1766

Landscape of Neolithic Axes

Report on fieldwork in 2023 at Llanfairfechan and Penmaenmawr

Cadw

Ymddiriedolaeth Archaeolegol Gwynedd
Gwynedd Archaeological Trust

Landscape of Neolithic Axes

Report on fieldwork in 2023 at Llanfairfechan and Penmaenmawr

Project No. G2495

Report No. 1766

Event PRN 46737

Prepared for: Cadw

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Cover photograph: Rainbow over Llanfairfechan with the Ffridd Tan y Graig screes

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Landscape of Neolithic Axes: fieldwork in 2023 at Llanfairfechan and Penmaenmawr (G2495)

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CRYNODEB

Cynorthwyodd Cadw Ymddiriedolaeth Archaeolegol Gwynedd i redeg elfen gwaith maes gwirfoddol Prosiect Tirwedd Echeliniau Neolithig ar gyfer 2023-24, o dan Gynllun Partneriaeth Tirwedd y Carneddau. Canolbwyntiodd y gwaith ar ddau safle nad oedd yn cael ei ymchwilio o'r blaen yn yr ucheldiroedd, Garreg Fawr (PRN 103600) a Chors y Carneddau (PRN 103604), yn ogystal ag ymestyn ymchwiliad yr ardal gwaith bwyeill wrth droed Dinas (Ty'n y Llwyfan, PRN 81634).

Cynhaliwyd gosod profion i ymchwilio i'r safleoedd ucheldirol gyda 14 o byllau prawf wedi'u cloddio yn Garreg Fawr ac 16 o byllau prawf yng Nghors y Carneddau. Datgelodd hyn fod safle Garreg Fawr, wrth droed y clogwyni sy'n ffurfio copa'r bryn, yn ardal weddol fach a diffiniedig o weithgarwch bwyeill. Yng Nghors y Carneddau roedd y maes gwaith yn helaeth, ac ni chyrhaeddwyd y terfynau yn y pyllau prawf. Dangosodd hyn fod carreg o ochr ddeheuol yr ymyrraeth folcanig yn cael ei ddefnyddio ar gyfer gwneud bwyeill ac mae'n debyg bod y gweithgaredd hwn yn parhau ymhellach i'r gorllewin ar hyd yr ochr ddeheuol hon.

Cafodd deunaw pwll prawf eu cloddio yn Fferm Ty'n y Llwyfan, a ddaeth o hyd i derfyn gogleddol y gweithgaredd gwneud bwyeill yn yr ardal hon. Cwblhawyd ffos werthuso a gloddiwyd yn y screes wrth droed Dinas, a ddechreuwyd yn 2021, gan ddatgelu dyfnder cymharol fas y sgri a natur y dyddodion gwaelodol. Roedd adfer darganfyddiadau o'r ffos hon, a oedd wedi'u plotio'n fanwl, yn dangos bod y screes wedi cael eu tarfu gan y gwaith cynhyrchu bwyeill fel bod lloriau cnapio ond yn debygol o oroesi o'r penodau cnapio diweddaraf.

SUMMARY

Cadw grant aided Gwynedd Archaeological Trust to run the volunteer fieldwork element of the Landscape of Neolithic Axes Project for 2023-24, under the Carneddau Landscape Partnership Scheme. The work focused on two previously uninvestigated sites in the uplands, Garreg Fawr (PRN 103600) and Cors y Carneddau (PRN 103604), as well as extending the investigation of the axe-working area at the foot of Dinas (Ty'n y Llwyfan, PRN 81634). The fieldwork took place between 10th and 21st July *and between* 25th September and 6th October 2023*, and was undertaken by volunteers under the supervision of Gwynedd Archaeological Trust and Snowdonia National Park Authority staff.*

T*est pitting was carried out to investigate the upland sites with 14 test pits dug at Garreg Fawr and 16 test pits at Cors y Carneddau. This revealed that the Garreg Fawr site, at the foot of the crags that form the summit of the hill, was a fairly small and well-defined area of axe-working activity. At Cors y Carneddau the area of working was extensive, and the limits were not reached in the test pitting. This showed that stone from the southern side of the volcanic intrusion was used for making axes and that this activity probably continued further west along this southern side.*

Eighteen test pits were dug at Ty'n y Llwyfan Farm, which found the northern limit of the axe-making activity in this area. An evaluation trench dug in the screes at the foot of Dinas, started in 2021, was completed, revealing the relatively shallow depth of the scree and the nature of the underlying deposits. The recovery of finds from this trench, which were plotted in detail, indicated that the screes had been disturbed by the axe-production work so that knapping floors were only likely to survive from the latest knapping episodes.

1. INTRODUCTION

1.1. Neolithic stone axeheads

The axe, with a polished stone axehead, was a tool of considerable significance, both practically and socially, in the Neolithic period. Not only did axes enable forest clearance and the construction of large timber buildings, but they were probably also symbols of status. Axeheads were selected as appropriate objects to be offered within ceremonial monuments indicating their cultural and possibly religious significance. Flint was often used for polished axeheads in south-eastern England but elsewhere axeheads were made from fine igneous rocks that could be knapped like flint. 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. Some sources were preferred and material from these was dispersed widely. The preference for certain sources implies that there were qualities in the stone, or possibly in the location of the source, that made axeheads from these materials particularly desirable. The source that produced the most axeheads, which were most widely distributed, was in the central Lake District, focussed around Great Langdale (Group VI) (Claris and Quartermaine 1989). Axes from this source have been found across Britain and considerable work has been done to study the area and identify quarry and axe-working sites. The second most widely distributed axes come from the Group VII stone source. Group VII axes are found over most of England and Wales, with occasional ones elsewhere (Clough 1988, Houlder 1988). This source can therefore be considered of second in importance in Britain to the Great Langdale source.

Group VII axes were demonstrated to come from a stone source near Penmaenmawr, Conwy, known as Graig Lwyd (Warren 1919, 1921, 1922). There has been some recognition that axe-working debris could be found over a much wider area, not just around the hill of Graig Lwyd. Axe debris was recorded as being found around the hills of Garreg Fawr and Dinas above Llanfairfechan (RCAHMW 1956, xliii, Houlder 1976, 58), but little professional archaeological work has been done to investigate the wider landscape and to study the stone sources beyond Graig Lwyd. However, since the 1990s Mr David T. Jones of Llanfairfechan has been collecting axe roughouts and exploring axe-working sites around Llanfairfechan. David Jones' work indicated that there was an extensive landscape around Penmaenmawr and Llanfairfechan across which evidence for Neolithic axe-working could be found. This is a landscape of national importance for British Neolithic studies, which has long deserved detailed study.

