Anthropologica et Præhistorica, 122, 2011, 5 – 17

The Paviland burin, the *burin busqué* and Aurignacian occupation of Britain

Rob DINNIS

Abstract

Aurignacian material in British collections has previously been described as typologically uniform, and this uniformity used to suggest that Aurignacian occupation of Britain may have been a single and potentially very brief event. The two defining artefact types of the British Aurignacian are the *burin busqué* and the Paviland burin: both bladelet cores which apparently produced bladelets of comparable morphology. The presence of these two types could therefore be seen to contradict this perceived typological uniformity. Here, the *burin busqué* and Paviland burin are described and discussed, and their technological independence assessed. Importantly, the techno-morphological differences between the two core types cannot be explained with reference to differential stages of core reduction and/or raw material factors alone. Instead, they represent two different technological approaches to bladelet production. Their presence in British collections can be seen as evidence for more than one Aurignacian occupation of British terrain, or at least that occupation was sufficiently prolonged that it encompassed the time when one technique was replaced by the other.

Keywords: Aurignacian, Upper Palaeolithic, lithic technology, Britain, northwest Europe

Résumé

Le matériel aurignacien de Grande-Bretagne a été auparavant décrit comme étant typologiquement uniforme, accréditant l'idée d'une occupation aurignacienne des îles Britanniques correspondant à un épisode probablement unique et sans doute de courte durée. Les deux types d'artefacts caractéristiques de l'Aurignacien britannique sont le burin busqué et le Paviland burin, *qui correspondent tous deux à des nucléus à lamelles qui produisent des supports de morphologie apparemment similaire. La présence de ces deux modalités de débitage lamellaire pourrait donc contredire l'unité supposée de l'Aurignacien britannique. Les burins busqués et les* Paviland burins *sont ici décrits et discutés en vue d'évaluer leur indépendance technologique. Il apparaît que les différences techniques et morphologiques de ces deux types de nucléus lamellaire ne peuvent simplement s'expliquer en tant que stades de réduction d'un même processus de débitage ni par l'influence des matières premières utilisées. Ils correspondent plutôt à deux approches différentes de la production lamellaire. La présence de ces modalités de débitage différentes dans les collections aurignaciennes britanniques suggère plusieurs phases d'occupation de la Grande-Bretagne ou, à tout le moins, une période d'occupation suffisamment longue pour englober le passage d'une technique à une autre.*

Mots-clés : Aurignacien, Paléolithique supérieur, technologie lithique, Grande-Bretagne, Europe du Nord-Ouest

1. THE BRITISH AURIGNACIAN: CURRENT UNDERSTANDING

Ever since Dorothy Garrod (1926: 191) described Britain as the "*Ultima Thule* of Upper Palaeolithic Europe", the paucity of Upper Palaeolithic assemblages and artefacts has been seen to reflect Britain's peripheral position during the Late Pleistocene and a limited amount of Upper Palaeolithic activity. Particularly when the Earlier Upper Palaeolithic is considered, there can be little doubt that this interpretation is broadly correct. In totality, British collections contain fewer than 100 lithic and bone artefacts that can safely be assumed to be Aurignacian (Swainston, 2000; Jacobi, 2007; Dinnis, 2009). Those that can be confidently assigned to the Gravettian are fewer than 20 (Jacobi, 2007). The only possible exception is the Initial Upper Palaeolithic Lincombian-Ranisian-Jerzmanowician, where a large number of smaller findspots are supplemented by several bigger assemblages, for example those from Beedings and from Kent's Cavern (Jacobi, 2007; Flas, 2008).

In an attempt to make sense of this general paucity of material, it has been suggested that Britain was completely devoid of human pres-

ence for long periods of the Late Pleistocene, with brief, punctuated occupation events interrupting this background human absence (e.g. Pettitt, 2008; Jacobi & Higham, 2011). The British Aurignacian has in recent years come to be viewed in this way. It is well-documented that known Aurignacian material in British collections is of *Aurignacien évolué* type only (Jacobi & Pettitt, 2000; Swainston, 2000; Jacobi, 2007; Dinnis, 2009), and reliable chronometric data are entirely consistent with a late Aurignacian age (32,000 ^{14}C BP: Jacobi *et al.*, 2006). Furthermore, the typological similarity of Aurignacian lithic artefacts in British collections has been noted, leading to the suggestion that the Aurignacian of Britain was a single and potentially extremely short occupation event (Jacobi, 1999, 2007; Pettitt, 2008).

2. STUDYING THE BRITISH AURIGNACIAN

With very few exceptions, occupation of Britain between 45,000 and 25,000 years ago is inferred from the contents of poorly- or unstratified lithic collections. The Aurignacian is no exception. British Aurignacian lithic material is summarised below, but here it suffices to say that all known Aurignacian findspots were excavated prior to the advent of modern archaeological methods. Any stratigraphy present at the point of excavation – if any coherent stratigraphy existed at all – is now lost. As a result, archaeological collections must be approached as demonstrably or potentially mixed, and allocation of material to archaeological culture must be made via careful typological selection of characteristic artefact types.

The collection from Goat's Hole at Paviland (Gower, south Wales) (Fig. 1), here referred to simply as "Paviland", is a case in point: no stratigraphy was observed during excavation (Sollas, 1913), and no attempt was made to record the spatial distribution of excavated material. Typological separation of material was then, as now, the method used to identify different phases of occupation of the cave.

When William Sollas wrote a description of his excavations at Paviland (Sollas, 1913),

