ALISON ROBERTS · NICK BARTON

AN EXAMPLE OF NOVICE FLINTKNAPPING IN THE BRITISH LATE UPPER PALAEOLITHIC?

Abstract

Excavations in 2013 in advance of new building work at Guildford Fire Station resulted in the discovery of a rare British example of a well-preserved Late Upper Palaeolithic open air site. The worked flint was in exceptionally fresh condition and preliminary assessment indicated that extensive refitting of artefacts and other studies such as microwear analysis would be possible. Subsequent work by the authors confirmed this observation and demonstrated that the flint assemblage was homogeneous and contained all stages of blade manufacture, and also evidence for the use and discard of tools. Two main knapping foci were identified which appear to have been linked to the presence of at least two skilled flint knappers. Of additional interest was the recognition near to one of these foci (Concentration 1) of a small refitting scatter of debitage apparently produced by a relatively unskilled knapper. Spatial analysis combined with refitting data suggest that this small group might indicate the presence on site of a novice learner alongside that of a more experienced flintknapper.

Keywords

Late Glacial, *Federmessergruppen,* Azilian, refitting, open air site, children

INTRODUCTION

The subject of learning in the transmission of Palaeolithic culture is a topic that continues to command widespread attention in the published literature (e. g., Stapert, 2007; Morgan et al., 2015; Assaf et al., 2016; Rivero, 2016; Lycett et al., 2016; Nishiaki and Jöris, 2019; Takakura and Naoe, 2019). Many of these studies are based on modern experimental observations or ethnographic data, but it is sometimes possible to infer various forms of such behaviour directly from the archaeological record. These range from identifying 'learner' individuals to examples of spatial evidence in which two or more actors, the teacher expert and beginner(s), are represented. Recognition of these aspects has come principally from the analysis of lithic artefacts and refitting studies which allow various levels of technical skill and locational information to be compared and dissected in detail. These have shown that it is possible to identify individual Palaeolithic flintknappers by differences in their technical abilities and sub-dividing them into separate categories ranging from 'beginners' to 'experts'. In the Late Upper Palaeolithic, for example, studies have shown the presence of knappers with divergent technical skills at sites such as Pincevent (Bodu, 1993; Bodu et al., 1990), Trollesgave (Fischer, 1989), Rekem (De Bie and Caspar, 2000), and in the Early Upper Palaeolithic Perigordian level at Solvieux (Grimm, 2000). At the fullest extreme, at least six different skillsets, presumably representing the work of six different individuals, were reported from the various refitted blade reduction sequences at the Magdalenian site of Etiolles (Olive, 1988; Pigeot, 1987, 1990, 2004). Amongst prime indicators of novice knapping in these contexts was the atypical use of hard hammer technique within an assemblage of predominantly soft hammer mode products (e. g., Pigeot, 2004: 100), and a high incidence of 'battering' and misplaced blows in detaching blades from cores which often resulted in large platforms on blanks (Stapert, 2007: 21).

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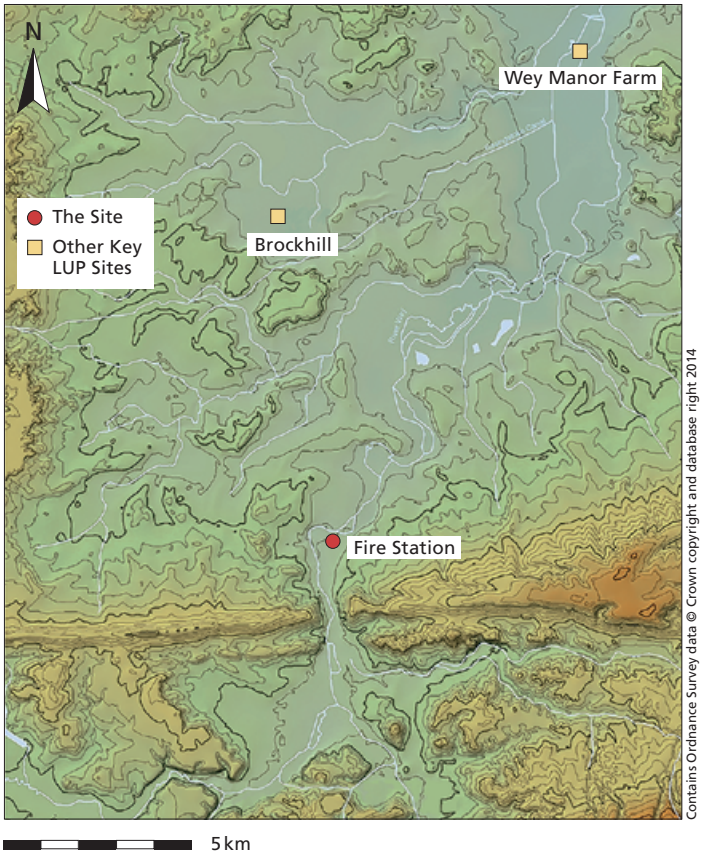