1.2. The project

The current project aims to investigate this nationally important Neolithic landscape, which has previously received remarkably little archaeological study. 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 (CLPS), a large-scale Heritage Lottery Fund funded project involving a group of 23 agencies and organisations under the leadership of the Eryri National Park Authority (ENPA). The CLPS 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, known as the Landscape of Neolithic Axes Project, has been developed with the CLPS, and has been delivered in partnership with the CLPS and ENPA. 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.

A major challenge to identifying axe-working locations in this landscape is to recognise sites and deposits obscured under turf and vegetation either in the pasture fields or on the moorlands. To solve this problem the project is concentrating on test pitting to allow deposits to be sampled and artefacts to be recovered. However, small excavations and other work is being used to identify and characterise sites associated with the axe working.

Plate 1. Example of a roughout found on Cors y Carneddau

Plate 2. View over Llanfairfechan to Traeth Lafan and Anglesey beyond

Plate 3. View of Dinas and Garreg Fawr from Cors y Carneddau

1.3. Previous Archaeological Work

Stone axes were made by knapping a piece of natural scree or quarried stone into shape before finishing it by grinding and polishing. The roughly knapped pre-form for an axe is known as a "roughout" (Plate 1). 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, 1921, 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).

The main axe working areas over Graig Lwyd were investigated in the 1990s by Gwynedd Archaeological Trust (GAT) and Bangor University Department of Continuing Education. This included detailed surveys of the surviving working areas and some small excavations. The surveys revealed the extent of the preserved working hollows in the northern screes, but the excavations and test pitting also demonstrated that the summit of the hill had been exploited for axe making, including quarrying of bedrock, rather than just the use of natural screes (Flook and Williams 1992, Davidson and Williams 1998, Williams and Davidson 1998, Williams and Davidson 2002).

The 1990s work also included the excavation of two cairns to the west of the main outcrop, which proved to have axe-working debris beneath them (PRNs 67326 and 67327 (Williams and Davidson 1998, 17-18)). A project run by GAT to study the pollen evidence and prehistoric sites on Waun Llanfair, a marshy plateau above Llanfairfechan, found axe-working flakes under two other cairns (PRN 470 and 485), as well as a narrow axe or pick of Graig Lwyd rock under one of the cairns (Caseldine *et al* 2007, 5-8). These finds were associated with flint tools and other evidence of more general occupation, suggesting that a range of activities took place at these sites, and they could be the remains of significant settlement sites. Our understanding of the vegetation history of the uplands in this area is also based on detailed pollen work carried out as part of this project (Caseldine and Griffiths 2014).

In 1961 there was a rare opportunity to fieldwalk one of the ffriddoedd just east of Dinas, when it was ploughed. Mr J. Davies found axe-working flakes scattered over a wide area, with roughouts, hammerstones and a small number of flint flakes (Davies 1961). This represented one of the most likely Neolithic settlement sites identified in the area (PRN 4720).

Since the 1990s Mr David T. Jones of Llanfairfechan collected axe roughouts and explored axe-working sites around Llanfairfechan. Mr Jones' collection and knowledge of axe-working sites was recorded in 2017 (Kenney 2017). Mr Jones identified three main axe-working sites: one the screes below the western end of Penmaenmawr Mountain (PRN 67330), on Garreg Fawr (PRN 67328) and in the screes at the foot of Dinas (PRN 67329). Some of his finds were published with John Llywelyn Williams (Jones and Williams 2004, Williams and Jones 2003). 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 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.

In 2019 Gwynedd Archaeological Trust and the Snowdonia National Park Authority undertook test pitting in a field just west of site PRN 67329, at the foot of Dinas on Ty'n y Llwyfan Farm. Sixteen test pits were dug by volunteers. This demonstrated that the test pit methodology was efficient at locating evidence of axe-working in the pasture fields. It showed that axe debris was present well beyond the limits of the screes and working seemed to extend over a much wider area than previously assumed (Ryan Young, Smith and Kenney 2020).

Fieldwork was to continue in 2020 and despite the COVID-19 pandemic plans were made for work in October. However, a local lockdown imposed at the start of October made it inappropriate to have volunteers working on