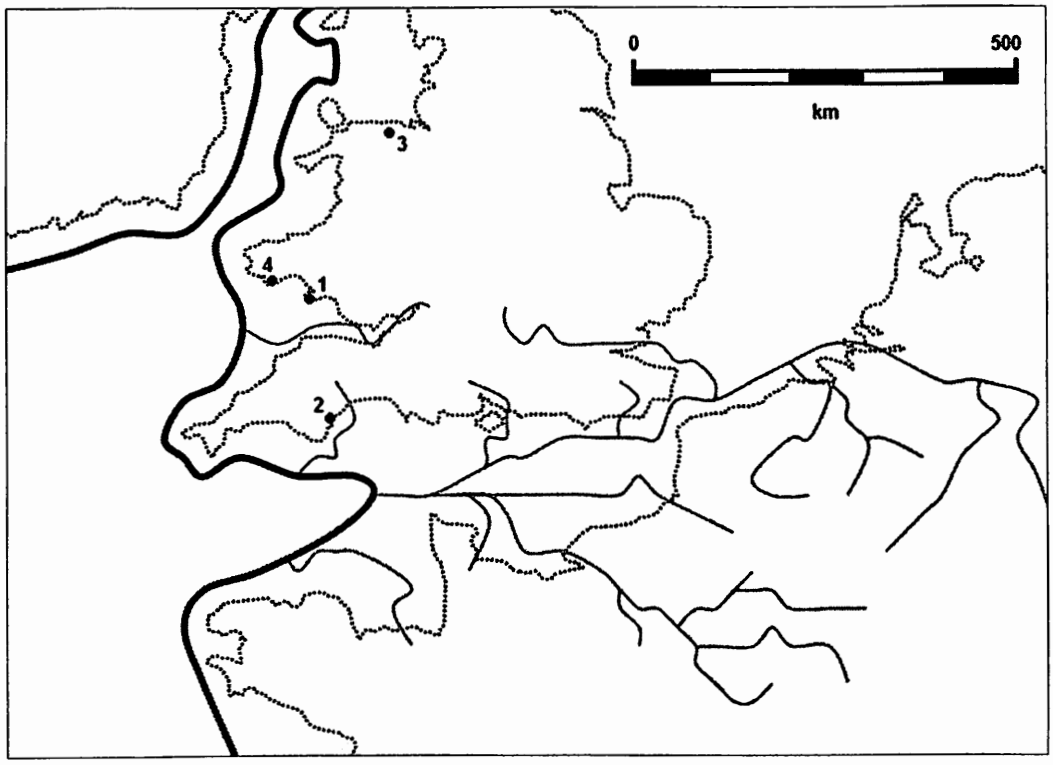

Fig. 1 — British Aurignacian sites discussed: 1. Paviland; 2. Kent's Cavern; 3. Ffynnon Beuno; 4. Hoyle's Mouth. Sea level is shown c.75metres below present day level, corresponding broadly to its position during the Aurignacian. The inferred position of major river systems during the Aurignacian is also given.

he made it clear that this typological separation of lithic material was carried out under the guidance of the Abbé Henri Breuil. Sollas, with Breuil, interpreted material as coming from numerous Late Pleistocene occupations, of both Middle and Upper Palaeolithic type, but with a majority part of the material being Aurignacian. It is a testament to Breuil that the different opinions of later researchers relate mainly to broader changes in our understanding of the European Upper Palaeolithic. With the exception of disagreements over the possible presence of a Middle Palaeolithic (see Swainston, 2000 vs. Jacobi & Higham, 2008), the overall cultural contents of the assemblage are generally still seen as close to that described by Sollas and Breuil. Supplemented by a small number of artefacts from other mixed or poorly-stratified cave assemblages, Paviland remains the main route through which the Aurignacian of Britain can be understood.

3. A MINOR PALAEOLITHIC MYSTERY SOLVED: THE PAVILAND BURIN

One peculiarity of the Paviland collection is a series of artefacts with regular and oblique inverse retouch facets, now understood as discarded bladelet cores and defined as 'Paviland burins' (Dinnis, 2008; Fig. 2). All known examples of Paviland burin from Paviland come from the excavations of Sollas, and he appears to have been unsure as to how they should be classified (Sollas, 1913: 344-348). All are seemingly assigned to the 'Middle Aurignacian' (= Aurignacian), and allocated to three typological categories: two 'scraper' categories ("Rostrate grattoir with inverse terminal retouches" [p.344] and "Flakes with terminal inverse oblique retouch" [p.347]); and one 'burin' category ("Lateral burins with inverse retouch" [p.348]). The fact that Sollas quotes the Abbé Breuil *directly* in his description of two of these three artefact types – an honour not awarded to any of Sollas's other 15 Middle Aurignacian typological forms – is telling. There can be no doubt that he was aware of their idiosyncratic and therefore typologically troublesome nature. This typological confusion is somewhat inevitable given the burin/scraper positioning of their retouch facets (Fig. 2). Clearly, Sollas classified those with retouch facets more 'scraper' or 'burin' in nature respectively into these groups.

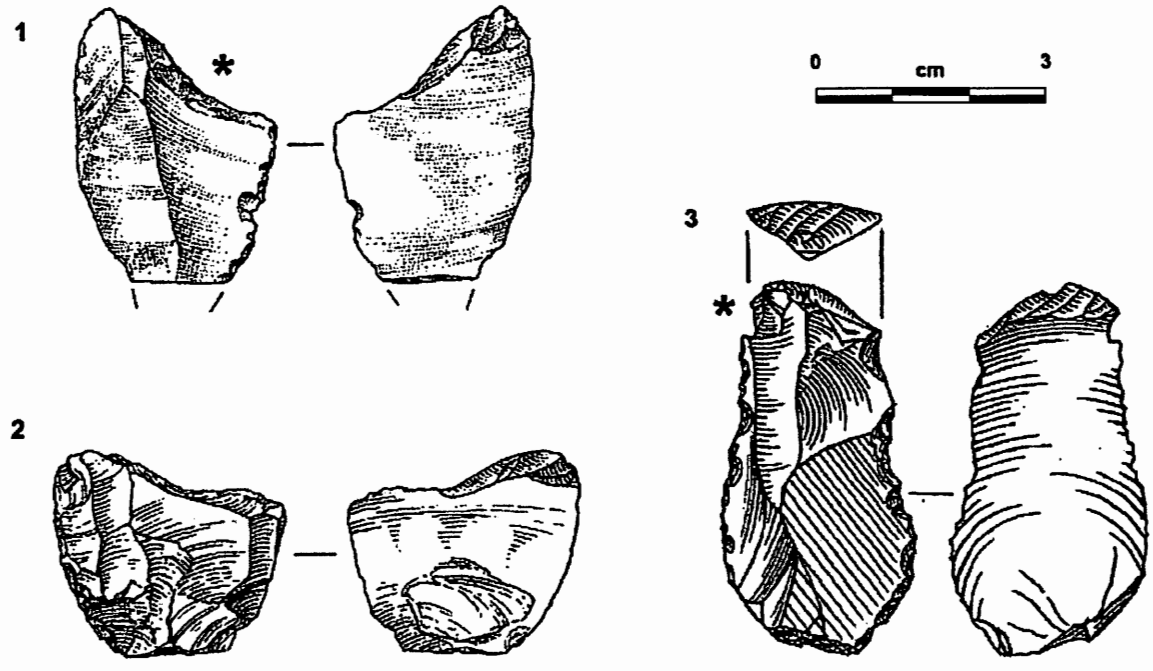

Fig. 2 — Paviland burins from Paviland..

