphological value as they are always irregular, curved, twisted of varied dimensions. Moreover, good blanks seem to have been voluntarily excluded. A dialectic observation of unworked blanks and backed pieces shows a systematic selection of the worst blanks, undoubtedly to avoid wasting raw material... Indeed, in addition to the blank used, the way retouching method is of some significance: the knapper did not try to achieve a precise shape. It is more the gesture itself than the finished object that counts. The knappers(s) seem to have been trained in the art of producing backs, which resulted in pieces that are rather difficult to

classify according to classic typological criteria. This is again contrary to standard Gravettian behaviour, which followed much stricter rules and had as a priority higher quality laminar products. This is shown by the Daguin assemblage, which has, among others, naturally pointed blades on the distal part explaining the frequent correlation between the orientation of the point and that of the blank debitage.

Observation of the 8 cores (fig. 4) associated with the backed pieces displays the same lack of technical investment, a carelessness that results in small second-rate blanks. In a context where there were so many high quality blocks, considering the significant number of objects collected on the site since the 19th century, it seems particularly surprising that the knapper(s) did not choose small, frost split, rolled or altered flint blocks. Indeed, these second-rate blocks cannot be interpreted as the result of a difficult supply of good quality raw material. As for the few knapped blanks, they have no economical finality, as most of them could have been refitted to the core.

It is also interesting to note that some of the laminar blanks, which were abandoned and isolated within the production, were nonetheless of a good quality (fig. 5), which is in contradiction with the concurrent use of bad quality flint. This demonstrates that economising raw material was not the only motivation of the stone knappers. When studying unretouched laminar products it can be demonstrated that the desired type of product is unique. They were trying to produce very standardized straight blades around 2.5 inches long, 0.5 to 0.8 inches wide and 0.2 inches thick (fig. 5). This size corresponds precisely to that needed to produce a Gravette point. The products were knapped using a soft mineral hammer, as shown by the marked abrasion in the butt, the often punctiform or reduced impact trace, the splintering of the bulb and the frequent presence fine, closely spaced undulations. As with this high-quality laminar production knapped using tangential percussion method, products refitted to the cores seem to have been knapped with a soft mineral hammer.



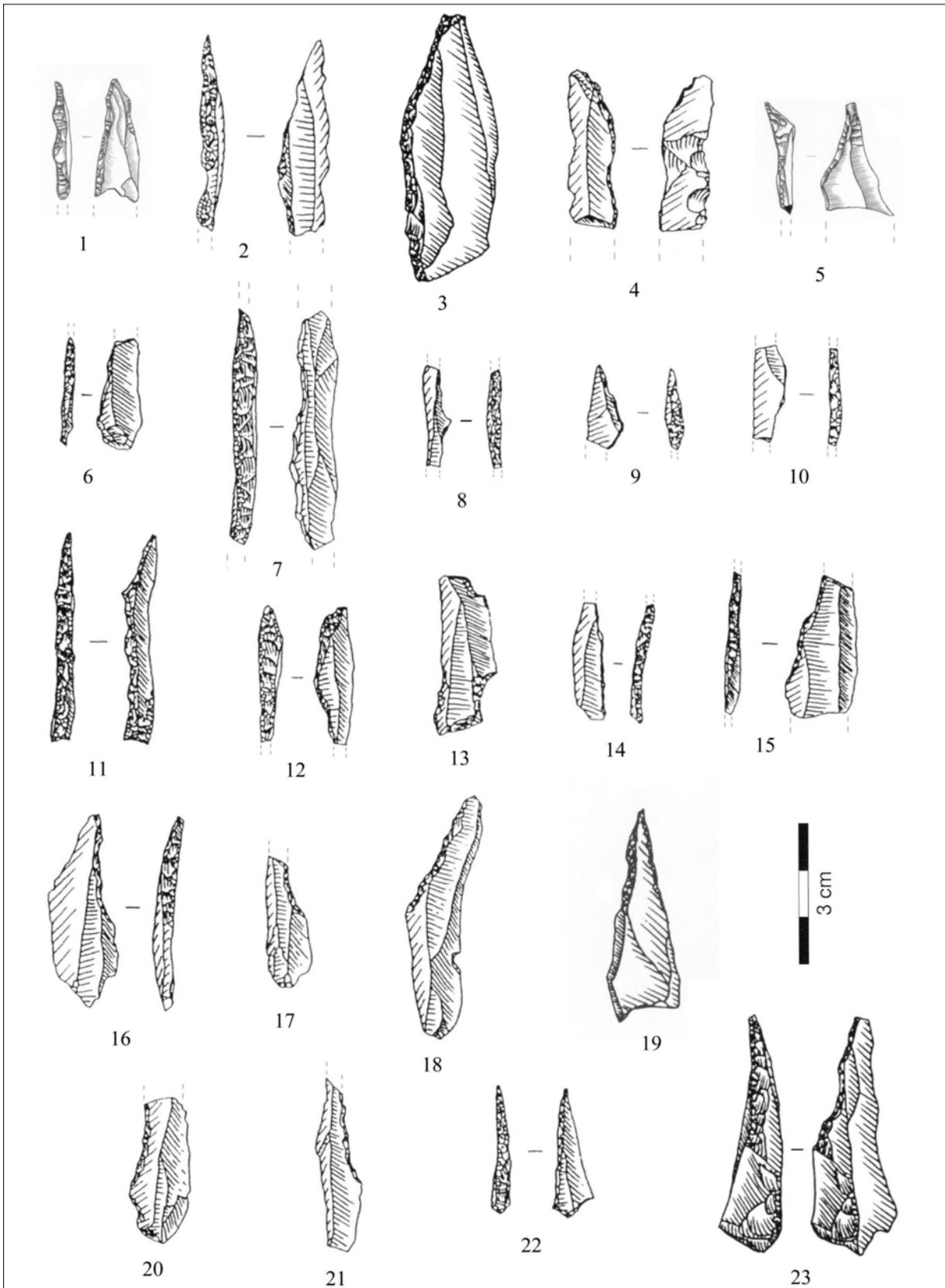


fig. 2 : The backed pieces of the Tercis assemblage collected by Christian Normand (by Normand Ch., 1993, except 1 and 5 by the author).



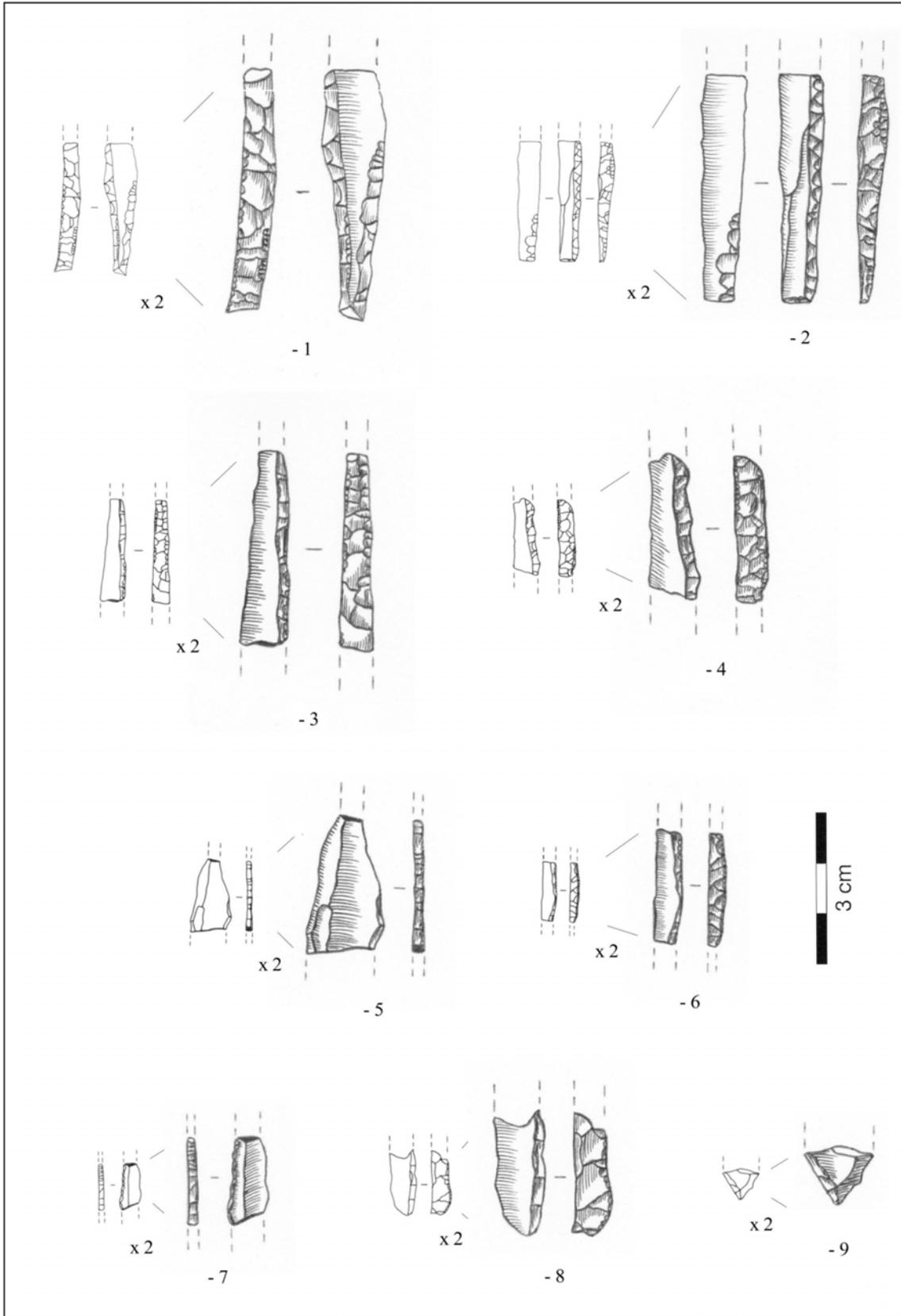


fig. 3 : The small backed pieces of the Tercis assemblage collected by Christian Normand.