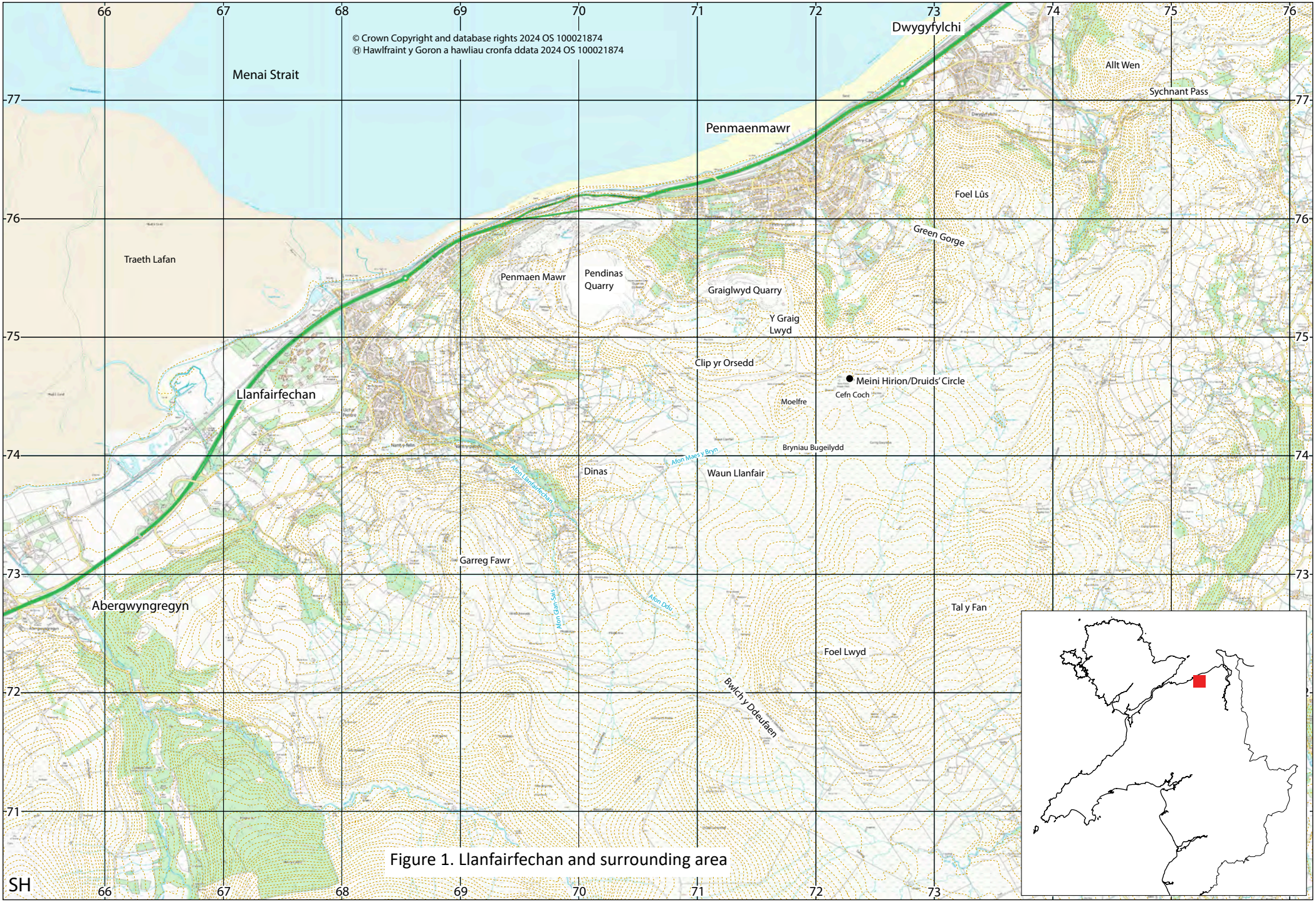


Figure 1. Llanfairfechan and surrounding area

Plate 4. View of Penmaenmawr Quarry from Clip yr Orsedd showing the large hole where Braich y Dinas hillfort once was

Plate 5. The less common and less impressive view of Graig Lwyd from the west

Plate 6. View over Waun Llanfair with Tal y Fan and Foel Lwyd in the distance

the project and the fieldwork was cancelled. The national lockdown over the winter and into March 2021 made it impossible to carry out fieldwork with volunteers later in the year.

Work recommenced in 2021, when a more extensive season of work was undertaken to investigate the Ty'n y Llwyfan site. This included test pitting to investigate the extent of the working and a small evaluation trench to establish the nature and preservation of working floors within the undisturbed natural screes. Test pitting was also carried out on the possible settlement site discovered in 1961 (PRN 4720). This site is referred to as Maes y Bryn and the test pitting provided evidence of axe making but also evidence to support the interpretation of this as a settlement site (Kenney and Smith 2022). Investigation of the Maes y Bryn site continued in 2022, so that a total of 30 test pits have been dug at this site. This confirmed the use of the site for domestic tasks with the discovery of more flint and scrapers made on the Group VII stone. The test pitting at the Ty'n y Llwyfan site was also extended in 2022 and small excavations carried out to further investigate features identified in earlier test pits (Kenney and Smith 2023).

The work in 2023, reported on in the current report, aimed extend the investigation of the wider landscape with test pitting at other sources, as well as further work at Ty'n y Llwyfan.

1.4. Geology and topography around Llanfairfechan

While axe-working sites can be found around both Penmaenmawr and Llanfairfechan the current work focuses on Llanfairfechan as the area least studied in relation to axe-making sites. Llanfairfechan lies on the north coast of Wales on the southern side of the Menai Strait with Anglesey to the north. At this point, the Strait widens as it opens into Conwy Bay and the extensive Traeth Lafan (Lafan Sands) covers much of the Strait at low tide (Figure 1, Plate 2). The village has developed on an alluvial fan where the Afon Llanfairfechan crosses the coastal plain to the sea after its short journey from the uplands to the south-east. The upper part of the valley is narrow and overlooked by two hills: Dinas and Garreg Fawr (Plate 3). Dinas is a distinctive hill with a flat summit at about 320m OD, on which was located an Iron Age hillfort (PRN 392). Its southern and western flanks are bare scree with the woodland of Nant y Coed covering its foot to the west. Garreg Fawr is a less dramatic but a bulkier presence with an outcrop of rock at the top reaching 364m OD. To the south are the outliers of the Carneddau range and to the east the long, isolated ridge of Foel Lwyd and Tal y Fan, the latter reaching 610m OD.

To the north-east Llanfairfechan is dominated by Penmaen Mawr, which used to be crowned by the Braich y Dinas hillfort (PRN 712) (Plate 4). However, the hillfort and much of the top of the mountain have been quarried away and its slopes remodelled by screes of quarry waste. A length of the original crags and natural scree below them still survives on the western side of the mountain. Running east from Penmaen Mawr is a ridge called Clip yr Orsedd at the eastern end of which is a rock outcrop known as Y Graig Lwyd (Plate 5). The outcrop was formerly much more extensive but has been largely quarried away by the Graiglwyd Quarry. This also had natural screes running down below it much of which have been buried under quarry waste, but some survive on its northern and eastern sides, largely overgrown with heath vegetation.

Where the streams of Afon Maes y Bryn, Afon Ddu and Afon Glan-Sais run down to meet and form the Afon Llanfairfechan, the mountains form a semi-circular bowl around an upland plateau, known as Waun Llanfair (Figure 1, Plate 6). This is now a wet, marshy, and rather desolate place but is covered with Bronze Age and Iron Age monuments indicative of more intensive use in the past (Caseldine *et al* 2007). The eastern side of Waun Llanfair is closed off by a shallow ridge running north from Tal y Fan. At the northern end of this ridge is a group of Bronze Age monuments including the Meini Hirion (Druids' Circle) stone circle, a ring cairn and other features with further cairns and a possible stone circle a little to the west and a standing stone and stone circle to the east.

This area was of interest to the Neolithic people, and therefore of interest to us today, because of its 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 grain and elsewhere it is very fine grained (BGS Geology Viewer (BETA)).