It was Stephanie Swainston (1999, 2000) who first conveyed explicitly the potential importance of these artefacts. Despite being unsure as to their Aurignacian attribution – and as a result omitting many of them from her quantitative analyses of the Paviland collection published in 2000 – she still devoted a section of this analysis to them (Swainston, 2000: 109-110). Those inversely retouched artefacts she did include in her quantitative analysis were the examples that she felt could be classified as "shouldered scrapers" (*grattoirs à épaulements*), and thus as Aurignacian. In the same analysis she (correctly) suggested that these artefacts were *all* likely to be Aurignacian. Elsewhere, believing the artefacts to be unique to the Aurignacian of Paviland, and therefore to the Aurignacian of Britain, Swainston (1999: 50-51) explained this retouch as a possible example of an idiosyncratic "style" applied to generalised stone tool forms. This "style", she suggested, may reflect a passive cultural representation of a group that had become separated from its region and group of origin, or alternatively as a deliberate cultural accentuation of this separation. What was clear to Swainston was that these artefacts contained within them considerable information that could shed light on the Aurignacian of Paviland, and thus of Britain.

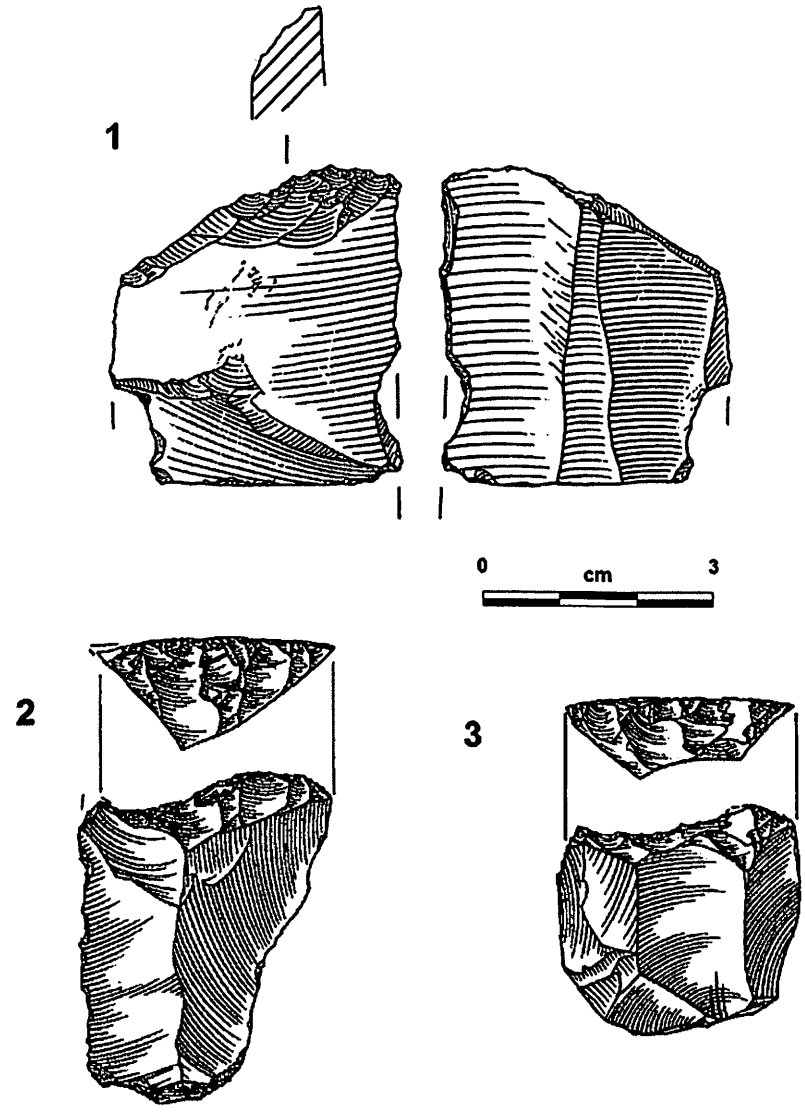

Fig. 3 — Paviland burin (1) and *"grattoirs à épaulements"*(2 & 3) from Kent's Cavern.

4. BLADELET PRODUCTION IN THE AURIGNACIAN OF BRITAIN

With their technological reassessment, and with their discovery in other Aurignacian assemblages, Swainston's suspicions have been confirmed (Dinnis, 2008, 2009). Like other Aurignacian carinated artefacts, Paviland burins can now be understood as cores discarded after the production of micro-lithic bladelets. Twenty-three Paviland burins are known from the Sollas collection from Paviland and a technologically comparable example has been identified in the Aurignacian collection from Kent's Cavern (Devon, southwest England; Fig. 1 & Fig. 3, 1). In addition, several Paviland burins are known from Aurignacian assemblages elsewhere in western Europe (see Dinnis, 2008, and 2009: 219-226 for an up-to-date list). However, away from Britain they are only found in abundance in Belgium, and chiefly at the cave site of Trou Magrite (Province de Namur). There, at least 13 examples were present within the mixed Aurignacian assemblage.

The other artefact particularly characteristic of the British Aurignacian is the bladelet core *burin busqué*. Single examples of entirely typical *burin busqué* have been identified in the mixed cave assemblages from Ffynnon Beuno Cave (Denbighshire, north Wales) and Hoyle's Mouth (Pembrokeshire, south Wales; Fig. 1 & Fig. 4). Three typical *burins busqués* are also present in the collection from Paviland. Plausibly technologically related to the *burins busqués* are seven *burins carénés* from Paviland.

Also from Paviland are seven *grattoirs à museaux plat* and eight *grattoirs à museaux épais*. The *grattoirs à museaux épais* are mostly atypical and thus are difficult to interpret, although some are obviously discarded bladelet cores comparable to those found in, for example, the *Aurignacien évolué* levels of Abri Pataud (Dordogne, France) (Chiotti, 2003). Unlike the Paviland burins and *burin busqués*, these *grattoirs à museaux épais* are made from poor quality, locally sourced raw materials available only in nodules of small size. They are certainly best understood as *ad hoc* uses of a relatively simple bladelet production method, and are unquestionably less characteristic of technological preference than the *burins busqués* and Paviland burins.

