1536

Landscape of Neolithic Axes Project: Year 1 Test Pitting, Ty'n y Llwyfan, Llanfairfechan

Cadw

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Ymddiriedolaeth Archaeolegol Gwynedd
Gwynedd Archaeological Trust

Landscape of Neolithic Axes Project: Year 1 Test Pitting, Ty'n y Llwyfan, Llanfairfechan

Project No. G2495

Report No. 1536

Event PRN 45665

Prepared for: Cadw

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Cover photograph: Digging test pits at Ty'n y Llwyfan

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SUMMARY / CRYNODEB

Gwynedd Archaeological Trust was grant aided by Cadw to undertake a community project investigating Neolithic stone axe working near Dinas, Llanfairfechan.

This first year of the Landscape of Neolithic Axes Project focused on test pitting in a field on Ty'n y Llwyfan Farm, at the foot of Dinas, adjacent to axe working site PRN 67329. The fieldwork was undertaken in November 2019.

In total 16 test pits were excavated with 818 Graig Lwyd flakes and fragments recovered and 3 broken axe roughouts plus two roughout fragments and a small number of chert flakes. The work demonstrated extensive evidence for axe-working across this area. The axe-working activity has been allocated PRN 81634.

Derbyniodd Ymddiriedolaeth Archaeolegol Gwynedd gymorth grant gan Cadw er mwyn ymgymryd â phrosiect cymunedol i ymchwilio gweithio bwyeill carreg Neolithig ger Dinas, Llanfairfechan.

Bu'r flwyddyn gyntaf hon o'r Prosiect Bwyeill Neolithig yn ffocysu ar gloddio prawf mewn cae ar Fferm Ty'n y Llwyfan, wrth droed Dinas, ac yn ymyl safle gweithio bwyeill PRN 67329. Gwnaethpwyd y gwaith maes yn Tachwedd 2019.

Cloddiwyd cyfanswm o 16 twll prawf a daethpwyd o hyd i 818 o naddion a theilchion Graig Lwyd a 3 brasffurf bwyeill wedi torri, ynghyd â dau ddarn brasffurf a nifer fechan o naddion siert. Dangosodd y gwaith dystiolaeth eang o weithio bwyeill ar draws yr ardal hon. Rhoddwyd PRN 81634 i'r gweithgarwch gweithio bwyeill.

1 INTRODUCTION

1.1 The Project

Polished stone axes were tools of considerable significance, both practically and socially, in the Neolithic period. Petrological analysis has identified several sources of the stone for these axes in Britain. The stone types identified have been classed as belonging to several Groups. Axes made of Group VII stone originated from a stone source close to the north coast of Wales. This stone source was identified at Graig Lwyd, Penmaenmawr and this location is widely known to archaeologists. It is less well known that the same stone occurs above Llanfairfechan and that this stone was also used to make axes and forms part of the source of the Group VII axes. In the uplands above Penmaenmawr and Llanfairfechan there is not a single stone source but an extensive landscape related to Neolithic axe production. This is a landscape of national importance with axes produced from this area being distributed across much of southern Britain, but it has received remarkably little archaeological study. The current project aims to start to correct that.

In 2017 GAT carried out a review of the environs of the stone sources, which suggested that related use of the landscape was more widespread than has previously been considered

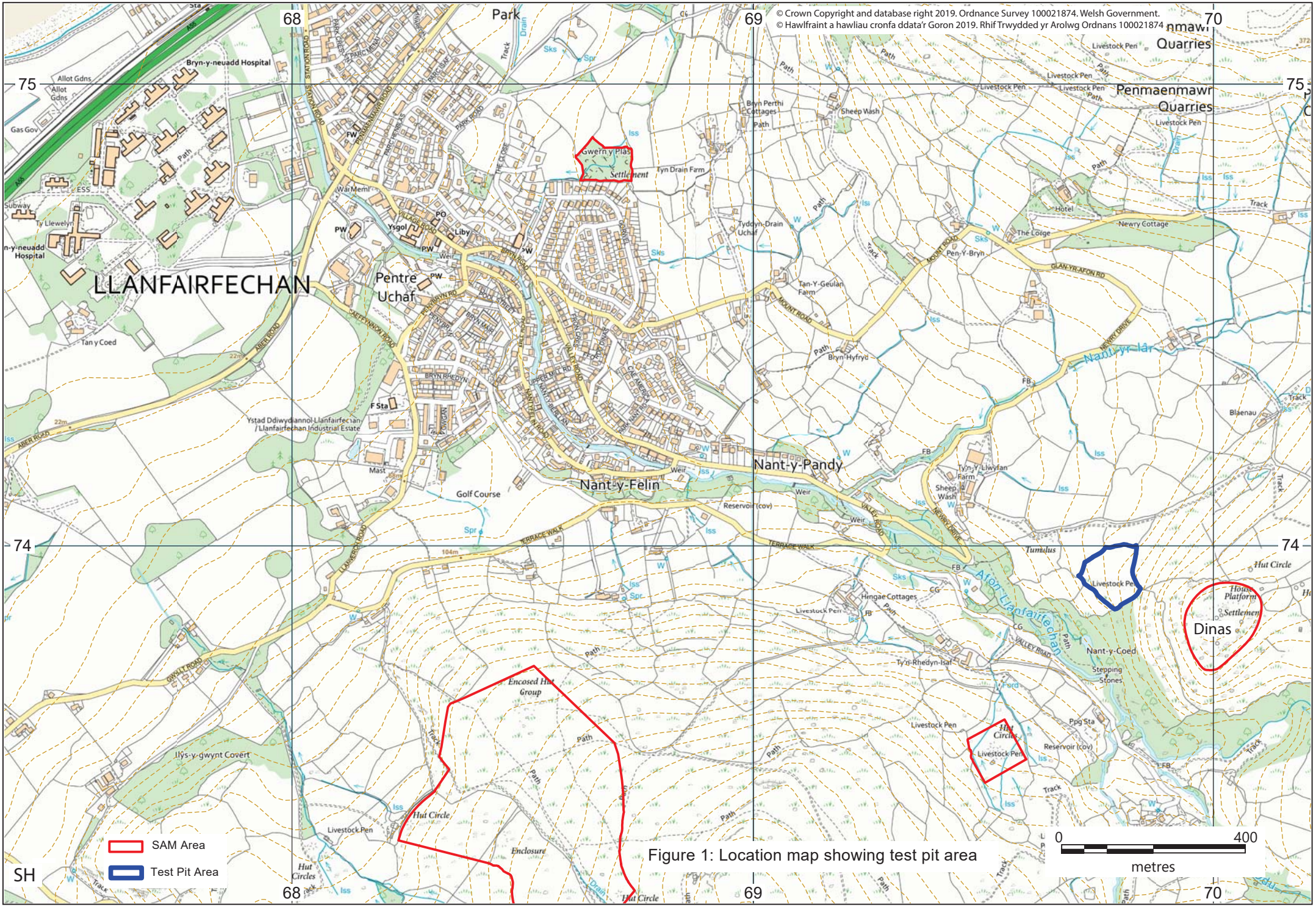

Figure 1: Location map showing test pit area

and deserves further investigation (Kenney 2017). A Management and Interpretation Plan for this landscape was produced in 2018-19 along with a survey of one of the identified axe-working sites (PRN 67329) (Kenney 2019). These studies provide the basis for the current project.