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 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 (BGS Geology Viewer (BETA)).

On a petrological level the igneous rock, referred to locally as "Pen Granite", is defined as augite granophyre (Clough 1988, 7), and generally it is sufficiently fine grained to be coarsely knapped, allowing it to be shaped into setts used to pave the streets of Liverpool and other cities. However, where it is very fine grained, around the margins of the intrusions, the rock has a conchoidal fracture and is particularly suitable for stone axe manufacture. The main area of this very fine rock is a zone 50m to 100m wide around the eastern and southern edges of the Graig Lwyd outcrop, (Williams and Davidson 1998, 3-5), and this is usually thought of as the stone axe source, but there is similar rock on Dinas, Garreg Fawr and round the western margin of Penmaen Mawr.

1.5. Palaeoenvironmental Evidence

Our understanding of the vegetation history of the uplands above Llanfairfechan has been enhanced by some detailed pollen work carried out as part of a project on Waun Llanfair. This work includes three pollen columns and samples taken from buried soils under excavated features (Caseldine and Griffiths 2014). This evidence suggests that in the later Mesolithic period Waun Llanfair was covered in hazel woodland with stands of pine on higher ground and alder in wetter areas. Some birch and probably oak was present, with oak woodland with a component of elm at lower levels.

Towards the start of the Neolithic the pine pollen declined, and alder increased. A fire event and drop in hazel pollen suggests an early Neolithic clearance event and there are also hints of pastoral use of the area. A decline in elm pollen occurred at the same time. In the middle Neolithic a decline in oak pollen suggests clearances in the oak woodlands. Although much of the area was wooded there are hints of open heath grassland nearby.

In the later Neolithic there was alder woodland in the wetter areas, oak woodland in the higher valleys and open hazel and birch woodland with some grass and heathland on the high, drier slopes. There was some small-scale clearance with the use of fire and some grazing activity. Barley type pollen was present in a buried soil with Graig Lwyd flakes and could indicate cereal cultivation, but this pollen type is also produced by some wild grasses. Some of the evidence from beneath two cairns that were excavated suggests a more open grass and heathland environment.

Woodland was still present in the area in the Bronze Age, so during the period of exploitation of the Graig Lwyd stone sources the area was largely wooded with some open areas on the higher slopes. The amount of alder pollen shows that parts of Waun Llanfair were wet during the Neolithic, as they are today, but the presence of trees would mean that more of the area would have been better drained than at present. The trees would also make it a more sheltered environment than at present.

It seems likely that the scree slopes from which the axe material was obtained were never heavily vegetated. The slopes of Dinas, where sheep have been kept off them, have stunted oaks growing on the scree but little undergrowth. The natural screes on the western side of Penmaenmawr Mountain are also wooded but again many areas have little undergrowth, although sometimes considerable amounts of moss. Most of the scree slopes may have been similarly bare in the Neolithic period, making them accessible and suitable stones easy to locate.

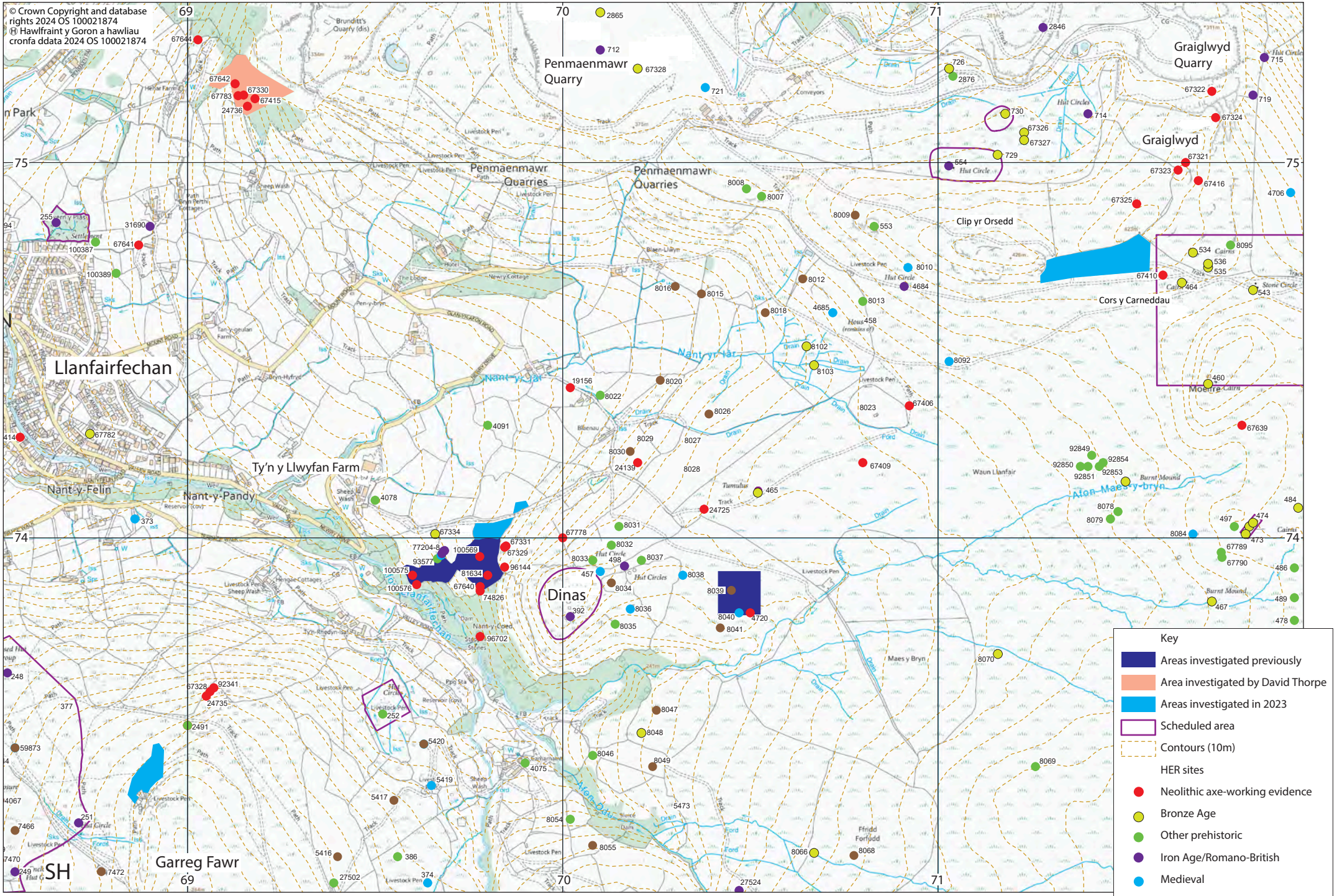


Figure 2. The location of work carried out in 2023 (see appendix I for a list of sites shown on this figure)