Fig. 1 Topographic relief map of the Guildford region showing the location of the Guildford Fire Station, Wey Manor Farm, and Brockhill Late Upper Palaeolithic sites. – (© Oxford Archaeology).

Arising from these studies, it has been hypothesised that the inexperienced knappers were probably children and, based on cross-cultural ethnographic studies (Murdock and Provost, 1973), some authors have even contended that they were mostly boys (Stapert, 2007; Johansen and Stapert, 2004). While such assumptions may be challenged (see for example: Archer, 2010, on female Konso flintknappers), the 'visibility' of young children of learning age in the archaeological record is now a widely accepted phenomenon, frequently referred to in various publications (e. g., Fischer, 1989; Grimm, 2000; Roveland, 2000; Sharpe and Van Gelder, 2004, 2006; Shea, 2006; Stapert, 2007; Högberg, 2008; Nowell and White, 2010; Bahn, 2015; Finlay, 2015; Nowell, 2015, 2021; Langley, 2018; Langley and Lister, 2018; Riede et al., 2018).

Despite a growing interest in the presence of children and novices at sites, there seems to have been little progress in developing these ideas along empirical lines, beyond observing variability in skillsets and how these reflect individual workmanship. In particular, only minimal attention has been given to the spatial dimension, for example in examining the organisation of occupation surfaces for evidence of novice knapping or comparing the lithic residues left by children/novices with those of more experienced or expert practitioners. An exception is the study by Anders Fischer (1989) at the Late Upper Palaeolithic Bromme site of Trollesgave. In this example, Fischer used refitting evidence to show two fan-shape flint scatters arranged close to one another and next to a large natural boulder. Although, one of the scatters showed a high degree of precision and expertise in the production of blades, the other – slightly further from the boulder – lacked the same quality in the execution of technique (Fischer, 1989: 44). This was apparent particularly from striking platforms which included little abrasion or trimming of the platform edges, and with blows delivered with less accuracy than on blades in the other scatter; the raw material in each case was of the same good quality. Fischer argued that the second scatter was the product of a child knapper training under