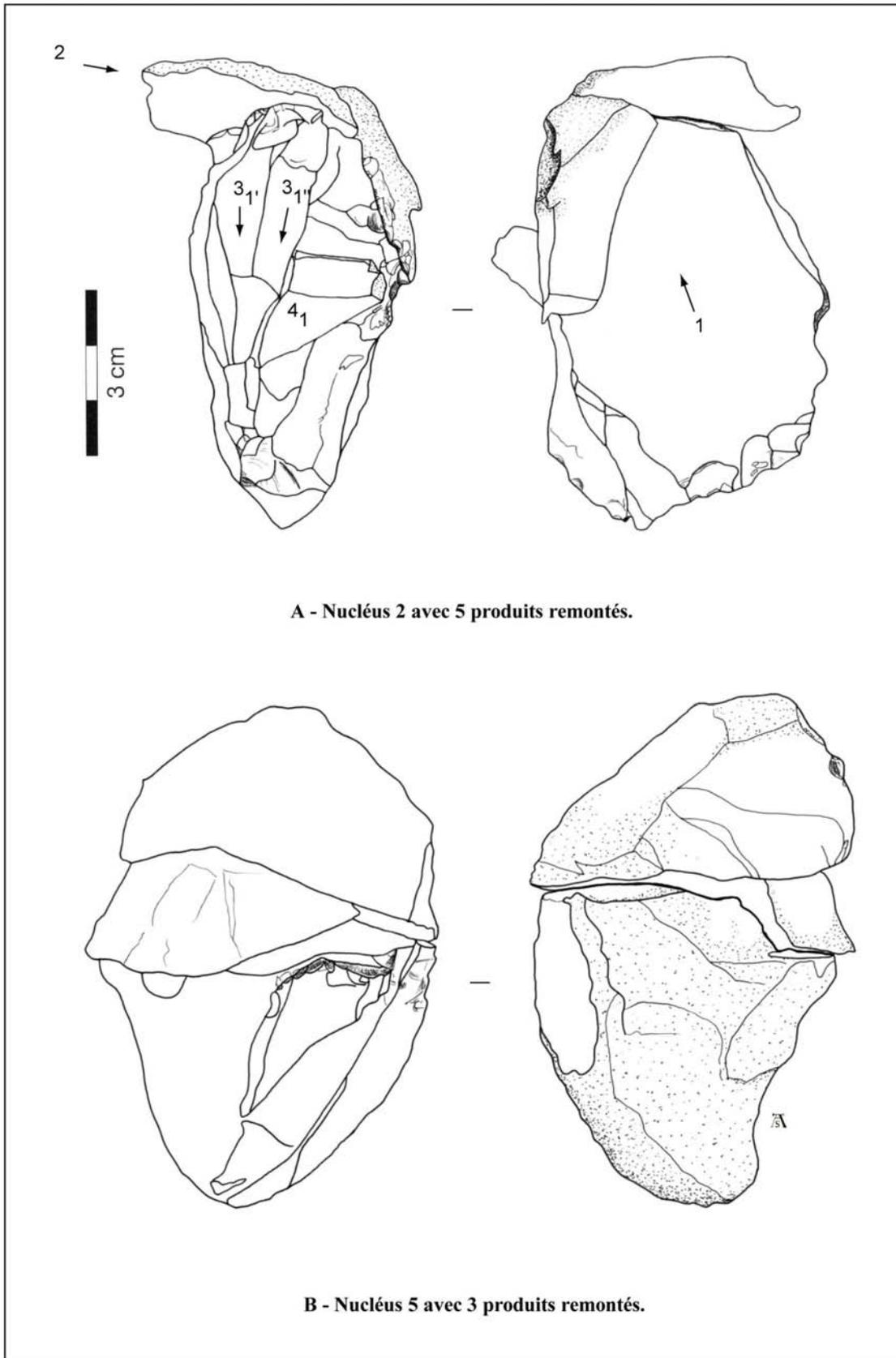


fig. 4 : Two examples among the seven cores present in the Normand assemblage of backed pieces.



However, the abrasion of the platform lip is not very intensive and even almost inexistent, contrary to that of the abandoned unretouched products on which an insistent abrasion can be observed. We can therefore already note two different types of uses: the use of good quality blocks to produce well-made blanks, which were taken away (did the cores stay in an adjacent concentration?) and the use of rather low quality blocks or flakes, used locally as most of the elements of the reduction sequence could be found, but which produced only products close to laminar flakes whose detachment was much less prepared. The difference between the 8 cores used for refitting and the well-made unretouched laminar products knapped in high quality flint is indisputable, especially if we take into account the fact that the abandoned products were of a lesser quality.

On the other hand, many arguments already lead me to individualize core n° 1 (fig. 6). It is the only one made with good quality grey/white flint, which is perhaps a sub-type of the “grey-black Tercis type” flint (Christian Normand, personal communication). This material is slightly out of place among the other pieces made of low-quality grey-black Maastrichtian flint. On the other hand, it is probably the only core that was productive with a complex management of the debitage. Finally, the core was not used in the same location as only one rather big sub-cortical blade is made from the same material, and is therefore the result of its use. All these arguments argue for an individualization of this core (and of the blade with which it is associated), thus corroborating the theories of Christian Normand. All the necessary arguments seem to be present to illustrate an example of an apprentice workshop (the first and only one yet found?) for the fabrication of backed weapon tips:

Petrographic arguments: one or more competent knappers(s) selected low quality flint for apprentices so as not to waste good quality flint. Core N° 1 and its single blade could have played the role of a model to guide apprentices; it could represent the “example to be followed”.

Economic arguments: This possible demonstration core is the only one that was productive. The other cores produced an average of only two or three irregular laminar products, which were not used. These products could thus be refitted on the cores.

Technical arguments: the poorly knapped cores reproduce—in a less careful and smaller manner (because of the low quality of the raw material)—the Gravettian debitage concept based on core reduction with two striking platforms organized into a hierarchy and a curved laminar removal surface with the objective of producing straight blanks. Though reproduced with notable clumsiness, these concepts are visible. They are just simplified, the capacity of using the best process in the context seeming not to have been always applied.

Spatial arguments: They are probably the best arguments for identifying debitage made by an apprentice. Indeed, a quality exploitation was made in an adjoining concentration or in a different area of this concentration where it was not collected. Core n° 1 and its blade, as well as all the good quality laminar products that could not be detached from the core in the assemblage, are the only evidence of the careful debitage where the degree of technical investment is much higher.

The Daguin assemblage

The 29 cores of the Daguin assemblage (fig. 7) and the abandoned laminar products reveal the search for a highly standardised, which was straight, rather thick and 2 to 3 inches long. Two types of exploitation were used there, mostly on flake edges but also on small blocks. The debitage is generally bipolar and organized in a hierarchy with a frontal exploitation extending onto the flanks. However, as there are no refits, it is difficult to determine if the second striking platform had other functions earlier in the reduction sequence. A high level of technical skill is observable in the management of the debitage process. The shaping and the initialization of the debitage are mixed together and the full debitage phase appears to have been quick and efficient. This



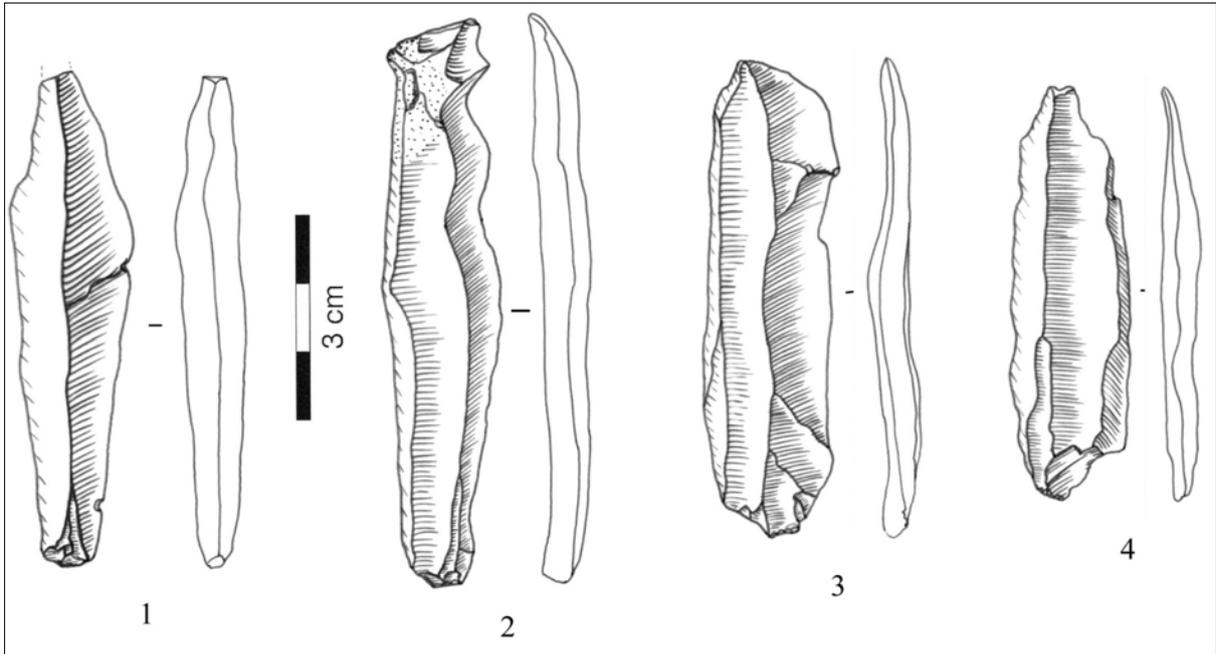


fig. 5 : Rather regular unretouched laminar products. These products, better manufactured than the blanks used for the backed pieces, were not retained. Tercis, backed pieces assemblage.

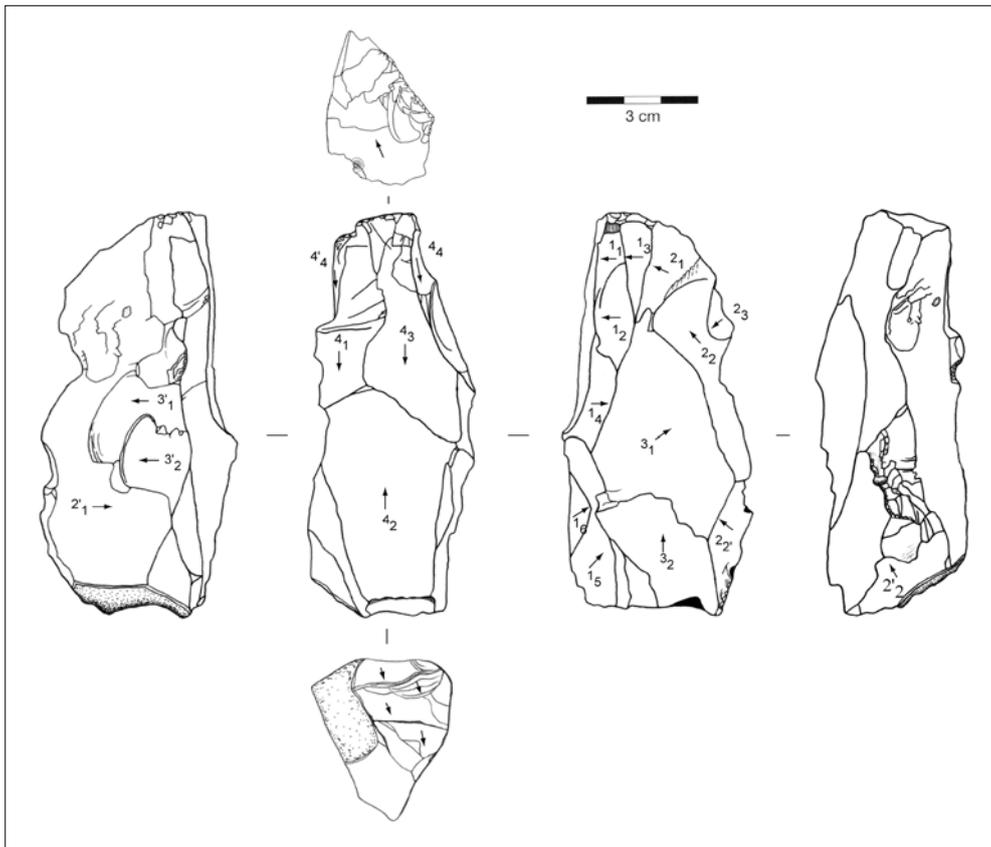


fig. 6 : Core 1. Normand backed piece assemblage.