Numerous artefacts present in both the Kent's Cavern collection and the Paviland collection have previously been described as Aurignacian *grattoirs à épaulements* (Swainston, 2000; Jacobi, 2007). These artefacts are actually extremely difficult to classify typologically, as a result of their technological variability. Most of them provide little indication that they are discarded bladelet cores, and "*grattoirs à épaulements*" may now be considered a somewhat

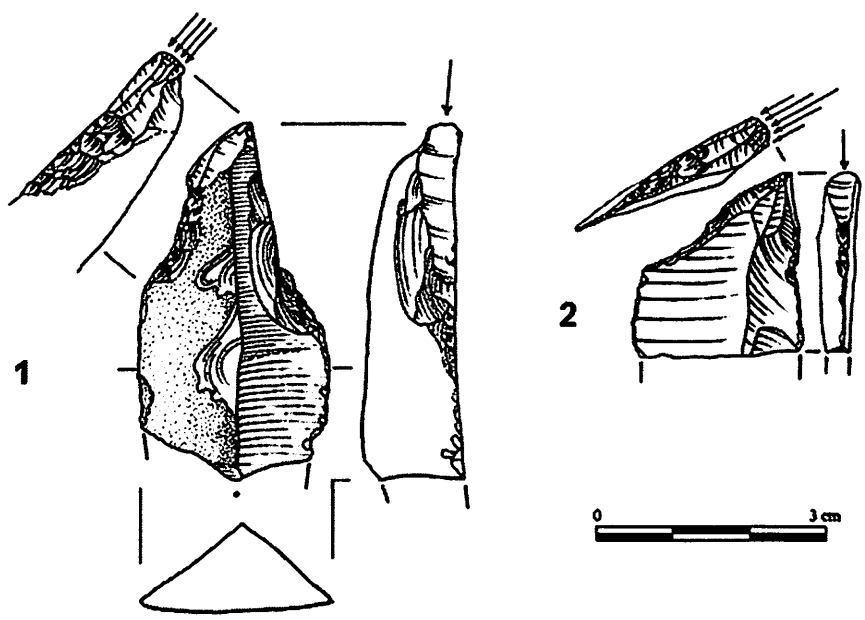

Fig. 4 — *Burins busqués* from Ffynnon Beuno (1) and from Hoyle's Mouth (2).

misleading classification. Their shared characteristic is the general concavity and obliqueness of their "scraper" edge, which is the result of one or a few wide retouch removals (e.g. Fig. 3, 2 & 3). Feasibly these artefacts are bladelet cores discarded after the removal of *éclats d'entretien*, which have removed obvious signs of their former bladelet core form, although this is presently unclear. Whatever the function that underlies their form, their shared presence in the Paviland and Kent's Cavern collections, as well as the shared presence of Paviland burins in both collections, strengthens the assertion that these two assemblages are culturally comparable. It also strengthens the assumption that the "*grattoirs à épaulements*" at both sites are, in fact, Aurignacian.

Overall, the most characteristic bladelet cores of the British Aurignacian are the Paviland burin and the *burin busqué*. In the previous publication on Paviland burins, discussion focussed on their relative abundances in Britain and in Belgium (Dinnis, 2008). There can be little doubt that this artefact reflects some form of cultural link between the two regions during the Aurignacian, and they are apparently good evidence that the source of the British Aurignacian lies to the east. In that publication the technological relationship between the Paviland burin and the *burin busqué* was considered only briefly (Dinnis, 2008: 29-30). The possibility that the Paviland burin resulted from a particularly intensive reduction of the *burin busqué* was proposed as one possible, if unsatisfactory, explanation for the form of the Paviland burin.

5. THE RELATIONSHIP BETWEEN BURINS BUSQUÉS AND PAVILAND BURINS

In Dinnis (2008), techno-morphological similarities and differences between *burins busqués* and Paviland burins were explained. These are summarised here in table 1. The reduction sequence of the *burin busqué* is shown in fig. 5. The lack of refitting pieces makes it impossible to reconstruct the entire reduction sequence of the Paviland burin, but its final stages as inferred from the core artefacts are shown in the schematic in fig. 6. Broadly speaking, bladelets produced from both cores would have been morphologically comparable: short and curved, with a variable degree of anticlockwise torsion and a pronounced marginal curvature distally on their left side (Table 1).

Following the description of the entire corpus of British Aurignacian lithic artefacts as typologically uniform (e.g. Jacobi, 1999, 2007), the relationship between *burins busqués* and Paviland burins requires exploration. One question in particular is important: do differences between *burins busqués* and Paviland burins simply reflect differences in the intensity of core reduction, or differences in the blanks available or selected for use; or are *burins busqués* and Paviland burins representative of two separate and independent technological procedures?

5.1. A desperate measure? The case for Paviland burins and *burins busqués* as the same technique

With reference to technological features shared by Paviland burins and *burins busqués*, it is feasible to conceive of them as occupying different points along one technological procedure. In this scenario, both core types would begin their life as *burin busqué* cores, with bladelets detached from a burin scar platform, across the width of the blank, and with a stop-notch used to determine their length (Fig. 4). Once bladelets had been detached and the core reduced, exhausted core artefacts would have been discarded. These discarded cores would be in a form we would recognise today as *burins busqués*, resembling those in fig. 4.

However, it is conceivable that *burins busqués* could have been reduced even further, perhaps when suitable material to create new bladelet cores was scarce, and that the production of these final few bladelets altered the morphology of the core. If, for whatever reason, the small size of these cores resulted in a need to change the axis through which bladelets were removed, this axis could have been shifted from across the width of the blank (as in *burins busqués*) to across the width/thickness of the blank, directed obliquely towards the ventral surface. The end result of this intensive reduction may therefore have resembled a Paviland burin.

Two technological characteristics of Paviland burins would support this interpretation. The first – visible on some, but not all, Paviland burins – is the presence of a burin scar platform

	Core preparation and reduction			Bladelet morphology				
	Blanks exploited	Platform creation and maintenance	Débitage area restriction	Mean length of bladelets produced (as determined from negative scars)	Curvature	Curvature of margins	Torsion	End product
Burin busqué	Wide blades/ laminar flakes with regular dorsal scars. Fine quality and often exogenous material favoured	Burin removal scar positioned 90° to the ventral and dorsal surfaces, positioned on the right side in c.90% of cases. This is renewed with further burin removals if/when bladelet débitage detachment becomes problematic	Retouched stop-notch limits bladelet débitage surface distally	15mm	Variable but always present	Left side, most pronounced distally	Anti-clockwise	Small Dufour bladelets (Roc-de-Combe subtype)
Paviland burin	Wide blades/ laminar flakes with regular dorsal scars. Fine quality and often exogenous material favoured	Burin-type removal scar orientated towards the dorsal surface, always positioned on the left side. Sometimes no evidence for any platform creation, and therefore the unaltered dorsal surface possibly sufficed for bladelet detachment	Sometimes retouched to limit bladelet débitage surface laterally	12mm	Variable but always present. Less pronounced than for bladelets from *burins busqués*	Left side, most pronounced distally	Anti-clockwise	??