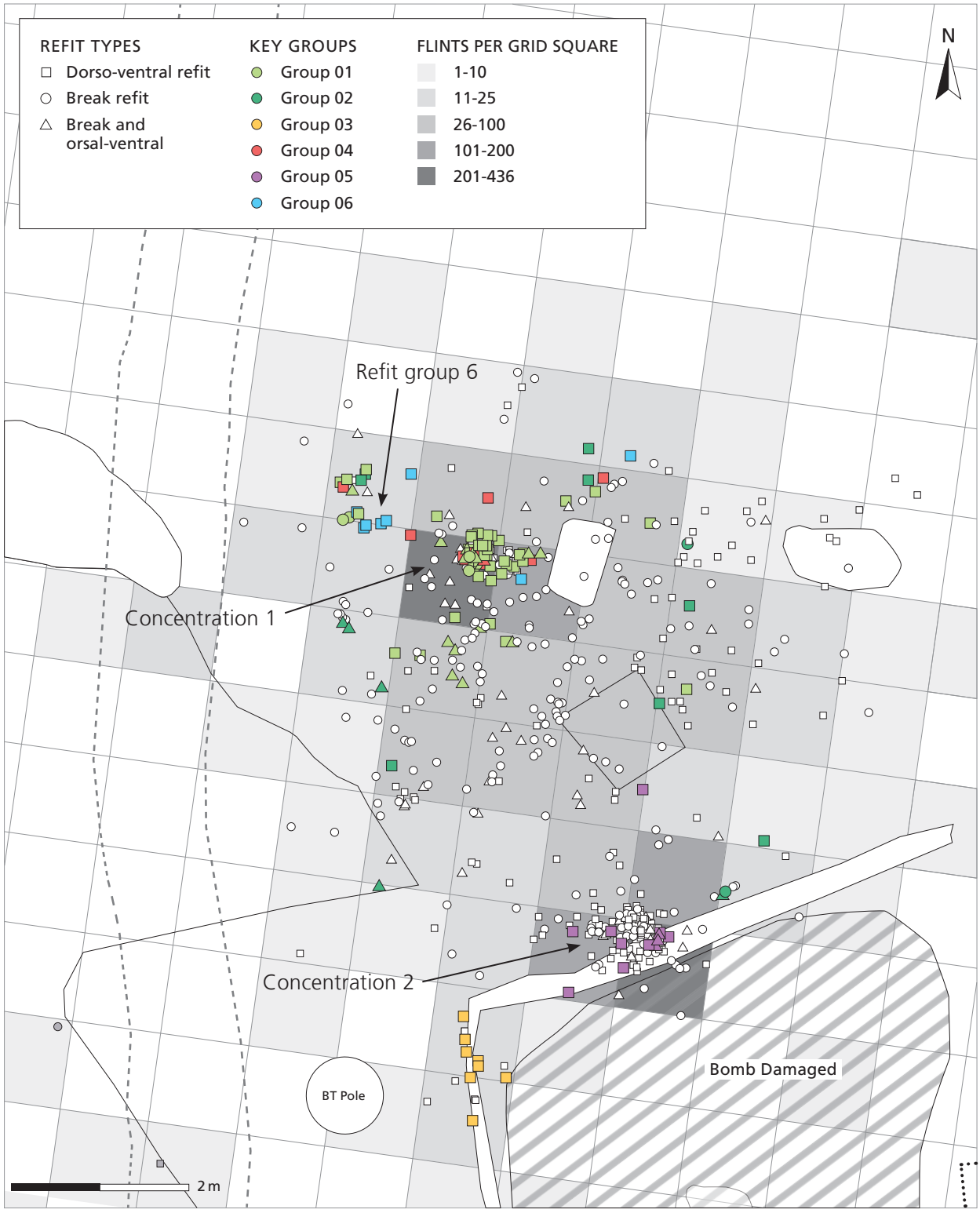

Fig. 2 Guildford Fire Station site plan showing distribution of excavated artefacts with ventro-dorsal refits. Refitting groups 1-6 in colour (RG-6 in Blue). – (© Oxford Archaeology modified by Nicole Viehöver, MONREPOS).