The landscape of the stone sources forms part of the northern end of the Carneddau mountain range. The Carneddau are the focus of the Carneddau Landscape Partnership Scheme, a large scale HLF funded project involoving a group of 23 agencies and organisations under the leadership of the Snowdonia National Park Authority. The project aims to help conserve the threatened heritage of the Carneddau by increasing understanding and enjoyment of the cultural and natural heritage of the area across a wide range of communities, individuals and organisations. The current project is a joint project with the Carneddau Landscape Partnership, known as the Landscape of Neolithic Axes Project. Work in 2019-20 provided a preliminary scoping study before the Carneddau Landscape Partnership was fully operational. The aim of the project is to include the local community and other volunteers in all aspects of the study and to raise awareness and understanding of this important archaeological resource as well as answering academic research questions.

The work in this first year of the project was focused on a field on Ty'n y Llwyfan Farm, Llanfairfechan that is adjacent to an axe-working site previously identified. Working out from a known site enabled the extent of axe-working evidence in the form of flakes and roughouts to be studied.

1.2 Landscape

The area studied in 2019-20 is located above the town of Llanfairfechan (Figure 1). Llanfairfechan is adjacent to Traeth Lafan on the Menai Strait, and is dominated by Penmaenmawr Mountain to the east. The higher part of the valley directly above the town is narrow and overlooked by two hills; Dinas and Garreg Fawr. Dinas, a distinctive hill with a flat peak on which is situated an Iron Age hillfort (PRN 392), was the focus of the fieldwork detailed in this report. The sides of Dinas to the south and west are bare scree (Plate 01) with the Nant y Coed woodland and nature reserve to the west.

The area is within the North Arllechwedd Landscape of Outstanding Historic Interest (HLW (Gw) 12): "A dissected, mainly upland, area situated on the northern flanks of the Carneddau ridge in north Snowdonia, containing well-preserved relict evidence of recurrent land use and settlement from the prehistoric to medieval and later periods" (Cadw 1998, 116).

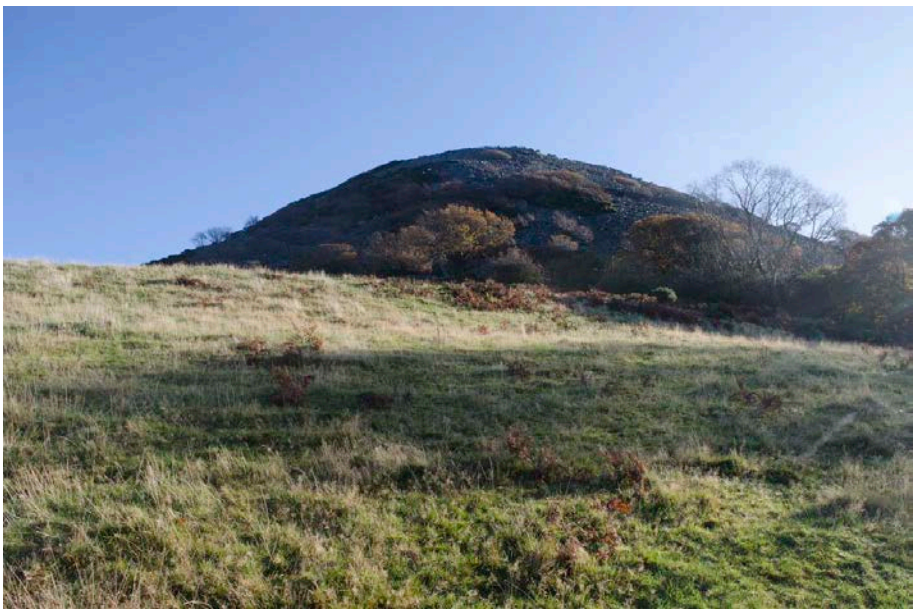

Plate 01 – View of Dinas from test pitting area (archive reference: G2495_2019_2073)

1.3 Geology

The bedrock under most of the Llanfairfechan area is siltstone of the Nant Ffrancon Subgroup, an Ordovician sedimentary rock. Protruding through these deposits are intrusions of silica-poor magma, also of Ordovician date. These rocks are a Microdiorite, and they cooled at varying rates so that in places the rock is coarse grained and elsewhere it is very fine grained (Geology of Britain Viewer). On a petrological level the igneous rock, referred to locally as “Pen Granite”, is defined as augite granophyre (Clough 1988, 7). It is the very fine grained stone, around the margins of the intrusions, that is particularly suitable for stone axe manufacture.

The bedrock protrudes through a blanket of glacial till with some deposits of glacial sands and gravels. Alluvial deposits are restricted to the narrow base of the river valley until they open out to form an alluvial fan under the village of Llanfairfechan. Around the eastern and southern sides of Garreg Fawr are built-up deposits of “head”, clay, silt, sand and gravel that have accumulated by down slope movements such as solifluction and soil creep during or after the glacial period (Geology of Britain Viewer).

1.4 Previous Archaeological Work

Stone axes were made by knapping a piece of natural scree or quarried stone into shape before finishing it by polishing. The roughly knapped pre-form for an axe is known as a “roughout”. During the manufacturing process faults in the stone often caused roughouts to break and they were then discarded on the working site. These broken roughouts and the flakes knapped from them are the indicative signs of an axe-working site and they can be present in very large numbers on an undisturbed site.

It has been known since 1919 that Neolithic stone axes were produced near a rock outcrop known as Y Graig Lwyd above Penmaenmawr. The first axe roughouts were recognised by Samuel Hazzledine Warren and he subsequently undertook excavations in the early 1920s (Warren 1919; Warren 1922). Warren found several tons of axes and roughouts, many of the best specimens of which were distributed to museums across Britain (Warren 1919, 1922; Glen 1935, 189). Petrological analysis by the Implement Petrology Committee of the Council for British Archaeology showed that axes from this source, referred to as Group VII, were widely distributed across most of England and Wales, with at least one in Scotland (Clough 1988; Houlder 1988).