Table 1 — Comparison of technological characteristics of *burins busqués* and Paviland burins and their bladelet débitage. Observations are based upon a sample of 205 *burins busqués* from French, Belgian and British collections and a sample of 40 Paviland burins from Belgian and British collections (see Dinnis, 2008, 2009 for details).

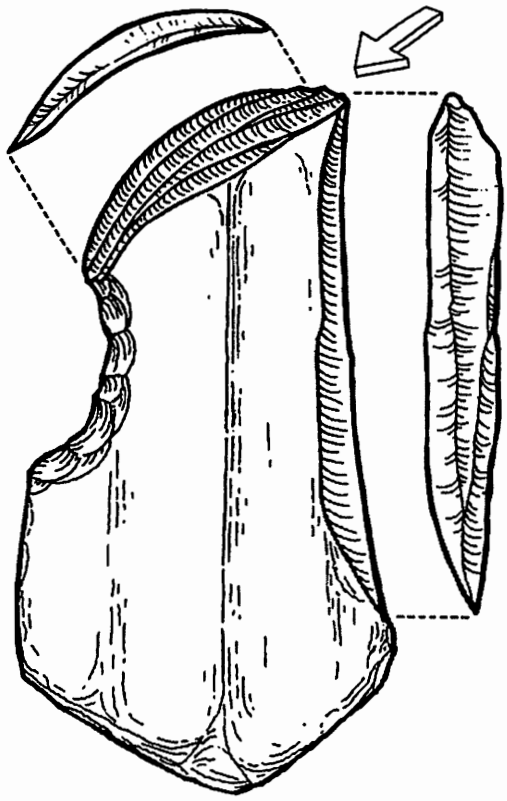

Fig. 5 — Schematic of platform creation and bladelet detachment from a *burin busqué*bladelet core.

from which bladelets have been detached (table 1; fig 2, 3 [marked with an asterisk]). This, of course, is a feature of *burin busqué* bladelet production (table 1; fig. 4), and may therefore hint at continuity between the two core types. The second is the presence of a retouched "stop-notch" on some examples of Paviland burin (table 1; fig. 2, 1 [area marked with an asterisk]). This is the defining characteristic of *burin busqués* (fig. 4). Its presence on Paviland burins could therefore be viewed as a remnant feature of a former *burin busqué* form, and thus as evidence for a direct relationship between the two core types.

In addition to these technological characteristics, the relative abundance of Paviland burins at Trou Magrite and at Paviland – two assemblages distant from sources of good quality raw material (Miller, 2001, Swainston, 2000) – would accord with the notion that Paviland burins arise where *burins busqués* require particularly intensive reduction. Likewise, the smaller size at the point of discard of Paviland burins in comparison to *burins busqués* (Dinnis, 2009), would also accord with this interpretation.

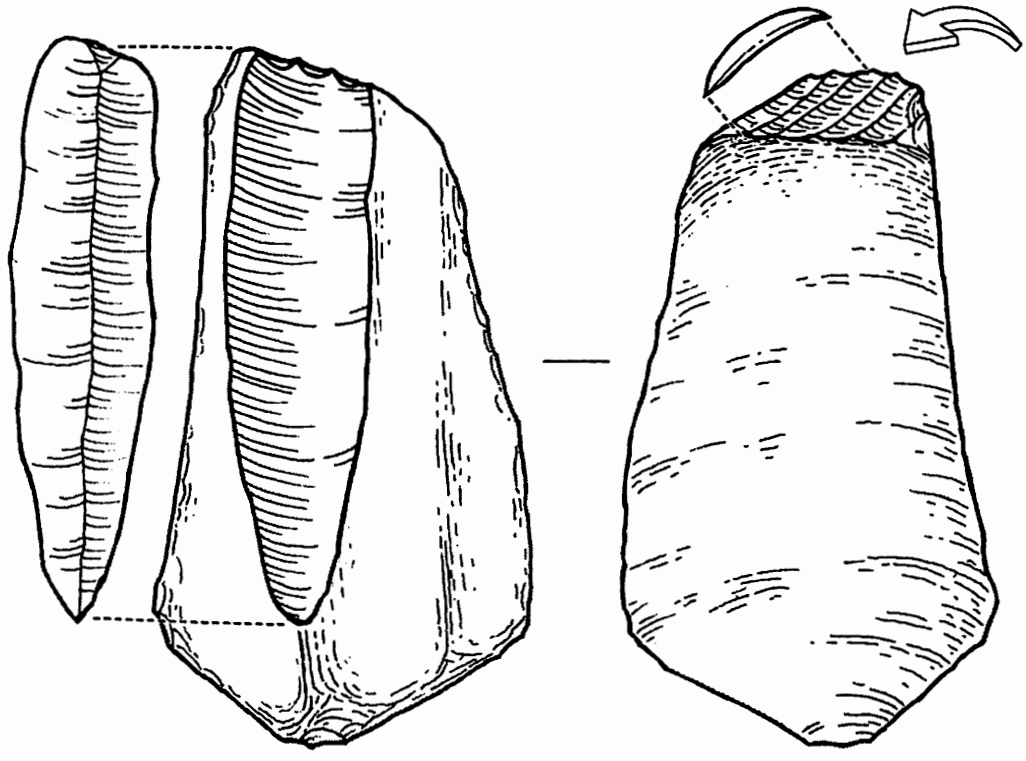

Fig. 6 — Schematic of platform creation and bladelet detachment from a Paviland burin bladelet core.

5.2. Different techniques: the independence of Paviland burin and burin busqué reduction

The hypothesis that Paviland burins are the final stage of a *burin busqué* reduction, however, meets difficulty when these technological features are considered more deeply. First, the use of a burin scar as the platform for detachment of bladelets is common to several Aurignacian bladelet cores (e.g. *burins carénés, burins des Vachons*), and its shared presence on these two core types is therefore perhaps of only limited significance. Furthermore, the presence and position of overlapping burin removal scars on the Paviland burin in fig. 2 (3 [area marked with an asterisk]) suggests that bladelets have been detached obliquely through its width/thickness for some time prior to discard. There is therefore no clue on this artefact, or on any Paviland burin, that the axis of bladelet production 'migrated' towards the ventral surface towards the end of its life, as would be expected in the scenario described above.