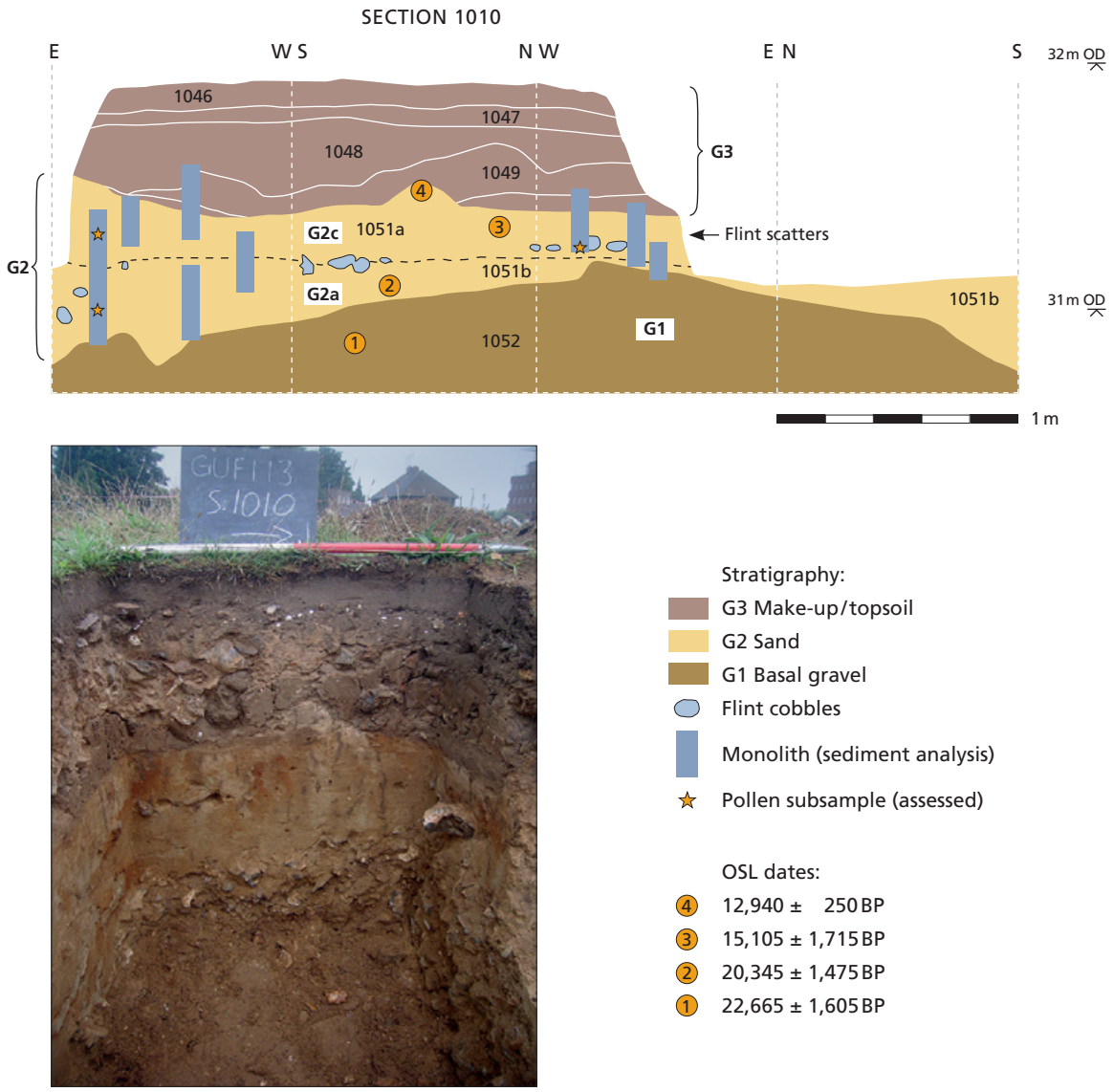

Fig. 3 Test pit sample section 1010 showing location of OSL samples (other OSL samples from section 1011 not shown). – (© Oxford Archaeology).

the guidance of a skilled (expert) craftsman who was seated in front on the boulder (Fischer, 1989: 45). Amongst the few other rare cases reported in the literature are those described by Dick Stapert and Lykke Johansen for the Late Upper Palaeolithic sites of Oldeholtwolde (Johansen and Stapert, 2004) and Gramsbergen (Johansen and Stapert, 2000) where a spatial relationship could be determined between artefacts left by an "expert knapper and an advanced pupil" (Stapert, 2007: 21). In both cases knapping scatters of markedly varying quality were observed 1 m to 1.5 m apart in configurations which would suggest "some kind of educational interaction during the work" (Stapert, 2007: 21).

In parallel with these publications a more integrated approach to the study of novice knappers at Palaeolithic sites was developed by Linda Grimm (2000). Based on her study of the Early Upper Palaeolithic location of Solvieux, she proposed five criteria which she believed could serve to distinguish novice knappers from more experienced ones. These can be summarised as follows (Grimm, 2000: 55):

1) Complete or near complete recovery of debitage clusters of novice knappers. This due to a novice's material being abandoned at the knapping location rather than being more widely disseminated, as in the case of products of more experienced knappers.
2) Poorer control of basic technical principles of knapping. This indicated by knapping errors such as removals that terminated prematurely in hinge or step fractures, in failure to maintain a correct flaking angle or the angle of the striking platform in relation to the main flaking face.
3) Cores usually abandoned at an early stage, largely due to knapping accidents (hinge or step fractures) and an inability to deal with core maintenance during reduction or to conceptualise solutions to problems.
4) Use of poorer quality raw material. Novices will have had more limited access to good quality material relying either on inferior stone or on reworked material abandoned at an earlier stage by more expert knappers.
5) A tendency to pursue activity in peripheral zones. This had already been noted in the Paris Basin Upper Palaeolithic sites where novice knapping was found to occur on the periphery of hearth-centred activity zones (Pigeot, 1990; Bodu et al., 1990).