Plate 7. Volunteers excavating a test pit at Ty'n y Llwyfan with the crags and screes of Penmaenmawr Mountain in the background, which were also a major stone source for axes

Plate 8. Volunteers excavating a test pit on Garreg Fawr

Plate 9. Sieving the soil and looking for flakes

Plate 10. Collecting and bagging finds on Garreg Fawr

Plate 11. Volunteers recording a test pit at Ty'n y Llwyfan

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 aim of the project is to study the landscape in which axe-working was taking place. Work so far has studied the extent of working at a major stone source at the Ty'n y Llwyfan site, generating an important assemblage for studying how and where working took place. It has also looked at a site away from the stone source where both axe-making and settlement took place, providing a comparative assemblage to the source site. The aim for the 2023 fieldwork was to extend the investigation and to obtain material from other stone sources to compare with what has been obtained so far. Garreg Fawr is another important stone source that has had almost no investigation and test pitting was carried out to start an investigation of this area. Test pitting was also carried out on the southern slopes of Graig Lwyd to determine how far axe working extended here and to start investigations of activity around the margins of Waun Llanfair (Figure 2). However, the limits of the axe production activity at the Ty'n y Llwyfan site had still not been fully defined, so further work here aimed to obtain as full an investigation as possible of one site. The small excavation trench started in 2021 to evaluate the screes at the foot of Dinas also required completing. The aim being to excavate sufficiently to test the depth of the screes and understand something of their origin and use for axe working.

2.2. Fieldwork

Test pitting

An extensive test pit survey is at the heart of the fieldwork programme for this project. Test pits allow the investigation of deposits obscured beneath pasture and other vegetation in a rapid but controlled manner (Plate 7). Additionally, they provide the opportunity for volunteers of varying experience and ability to experience excavation and recording, generally without having to deal with complex features and layers. The test pits were used to identify the quantity and character of axe debris across the areas to be sampled. They enabled the layers with the highest concentrations of debris to be identified and foci of activity to be located.

The test pits measured 1m square (Plate 8) and were generally situated with the sides facing the points of the compass for consistency and easy recording with volunteers, although in some cases, where it was thought more useful, they were orientated down the slope. The turf from 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, using a sieve with a 1cm mesh, and any artefacts found were retained (Plates 9 and 10). The test pits were generally excavated down to the natural subsoil, though occasionally this was not reached. The layers within the pit were then recorded on simplified context sheets, using a booklet produced specifically for this project (Plate 11). 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 test pit 9. Where the section was of interest a section drawing was created at a scale of 1:10. If there were features of interest in the base of the test pit then a post-excavation plan was drawn, at scale of 1:10 or 1:20. All the test pits were photographed during and after excavation. Stony layers were photographed in plan before excavation and at least one representative section was photographed for each pit. The test pits were located using a survey quality Trimble Global Positioning System (GPS).

The excavation and recording of the test pits were carried out by volunteers under the supervision and guidance of GAT and ENPA archaeologists (Plate 12).

Three areas were investigated by test pitting; an area at the foot of the crags on Garreg Fawr (centred on SH 6888 7335), part of the south facing slope between Graig Lwyd and Clip yr Orsedd, known as Cors y Carneddau

Plate 12. John Roberts (ENPA archaeologist) supervising test pit digging in the rain on Cors y Carneddau

Plate 13. The invaluable buggy with equipment up on Garreg Fawr

Plate 14. Children from Ysgol Pant y Rhedyn finding flakes with Rhys Mwyn

Plate 15. Bethan Jones teaching children from Ysgol Pant y Rhedyn about test pitting

Plate 16. Lots of test pitting being done at Ty'n y Lwyfan with the tent for shelter and the buggy provided by CLPS in the background

(centred on SH 7143 7474) and to the north of the fields already investigated at the Ty'n y Llwyfan site (centred on SH 6980 7402). The location of these sites is shown on Figure 2.

The work on Garreg Fawr was carried out between 10th and 14th July 2023. As no previous work has been done in this area the aim was to provide an initial evaluation of the area, determining whether axe debris could be found and if there were specific concentrations. It was planned to lay the test pits out in transects from the edge of the natural scree and quarry waste at the base of the cliffs down the slope. However, the presence of gorse bushes made strict lines difficult, and the test pits were positioned relatively evenly, roughly but not exactly 20m apart, to give a coverage of the area with occasional extra pits, such as to test behind a large boulder. The presence of fine, good quality stone in the post-medieval quarry waste gave a central point to work out from as this stone was likely to have been used for making axes.

This site is at about 320m altitude on the open common. The exposed position and distance and steepness required to walk in restricted volunteers to the more active and hardy individuals. Due to the site being open to the public, as well as being exposed to the weather, a tent was not considered suitable for shelter, so shelter was restricted to the walls of the sheep fold. Access was greatly assisted by the use of an All-Terrain Vehicle (ATV), which enabled equipment to be brought on to site and provided for rapid evacuation in case of an emergency (Plate 13). The use of a lockable tool store on site was a great benefit, though the wind even managed at one point to blow that over.

The test pitting on Cors y Carneddau took place during the following week, 17th to 21st July 2023. This took place on the open common about 180m south-west of the main working area on Graig Lwyd. There are outcrops of rock and small crags in this area, but it was not obvious if these might be suitable for axe making. However, both Hazzledine Warren (Warren 1919, 342; Warren 1922, 2) and David T Jones (pers. comm.) reported flakes being found near a large Bronze Age cairn forming the western edge of the Cefni Coch/Penmaenmawr Stone Circle (CN024) scheduled area. It therefore seemed probable that axe making continued in this area. The aim was to work from just outside the scheduled area as far west along the slope as time allowed. The test pits were laid out to cover the area fairly evenly but were position taking the topography, rock outcrops and the presence of a large boulder into account. Before work started the limit of the scheduled area was marked out with canes located using the GPS equipment to ensure there was no risk of accidentally intruding on the scheduled area.