The stone source is always referred to in the archaeological literature as “Graig Lwyd” but the same rock, suitable for axe production, also outcrops above Llanfairfechan and it has long been realised that Graig Lwyd was not the only source of this rock in the area. Warren realised that axe roughouts could be found over a much wider area and the Royal Commission (RCAHMW 1956, xliii) and Houlder (1976, 58) recognised that the stone axe workings extended to Garreg Fawr and Dinas, but little professional archaeological work has been done to investigate the stone sources above Llanfairfechan. However, since the 1990s Mr David T Jones of Llanfairfechan has been collecting axe roughouts and exploring axe-working sites around Llanfairfechan. Mr Jones’ collection and knowledge of axe-working sites was recorded in 2017 (Kenney 2017). This led to the identification of an axe-working site in the screes at the foot of Dinas (PRN 67329, centred on SH6984573975) as being of considerable archaeological potential. A survey was carried out on this site in 2018 (Kenney 2019), and the test pitting described in this report aimed to identify how far axe-working activity continued beyond the exposed screes into the pasture field below the previously identified site.

2 METHODOLOGY

2.1 Aims and Objectives

The research objectives of the overall project are to contribute to the understanding of Neolithic axe working in this area, including the identification of sources of raw material and the social context for access to and exchange of materials within the Welsh landscape. Specific aims include identifying the extent of axe working areas, both the limits of known working areas and identifying the distribution of these areas across the landscape. Other potential aims are to identify contemporary occupation and axe-finishing sites, to locate potential quarrying sites, and to obtain dates from the axe-working sites to contribute to dating the duration of the activity.

The specific aim of the 2019-20 fieldwork was to investigate the extent of the axe-working area at the foot of Dinas and identify any *in situ* working floors or traces of other contemporary activity. The requirement was to detect activity under pasture land or natural vegetation and a test pitting programme was considered to be the best method of achieving that.

2.2 Fieldwork

An extensive test pit survey is at the heart of the fieldwork programme for this project. This first year of fieldwork focused on field testing the test pitting methodology and attempted to establish if any material relating to Neolithic axe-working could be found in the fields below Dinas. The fieldwork took place between 13th and 20th November 2019, including the weekend, and was undertaken by volunteers supervised by professional archaeologists.

The test pitting took place in one of the highest improved pasture fields on Ty'n y Llwyfan Farm, Llanfairfechan (centred on SH 698 739). This is located at the foot of Dinas and adjacent to an area of stone axe-working identified in and around open screes (PRN 67329). The screes appear to continue into the south-eastern edge of this field but are concealed under turf; from the surface appearance it appears that most of the field is not underlain by scree. The field is covered by short, sheep-grazed pasture, improved by ploughing, but there is also evidence of more ancient ploughing, probably in the Iron Age and medieval periods, resulting in the formation of lynchets.

The test pits all measured 1m square and were situated with the sides facing the points of the compass for consistency and easy recording with volunteers. The turf from the each pit was removed by hand and stacked nearby for reinstatement after the excavation was complete. The spoil from within the pit was removed stratigraphically by layer, sieved onto a tarpaulin and any artefacts found retained. The layers within the pit were then recorded, using a booklet produced specifically for this project, on simplified context sheets. The numbering system on this project for both contexts and finds uses the pit number as a prefix e.g. (901) is the first context within pit 9. A section drawing of each pit was created along with a post-ex plan. Each of the pits and small finds was surveyed using a Trimble Global Positioning System (GPS).

The test pits were located to investigate various parts of the field and the effect of various topographic features on the location of axe-working debris. Locations were investigated both close to and at a considerable distance from the screes that were used as a source of stone for the axes.

2.3 Outreach

Thirty seven volunteers were involved in the fieldwork, some for a day or two and some for the duration. Of these volunteers 9 were from Llanfairfechan and 10 from Penmaenmawr/ Dwygyfylchi, with 6 more from elsewhere in Conwy and 10 from elsewhere in Gwynedd. Two volunteers were from further afield, with links to the area. Two volunteers also washed and weighed the finds.

Figure 2: Test pit location map with Small Finds

As well as the field work there was also a public walk on Sunday 17th November to see the test pitting and to look at the landscape of axe working and visit later archaeological features. With permission of Gareth Wyn Jones the route went through Ty'n y Llwyfan land up to the summit of Dinas to look at the hill fort. Various other sites were visited on the way and the walk descended by the permissive route to Dinas so that participants could see the public route to Dinas.

The walk was led by Jane Kenney and John G Roberts (Snowdonia National Park Authority Archaeologist) and attended by 21 people, who were very appreciative and said that they had learnt a lot about the area, despite the weather being far from ideal.

3 RESULTS

3.1 Introduction

In total 16 test pits were investigated during the 8 days of fieldwork (Figure 2). The pits were situated throughout the field but with a focus on 'flatter' areas within the landscape. Three terraces ran across the field investigated. These were almost certainly enhanced by the action of ploughing, even if they may partly result from the underlying natural topography. These terraces can therefore be described as lynchets and they form part of a system that surrounds Dinas. This field system is probably of Iron Age date in origin, though most likely also used in the medieval period.

The majority of the test pits were placed on the three 'terraces', 8 on the upper terrace, 4 on the middle terrace and 2 at the bottom of the field. Pit 10 was placed on the slope between the upper and middle terraces and Pit 15 next to a possible cairn near the entrance to the field. See Appendix I for a detailed list of contexts recorded in the test pits, see Appendix III for coordinates of the test pits.

3.2 Upper Terrace

The upper terrace encompasses an area of approximately 5000 square metres and is steeply sloping from the south east to the north-west (Plate 02). Test pits 1-8 were situated in this area with Pit 8 the highest at 227m AOD and Pit 01 the lowest at 214m AOD.

Plate 02 – View of the top terrace looking towards Dinas (archive reference: G2495_2019_2001)

The pits on this terrace ranged between 0.21m and 0.42m in depth and generally contained 3 contexts; a mid brown silty topsoil and a mid orangish brown subsoil/ploughsoil overlying a yellowish grey boulder clay. The only exception to this was Pit 07, the shallowest of the pits, which only contained a topsoil layer above the natural. This is more than likely due to the pits proximity to an area of bedrock protruding through the turf.