We believe that these criteria in combination with refitting studies could provide an effective empirical means of identifying the presence of novice knappers at a site, particularly in cases where there is little likelihood of mixing from potentially intrusive material. In adopting this approach for analysing occupation surfaces, we believe that it will be possible to gain a clearer insight into pedagogic behaviour in the Upper Palaeolithic. In the best cases it will enable the activities of novices to be mapped more precisely and lead to a better understanding of knowledge transmission and the teacher-learner relationships described by Fischer (1989) and others. Here we employ this method as a basis for discussing the interpretation of a possible novice flint knapper scatter at a recently discovered Late Upper Palaeolithic site in southern Britain.

THE GUILDFORD FIRE STATION SITE

Background: Site location, topographic setting, geology, dating

The Guildford Fire Station site (NGR SU 9965 5081) at Ladymead is located on the right bank of the River Wey, near the southern edge of the medieval town of Guildford in Surrey. It occupies a relatively low-lying position at ca. 30 m OD (i. e., Ordnance Datum) in a large meander of the river and just above the present valley floodplain. The site also lies 2 km north of the point where the river forms a narrow, steep-sided gorge that cuts through a flint-rich ridge of chalk that rises to elevations of 150 m OD before opening out northwards into a wide floodplain (**Fig. 1**). The site would thus have been ideally placed in proximity to high quality flint raw material sources and potentially also to good hunting terrain for driving and trapping animal game. The site assemblage consists mostly of flint artefacts forming a scatter of occupation debris dispersed over an area of approximately 36 m^2 (**Fig. 2**; n = 15,703 including small debitage). The flints were concentrated in a relatively narrow horizon about 20 cm thick in a shallow stratified sequence of sands and silts (unit G2c) (**Fig. 3**). Immediately below the scatter was a discontinuous natural bed of cobble- and pebble-sized clasts recorded as unit G2b. The cobble layer may have formed a barrier to the downward migration of the flint artefacts. It was composed of both very large flint nodules and a smaller component of greensand chert, none worked. The cobbles had distinctively 'chattered' outer cortical surfaces and many internal flaws (frost