is a very elegant reduction sequence characterized by a high aptitude for adaptation, needing no complex preparatory phase, for example, which would have resulted only in a waste of raw material often present in the form of small nodules. This operational and technical purity expressed by the search for “**a subtle balance where a low-cost pre-shaping will allow a low-risk laminar extraction**” (Pigeot, 1987) is particularly difficult and signals the work of a very experienced knapper with an excellent knowledge of knapping principles (fig. 7). The general impression is therefore of an adaptation of actions to the raw material more than the strict implementation of more complex debitage modalities which would indeed allow debitage of an even better and more controlled quality, but would use more raw material. This is corroborated by the high number of operational modalities and different debitage rhythms used to produce a single blank (bipolar not organized into a hierarchy, bipolar organized into a hierarchy, opposed-off-centred, unipolar – tightened frontal, widened frontal, semi-rotating). The rhythm is perfectly controlled, as are the lateral and longitudinal convexities, through the use of restoration techniques freely used by the knapper, the last resource being to continue the debitage with an opposed-off-centred technique allowed by a highly arched removal surface and the triangular section of the core. Together with this quality debitage, twenty backed pieces were discovered (fig. 8 and 9). Most of these are very well made, which is in agreement with what was noted on the debitage. One or more knappers(s) of equal competence seem to have worked here. The fact that some pieces were broken while being shaped and/or the existence of pieces broken and abandoned after being used, as well as pieces with an very high distortion relative to an ideal morphological and/or dimensional concept, be it technical or symbolic, may explain their being abandoned in the context of a knapping workshop. For all these reasons, the Gravettian weapon tips of the Daguin series, in the same way as those of the first series, do not represent the fulfilment of the ideal concept. However, (and it is here that the assemblage allows us to advance in our understanding of the technical (and typological)

ideal of these Gravettian groups), it shows a very high level of technical investment. In the end, the weapon tips desired, retained and used by the knappers must have been very similar in size and morphology to those backed pieces.

The Daguin assemblage corroborates the hypothesis of a distribution of the weapon tips and debitage products in the assemblage of backed pieces into two skill levels. It represents the ideal concept (and not result) intended by the knappers of the first concentration

If we consider only the Gravette points (disregarding the two bitruncated backed bladelets of the Daguin assemblage), the desired concept can be defined as follows: the size of the points tends toward a length of 2 to 2.5 inches, a width varying between 0.25 and 0.5 inches and a thickness between 0.1 and 0.2 inches. These tools are characterized by a very slender morphology as well as a very straight back. The latter is more often on the right than on the left, made by a dominating, abrupt, alternating (crossed) retouch on the proximal and distal parts. Finally, the unfinished products allow identification of the different production phases: the first one corresponds to initial forming of the back using semi-abrupt retouch. Dividing the shaping process into two different stages allowed the knapper to avoid breaking the blank. This stage indeed appears to be trickier as the pieces are generally abandoned when the blank is broken during the shaping of the back. The unfinished Gravette Point (fig. 9 – n° 1) illustrates this first stage: the right edge has been shaped by semi-abrupt retouch. The blank was broken during this first production phase, which consisted of forming a semi-abrupt back before completely finishing it with abrupt retouch. Object n° 4 (fig. 9) illustrates the second stage. It is a backed piece broken at both ends. The left edge shows direct retouch. Two abrupt retouch shoulders flank a central portion with semi-abrupt retouch. It is thus possible to examine one stage of the work: after having completely worked the edge with semi-abrupt retouch, the knapper performed a second passage to



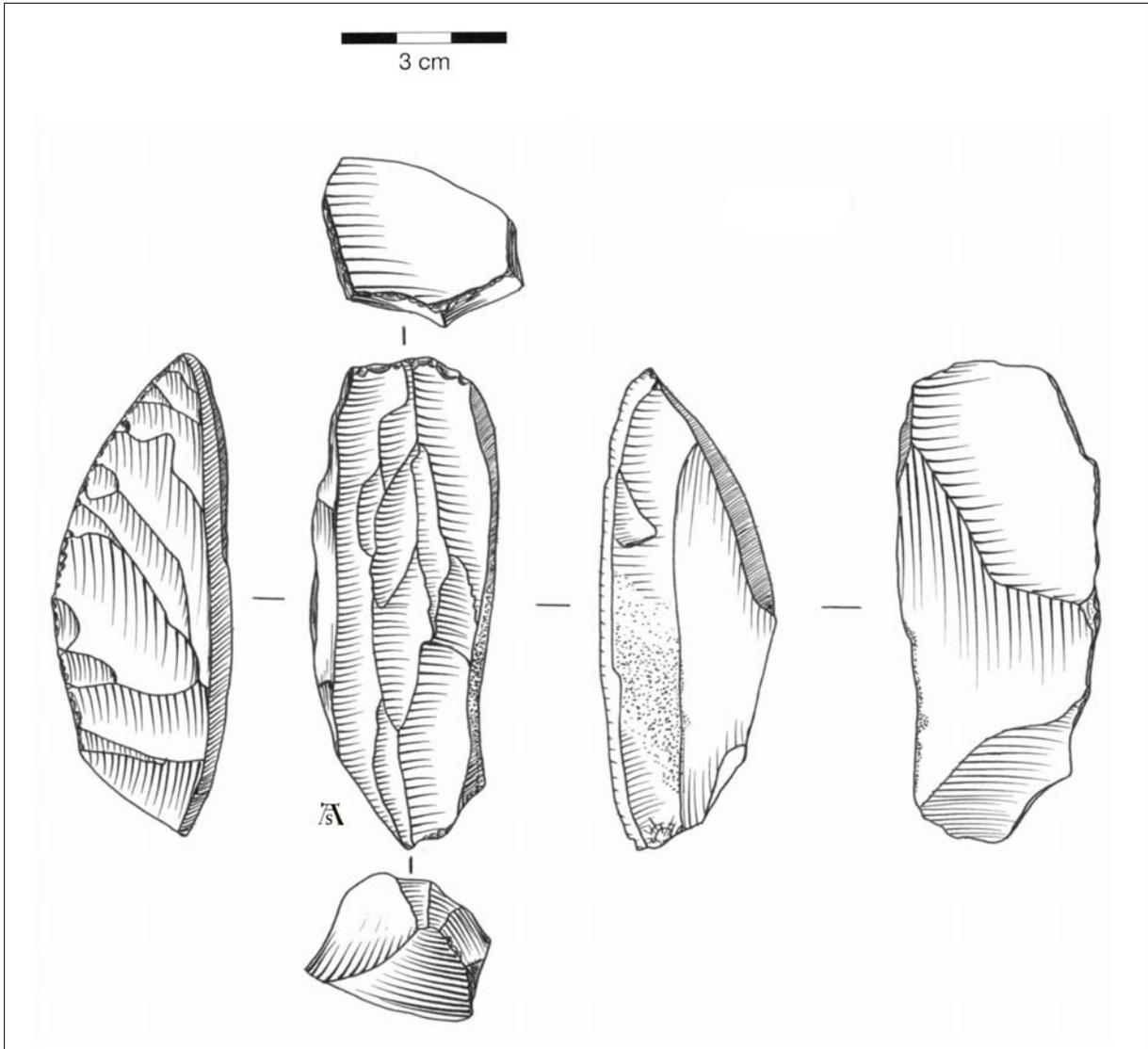


fig. 7 : Core destined for the production of Gravettian laminar blanks. Daguin assemblage.



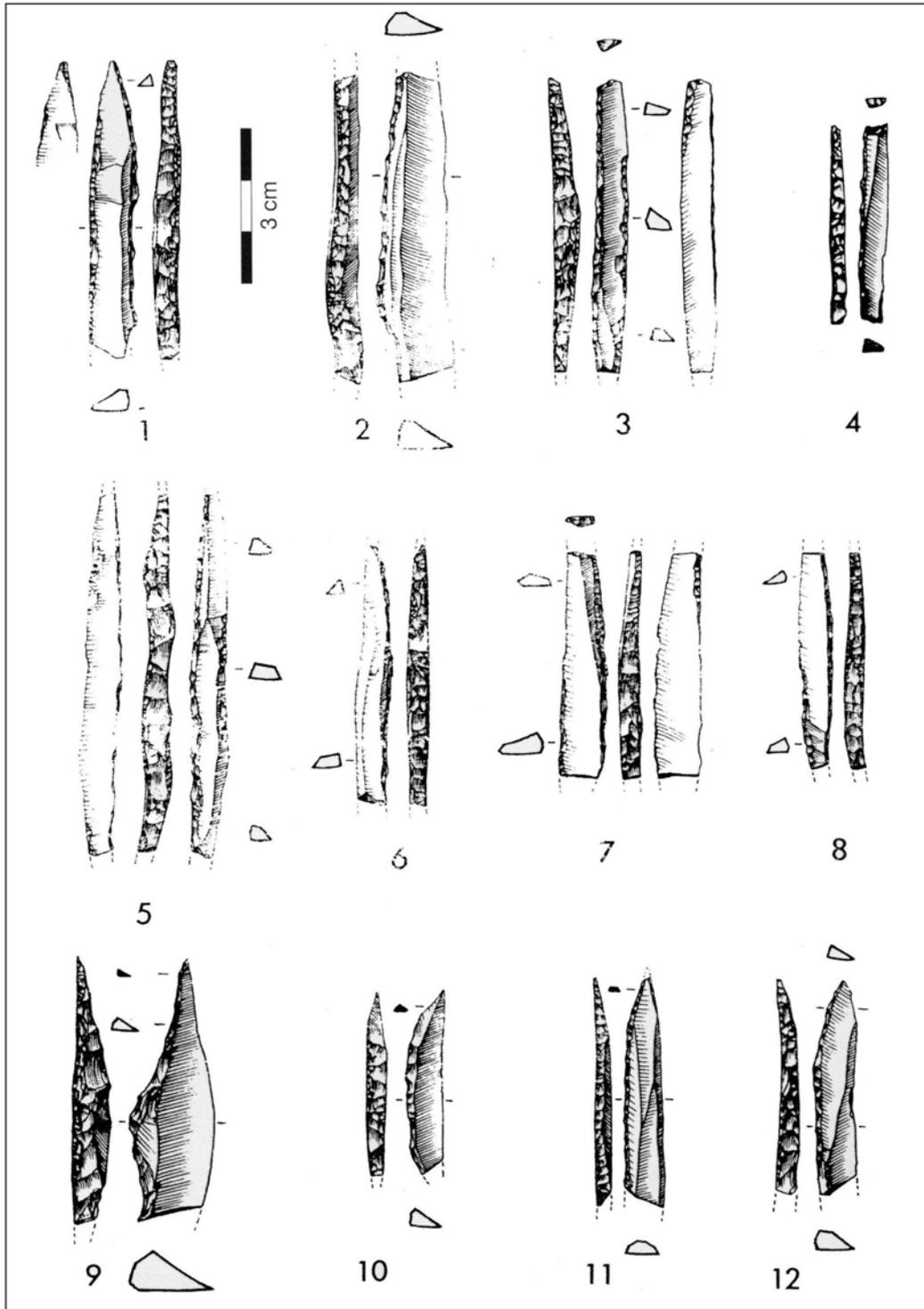


fig. 8 : Backed pieces of the Daguin assemblage (drawing by Pierre Laurent, from Thibault Cl., 1970).