Pit 08 was the situated closest to the exposed scree on the flanks of Dinas and contained a large amount of stone, particularly at the base of the pit (Figures 03 and 04).

3.3 Middle Terrace & Pit 10

Four pits were excavated on the middle terrace (09, 11, 12 and 16) and Pit 10 was situated on the slope between the upper terrace and the middle terrace (Plate 03).

Plate 03 – View of Pits 11 and 12 from Pit 10 (archive reference: G2495_2019_2072)

The pits on this terrace were deeper than on the upper terrace ranging from 0.33m to 0.50m in depth. The topsoil in this area consisted of a mid to dark brown silty clay which overlaid a mid brown ploughsoil layer. On the middle terrace a mid orange brown gritty sandy clay subsoil was encountered under the ploughsoil. Although flakes were recovered from this layer these were generally fewer in number than from the ploughsoil. The natural on the middle terrace consisted of a yellowish grey sandy clay, which was similar to that encountered on the upper terrace but of a looser consistency.

A partial roughout was recovered from the ploughsoil layer in Pit 11 (SF1101, Plate 04). Another partial axe was found within a charcoal rich deposit (1603) located in the north eastern quadrant of Pit 16 (SF1601, Plate 05, Figure 05). There was also a quantity of slag found within this deposit. The purpose and extent of this feature is unclear and further investigation is needed in this area.

Figure 03: South facing section of Pit 08; Scale 1:10@A4.

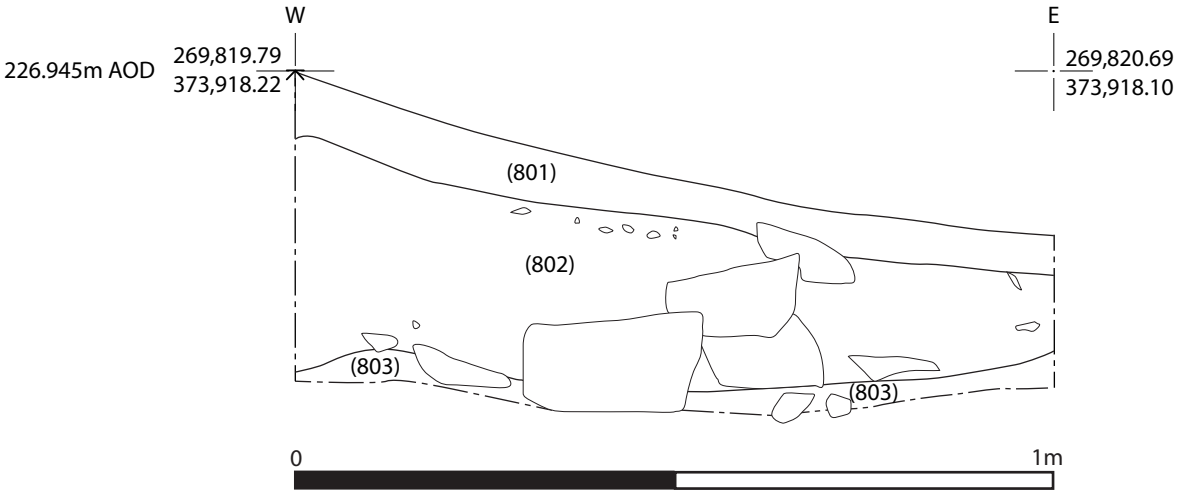

Figure 04: Post-ex plan of Pit 08; Scale 1:20@A4.

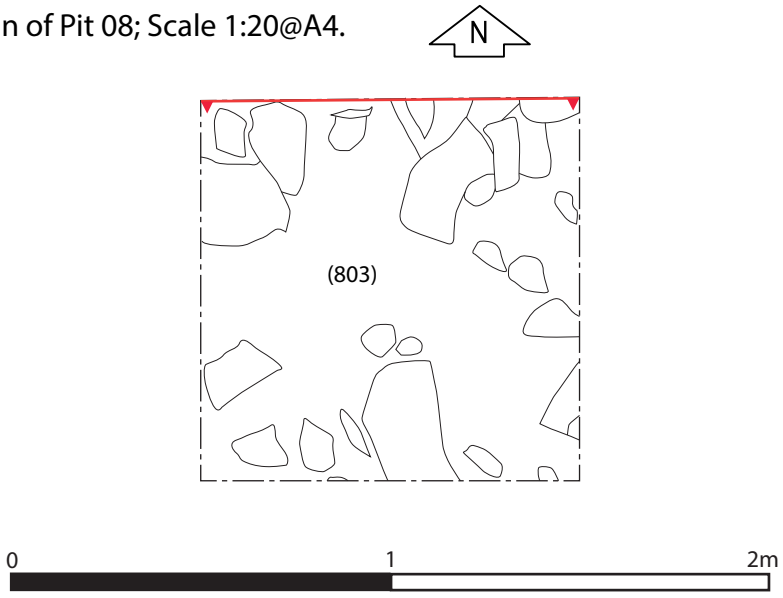

Figure 05: Post-ex plan of Pit 16; Scale 1:20@A4.

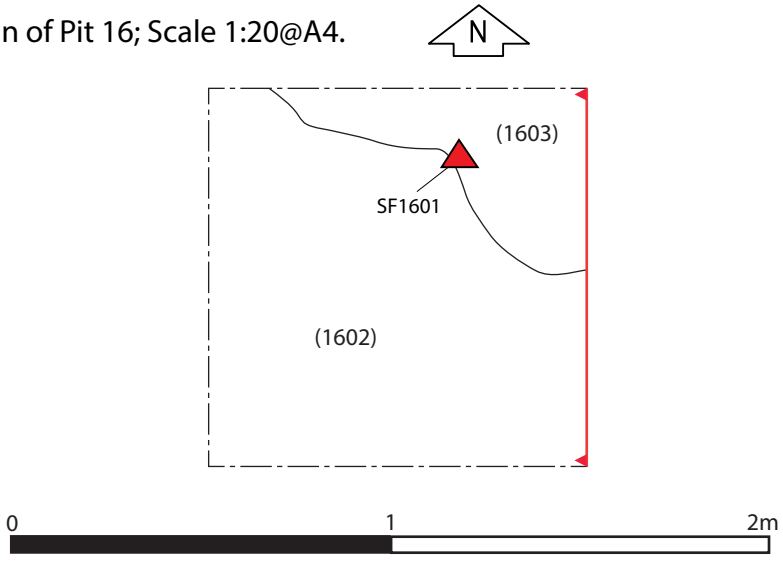

Plate 04 – Partial roughout SF1101 in Pit 11; scale 20cm (archive reference: G2495_2019_2085)

Plate 05 – Partial axe SF1601 found within deposit (1603) in Pit 16 (archive reference: G2495_2019_2101)

Pit 10, located on the slope between the upper and middle terraces, was very shallow, 0.20m in depth. It contained a single layer of mid brown silty clay above the yellowish grey sandy clay natural.