Likewise, the presence of a "stop-notch" on examples of Paviland burin is far from convincing evidence for a direct relationship between the two core types. Positioned to regulate the length of detached bladelets on *burins busqués*, its purpose is apparently subtly different on Paviland burins. Instead of restricting the length of bladelets, the stop-notch on a Paviland burin apparently restricts the width of the bladelet débitage surface more than it does the length: it is the thickness of the blank that largely determines the length of bladelets (see Fig. 2, 3). Again, the relevance of this shared feature is questionable, given its apparent functional difference.

Other technological features contradict the hypothesis that Paviland burins are the end result of particularly thorough *burin busqué* reduction. Perhaps the most striking difference between the two core types is the position of the bladelet débitage striking platform. On Paviland burins, bladelets are struck from the left side of the blank, either from a dorsally orientated burin removal or from the dorsal surface itself (table 1; fig. 2). For *burins busqués*, bladelets are ordinarily struck from the right side of the blank (table 1, fig. 4). As noted previously (Dinnis, 2008), the switch from a *burin busqué* to a Paviland burin would thus apparently require the removal of a large amount of material, in order that a new working area could be created on the opposite side of the blank. This is incongruous with their interpretation as a technique through which the life of a *burin busqué* could be extended, and through which more bladelets could be extracted from scarce raw material.

Aspects of raw material use are also inconsistent with the explanation that Paviland burin cores are discarded where raw material is in particularly short supply. Although found in abundance at Trou Magrite and Paviland, at least four Paviland burins are present in the assemblage from Spy (Province de Namur). There are numerous typical *burins busqués* at Spy (Otte, 1979; Flas *et al.*, in press), and there are no obvious reasons to believe that raw material availability was an issue for Aurignacian hunter-gatherers there. The single Paviland burin from Kent's Cavern is also difficult to explain, being in an assemblage where flint was readily available (Jacobi, 2007), and being created on a blank entirely suitable for *burin busqué* bladelet production. (Compare the blanks of the Paviland burin from Kent's Cavern and the *burin busqué* from Ffynnon Beuno [fig. 3, 1 and fig. 4, 1]: both are made on wide blades or laminar flakes of good quality material, with characteristic central dorsal scars and triangular cross-section.)

Furthermore, at other sites distant from raw material sources and where technological features demonstrate that *burins busqués* have clearly been worked until totally exhausted, Paviland burins are absent. The assemblage from Gohaud (Loire-Atlantique, France) demonstrates this well: efforts to prolong the life of *burins busqués* include the delicate and subtle modification of the bladelet débitage platform once the core was too small to create an entirely new platform (Dinnis, 2008, 2009; see also Allard, 1978). As would be expected for a typical *burin busqué* assemblage, on 20 of the 21 *burins busqués* from Gohaud bladelets have been struck from the right side of the blank. The techno-morphology of none of these 21 artefacts approaches that of a Paviland burin. Even more prescient is the *burin busqué/burin caréné* assemblage from Trou du Renard (Province de Namur), situated close to the site of Trou Magrite where numerous Paviland burins were recovered. At Trou du Renard, small nodules of flint have been utilised for the production of

bladelets using *burin busqué/burin caréné* methods. Despite an unusually high number of these core artefacts showing that bladelets were detached from left to right (36%; 5 of 14 artefacts), none displays the key features which are used to define a Paviland burin (Otte, 1976; Dinnis & Flas, in prep.). A paucity of preferable raw material and a particularly thorough reduction of bladelet cores has at neither site led to a Paviland burin-type form of *burin busqué*.

Taken together, these observations are certainly sufficient to conclude that Paviland burins did not simply arise when *burin busqué* creators were distant from a good source of raw material. Assuming that bladelets from *burins busqués* and from Paviland burins were morphologically and functionally comparable, the most reasonable explanation for the presence of *burins busqués* and Paviland burins in British collections would therefore be that they are representative of two, independent methods used during the Aurignacian to create the same end product. This has implications when the nature of British Aurignacian occupation is considered.

6. DISCUSSION: THE NATURE OF AURIGNACIAN OCCUPATION OF BRITAIN

The re-reading and new interpretation of British Aurignacian lithic material presented here and previously (Dinnis, 2008) is based upon the increased technological understanding of Aurignacian carinated lithic artefacts formulated over the past decade and more (e.g. Lucas, 1997; Chiotti, 2000, 2003; Hays & Lucas, 2001; Le Brun-Ricalens *et al.*, 2005, 2006; Pesesse & Michel, 2006; Flas *et al.*, 2006). One observation arising directly from this improved understanding is that the carinated component of unmixed and truly homogeneous Aurignacian lithic assemblages shows a remarkable consistency in the method of bladelet production used, and in the morphology of the resulting bladelets. Often, the extent of this consistency has been masked by the (necessary) typological classification of artefacts.

The *Aurignacien évolué* assemblage from level 7 (lower) of Abri Pataud (Dordogne, France) illustrates this well. In this level are several bladelet core artefact types. The most numerous typological category is the *burin busqué*, with 78 examples. The second most numerous typological category is the *burin caréné*, with 20 examples present. These are likely to represent the stage of the *busqué* reduction sequence at which successive bladelet removals have obliterated the *busqué*-defining stop-notch (Dinnis, 2009). These two artefact types are therefore one technological continuum.

However, present in lower numbers are other artefact types which would also now be viewed as discarded bladelet cores, most notably *burins des Vachons* and *grattoirs à museaux épais* (Dinnis, 2009; see also Chiotti, 2005). It is noteworthy that, despite there being an unusually elevated amount of non-local material present in the level 7 assemblage, all four *grattoirs à museaux épais* and 12 of the 13 *burins des Vachons* are made on local material, poorer in quality and found in smaller nodules than flint imported to the site. In contrast, almost half of the *burins busqués/burins carénés* are made on imported material (43%; 44 of 98 artefacts). Furthermore, the artefacts classified as *burins des Vachons* (for example by Chiotti, 2005) are technologically much closer to *burins busqués* than they are to true *burins des Vachons* (*sensu* Pesesse & Michel 2006). A better typological classification for these artefacts would be *burins busqués à tendance Vachons* (Pesesse & Michel 2006): the imperfect blanks used for these particular bladelet cores have been ventrally modified so that they are suitable for bladelet production using the dominant *busqué* technique. It is this expedient modification which has led to their typological classification as *burins des Vachons*.