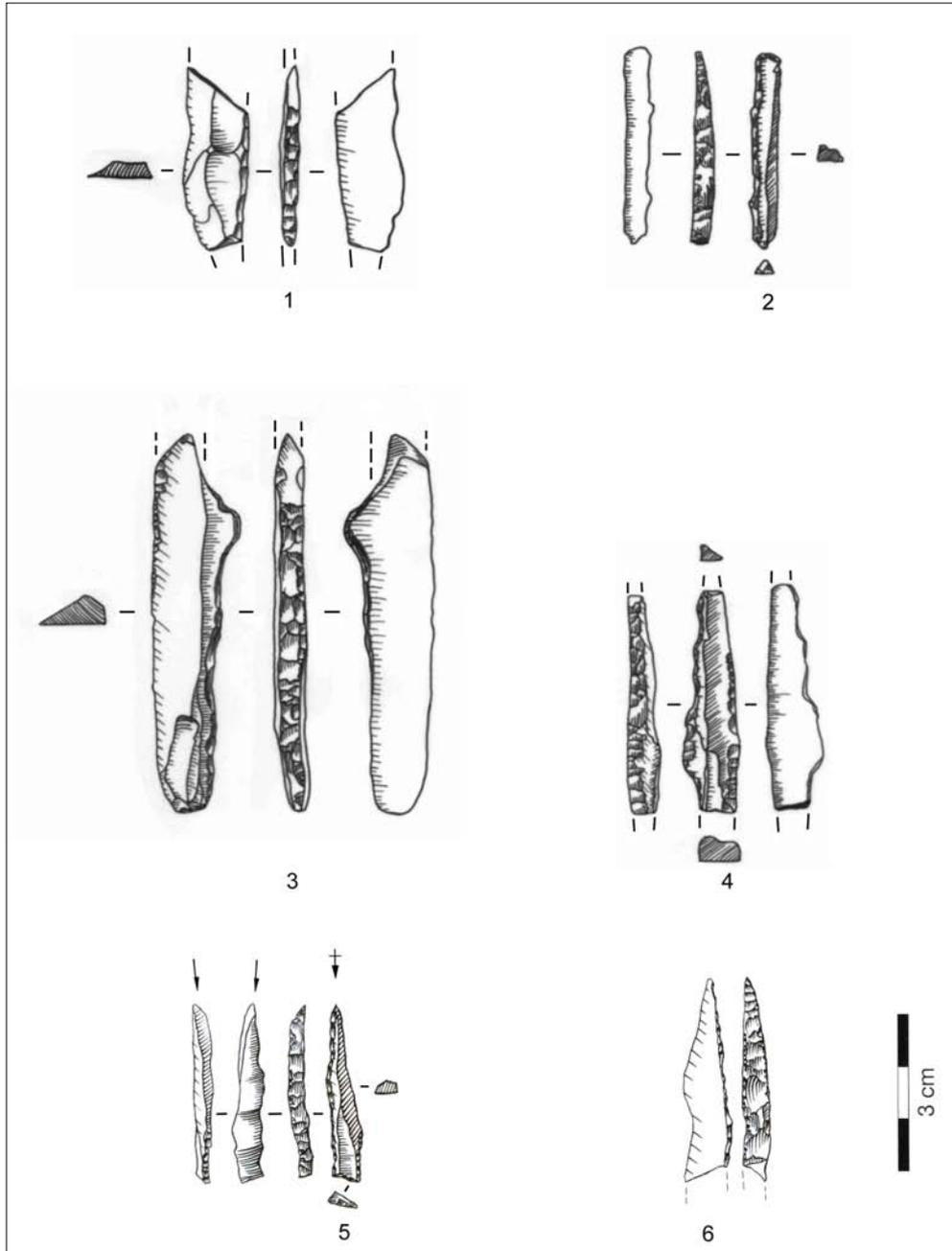


fig. 9 : The other backed pieces of the Daguin assemblage.



make the retouch steeper, beginning at each end. It is at this stage of shaping that the end must have been broken. It is also possible to observe partial direct retouch on the opposite edge, which means the knapper first straightened the edge before completely shaping the back. As for the shaping direction, it is usually difficult to assess. On the unfinished piece n° 4 (fig. 9), the shaping of the back from both distal and proximal ends is similar to the methods used in the backed piece assemblage: retouch is often frequently preformed from both ends by several removals joining one another in the central part, as was already noted M. Lenoir and J. K. Kozłowski (1988). Finally, one of the characteristics of the operational modalities seems to be very significant: a diagonal truncation can be felt on the distal extremity of six of the pieces. This production technique, which consists of shaping the back from the ends beginning after having truncated the distal third can be noted on the final (abandoned) shape of pieces 1, 6, 7, 9, 11 and 12 (fig. 8). This knapping method, consisting of starting back retouch with a distal truncation of the laminar blank links the Gravette points of the Daguin assemblage to the backed pieces of the Norman assemblage (fig. 10). This method seems to have been used by beginning knappers in the series collected by Christian Normand. Objects 2, 3, 4, 11, 18 and 23 of this assemblage (fig. 2) clearly show, for example, the first steps of shaping the back with a diagonal distal truncation.

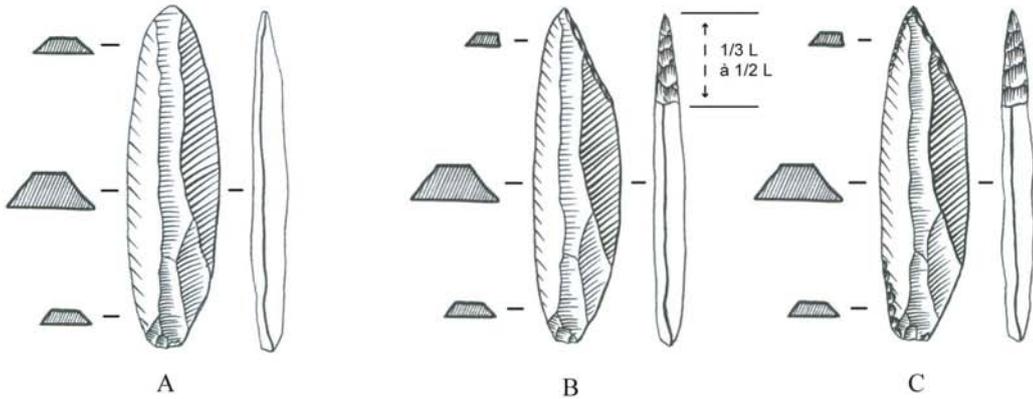
The care taken in the debitage of the Daguin assemblage demonstrates the high degree of technical investment required for the manufacture of Gravette points, but also (and above all) that of the blanks of these points. The blank selection phase also shows a high level of investment given the great number of good quality blanks abandoned on the site. All these elements further emphasize the importance of the apprenticeship process (fig. 11). In the case of Tercis, the role of apprenticeship is perhaps more economic than technical. The aim seems to be more focused on learning how to produce a back without breaking the blank, thus collected among the abundant waste products, than on the production of an ideal piece which would have, in this case, required

the section of a standardized blank. Indeed, the relative number of broken pieces often appears to be rather high. H. Bricker had already observed this (Bricker, 1973) at the Abri Pataud, as did Magen O'Farrell more recently at Corbiac (O'Farrell, 1996, 2004). On the other hand, retouching is not in itself very difficult. This hypothesis seems to us even more plausible since the ideal blank of a Gravette Point is highly standardised and therefore doubly valued. The loss of raw material during the shaping of the back is indeed even more detrimental as the technical investment required for the debitage is high. Knapping straight blades of the desired dimensions and mastering the operational modalities of Gravettian cores like the ones observed in the Daguin assemblage (fig. 7) is technically quite difficult. Consequently, breaking a straight blank while retouching the back would have been particularly annoying, especially if raw materials were scarce.

It is nonetheless possible to contest the reality of these different skill levels. The search for diverse, little standardized flake blanks is a method universally applied within societies whose economy is at least partly based on the exploitation of flint. Indeed, a quick comparison with the Isturitz or the Brassempouy collections, for example, shows how important the use of flakes may be in the Gravettian, in particular for the production of Noailles burins. If we consider that they can represent almost half of the domestic tools produced, we can see that we should absolutely not underestimate the economic importance of the more rapidly produced blanks. We can simply note that, on one hand, this economic behaviour does not exclude the learning process hypothesis and, on the other, if the lower quality blanks found at Tercis had an economic finality, why abandon the best laminar blanks? The hypothesis according to which they were essentially looking for highly standardized laminar blanks, and therefore would abandon the regular blanks, seems to be the obvious one. The waste products of this reduction sequence would then be used by the less competent knappers to learn how to manufacture backed tools. What type of information can we thus try to reveal based on the



I - Première étape : la variabilité morphologique des supports sélectionnés induit celle des modalités de retouche. Le tailleur semble préférer amorcer le façonnage du dos par troncature du tiers distal (B) avant de retoucher le bord opposé par retouche directe si nécessaire.



II - Deuxième étape : façonnage complet du dos par séries de retouches rectilignes. Le dos est confectionné en plusieurs passes progressivement plus abruptes. Le bris de la pièce au début de cette étape (A) créé une pièce à cran.