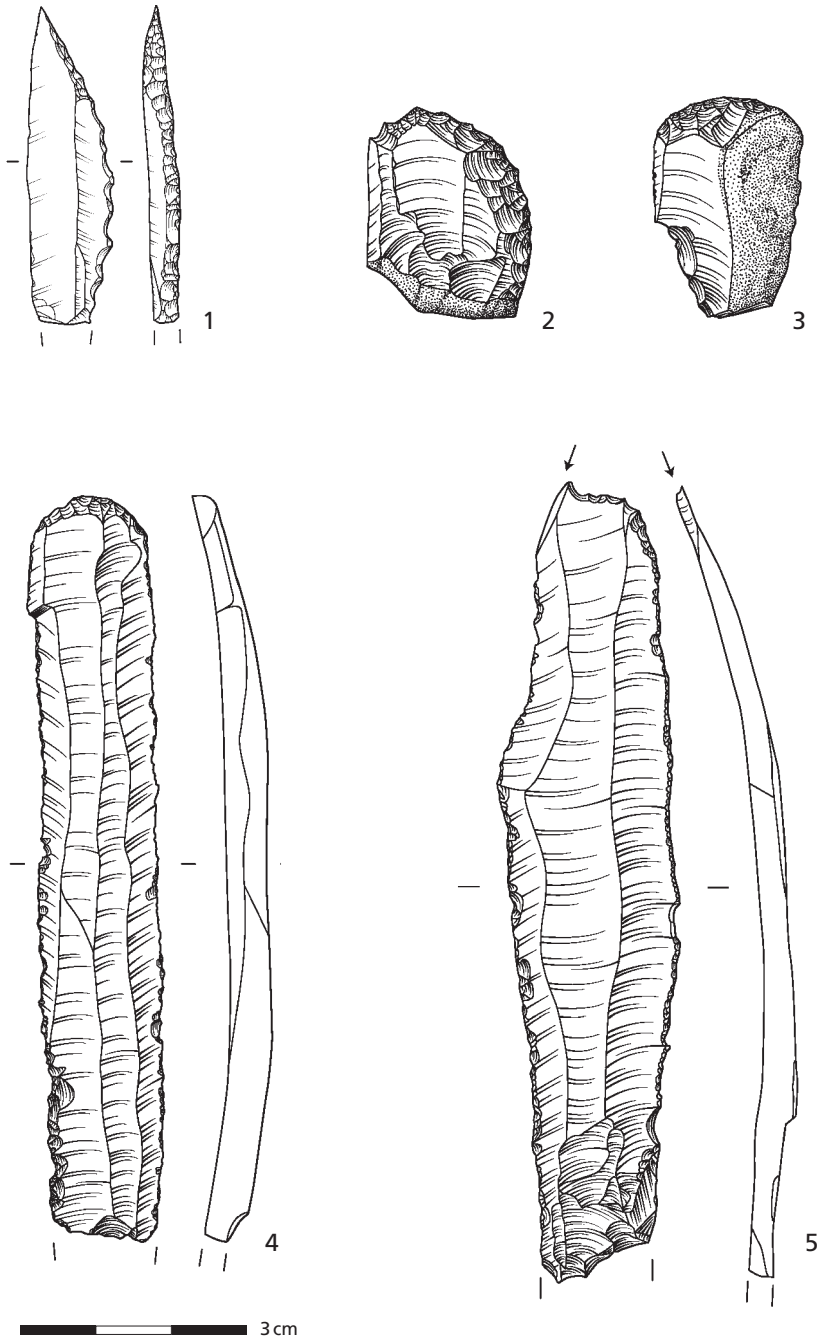

Fig. 4 Lithic artefacts from Guildford Fire Station: **1** Curved bi-point (catalogue c.308); **2-3** short end-scrapers (2: c.1272, 3: c.1408); **4-5** *lames à retouche rasante* (4: c.2471 end-scraper; 5: c.19 burin on truncation). – (© Oxford Archaeology).

cracking?) and were not the source of the flints in the archaeological layer. Despite the large size of some of the cobbles in unit G2b, there were no signs that they had been used for building hearths or other structures. No bone survived in the archaeological horizon.

Dating of the lithic assemblage is based on nine OSL (Optically Stimulated Luminescence) measurements of sediments from above, within and below the archaeological horizon. The samples that relate most closely to the archaeological material show that stratigraphic unit G2c, that contained the finds, has an estimated

age of 15,105 ± 1,715 BP (absolute years). It is sealed by an upper sand sequence with an estimated age of 10,150 ± 915 BP. Sands beneath the Cobble layer (G2a) provided two OSL estimates of 20,345 ± 1,475 BP and 19,880 ± 1,020 BP, placing their deposition towards the end of the Last Glacial Maximum. From these determinations it suggests that the occupation of the site dated to the first half of the Late Glacial (Windermere) interstadial, roughly equivalent to the Late Bølling oscillation in the North European terminology (Naudinot et al., 2019).

Typological and technological attributes of the flint assemblage identify it as belonging to an early facies of the *Federmessergruppen* (or Azilian). This is based partly on the retouched tools (n = 263) which include a curve-backed blade pointed at both ends (bi-point) (**Fig. 4: 1**) and several broken, backed points. There is a notable scarcity of backed bladelets (5 fragments) and absence of trapezoidal backed forms (Cheddar points) typical of the Magdalenian and British Creswellian facies, respectively. Amongst the end-scrapers are shorter examples typical of the *Federmessergruppen* (**Fig. 4: 2-3**), and the burins include a relatively equal representation of dihedral and thicker truncation types. One of the most diagnostic tool forms are seven blades with invasive stepped and scaled retouch (knife blades or *lames à retouche rasante*) (**Fig. 4: 4-5**). Such blades with *rasante* retouch are regarded as an important typological marker of the Azilian in mainland Europe (Bodu and Mevel, 2008); they are uncommon in the Late Magdalenian. Technologically, the assemblage is characterised by regular blades, straight or slightly curved in profile, often from a single preferred flaking direction. The use of soft stone hammer percussion (as opposed to organic hammer percussion) to produce them is a feature shared with *Federmessergruppen* and Azilian assemblages on the European mainland (Naudinot et al., 2019).

Flint scatters and refitting evidence

Two dense flint concentrations were identified within the excavated scatter of flint artefacts: Concentration 1 (C1) in the north-western part of the site, and Concentration 2 (C2) in the south-eastern part. Both concentrations were about 2 m^2 in size and were separated by a gap of about 4-5 m. Most of the rest of the flint assemblage recovered from the site was in the area between and to the east of the two concentrations (see **Fig. 2**). Both concentrations consisted of large quantities of knapping debris including cores, crested pieces, core tablets and other rejuvenation products, and refitting has shown that they were foci for blade manufacture. They also contained more than half of the assemblage debitage with a high proportion of artefacts with cortical surfaces implying prime knapping areas where cores were reduced from raw nodules. Where cortex survives on artefacts it usually has the characteristics of slightly weathered flint nodules derived from the Chalk (rather than river gravel flint). It is therefore presumed that the nodules were brought from a nearby chalk outcrop to the site for working.