As this area is at about 400m altitude the issues relating to access and exposed locations applied here even more than Garreg Fawr. The walk in for volunteers, though fairly long, was not as steep as that to Garreg Fawr and the CLPS provided a minibus to take people to the highest access point from the road, saving an additional walk. The tool store and ATV were also very useful here, but there was even less shelter, however the weather was generally favourable.

The Ty'n y Llwyfan site is located at the foot of Dinas, in the highest improved pasture fields on Ty'n y Llwyfan Farm. This work was carried out between 25th September and 6th October 2023, with the last three days being finishing off time with staff and a small number of experienced volunteers. Previous work had revealed a concentration of axe making activity in the northern part of Cae Graig. The test pits were positioned to determine whether this continued in the field immediately to the north (Cae Bach) and whether the limits of the working could be found. The test pits were laid out in a rough grid about 20m apart, but closer together in places depending on the topography. There was a greater density of test pits in the southern part of Cae Bach because this was the area expected to have most finds and test pits were located here for the school children that came to help on site, to guaranteed that they would find flakes. Three test pits were also dug further north to test whether the natural hill slope here was still scree and to determine whether axe working did continue this far.

The fields investigated are improved pasture and were under fairly long grass at the time of test pitting. This area is at an altitude of about 210m and is much more accessible, allowing a wider range of volunteers to be involved, including pupils from the local school. Being on private land the tent could be used for shelter, though this had to be taken down and re-erected one day to avoid damage during strong winds.

Evaluation trench

During the period of fieldwork in this area the small excavation in the screes was also completed. This was position in the natural screes above the wall bounding the improved pasture.

Roughouts and axe-working flakes had been recovered from the screes at the foot of Dinas on its western side. This area (PRN 67329) had been surveyed in 2018 to record surface features and locations where axe debris was visible on the ground surface. The natural screes in this area had been used as a source of stone for making axeheads and these had been worked in this area. However, the nature, depth, and preservation of archaeological deposits in this area could not be determined from surface inspection alone. An evaluation trench was therefore dug to investigate this in 2021, but this could not be completed in that season. It was not finished off in 2022, as the location of the trench in relation to the other test pitting would have split the staff team and made the supervision of the numerous volunteers difficult. With fewer volunteers to supervise in 2023 it was possible to finish excavating this trench.

The evaluation trench (trench 31) was located towards the southern end of the previously surveyed area where small axe-flakes were visible on the surface, suggesting that the area may not be seriously disturbed. The trench measured 4m by 2m was laid out running directly down the slope across a slight terrace. It had been covered with plastic sheet and backfilled in 2021, and once the area had been cleared of bracken was easy to locate. The backfill was removed and the previously excavated surface exposed.

The deposits were carefully excavated in thin spits, which coincided with layers where possible. Loose flakes recovered during cleaning were bagged and plotted with the Trimble GPS. When cleaning down to the top of a spit an attempt was made to keep flakes *in situ* as much as possible. When a spit was cleaned, as well as general photographs, numerous photographs were taken for photogrammetry. Targets were laid out and surveyed in with the Trimble GPS and were included in the photographs. The Agisoft Metashape Professional program was used to combine the photographs to create a 3D model of the site. This was georectified using the surveyed targets. From this data an orthomosaic could be produced. This is a combined, perfectly horizontal image exactly to scale and georectified. This image was traced onto drafting film and annotated in the field to show which items were flakes and which were roughly flaked blocks. Find numbers were also added as finds were lifted.

Planned finds were lifted before excavating the next spit. Flakes, roughouts and smaller or more complex flaked pieces were bagged for further study. Larger blocks, which had been only roughly worked with one or two flakes removed, were recorded on site. These were photographed, measured and weighed then discarded on the spoil heap and used to backfill the trench. They were marked on the annotated plans.

The same procedure was followed for subsequent spits. The quantity of material and care needed to excavate each spit meant that the scree deposit was not fully excavated across the whole trench. However, to investigate lower deposits a narrow sondage was dug down the north-east side of the trench. This demonstrated the depth of the scree and allowed a view of deposits over which the scree had built-up. The sondage reached a depth of 1.0m, beyond which it was not safe to continue digging.

Soil from the trench was deposited on a plastic sheet alongside the trench, allowing for easy backfilling once the excavation was complete. No plastic or geotextile was placed in the trench before backfilling, as there is no intention to return to this site and it was considered unacceptable to leave plastic in the ground over the long term.

This work was carried out at the same time as the test pitting between 25th September and 5th October 2023. Excavation was carried out by generally three volunteers at a time under the supervision and with the assistance of Jane Kenney. Volunteers also bagged and recorded finds, annotated the plans, and assisted with surveying.

2.3. Post-excavation work

Volunteers undertook the cleaning and cataloguing all the finds. Finds were washed, dried, weighed and counted. Finds were catalogued on a spreadsheet. George Smith then inspected a sample of the collection and assessed the material.

The current report covers the results of the 2023 fieldwork and includes an assessment of the lithic collection by George Smith.

The fieldwork has produced an assemblage of national importance. To provide detailed and informed analysis and obtain the maximum information, funding from the 2023 Collaborative Doctoral Awards Competition of the White Rose College of Arts and Humanities (Universities of Leeds, Sheffield and York) has been obtained by Bob Johnston of Sheffield University for a PhD student to study the Group VII axe sources. The studentship is designed as a partnership with the Carneddau Landscape Partnership Scheme / ENPA and one of the main aims is for the student to carry out a detailed study of the axe debris from this project. Becky Vickers has been appointed as the PhD student and started work in October 2023. A meeting was held at the GAT office on 27th November 2023 to allow Becky to see the material and start considering a methodology. The meeting included Becky's supervisor Bob Johnson, John G Roberts (ENPA Archaeologist), George Smith and Jane Kenney. Also present was Mark Edmonds, emeritus professor from York University, who has worked extensively with material from the largest axe stone source around the Langdale Valley, who has agreed to provide advice on recording methodology for the axe debris. Becky's work will lead to a full analysis of the axe debris with comparisons of the different sites and will place the current work in a local and national context.

Post-excavation work studying finds other than axe debris, obtaining radiocarbon dates and pulling together the descriptive and interpretative text on the fieldwork from the full duration of the project will be carried out by GAT. It is hoped that with Becky's analysis this will eventually lead to a paper in the Proceeding of the Prehistoric Society.