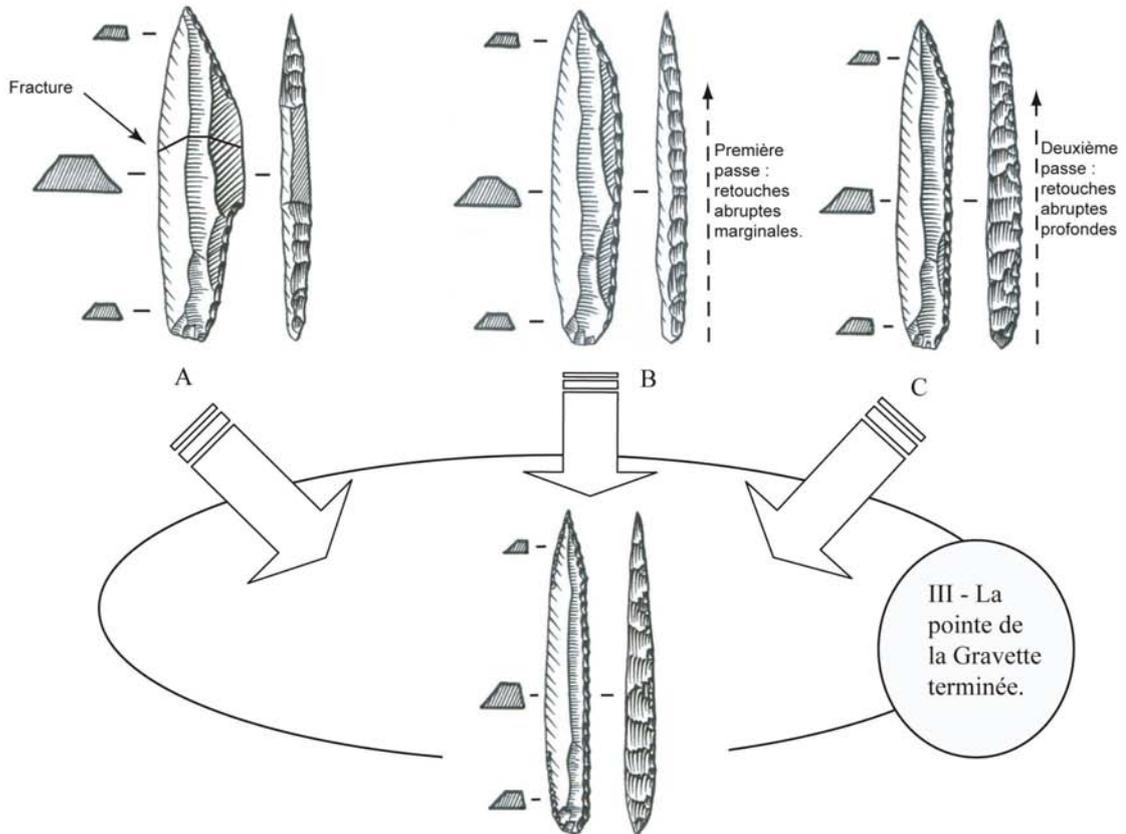


fig. 10 : Manufacturing scheme of a Tercis Gravette point using a distal truncation.



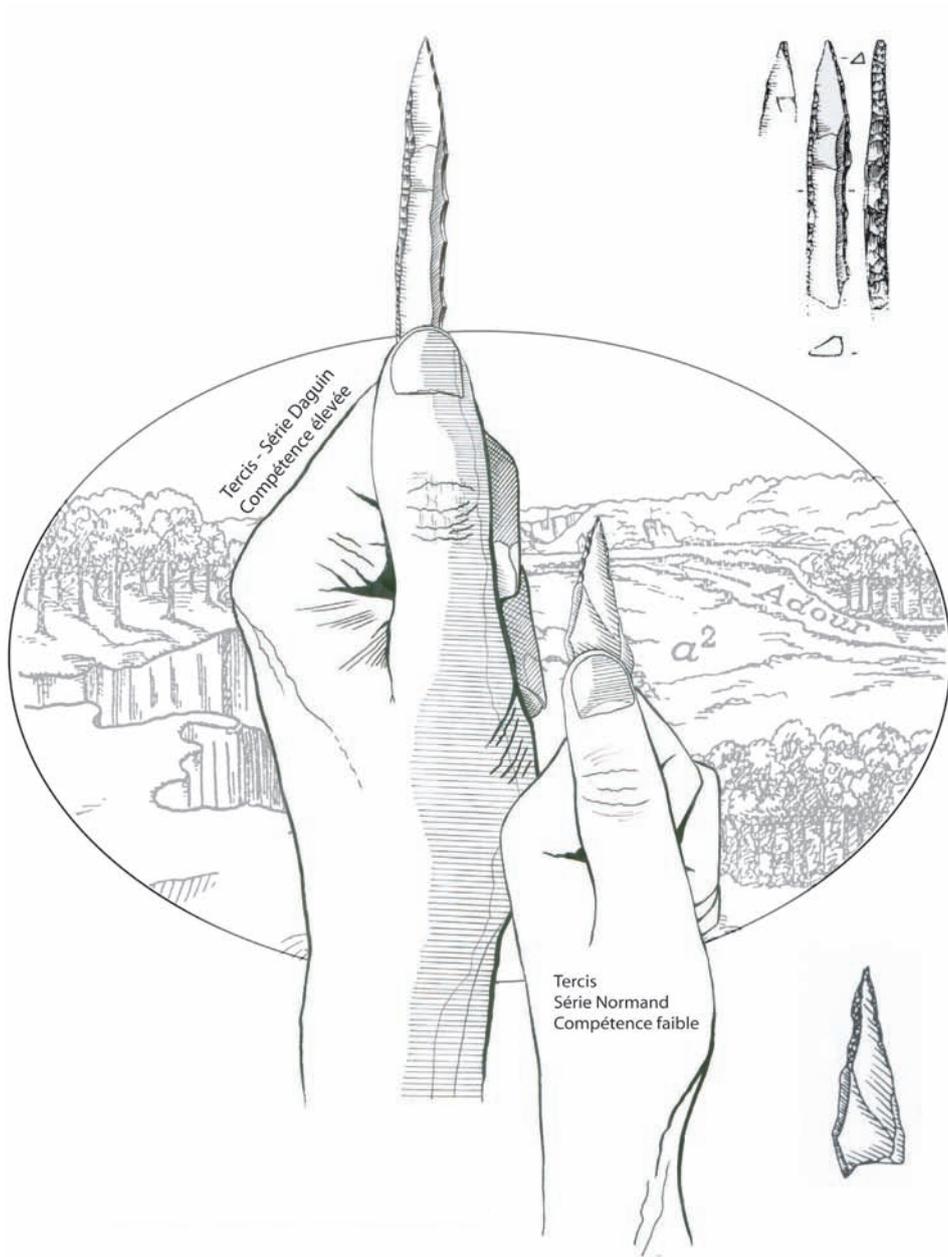


fig. 11 : Tercis (Landes): a site allowing an intimate approach to a Gravettian community through the hypothesis of apprenticeship.

different occupations in the area? Let us now look at the example of Isturitz, which is, along with Brassempouy, the key deposit of the South-West Atlantic zone, as well as the largest collection of Gravettian backed pieces in the geographic area considered.

Regional perspective : comparison of Tercis and Isturitz layers IV/FIII and III/C.

Since the site of Brassempouy contains a very small quantity of Gravette points, we prefer to focus our comparison here on the example of Isturitz Cave. Two extensive excavation sessions were conducted at this site: that of Emmanuel Passemard from 1912 to 1922, and that of René and Suzanne de Saint-Périer from 1928 to 1952. The recent excavation of Gravettian backdirt from the early Saint-Périer excavations (1952) by Christian Normand, associated with old collections, has yielded an impressive assemblage of Gravette Points. All of these Gravette Points come from Isturitz Cave and can be divided into two Gravettian layers that can be linked to two old excavation seasons: layers IV/III of the Saint-Périer excavation, corresponding respectively to layers FIII/C of the Passemard excavations. Nevertheless, considering the thickness of the layers (sometimes 1 metre for the lower layer IV/FIII), these old distinctions probably represent the confusion of several sub-layers not detected by the excavators.

A powerful concept linking the Gravette points of the lower Gravettian layers at Isturitz (IV/FIII) despite a variable outcome.

The great majority of the Gravette Points come from layer IV. There are 269 in the Saint-Périer collection (IV). I will therefore focus on the study of this collection since the few complete or almost complete Gravette Points of the Passemard collection (8 pieces) or of the sieving operations (3 in 1998, 2 in 2004, 4 in 2005) contribute no supplementary information on the morpho-dimensional characteristics. Among these points, 99 are whole or almost whole (that is more than a quarter!), which is an impressive proportion that may have been augmented by a selective sorting by the Saint-Périers. I will voluntarily ignore questions concerning their

representation within the whole lithic tool kit because of the confusion mentioned above. The proportion of tools is of little interest as they probably mixed tools belonging to different layers. The proportions therefore have no diachronic value.

In terms of the morpho-dimensional characterization of the Gravette Points of layers IV/FIII, they have, beyond their variability in size, a great conceptual homogeneity (fig. 12). The global shape of the points is systematically slender and lanceolate, both edges being symmetrical to the axis joining both ends, the distal part being slightly more slender than the proximal one whose base tends to be rounded. The opposite edge is slightly retouched, but may be left unretouched if the edge of the blade is naturally convex. If it does require retouch, it is direct and made before the back is retouched, as shown by the unfinished points. The retouch logically concerns mainly both ends, as they need to be pointed. As for the back itself, it seems to be shaped with a double notching (fig. 13). Consequently, it is impossible to determine if the shaping was started by preferentially selecting one specific end. The shaping can be on the right side or on the left (if we consider that a typological group corresponds to a homogeneous occupation). Alternating (crossed) retouch is not systematically employed. In general, direct retouch seems to be dominant, at least at first, and physical laws determine the use of alternating retouch when the back extends beyond the central dorsal ridge, which explains why it is very often used at the extremities. Finally, the last characteristic is the low-angle inverse retouch on the extremities, whose cultural meaning has largely diminished since its definition by Denise de Sonneville-Bordes (1954, 1955 and 1956). However, it is no doubt well developed in layer IV at Isturitz, which confirms the data from Abri Pataud where it is most frequent the Noailles layer (David, 1985). This low-angle inverse retouch is more or less invasive and could be linked to the search for lanceolate points. Between the simple marginal inverse retouch and the invasive low-angle inverse retouch, there are many nuances that seem to serve a single goal. In the same way, there are also several different degrees of retouch



development on the edge opposite the back, which is often difficult to dissociate from Vachons type retouch. In the case of Isturitz (IV/FIII), it does not seem useful to attempt to separate Gravette Points from Vachons Points. Since the presence or not of retouch seems to depend mostly on the initial morphology of the blank, it would be much appropriate to include Gravette points and Vachons points in a single category, according to individual preferences. Indeed, the concept underlying the production of points seems so powerful that any shift from the norm must have a technical explanation.