Overall, then, the assemblage from Abri Pataud level 7 shows a strict adherence to the *burin busqué* bladelet production method, and deviations from this are explicable as *ad hoc* uses of local and non-preferential raw material (i.e. for the *grattoirs à museaux épais*) or as technological techniques applied to bring problematic blanks in line with the *busqué* norm (i.e. for the "*burins des Vachons*"). In all cases, the morphology of bladelets produced is consistent. This uniformity of carinated artefact bladelet production can also be seen within other, homogeneous *Aurignacien évolué* assemblages, for example those from Maisières-Canal (Province du Hainaut), Gohaud and Abri Pataud level 8 (Allard, 1978; Chiotti, 2005; Flas *et al.*, 2006; Dinnis, 2009): the morphology of bladelets

produced is consistent, and deviations from the one technical norm used for their production are easily explicable with reference to expedient uses of non-preferential raw material or problematic blanks.

Previous descriptions of the typological uniformity of British Aurignacian lithic material were likely the result of the overall paucity of assemblages and artefacts, but were probably also the result of an incomplete understanding of the function and technology of characteristic Aurignacian bladelet core artefacts. Indeed, it is certainly the case that the two largest British Aurignacian assemblages – Paviland and Kent's Cavern – *do* show a level of techno-typological similarity which can be considered as strong evidence for their common cultural source. However, the presence of entirely typical *burins busqués* and Paviland burins at British sites contradicts the notion of typological uniformity across the entire British Aurignacian. Given the consistency of carinated artefact bladelet production within demonstrably homogeneous Aurignacian assemblages elsewhere, the presence of these two artefact types is good evidence that Britain was the subject of more than one Aurignacian occupation, or, alternatively, was the subject of a prolonged occupation which encompassed a time during which traditions of bladelet manufacture changed.

A prolonged but very low-density occupation of Britain, possibly incorporating a large degree of seasonality, is not implausible. For the Aurignacian in particular, the corpus of material currently known from British collections may be particularly poorly representative of actual human occupation. The known geographical range of the Aurignacian in Britain will have been subjected to huge geological alteration into and out of the Last Glacial Maximum (LGM: c.22,000 years ago), and this will no doubt have skewed the archaeological record of the pre-LGM Aurignacian to a significant but, unfortunately, largely unquantifiable degree. If the known range of the British Aurignacian is a reasonably fair reflection of the actual areas occupied – already a very big 'if' – then c.75% of Aurignacian territory has subsequently been scoured by LGM ice sheets or has been submerged by Holocene sea level rises (Dinnis, 2009). In fact, this is a conservative estimate: this figure excludes the Channel River area from "British terrain", despite the possibility that this area was a particular focus of Aurignacian activity (Dinnis, 2008, 2009). Any comparison of the number of Aurignacian sites and findspots in Britain with the number in neighbouring regions which have not been subjected to these geological processes (for example, Belgium) is clearly inherently problematic. With so little Aurignacian material likely to have survived the rigours of the late Pleistocene and early Holocene, it is unclear whether prolonged occupation would now be archaeologically visible at all. Without doubt, the construction of interpretative core-periphery models such as that proposed by Campbell (1977) cannot be justified for the British Aurignacian.

Despite this sizeable caveat, known British assemblages do currently suggest a less dense and more sporadic Aurignacian occupation than in regions such as Belgium. Most notable is the complete absence of any lithic or osseous artefact which would fit better in the *Aurignacien ancien* (or *Protoaurignacien*), despite such artefacts being present in neighbouring Belgium (Otte, 1979; Dinnis, 2009; Flas *et al.*, in press). In this regard, the record of Aurignacian material does nothing to contradict the image of Late Pleistocene Britain as frequently empty of humans (Jacobi, 1999, 2007; Pettitt, 2008; Jacobi & Higham, 2011). Occupation of Britain seemingly only occurred during the later stages of the Aurignacian.

A better interpretation of the presence of Paviland burins and *burins busqués* in Britain may be that they are the sparse surviving remnants of several brief occupation events. Indeed, I would favour a chronological separation of these two artefact types, with the Paviland burin technique as a development of the *burin busqué* technique, and therefore younger than the *burin busqué* (Dinnis, 2009), although more data are needed to test this supposition. It is possible that more Aurignacian *burin busqué* and Paviland burin assemblages lie undiscovered in British museum collections, but it is extremely unlikely that a substantial collection comparable to that from Paviland has gone unnoticed until now. To further characterise the nature of the Aurignacian occupation of Britain will require new fieldwork at known sites, or, preferably, the location and excavation of new sites.

Acknowledgements

I am particularly grateful to Paul Pettitt, Roger Jacobi† and Damien Flas for their help with my AHRC supported doctoral research, from which this paper has arisen. Many thanks are also due to staff at various museums and institutions in Britain, Belgium and France. Permission to reproduce the artefact illustrations in figures 2, 3 and 4 was kindly given by Jeff Wallis, Roger Jacobi and Andrew David. Many thanks also to Craig Williams for preparing the schematics in figures 5 and 6, and to Natasha Reynolds and Jesse Davies for help preparing the manuscript and figures. The comments of two reviewers were also very gratefully received. The time spent writing it has been made possible by the Leverhulme Trust funded Ancient Human Occupation of Britain project.

References

ALLARD M., 1978. Le gisement aurignacien de Gohaud à Saint-Michel-Chef-Chef (Loire Atlantique). I Étude archéologique. *Gallia Préhistoire*, **21**: 1-42.

CAMPBELL J. B., 1977. *The Upper Palaeolithic of Britain: A Study of Man and Nature in the Late Ice Age*. Oxford, Clarendon Press, 2 vol., 264 p.

CHIOTTI L., 2000. Lamelles Dufour et grattoirs aurignaciens (carénés et à museau) de la couche 8 de l'abri Pataud, Les Eyzies-de-Tayac, Dordogne. *L'Anthropologie*, **104**: 239-263.

CHIOTTI L., 2003. Les productions lamellaires dans l'Aurignacien de l'Abri Pataud, Les-Eyzies-de-Tayac. *Gallia Préhistoire*, **45**: 113-156.

CHIOTTI L., 2005. *Les industries lithiques aurignaciennes de l'abri Pataud, Dordogne, France. Les fouilles de Hallam L. Movius Jr*. British Archaeological Reports (International Series), **1392**. Oxford, 349 p.

DINNIS R., 2008. On the technology of late Aurignacian burin and scraper production, and the importance of the Paviland lithic assemblage and the *Paviland burin*. *Lithics: The Journal of the Lithic Studies Society*, **29**: 18–35.