3.4 Bottom Terrace

The bottom terrace was very small and mostly covered in bracken (Plate 06). There were two pits located on this terrace, 13 and 14. Pit 13 was 0.43m and Pit 14 0.50m in depth. They both contained two layers overlying the yellowish grey sandy clay natural, a mid brown silty clay humic topsoil and a mid orangish brown silty clay subsoil.

Plate 06 – View of Pit 13 from middle terrace (archive reference: G2495_2019_2076)

3.5 Pit 15

Pit 15 was located adjacent to a possible cairn situated in the north of the field and on the slope between the upper and middle terraces. It was initially thought that this pit would be relatively shallow and mirror the deposits encountered in pit 10, the other pit located on the slope between terraces. Upon excavation the pit reached a total depth of 0.52m and contained three layers above the yellow sandy clay natural (Plate 07). The first of these was a dark brown silty topsoil which overlaid a dark brown orange silty clay ploughsoil containing a large amount of angular stone inclusions and stone flakes. The third layer in this pit consisted of a yellowish brown sandy clay subsoil/hillwash containing larger stone inclusions. Both the ploughsoil (1502) and the subsoil/hillwash (1503) contained large quantities of stone flakes, possible hammerstones and burnt stones, although there was no evidence within the pit of *in situ* burning.

Plate 07 – South facing section of Pit 15; scale 1m (archive reference: G2495_2019_2131)

3.6 Summary of finds

All test pits produced some flakes indicative of axe-working. Some produced significant quantities of flakes, especially TP15. Table 1 gives a rough indication of the quantity of material from each pit, as it shows the total weight of flakes and roughouts. A more precise record of the finds is given below in section 4. Colour coding of the test pits shown in Figure 02 indicates the distribution of flakes across the field.

As well as flakes and roughouts occasional other material was found such as chert flakes and rounded stones, suitable for use as hammerstones but lacking evidence of having been used.

See Appendix II for a full list of finds.

Table 1 Weight of flakes and roughouts by Test Pit

Test pit	Total weight of flakes and roughouts (g)
01	747
02	1173
03	1340
04	307
05	886
06	1761
07	19
08	2152
09	589
10	1053
11	2996
12	289
13	3025
14	739
15	25244
16	2348

4 LITHIC FINDS ASSESSMENT REPORT

George Smith

4.1 Introduction

The project aimed to identify whether stone axe working had taken place within an area below the slopes of the hill of Dinas, from where previous surface finds of stone axe working material had been found. The area was a pasture field immediately below the scree-covered slopes of the hill. Sixteen 1 metre square test pits were excavated over the area, concentrating on areas of the field that were least steep, and possibly therefore more attractive for working areas. These areas to some extent corresponded with terraces that probably derived from Medieval ploughing. The topsoil was therefore mixed by ploughing, but many of the finds came from below the plough soil and some from some depth, close to the interface with the underlying subsoil, which was glacial clay.

4.2 Assessment methods

Finds were recorded by layer in an Access database but have been combined here in Table 2 to provide a summary by test pit. Objects were categorised by broad type and material.

Table 2 Summary of quantity of finds by Test Pit

Test pit	*GL: Axe rough out*	*GL: Primary frag*	*GL: Flake/ Frag*	*GL: Angular frag*	*Chert/ Other: Flake/ Frag*	*Utilised pebble hammer stone?*	*Split pebble Frag*	*Other rock angular frag*	*Other Object*
1			10	2		1	2	8	
2			12	6	2			16	
3		2	25						
4			7						
5		2	24		7				
6			46		11				
7			3						
8		4	147				3		A few GL flakes have possible retouch. One GL flake has ?bituminous adhesions
9			33		17		2		
10		1	12			1	1		
11	1	3	84			2			1 Chert core reject
12			3		1		1		
13	1	7	34						
14	1		4						
15	1	52	241	1	4	5	122	2	12 ?burnt stone 1 anvil/blank 3 GL retouched piece
16	1	12	11	32					1 charcoal 8 fe slag 1 part perf pebble
Total	**5**	**83**	**694**	**41**	**42**	**8**	**131**	**26**	

The broad categories provide a general idea of the type and intensity of activity present but not the way in which the material was being worked. For instance, what types of product were being made? What stages of axe manufacture were present? Were other activities present than just axe manufacture?

4.3 Raw material

Rock types were only identified at a basic level for the assessment. As expected the great majority of the objects were of Graig Lwyd type rock. However, there were a few objects of other materials, notably black chert and coarse igneous, both of which derived from the glacial till. Unworked cobbles and pebbles of various materials were found during the excavation. Objects of Graig Lwyd material were surprisingly poorly preserved over all, with most objects deeply weathered. This makes finer identification of manufacture difficult. Only a few objects have well preserved faces and why that should be is problematic. Although