There are some deviant cases, however. For example, one Gravette Point discovered in the backdirt of the Saint-Périer excavation of 2005 (fig. 16 – C) is slightly crooked, which means the piece is not perfectly symmetrical relative to the axis joining both ends. This geometrical deviancy seems to have annoyed the knapper who tried to correct the form through direct retouch, followed by inverse retouch on the opposite edge of the back. Unfortunately, a slight protuberance prevented a complete correction. This point is a good example of a piece manufactured by a competent knapper, though the final goal was not reached. The underlying concept of the object seems identical to that of all the other points, but the intrinsic contingencies of flint knapping sometimes resulted in shifts that we cannot interpret as a flexible feature of the operational concept, but rather as a failure or mistake during production. This object is an excellent example in the search for a common theoretical concept hidden behind obvious differences, whether they are interpreted as skill levels or material contingencies.

Following observations made in the Daguin assemblage, this point represents the failure of a competent knapper, meaning an unaccomplished concept that is nonetheless detectable. Given the high skill level shown by the knapper, his intentions and mistakes can be seen behind the object. The failed pieces, found marginally in association with well-made pieces are, in opposition to the ensemble, even easier to understand. An interpretation of the backed tools from Tercis isolated

from the cultural norm seems more delicate, which explains the difficulty of linking the Tercis concept with that of Isturitz IV/FIII.

A specificity of the upper layer (III/C) of the Isturitz Gravettian

Nevertheless, in the context of a comparison with Tercis, the points of the upper layer C are much more interesting (fig. 14). The Passemard collection indeed offers Gravette Points designed according to a slightly different operational concept. They are more slender and have a back that is straighter or slightly angular in the proximal third (fig. 14). The base has the shape of a quarter-circle as a slight inverse retouch made the heel rounder from the opposite edge on. The longitudinal symmetry seems therefore much less mandatory. This special morphology, unknown in the lower layers and which contains only lanceolate symmetrical points, concerns almost half of the Gravette Points in layer C (Passemard collection). These Gravette Points could represent a different cultural skill, already noted by Passemard:

«Finally, this remarkable shape appearing in layer FIII, the point with battered back, is developing, but larger and more elegant than previously. [...] All the points are straight and I found no curved ones.» (Passemard E., 1944, p. 36).

This conceptual modification of the “Gravette Point” as an object possesses an obvious diachronic interest. We must still find the reasons for it, however. Is it the morphological concept of Gravette points that changed or their production techniques? In other words, was the morphological change intentional or was it the tacit result of a change of production techniques? Which change (morphological or technical) gave rise to the other?

From this research perspective, the straighter form of the back could be linked to a more gradual back shaping technique than that of the double notching found in layer IV/FIII (fig. 13 and 15). The shaping of the back follows a straight line and is performed in progressively abrupt successive passes, thus corresponding to the

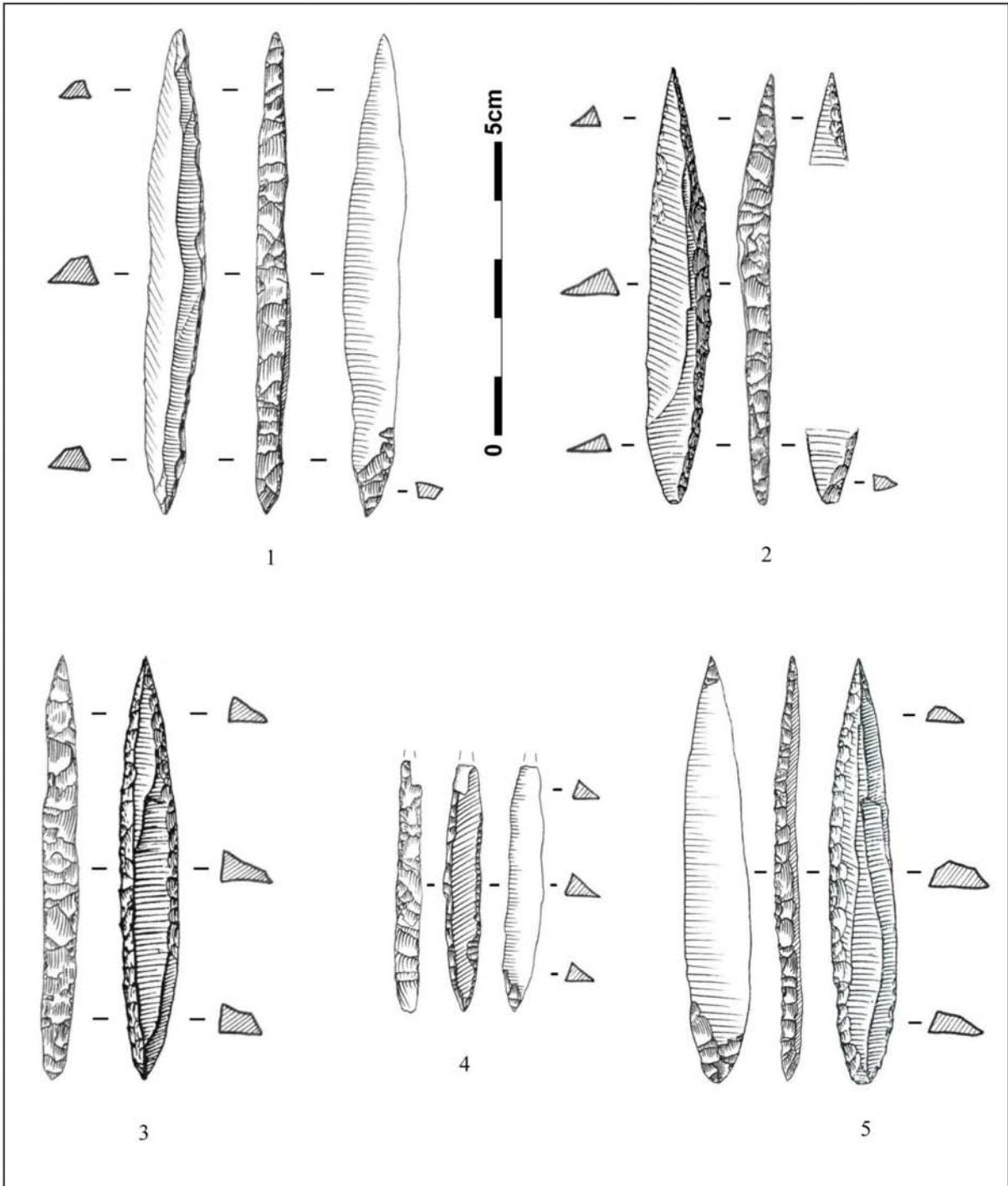
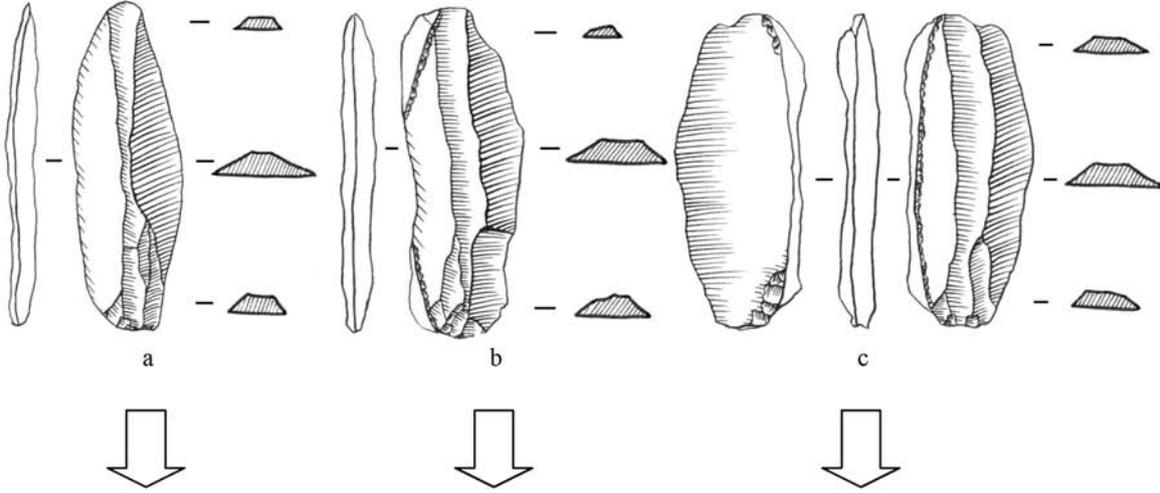


fig. 12 : Gravette points of Isturitz – layer IV/FIII.

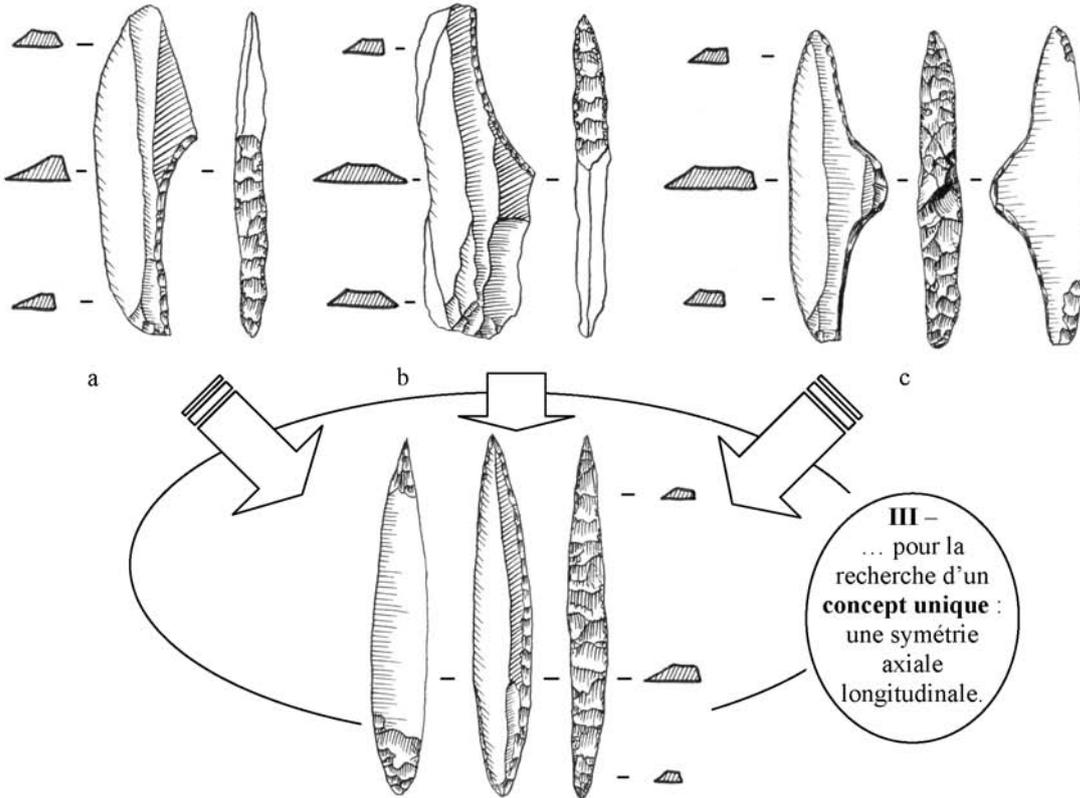


I – Première étape : La variabilité morphologique des supports sélectionnés induit celle des modalités de retouche. Le tailleur commence par façonner la convexité du bord opposé au dos.