DINNIS R., 2009. *Understanding the British Aurignacian*. Unpublished doctoral thesis, University of Sheffield.

DINNIS R. & FLAS D., in preparation. The Aurignacian lithic assemblage from Trou du Renard in the context of the northern European Recent Aurignacian.

FLAS D., 2008. *La transition du Paléolithique moyen au supérieur dans la Plaine Septentrionale de l'Europe*. Anthropologica et Praehistorica, **119**, 256 p.

FLAS D., MILLER R. & JACOBS B., 2006. Les "burins" de l'Atelier de débitage aurignacien de Maisières-Canal (Province du Hainaut, Belgique). *In* : J.-P. BRACCO, M. DE ARAUJO IGREJA & F. LE BRUN-RICALENS (eds), *Burins Préhistoriques: Formes, Fonctionnements, Fonctions. Actes du colloque d'Aix-en-Provence (3-5 mars 2003)*. ArchéoLogiques, **2**. Luxembourg, MNHA: 55-74.

FLAS D., TARTAR É., BORDES J.-G., LE BRUN-RICALENS F. & ZWYNS N., in press. New observations on the Aurignacian from Spy: lithic assemblage, osseous artefacts and chronocultural sequence. *In*: H. ROUGIER & P. SEMAL (eds), *Spy Cave: State of 120 Years of Pluridisciplinary Research on the Betche-aux-Rotches from Spy (Jemeppe-sur-Sambre, Province of Namur, Belgium)*. Royal Belgian Institute of Natural Sciences & NESPOS Society, Brussels.

GARROD D. A. E., 1926. *The Upper Palaeolithic age in Britain*. Oxford, Clarendon Press, 211 p.

HAYS M. A. & LUCAS G., 2001. Experimental Investigations of Aurignacian Dufour Bladelets. *In*: M. A. HAYS & P. T. THACKER (eds), *Questioning the Answers: Re-solving Fundamental Problems of the Early Upper Paleolithic*. British Archaeological Reports (International Series), **1005**. Oxford: 109-117.

JACOBI R. M., 1999. Some observations on the British Early Upper Palaeolithic. *In* : W. DAVIES & R. CHARLES (eds), *Dorothy Garrod and the Progress of the Palaeolithic: Studies in the Prehistoric Archaeology of the Near East and Europe*. Oxford, Oxbow Books: 35-40.

JACOBI R. M., 2007. A collection of Early Upper Palaeolithic Artefacts from Beedings, near

Pulborough, West Sussex, and the Context of Similar Finds from the British Isles. *Proceedings of the Prehistoric Society*, **73**: 229-325.

Jacobi R. M. & Higham T. F. G., 2008. The "Red Lady" ages gracefully: new ultrafiltration AMS determinations from Paviland. *Journal of Human Evolution*, **55** (5): 898-907.

Jacobi R. M. & Higham T. F. G., 2011. The British Earlier Upper Palaeolithic: Settlement and Chronology. *In*: N. Ashton, S. Lewis & C. Stringer (eds.), *The Ancient Human Occupation of Britain*. Elsevier. Amsterdam: 181-222.

Jacobi R. & Pettitt P. B., 2000. An Aurignacian point from Uphill Quarry, Somerset, and the colonisation of Britain by *Homo sapiens*. *Antiquity*, **74**: 513-518.

Jacobi R. M., Higham T. F. G. & Bronk Ramsey C., 2006. AMS radiocarbon dating of Middle and Upper Palaeolithic bone in the British Isles: improved reliability using ultrafiltration. *Journal of Quaternary Science*, **21**: 557-573.

Le Brun-Ricalens F., Bordes J.-G. & Bon F. (ed.), 2005. *Productions Lamellaires Attribuées à l'Aurignacien : chaînes opératoires et perspectives techno-culturelles*. ArchéoLogiques, **1** Luxembourg, MNHA, 568 p.

Le Brun-Ricalens F., Bracco J.-P. & Brou L., 2006. Burins carénés, grattoirs carénés et formes associées: un retournement! *In* : J.-P. Bracco, M. De Araujo Igreja & F. Le Brun-Ricalens (eds), *Burins Préhistoriques: Formes, Fonctionnements, Fonctions. Actes du colloque d'Aix-en-Provence (3-5 mars 2003)*. ArchéoLogiques 2. Luxembourg, MNHA: 345-356.

Lucas G., 1997. Les lamelles Dufour du Flageolet I (Bézenac, Dordogne) dans le contexte aurignacien. *Paléo*, **9**: 191-220.

Miller R., 2001. *Lithic Resource Management during the Belgian Early Upper Paleolithic: Effects of Variable Raw Material Context on Lithic Economy*. ERAUL, **91**. Liège, 220 p.

Otte M., 1976. L'occupation aurignacienne du Trou du Renard (Furfooz). *Bulletin de la société royale belge d'Anthropologie et de Préhistoire*, **87**: 117-139.

Otte M., 1979. *Le Paléolithique Supérieur Ancien en Belgique*. Monographies d'Archeologie Nationale, **5**. Bruxelles, Musées Royaux d'Art et d'Histoire, 684 p.

Pesesse D. & Michel A., 2006. Le burin des Vachons: apports d'une relecture technologique à la compréhension de l'Aurignacien récent du nord de l'Aquitaine et des Charentes. *Paléo*, **18**: 143-160.

Pettitt P. B., 2008. The British Upper Palaeolithic. *In* : J. Pollard (ed.), *Prehistoric Britain*. Blackwell Studies in Global Archaeology. London, Blackwell: 18-57.

Sollas W. J., 1913. Paviland Cave: an Aurignacian station in Wales. *Journal of the Royal Anthropological Institute of Great Britain and Ireland*, **43**: 325-374.

Swainston S., 1999. Unlocking the inhospitable. *In*: W. Davies & R. Charles (eds.), *Dorothy Garrod and the Progress of the Palaeolithic: Studies in the Prehistoric Archaeology of the Near East and Europe*. Oxbow Books. Oxford: 41-56.

Swainston S., 2000. The lithic artefacts from Paviland. *In*: S. H. Aldhouse-Green (ed.), *Paviland Cave and the "Red Lady": a definitive report*. Western Academic and Specialist Press: 95-113.

Author's address:

Rob Dinnis
Project Curator: "Ancient Human Occupation of Britain"
The British Museum (Prehistory and Europe)
Franks House
56 Orsman Road
London N1 5QL (UK)
rdinnis@thebritishmuseum.ac.uk