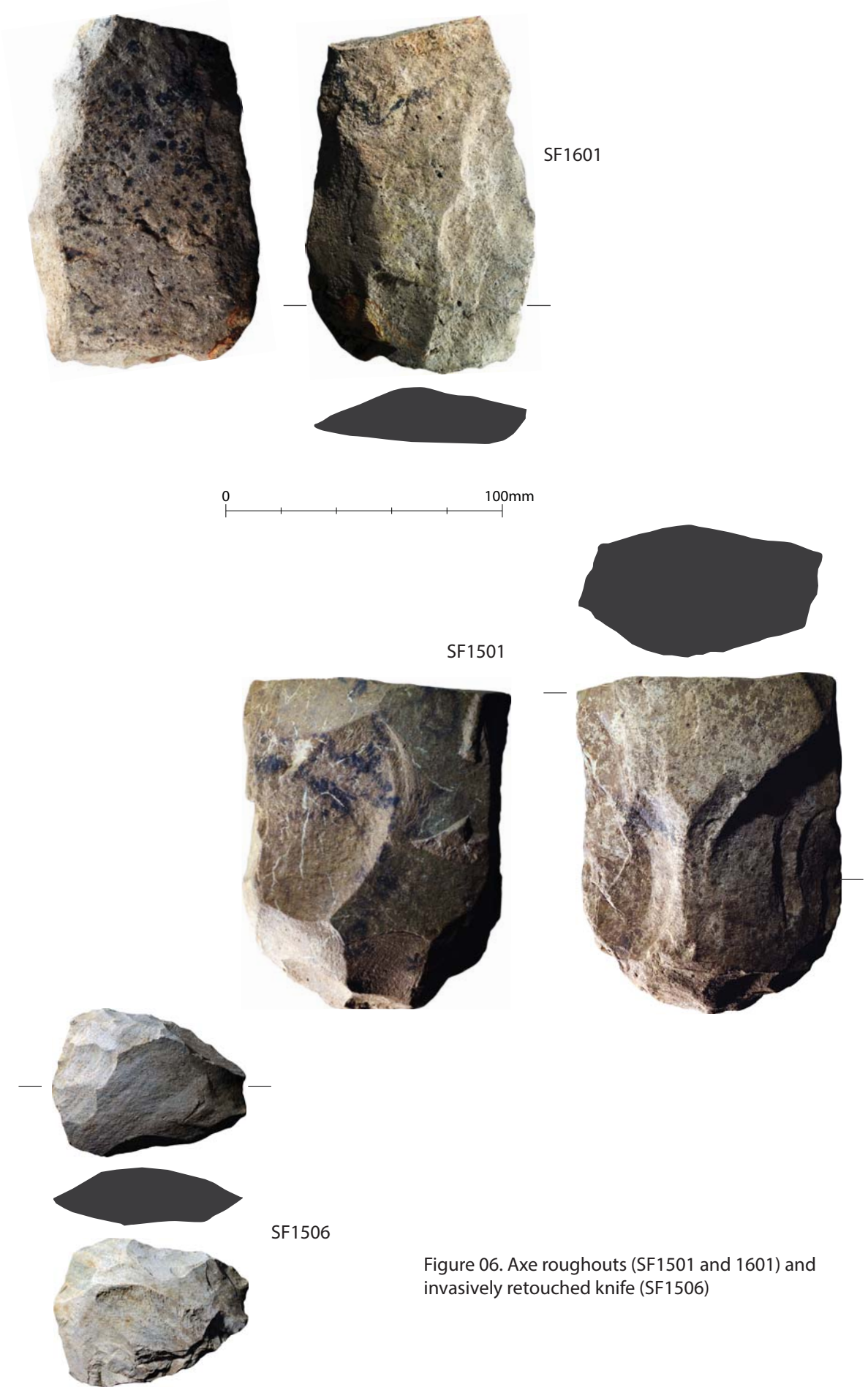

Figure 06. Axe roughouts (SF1501 and 1601) and invasively retouched knife (SF1506)

some of the objects derived from a cultivated horizon there is little evidence of post-manufacture damage.

4.4 Results

Amongst the Graig Lwyd type material the most numerous pieces are in the category of flake/flake fragment/irregular fragment. These vary in size considerably and further study should show the stages of manufacture present. Some are curving flakes and some quite small suggesting that axes were being prepared to a final roughout stage.

Where bulbs of percussion are present, they suggest heavy hammer percussion on the larger flakes, perhaps with soft hammer on smaller thinning and shaping flakes.

The primary fragments are larger pieces, generally angular, broken rather than flaked. These were probably the residue of breaking larger pieces to try to produce a piece that might a suitable shape for flake reduction.

There were a number of smaller angular fragments with no flaking evidence and it is not clear whether these are all natural ice shatter or some at least might be the residue of uncontrolled primary manufacture.

One well preserved piece of Graig Lwyd from Pit 15 is a secondarily edge retouched knife (Figure 06) and a few other flakes show some possible secondary edge retouch although that is problematic because of the possibility of trample damage and because of the poor surface preservation of the objects.

The presence and working of a small amount of black chert is interesting because it suggests that some other activities than purely axe manufacture were taking place, but insufficient to suggest domestic activity.

Despite the evidence of hard hammer stone working no definite hammer stones were found. Numerous cobbles of suitable size and material were found and a large sample were kept and cleaned but no definite evidence of percussion has been identified and repeated percussion is unlikely to have been masked by weathering.

There are quite a few split pebbles of non-Graig Lwyd rock which seem to have been caused by human activity but not from use as hammer stones. Some from pit 15 were burnt and so probably shattered by heat.

4.5 Further analysis

Study of the roughouts and more detailed study and recording of the types and dimensions of flakes will show how the working was being carried out and with what aims. The large amount of lithic material from pit 15 provides the possibility of defining what specific methods of reduction and shaping were going on in that small area and suggests that more extensive work there would be very productive and valuable. Further analysis would then be best left until a larger assemblage is available and that could include, for instance, recording the distribution of artefacts and the possibility of identifying knapping clusters and a better appreciation of the manufacturing sequence.

Any analysis of the manufacturing process would need comparison with, and therefore further analysis of, some material from the main Graig Lwyd site, where there is a lack of metrical analysis data.

Thin section analysis of objects from Dinas need to be compared to those from the main Graig Lwyd quarry to see if there is any chance of characterisation.

If it is possible, radiocarbon dating of the flake from pit 8 will be very useful although further excavation should provide charcoal for dating as some stones from Pit 15 appear to have been burnt.

4.6 Discussion of lithic assemblage

The pits were scattered over a very wide area but every one produced at least a few worked flakes of local Graig Lwyd type rock. Unless there was some later redistribution process this suggests that stone working activities took place very widely around Dinas, perhaps over a long period. However, the pits that produced the most material, pits 8 and 15, were situated on natural platforms that looked to be favourable for working areas and in places that would not have been much modified by medieval ploughing. David Jones reports that there are similar platform areas within the hillside scree, above, which are probably working areas (see survey in Kenney 2019). The whole of the area of Dinas and in particular the scree area therefore needs to be surveyed and recorded for the distribution of worked material and the location of possible working platforms.

The axe roughouts that have been found (Figure 06) are all fairly early stage rejects or practice pieces, rather than late stage broken rejects. One at least is a secondarily worked large flake of a size that could never have ended up as an axe. This could have been just a practice piece but more likely was aimed at making a chopping tool rather than an axe.

Generally, the primary fragments present suggest that pieces of scree were being used as raw material. One such large (unworked) block was found near the base of pit 15. These were easily available but would be of surface-weathered and not very good material. That corresponds with the relatively small size of even the largest flakes here. This appears to contrast with the frequent much larger flakes from excavated areas of the main Graig Lwyd quarry, where the raw material was massive flakes quarried from *in situ* outcrops (Williams and Davidson 1998 and 2002). The sourcing of better quality raw material may be related to the time period in which the activities were taking place or to territorial control of the best quarry area. One Graig Lwyd flake from pit 8 has a considerable area of possible bituminous adhesion, which if that is true, might be a candidate for radiocarbon dating. One piece of charcoal from pit 16 was associated with probable iron slag and probably relates to medieval or later field clearance.