Si besoin, correction du bord opposé au dos par retouche directe et/ou retouche inverse rasante des extrémités.



II - Deuxième étape : façonnage du dos par double encochage à l'aide d'une retouche directe puis croisée utilisée d'une manière particulièrement insistante aux extrémités...



III –
... pour la
recherche d'un
concept unique :
une symétrie
axiale
longitudinale.

fig. 13 : Isturitz Gravettes manufacturing scheme (layer IV/FIII) made with a double notching.



observations made on the Tercis assemblage (fig. 10). The position of the truncation sometimes displays a notable difference with Tercis. In the Tercis assemblage, it allowed the shaping of the back to be initiated on the distal part, while in Isturitz level C, the morphology of the finished point implies a proximal truncation of the blank. Though the Tercis points (Daguin assemblage) can be considered, due of the straightness of their backs, as being closer to the Isturitz C layer than to the IV/FIII layer, no full identity can be observed between the concepts. It is unfortunate that the lithic assemblage (and the points) of layer C are so few (around twenty pieces). Do the Tercis points fall within the range of variability of the “Isturitz C point” type, a type whose representation—and variability—is still biased due to the small size of the sample? Or is this another Gravettian occupation that can be differentiated (diachronically?) from occupations IV/FIII and III/C of Isturitz Cave? It is unfortunately too early to choose between these two alternatives (fig. 16). We can, however, note that this preferential convergence of the Tercis and Isturitz C points correlates with a body of evidence (stratigraphic, technological and typological) that orients us more toward a chronocultural attribution of the Tercis series to a more recent phase of the Gravettian.

The shaping techniques offer interesting research perspectives concerning the knapping debris that can be associated with the production sequences of weapon tips, such as points with back protuberances, truncated blades, shouldered artefacts and diverse partially backed pieces, etc... Could some of these technical waste products be more closely associated with production modalities that could more easily generate such failures during the shaping of the back? This would lead to the question of whether the increased presence of some waste products might reflect a skill characteristic of a particular facies. To put it more simply, could the proportions of some technical pieces have a chronocultural diagnostic value, related that of the associated weapon tips? For example, the lanceolate Gravette points of layer IV/FIII at Isturitz seem to generate more points with a back protuberance. Their manufacturing technique using a double notching followed by reduction

of the protuberance sometimes failed during the last step, thus creating objects with a specific form (fig. 15). On the contrary, more obliquely blunted pieces (fig. 17) might be found in assemblages such as that of Tercis and Isturitz C in association with Gravette Points with a straighter back and a proximal and/or distal angulation.

Considering the low degree of morphological difference between the Gravette points from Isturitz IV/FIII, Isturitz C and Tercis, all our previous reflections inevitably lead us to a more detailed study of back shaping methods as a culturally diagnostic element. Following the hypothesis that the term “Gravette Point” amalgamates several types of points whose morpho-technical characteristics may or may not overlap, and consequently merges them into a single typological group in the eyes of the Prehistorian, the different types of points would seem to be a result of their production strategy rather than of an intentional search for a particular morphology. More research is necessary, however, to conclusively respond to this question, particularly concerning the dimensions of the points and their implications in hunting strategies. For example, the Gravette Points realized by double notching from Isturitz IV/FIII are generally smaller and lighter than those from Isturitz III/C and Tercis (Daguin assemblage), a difference in size that could explain a change in production techniques.

Conclusions

If the identity of a culture is closely linked to the transmission of its criteria (the phenomenon of enculturation), it then seems important to define the spheres of activity that imply the greatest investment in terms of apprenticeship. The degree of investment in each of the spheres considered is more or less proportional to its own significance within the society.

Moreover, a close interaction seems to exist between different types of weapon tips and the evolution of lithic production systems (Nuzhnyj, 1993). It is mainly through the study of weapon tips, their production strategies, or even the nature of their raw material procurement, that it will be possible to distinguish cultural sub-facies. What appears to be common among many human groups is



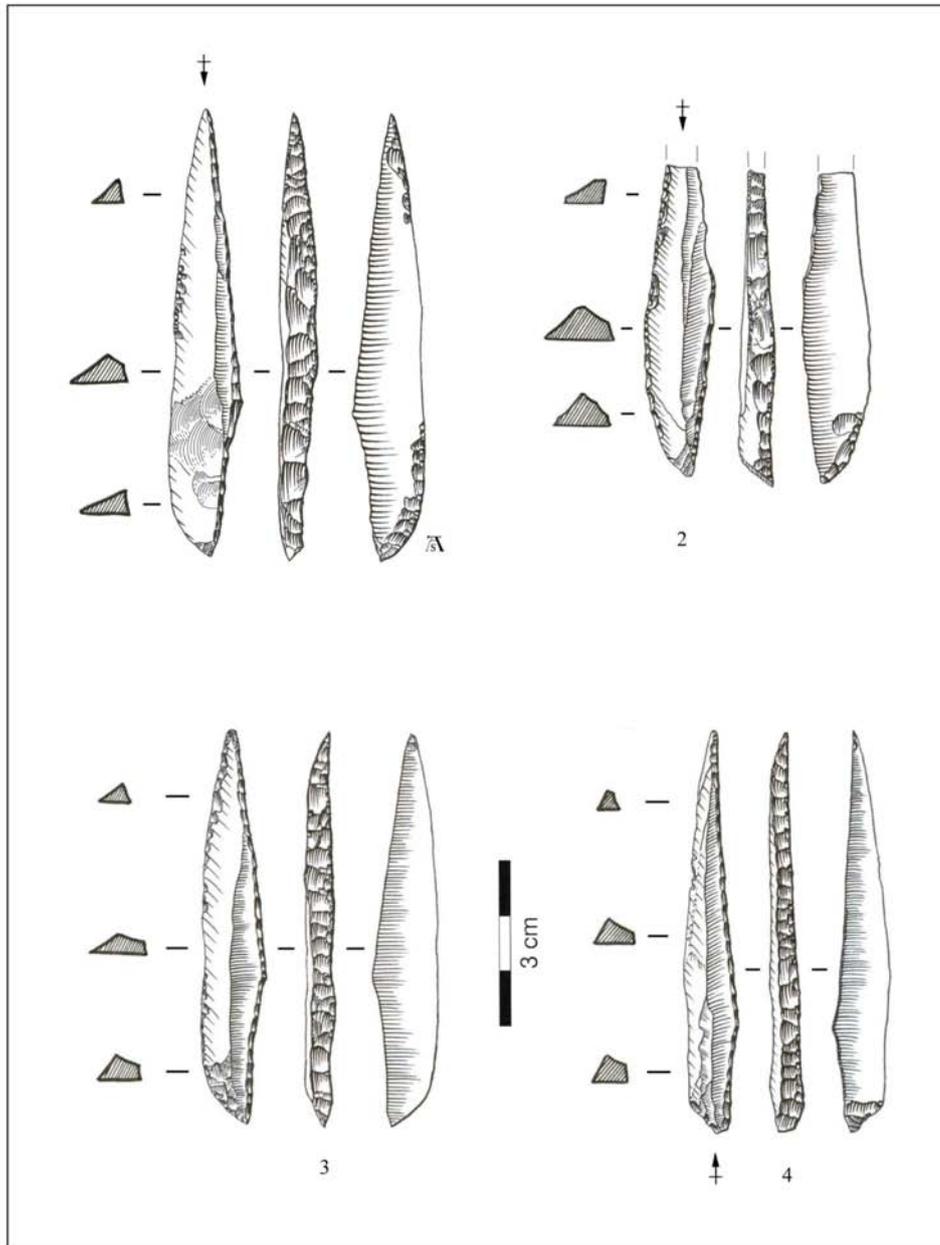


fig. 14 : Gravette points from the Isturitz Cave. Passemard Collection. Gravettian, upper layer (C).

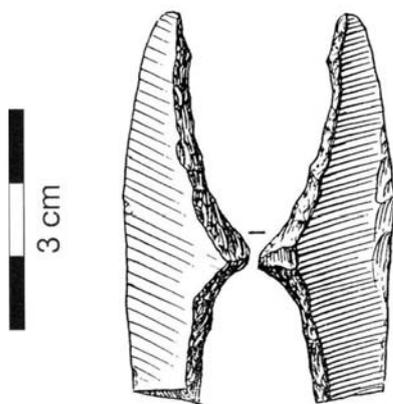


fig. 15 : Gravette point with a back protuberance. Isturitz, Gravettian, lower layer (IV). By Saint-Périer R., 1952).