The knapping strategies reconstructed from refitting revealed a very similar pattern of reduction in each of the concentrations which involved the production of long regular blades, straight or slightly curved in profile, and often from a single preferred flaking direction. The elaborate shaping of cores included the careful preparation of butts for the longer blades, and the frequent use of faceting and platform abrasion. One other consistent feature of C1 and C2 was the relatively low incidence of bladelets and the fact that in their final stages, the cores show the preferential production of short, straight blades generally made with soft stone hammer percussion. From refitting it also became clear that each of the concentrations had many internal refits, and also refits with material from elsewhere on the site, but that there were few inter-connecting conjoins between C1 and C2. There are only two main instances of artefacts refitting between the two concentrations and these were both examples where a tool knapped in one concentration was found in the

Fig. 5 Photograph of refitting group RG-6. – (© Institute of Archaeology Oxford University).

area of the other: refit groups RG-2 (n = 15) and RG-10 (n = 11). There are two other instances but in both cases the refitting groups are too small to allow interpretation: refit groups RG-23 (n = 5) and RG-29 (n = 4). Despite similarities in the overall quality and standard of blade production in C1 and C2, there are subtle variations in the knapping techniques that would indicate the actions of different experienced individual flintknappers. For example, a method similar to the *en éperon* technique for isolating platforms prior to blade removal occurs more frequently in C2 and its related refitting groups, while there is a slightly higher proportion of plain butts, often with the bulb of percussion located precisely at the edge of the platform, in C1 and related groups. These variances perhaps suggest differences in technical ability between the individual knappers responsible for the main concentrations. Alternatively, since there are well-made blades in both clusters, then it may simply be a question of divergent styles of flintknapping. Either way, the differences in knapping style seem to indicate the presence on site of at least two knappers skilled in blade production.

The only refitting group that does not seem to be entirely the product of skilled flint working is refit group 6 (RG-6; n = 8) (**Fig. 5**), which we hypothesize was the work of an inexpert, possibly novice, knapper. This group consists mainly of laminar flakes with large plain butts removed from a single platform cortically-backed core (c.1908). The flint is of good quality and originated from a river cobble; a different source from the other cores at the site. The removals were apparently by soft stone percussion and are reasonably well-executed although generally lacking the precise technical skill shown on debitage from other refitting groups. These flakes and the core were all found near each other about 1 - 1.5 m to the west of C1 (**Fig. 2**), at the edge of the excavated site. The core appears to have been abandoned before it was exhausted, most

Fig. 5 (continued)

likely as the platform was damaged by the lack of care with which the final 2-3 removals were executed. These final removals were not recovered during the excavation, but the negative scars on the core show that they were uncontrolled and apparently either hard hammer struck and/or detached with considerable force. These combined factors regarding RG-6 would seem to fulfill the main criteria for identifying the activity of a relatively unskilled 'novice' flint knapper: i. e., recovery of a near complete debitage cluster from a small area; lack of technical precision in knapping compared to the rest of the assemblage; early abandonment of a core; proximity to activity of a skilled knapper; and activity at the periphery of a site/activity area. Further support for this interpretation is provided by two other artefacts in this refitting group, both of which were found away from the main RG-6 scatter. One is a successful platform rejuvenation flake (c.1908) that had been removed immediately prior to the start of the series of laminar flake removals. Dorsal features and refitting show that before this flake was detached the entire core platform had been crushed by repeated unsuccessful blows. The rejuvenation flake had been detached efficiently by soft stone percussion and was found within C1. Its presence there is hard to explain other than by hypothesizing a connection between the skilled knapper in C1 and the nearby 'novice' knapper. Perhaps this simple repair to the core could be seen as an 'educational interaction' with the novice of the type proposed by Johansen and Stapert, in this case possibly demonstrating how to refresh a core platform. In this light it is interesting to note that the flake that subsequently removed the remaining part of the damaged platform (c.879, from the main RG-6 scatter) had been knapped by the same characteristic method of delivering a blow precisely at the edge of a plain platform that is most frequently seen in C1 and related refitting groups. This perhaps is another indicator of a skilled knapper instructing or guiding the novice.