5 GENERAL DISCUSSION

All the test pits produced Graig Lwyd type flakes, with TP07 and TP12 producing the fewest (Figure 02). This indicates axe-working over a wide area. The general area of axe-working has been allocated PRN 81634 and it is centred on SH 697 739. The screes from Dinas continue under the turf down the south-eastern edge of the field but the rest of the field is away from the scree. The flakes and roughouts found during the fieldwork confirm that the scree was the source of stone for axe-working in this area, but axe-working was not taking place just on the screes. The test pits with the largest numbers of flakes were TP08, TP11 and TP15. While TP08 was on the edge of the scree, TP11 was on a level platform ploughed as a narrow field probably in the medieval and previous periods. TP15 was located on a slope that was at least partially a lynchet scarp. TP11 and TP15 were a considerable distance from the nearest scree.

Most of the flakes recovered came from ploughsoil and it is likely that they had moved some distance downslope. However, in test pits TP09, 11, 12 and 15 flakes were found in natural subsoil, which may represent the base of a relict soil horizon. It is likely that these had not moved far from where they were originally deposited. In the case of test pits TP09 and TP11 their location on a level platform would suggest that even flakes in the ploughsoil had been mixed vertically in the soil without moving far from their origin. The quantity of flakes as well as a roughout in TP15 would suggest that this is at or close to an axe-working floor. Its position on a fairly steep slope means that this area may have been less disturbed by ploughing than elsewhere.

Of particular interest is TP16 where a roughout was found in a thin, charcoal-rich deposit. Some iron slag was also found in this deposit, so there is some doubt about this being an

undisturbed prehistoric layer, but it is suggestive of activity in this area that would be worth further investigation.

Also of importance is the recovery of chert flakes. These were generally few in number, with test pits TP05, 06 and 09 having the most (TP09 had 17 flakes). There was also a chert core reject in TP11. As test pits TP05 and 06 were towards the top of the field and TP09 and 11 towards the bottom this does indicate that chert flakes were also widely spread. While the numbers found do not indicate domestic activity in any of the locations tested, it does raise the question of where these flakes originated from and suggests that domestic activity, possibly of a very short-term nature, took place somewhere in the vicinity.

6 FURTHER RESEARCH

This season of test pitting has demonstrated the effectiveness of this technique at locating axe-working activity under ploughed pasture. The results have revealed how extensive this activity was beyond the limits of the screes. No *in situ* knapping floors were identified, which may be due to these having been disturbed by ploughing, but TP15 must have either been close to a knapping floor or represent a disturbed working area. Further test pitting in this field may identify foci of activity, which even if disturbed, might be interpreted as the locations of knapping floors. Further investigation is needed close to TP15 to define the extent of the concentration of knapping debris, and near TP16 to investigate the charcoal-rich deposit.

The absence of obvious hammerstones is intriguing. Further test pitting would investigate whether this was just chance or whether there is a genuine scarcity of hammerstones associated with knapping debris in this area. This could possibly indicate that hammerstones were curated and transported between knapping sites, being rarely deposited.

A topographic survey of the field is important to locate the test pits in relation to the lynchets and other features.

This field was chosen for initial investigation because it was immediately adjacent to a known area of axe-working. The question remains of how much further axe-working activity spread across this area. Further extensive test pitting downhill to the south-west and along the slope to the north-west and north from the current field could provide an indication of this.

The presence of chert flakes supports the probability that there was some Neolithic occupation in this area. Locating this through test pitting could require a large number of test pits, most of which might be negative. However, investigation of level areas that appear attractive for settlement would be worthwhile to attempt this.

Subsequent years of the Landscape of Neolithic Axes Project will address these questions. In 2020-21 further test pitting will take place in this area to investigate the activity identified in the 2019 work and also to expand the area investigated to determine the extent of the activity. There will be a small excavation to determine the character and preservation of deposits in the undisturbed area of scree within site PRN 67329. This work will be combined with test pitting near Graig Lwyd Farm, Penmaenmawr, which will provide a comparative site where axe-working is suspected of taking place just off the natural screes at a low level in a similar way to the activity at Ty'n y Llwyfan. The work will again be carried out by volunteers under professional supervision and will be combined with public events and a schools programme delivered by the Carneddau Partnership to increase awareness and understanding of this important archaeological landscape.

7 ACKNOWLEDGEMENTS

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8 COPYRIGHT

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10 Appendix I: List of Contexts

Context No.	Type	Depth of deposit	Description	Colour & Composition
101	Layer	0.05m	Turf and topsoil	Mid orangeish brown sandy silt
102	Layer	0.3m max	Ploughsoil	Pale brown silty sand
103	Layer		Natural	Pale yellow sandy clay
201	Layer	0.1m	Turf and topsoil	Mid brown silty clay
202	Layer	0.2m	Ploughsoil	Mid brown silty clay with gravel inclusions
203	Layer	0.3m	Ploughsoil	Mid brown silty clay with gravel inclusions and larger slabs
204	Layer		Natural	Yellowish sandy clay
205	Deposit		Bioturbation/animal burrow	Mid orangeish brown sandy silt
301	Layer	0.15m	Turf and topsoil	Mid brown sandy clay
302	Layer	0.19m	Ploughsoil	Mid orangeish brown sandy silt with more gravel inclusions
303	Layer		Natural	Brownish Yellow Sandy clay
401	Layer	0.2m max	Turf and topsoil	Dark Brown silt
402	Layer	0.25m max	Ploughsoil	Yellowish brown silty clay
403	Layer		Natural	Grey/white and yellow/orange clay
501	Layer	0.36m	Turf and topsoil	Mid orangeish brown sandy silt
502	Layer	0.05m	Ploughsoil	Yellowish brown sandy silt
503	Layer		Natural	Ochre sandy clay
601	Layer	0.16m max	Turf and topsoil	Dark brown humic silt
602	Layer	0.2m max	Subsoil	Dark orangeish brown silty clay
603	Layer		Natural	Greyish yellow sandy clay
701	Layer	0.21m	Turf and topsoil	Mid brownish brown silt
702	Layer		Natural	Yellow sandy clay
801	Layer	0.1m	Turf and topsoil	Mid brown sandy silt
802	Layer	0.3m max	Subsoil	Pale brown sandy clay
803	Layer		Natural	Pale brownish yellow sandy clay
901	Layer	0.1m	Turf and topsoil	Dark brown silt
902	Layer	0.2m	Ploughsoil	Mid orangish brown silty clay
903	Layer	0.23m	Subsoil	Orangish brown sandy clay
904	Layer		Natural	Light brownish yellow sandy clay
905	Layer		Natural	Greyish brown sandy clay
1001	Layer	0.07m	Turf and topsoil	Mid brown silt
1002	Layer	0.12m	Ploughsoil	Mid brown Silty clay
1003	Layer		Natural	Brownish Yellow Sandy clay
1101	Layer	0.1m	Turf and topsoil	Dark brown silty clay
1102	Layer	0.11m	Ploughsoil	Mid orangish brown silty clay