2.4. Outreach

While the project aims to produce archaeological information to understand a nationally important but understudied landscape, of equal importance is the aim to enable volunteers to engage with this landscape and its prehistory and experience archaeological fieldwork. The focus was therefore very much on providing an opportunity for volunteers of all ages, backgrounds and abilities.

Adult volunteers were recruited and managed through the CLPS, with onsite training, supervision and management by GAT and ENPA staff. CLPS also funded welfare facilities and the site vehicle.

Forty-six volunteers were involved in the fieldwork in July and twenty-eight in September, some volunteering for both phases of fieldwork. Some volunteers came for a day or two and some for the duration. As well as excavation the work provided an opportunity for volunteers to learn recording, photography, finds identification, section drawing and occasionally GPS survey.

Sixty-six local primary school pupils from years 5 and 6 at Ysgol Pant y Rhedyn, Llanfairfechan engaged with the project. They took part in test-pitting sessions on 26th and 28th September 2023 (Plates 14, 15 and 16). Prior to the fieldwork they were given a presentation at the school to introduce them to the Neolithic period and stone axes. After the fieldwork they had a follow-on class involving learning to record axe flakes from the project. The school programme was funded by the National Lottery Heritage Fund through the Carneddau Landscape Partnership Scheme and delivered by Sian Evans and Bethan Jones of GAT, with the assistance on site of Rhys Mwyn and CLPS staff.

Test pitting, especially where there is a good chance of finding artefacts, is well suited to younger audiences and the sessions produced a considerable number of axe flakes and some special finds. The school programme session prompted much positive feedback from children and adults alike.

Volunteers undertook the daunting task of cleaning and cataloguing all the finds. This responsible task involved the use of an Excel spreadsheet and the sorting of finds into an organised system, giving them a good experience of the nature of post-excavation archaeological work.

Talks on the project were given to the Talwrn Archaeological Society (17/04/2023), Penmaenmawr Historical Society (15/11/2023), Cwm Penmachno Historical Society (09/01/2024), Dolwyddelan Historical Society (05/02/2024), Aberconwy Historical Society (07/02/2024) and to the Friends of GAT (21/02/2024).

2.5. Archiving

The current report will be submitted to the Gwynedd Historic Environment Record (HER). A database of sites has been produced for ease of entry into the HER. This includes a summary of each site, which is translated into Welsh, as are the site names.

When the whole project is complete the digital archive will be submitted to RCAHMW for long term curation. The finds will be further studied in a later part of this project. A discard policy will be devised and retained material will be deposited with the Penmaenmawr Museum or another appropriate museum.

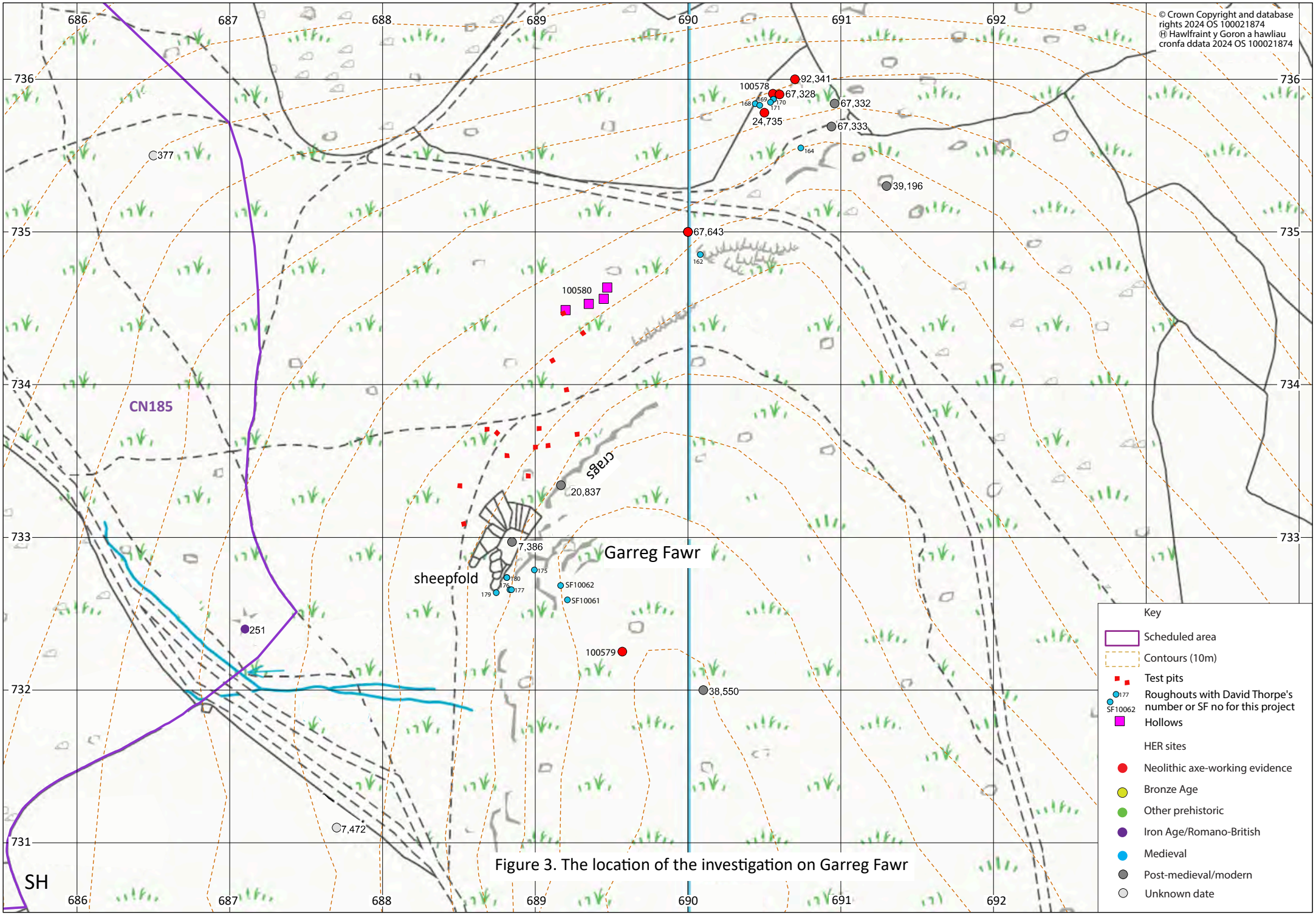


Figure 3. The location of the investigation on Garreg Fawr

Plate 17. The crags on Garreg Fawr with scree and quarry waste below and the crags and Ffridd Tan y Graig screes in the distance

Plate 18. The crags on Garreg Fawr with scree and quarry waste below, from the north

Plate 19. Quarry in Garreg Fawr crags with quarry waste below, from the north-west

3. RESULTS

See Appendix II for details of each test pit.