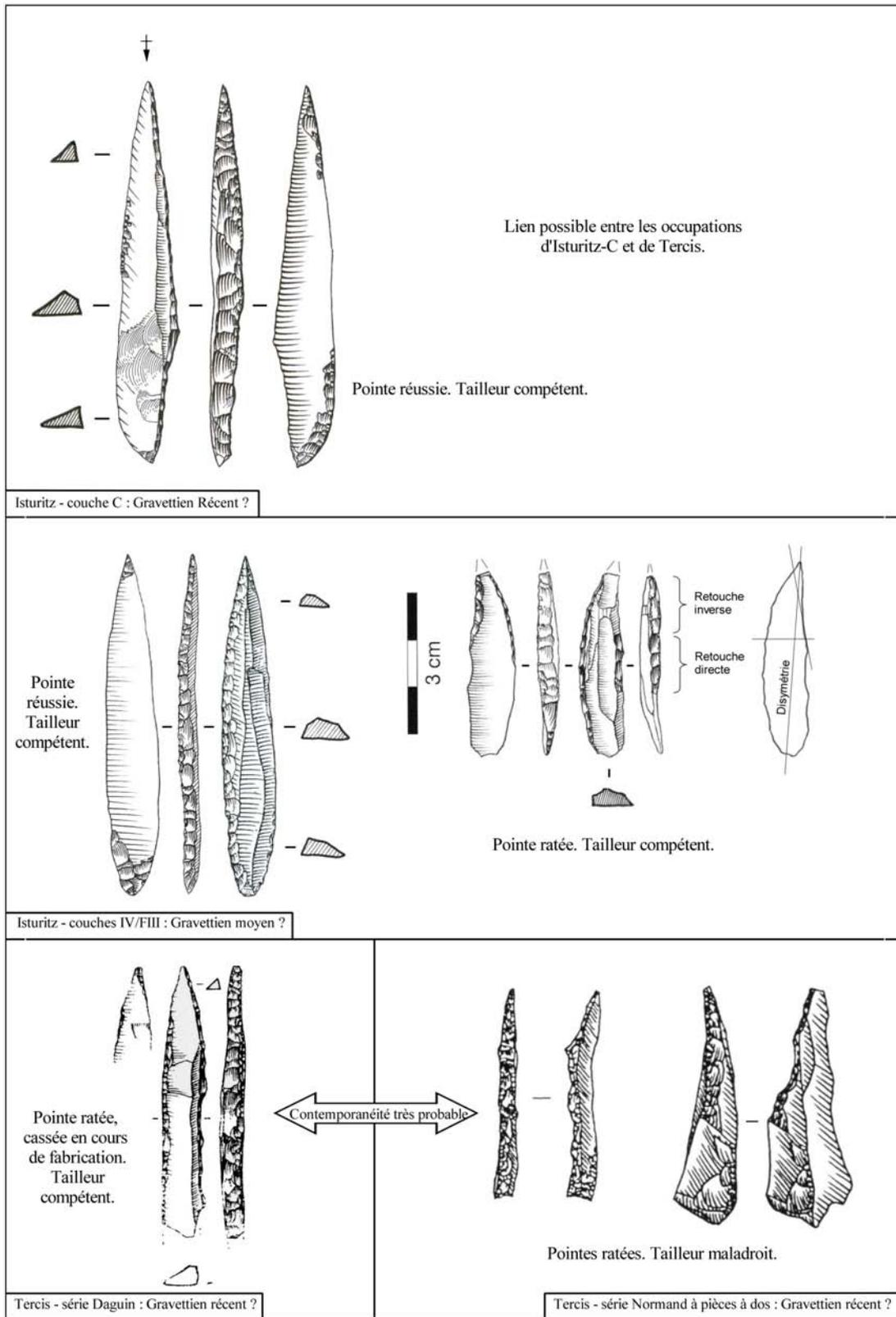


fig. 16 : Gravette points from Isturitz and Tercis. A variety of occupations, cultural and/or individual skill and degrees of success behind a single and blurred typological group.



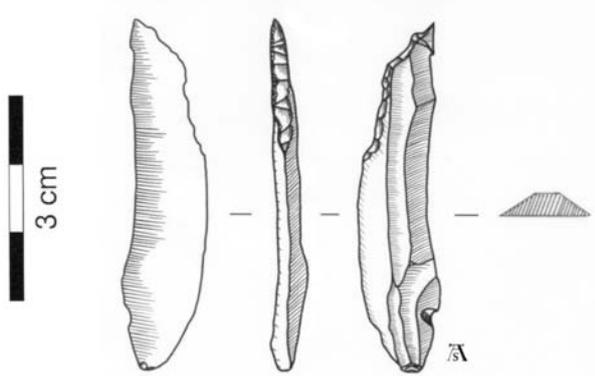


fig. 17 : Truncated piece with partial back: probable Gravette point in the process of fabrication. Pottier assemblage. Tercis.

particularly prevalent in the case of the Gravettian, a techno-complex particularly influenced by its lithic weapon tips.

One interest of more detailed, and thus qualitative, studies of lithic weapon tips, through the integration of new analysis tools arising from technology, is to refine typological classifications. The integration of an object within the total production sequence can considerably modify its typological attribution. Current discussions concerning shouldered points (some shouldered points are in fact unfinished backed pieces) shows the degree to which this typological adjustment can change the inventories of certain tool types, and therefore, socio-cultural and palaeoecological interpretations of them.

The refinement of typo-technological studies of weapon tips is a new, fundamental research direction for the definition of cultural groups. A consideration of the influence of different skill levels may lead to important explanations of the variability of Gravettian weapon tips.

Indeed, some flexibility exists in the definition of the principal Gravettian weapon element types (Gravette Points, Picardie Bladelets, marginally retouched bladelets, truncated and bi-truncated backed bladelets and backed bladelets). It would thus be interesting to investigate to what extent this variability may be the result of a greater or lesser mastery of technical actions

(the detachment of bladelets from Raysse burins, the detachment of straight blades from a curved bipolar core destined to be retouched in Gravettes, for example). Gravettian groups would then distinguish themselves not as much by the exclusive choice of a technical system(s) for the production of blanks as through the “mastery”, “preference” or “care” applied in some of their production strategies.

To each researcher then to contribute his/her own evidence and arguments to the explanation of this qualitative variability: a phenomenon of acculturation, borrowing or imitating the technical actions of a neighbouring group, thus based on the postulate of a previous individualization of cultural groups; a phenomenon of ecological impulse influencing the care invested in the production of weapon tips, independent of the existence, or not, of different technical traditions, an explanation that can, on the contrary, explain the division into different cultural groups; a sociological phenomenon of labour organization and of individual choice, in which case one or more knappers(s) in the community is(are) specialized in the manufacture of weapon tips. These specialists would be more or less skilful in the realisation of a given technical action and inevitably invest more in their preferred technique. It is unfortunate that the organization of labour, a high resolution sociological approach to human groups (as in the case of Etiolles), is barely conceivable for earlier phases of the Upper Palaeolithic.

Acknowledgments

I am particularly grateful to Mr. Christian Normand who entrusted me with his study of the Tercis and Isturitz assemblages, written in the context of his university thesis. I also thank Mr. François Bon and Ms. Marie-Hélène Dias-Meirinho for their support and their careful and judicious discussions. Many thanks to Mrs. Catherine Schwab and Ms. Marie-Sylvie Larguèze of the Musée des Antiquités Nationales in Saint-Germain-en-Laye for the way they welcomed me, as well as to Ms. Sigolène Loizeau

and Mr. Vincent Mistrot of the Musée d'Aquitaine in Bordeaux.

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References

ARAMBOUROU R. (1963) – *Essai de paléogéographie du Paléolithique des Landes*. Thèse complémentaire pour le Doctorat ès Sciences, Université de Bordeaux I.

BOUCHER H. du, (1877) – Les Aquenses primitifs ou Dax avant l'Histoire. *Bulletin de la Société de Borda*, p. 273-288 et p. 423-437.

BOUCHER H. du, (1878) – Quelques nouvelles trouvailles préhistoriques landaises. *Bulletin de la Société de Borda*, p. 56-61.

BOUCHER H. du (1879) – Matériaux pour un catalogue des stations préhistoriques landaises. *Bulletin de la Société de Borda*, p. 307-317 et *Matériaux pour l'histoire primitive et naturelle de l'Homme*, volume 14, série n°2, tome X, p. 258-270.

BRICKER H.M. (1973) – *The Perigordian IV and related cultures in France*. Ph. Dissertation. Harvard, Harvard University.

DAGUIN F. (1948) – L'Aquitaine occidentale, Géologie régionale de la France vol. 5, dir. Albert F. de Lapparent, Actualités scientifiques et industrielles 1050, Hermann & Cie, Paris, 232 p.

DAVID N.C. (1985) – *Excavations of the abri Pataud, Les Eyzies (Dordogne): The Noaillien (level 4) assemblages and the Noaillien culture in Western Europe*, Peabody Museum,

Harvard University, 355 p., 69 fig., 88 tabl. (American School of Prehistoric Research, bull. n°37).

KOZLOWSKI J. K. et LENOIR M. (1988) – *Analyse des pointes à dos des gisements périgordiens de l'Aquitaine*, Uniwersytet Jagiellonski, Cracovie.

MEAD M. (1973) – *Une éducation en Nouvelle-Guinée*, Paris, Payot, 310 p.

NORMAND Ch. (1987) – Le gisement paléolithique de plein air du Vignès à Tercis (Landes). *Bull. Soc. D'Anthropologie du Sud-Ouest*, tome XXII, n°2, p. 71-80.

NORMAND Ch. (1993) – Un atelier de taille de pièces à dos à Tercis (Landes), *Archéologie des Pyrénées occidentales et des Landes*, 1992/1993, t. 12, p. 27-51, 6 fig.

O'FARRELL M. (1996) – *Approche technologique et fonctionnelle des pointes de la gravette : une analyse archéologique et expérimentale appliquée à la collection de Corbiac*, Mémoire du DEA d'anthropologie option préhistoire, Université de Bordeaux I, 97 p.

PASSEMARD E. (1944) – *La caverne d'Isturitz en Pays Basque*, Préhistoire, tome 9, Paris, Presses Universitaires de France, 95 p., 63 fig., 64 pl.

PIGEOT N. (1987) – *Magdaléniens d'Etiolles : économie de débitage et organisation sociale (l'unité d'habitation U5)*. Gallia préhistoire, Supplément, vol. 25.

POTTIER R. (1872) – Etude préhistorique sur les environs de Dax (Landes). *Matériaux pour l'histoire primitive et naturelle de l'Homme*, volume 7, série n°2, p. 236-243.

SAINT-PÉRIER R. de (1952) – *La grotte d'Isturitz. III : les Solutréens, les Aurignaciens et les Moustériens*, Archives de l'Institut de Paléontologie humaine : mémoire n°25, Paris, Masson, 264 p., 135 fig., XI pl. h.-t.

SIMONET A. (2004) – *L'atelier de taille gravettien de Tercis (Landes). Approche technologique, économique*



et sociologique : Etude de l'industrie lithique de deux concentrations dites « à pièces à dos » et « à grandes lames », mémoire de Maîtrise, Université de Toulouse – Le Mirail, 203 p + 93 planches et 14 photographies.

SONNEVILLE-BORDES D. de et PERROT J. (1954, 1955 et 1956) – Lexique typologique du Paléolithique supérieur, *Bulletin de la Société Préhistorique Française*, Tome 51, p. 327-335, Tome 52, p. 76-79, Tome 53, p. 408-412 et 547-559.

THIBAUT CL. (1970) – Tercis, in *Recherches sur les terrains quaternaires du Bassin de l'Adour*. Thèse de Doctorat Sciences Naturelles, Université de Bordeaux I, p. 577-583.

To quote this article

SIMONET A. (2008) - A gravettian knapping workshop at Tercis (Landes) : a probable case of apprenticeship in the fabrication of lithic weapon tips. In : J.-M. Pétillon, M.-H. Dias-Meirinho, P. Cattelain, M. Honegger, C. Normand, N. Valdeyron (coord.), *Projectile weapon elements from the Upper Palaeolithic to the Neolithic (Proceedings of session C83, XVth World Congress UISPP, Lisbon, September 4-9, 2006)*, *Palethnologie*, 1, p. 183 - 210.

Article translated by Magen O'Farrell





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