Context No.	Type	Depth of deposit	Description	Colour & Composition
1103	Layer	0.12m	Subsoil	Dark brownish orange sandy clay
1104	Layer		Natural	Yellowish orange sandy clay
1201	Layer	0.08m	Turf and topsoil	Mid brown clayey silt
1202	Layer	0.14m	Ploughsoil	Mid brown silt
1203	Layer	0.24m	Subsoil	Orangey brown sandy silt
1204	Deposit		Bioturbation	Light orangish brown medium sand
1205	Layer		Natural	Pale yellowish orange sandy clay
1301	Layer	0.07m	Turf and topsoil	mid brown silt
1302	Layer	0.35m	Ploughsoil	mid brown silt
1303	Layer		Natural	Yellowish brown gritty silty clay
1401	Layer	0.25m max	Turf and topsoil	Dark brown humic rooty silt
1402	Layer	0.25m max	Subsoil	Dark reddish brown silty clay
1403	Layer		Natural	Yellow/Grey hard gritty boulder clay
1501	Layer	0.1m	Turf and topsoil	Dark brown silty
1502	Layer	0.3m max	Ploughsoil	Dark brown orange silty clay
1503	Layer	0.25m	Subsoil/Hillwash	Yellowish brown sandy clay
1504	Layer		Natural	Yellow sandy clay
1601	Layer	0.1m	Turf and topsoil	Dark brown humic silt
1602	Layer	0.3m	Ploughsoil	Mid brownish brown silt
1603	Deposit	0.1m	Charcoal rich silt	Black Silt and charcoal mix
1604	Layer		Natural	Pale Yellowish brown clay

11 Appendix II: List of Finds

Find No.	Context No.	Material	Description	Weight (g)	OS coordinates
101	101	Stone	Flakes	45	
102	102	Stone	Flakes	702	
103	102	Stone	Pos Hammerstones	820	
104	Unstratified TP01	Stone	Pos Hammerstones	1534	
201	201	Stone	Flakes	93	
202	202	Stone	Flakes	581	
203	203	Stone	Flakes	499	
301	301	Stone	Flakes	119	
302	302	Stone	Flakes	1022	
303	Unstratified TP03	Stone	Flakes	199	
401	401	Stone	Flakes	307	
501	501	Stone	Flakes	245	
502	502	Stone	Flakes	500	
503	Unstratified TP05	Stone	Flakes	141	
504	Unstratified TP05	Stone	Pos Hammerstones (discarded)	0	
601	602	Stone	Flakes	1761	
701	701	Stone	Flakes	19	
801	802	Stone	Flakes	2152	
901	901	Stone	Flakes	83	
902	902	Stone	Flakes	243	
903	903	Stone	Flakes	263	
904	903	Stone	Pos Hammerstones	705	
1001	1002	Stone	Pos hammerstones	1648	
1002	1002	Stone	Flakes	1053	
1101	1102	Stone	Partial Axe roughout	1669	269744.44, 373939.74, 202.82
1102	1102	Stone	Flakes	1214	
1103	1102	Stone	Pos Hammerstones	662	
1104	1103	Stone	Flakes	113	
1105	1103	Stone	Pos Hammerstone	1299	
1106	1102	Stone	Odd shaped stone with hole (discarded)	0	
1201	1202	Stone	Flakes	85	
1202	1203	Stone	Flakes	204	
1301	1302	Stone	Pos broken end of roughout	377	
1302	1302	Stone	Pos Hammerstones	1828	
1303	1302	Stone	Flakes	994	
1304	1302	Stone	Flakes	1654	
1401	1402	Stone	Flakes	739	

Find No.	Context No.	Material	Description	Weight (g)	OS coordinates
1501	1502	Stone	Partial Axe roughout	1043	269763.97, 373965.72, 209.24
1502	1501	Stone	Flakes	1643	
1503	1502	Stone	Flakes	11059	
1503	1502	Stone	Flakes	6119	
1504	1503	Stone	Flakes	3479	
1505	1503	Stone	Large flat stone	10700	
1506	1503	Stone	Retouched flake	107	
1507	1502	Stone	Possible broken roughout	1794	
1508	1502	Stone	Large stone with cut marks	3696	
1509	1502	Stone	Poss burnt stones	2809	
1510	1502	Stone	Poss hammerstones	1793	
1511	1502	Stone	Poss worked stones	1694	
1512	1502	Stone	Quartz	143	
1513	1502	Stone	Poss worked stones	868	
1514	1502	Stone	Large stone	2166	
1515	1502	Stone	Poss hammerstone	490	
1516	1502	Stone	Poss burnt stones, including a flake of Graig Lwyd	1135	
1517	1503	Stone	Poss hammerstones	1369	
1518	1503	Stone	Poss burnt stones	568	
1601	1603	Stone	Partial Axe roughout	438	269758.19, 373886.57, 203.73
1602	1601	Stone	Flakes	79	
1603	1602	Stone	Flakes	1831	
1604	1602	Stone	Pos Hammerstones	1829	
1605	1603	slag	Magnetic slag	421	
1606	1602	slag	fragments of charcoal and slag	10	
1607	1601	Stone	Possible stone bead?	14	

12 Appendix III: Location of test pits

Grid references for test pits rounded to the nearest metre.

Test Pit	Easting	Northing	Height OD (m)
TP01	269792	373976	214
TP02	269808	373969	217
TP03	269806	373946	220
TP04	269789	373925	217
TP05	269780	373965	214
TP06	269806	373907	222
TP07	269792	373960	216
TP08	269820	373918	227
TP09	269747	373962	205
TP10	269761	373936	209
TP11	269744	373940	203
TP12	269745	373918	203
TP13	269717	373931	195
TP14	269729	373959	199
TP15	269764	373965	210
TP16	269758	373886	204

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