The other refitting artefact in RG-6 is a well-made blade (c.2403) with an *en éperon*-type isolated butt and features of soft-stone percussion. It was found about 3 m to the east of the main group of 'novice' refits, and about 2 m north east of C1 in an area where some tool using activity seems to have occurred. Refitting shows that this blade relates to an earlier phase of use of the RG-6 core when the volume of the block was larger and the main working platform higher. The blade is clearly the product of skilled blade manufacture, and it perhaps represents the final phase of the use of the core for that purpose before it was passed to a novice for knapping practice. As no further refits have been found it cannot be determined if earlier blade manufacture took place onsite or whether the core was brought in from another location. The presence of this blade in the refit group does demonstrate at least two phases of use of this core, originally for skilled blade manufacture, and later as raw material for a novice to use for knapping practice. This is consistent with Grimm's observation that novices often reuse material discarded by more expert knappers.

Refitting of other material found close to the RG-6 scatter provides further potentially relevant information regarding interaction between the novice and the skilled C1 flintknapper. Several large thick debitage elements from C1 refit groups (four from RG-1: n = 71; two from RG-2: n = 15; and one from RG-4: n = 11) were found closely clustered together with elements of the RG-6 novice group (see **Fig. 2**). The distribution of these large debitage pieces does not appear to have been by chance as the artefacts must have been moved there up to 1.5 m from where they were knapped. In our view it is plausible that they had been deliberately placed there together – possibly for reference or for future use in knapping practice by the novice. In addition, the only tool associated with the main RG-6 novice group is a broken edge-damaged flake, that was originally knapped as part of RG-1 in Concentration 1.

DISCUSSION

Refitting data and technological observations of the *chaîne opératoire* demonstrates a spatial connection between the C1 knapping concentration and the adjacent smaller RG-6 scatter. One of the main questions however concerns the nature of that connection. Based on our analysis we would argue that RG-6 represents the work of a novice, lying adjacent to a concentration of more expertly knapped material near the edge of the known site and thus fulfilling the criteria set out by Grimm (2000). In addition, the reduction method of RG-6 was not particularly skillful in its execution, the resulting products were simple laminar flakes, most of the artefacts were abandoned close to the core, and the flint used had already been discarded by a more expert knapper. Although not conclusive, it is therefore tempting to interpret the evidence from the Guildford site as that of a novice sitting alongside an expert knapper, observing the process and products of the skilled work, as part of a learning experience. This is not too dissimilar to the scenario envisaged at Trollesgave in which an inexperienced novice is described seated next to and receiving instruction from a highly skilled knapping teacher (Fischer, 1989).

Of the potential counter-arguments to this interpretation, it could be suggested that the core simply represented an expedient use of locally available lithic raw material that came from the bed of the nearby river Wey. This contention, while possible, seems unlikely to us because none of the flakes from this core showed any signs of use-wear and they lay in a small cluster, more or less as they had been knapped. This interpretation also does not take sufficiently into account the extended 'life-cycle' of the RG-6 core which at an earlier stage seems to have been worked by a more expert knapper. Nor does it explain the skilled repair of the original damaged platform, or the connections with C1 that can be demonstrated by refitting.

Taking a broader view of human activity in southeast Britain during the Late Upper Palaeolithic, it is interesting to note that another example of novice knapping has been described at the nearby site of Wey Manor Farm, Surrey (Jones and Cooper, 2013). This site is believed to be of similar age to the Guildford Fire Station site and lies just 11 miles downstream on the River Wey (**Fig. 1**). Although the assemblage is not as extensive as at Guildford there are many similarities between the two sites, including that they were both probably short-term occupations made by a small group of people. The possible presence of a novice flintknapper on both sites might be another significant parallel. The diagnostic indicator in the Wey Manor Farm assemblage was a fragment of a well-made blade core that had broken along a natural fracture plane and had subsequently undergone a final phase of poorly executed reduction (Jones and Cooper, 2013: 21). This final phase of working had resulted in a series of stepped fractures and apparently failed attempts at platform rejuvenation (Jones and Cooper, 2013: Fig. 2.14). The end-product was interpreted as being the work of a child, and the report speculates that the child might have been present either as an apprentice with a hunting-task group or possibly as a member of a family group (Jones and Cooper, 2013: 49). The same might possibly also be true of the Guildford site. It suggests the importance of finding further examples of high-resolution sites of such kind to explore whether such patterns were more widespread.

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