3.1. Garreg Fawr (PRN 103600, centred on SH 6887 7334)

Topography and archaeology

The microdiorite outcrops near the summit of Garreg Fawr as cliffs about 20m high (Figure 3, Plates 17 and 18). Below these are screes, partly covered in turf but largely buried under waste from a small post-medieval quarry (PRN 20837) in the cliffs (Plate 19). There are also extensive scree deposits, some open but much under turf, around the northern side of the hill.

Field-walking by David T Jones on the north-western side of Garreg Fawr, above Ffridd Hengae, revealed substantial evidence of axe making at an altitude of approximately 280m OD (Figure 3). The area is an exposed scree slope in which some large, tumbled boulders and possibly bedrock protrude (PRN 67328) (Figure 3). Two complete roughouts (PRN 24735) stacked on top of each other were found by David T Jones. Another roughout was found in 2021 (PRN 92341) and reported to the Portable Antiquities Scheme. David Thorpe has also investigated this area and found several roughouts and hammerstones (Thorpe 2023). The knapping debitage can be found scattered throughout the exposed scree, and smaller flakes can be found in erosion scars beyond the limit of the exposed scree. Some of the boulders within the scree have pieces broken from them (PRN 100578). David T Jones found another roughout on Garreg Fawr (PRN 67643). Its location was not accurately recorded but it probably came from a similar area. The exposed scree continues to the east around the northern side of Garreg Fawr, but no flakes have been found here and the stone is generally not as fine and suitable for axe making.

There is a fine multi-cellular sheepfold (PRN 7386) built against the foot of the cliffs (Plate 20) and the author has heard casual references to roughouts being found in this, but no finds have been formally recorded from this area. However, inspection of the open screes to the south of the cliffs revealed some worked material and rounded clasts (possible hammerstones) (Figure 3, see Thorpe 2023 and Kenney and Smith 2023, 75-76). A rock outcrop near the top of Garreg Fawr has a possibly quarried face, which is heavily weathered and possibly suggestive of Neolithic quarrying (PRN 100579). The waste heap from the post-medieval quarry (PRN 20837) is composed of pieces of fine microdiorite, some of which have produced very well-formed flakes. This material is clearly of the high quality necessary for axe making. Working of the screes below the cliffs would therefore seem to be very likely, but the scree not covered by recent quarry waste is obscured under turf, making test pitting the best way to explore this area.

The area investigated is on a north-west facing slope that runs down from the crags near the summit of Garreg Fawr (Figure 3). There is a fine view over Traeth Lafan towards Anglesey and views towards the higher mountains of Foel Fras and Lwytmor and in the opposite direction to Penmaenmawr Mountain. From the summit of Garreg Fawr, Dinas can also be clearly viewed.

The area is covered by closely grazed turf, making test pits relatively easy to dig, but also by numerous gorse bushes. Gorse in part of the area has been burnt off, but this is now growing back and provided an obstruction to test pit digging. more established gorse bushes also provided obstructions in some of the area investigated. Further down the slope and on the summit, there are extensive areas of heather and bilberry. Areas of erosion are few, so it is difficult to search for axe debris except in the open screes not covered by quarry waste.

Much of this slope is protected by a scheduled area (CN185) due to an enclosed Iron Age farmstead (PRN 248) and its surrounding field system and other features. However, there was plenty of room above the scheduled area for test pitting, so there was no risk of accidentally trespassing on this. There is no trace of field boundaries north-east (uphill) of the scheduled area and it appears that the upper part of the hill has never been ploughed, even in the prehistoric period. However, the sheepfold has been built over an earlier monument (PRN 103602). This is visible as a subtle stony scarp running around the north-west side of the sheepfold. This may be an Iron Age enclosure, possibly a livestock enclosure rather than settlement (further described and discussed below).

Figure 4. The position of test pits on Garreg Fawr

Plate 20. Multi-cellular sheepfold on Garreg Fawr, from the east with Traeth Lafan in background

Plate 21. East facing section of TP108

Plate 22. West facing section of TP104

Plate 23. Scree blocks in TP105, from west

Plate 24. TP109 from the west

Plate 25. The crag adjacent to TP109, showing closely spaced fracture lines

Plate 26. Scree in TP112, from NNW

The lidar[1] (light detection and ranging) plot for this area shows the field systems in the scheduled area but does not indicate fields or other features within the test pitted area, except for several slight hollows (PRN 100580). These were seen on the lidar data and inspected on the ground (Kenney and Smith 2023, 75-74). These are slight platforms terraced into the slope with a little build-up of material on the southern side, and they are distributed in a shallow arc across the hill slope (Figure 3). A test pit (TP114) was dug into one of these to determine whether they were related to the axe working.

Test pits

The aim was to work along and down the slope out from where the quarry waste indicated good stone. Test pits were roughly 20m apart, but placed where the gorse allowed, with some pits in between (Figure 4). Fourteen test pits were excavated.

The glacial clay across the area was generally an orange-brown or yellow-brown stony clayey silt. Where this was investigated, as in TP108 and TP111, it could be seen that this contained a high proportion of shale fragments and is a mixing of fragments from the underlying shale with glacial deposits, probably through freeze/thaw action (Plate 21). In TP108 this deposit (10803) was only 0.17m thick, while in TP111 the deposit (11103) was over 0.4m thick (Figures 5 and 6). In both cases, directly under this was the shattered upper surface of shale bedrock (10804 and 11104). This bedrock must underlie the whole slope from the foot of the microdiorite crags. It was assumed that the microdiorite scree continued for some distance down this slope, but it was much more restricted than assumed. In TPs 104 and 111 the scree (10402 and 11102) was of densely packed angular stones up to 0.3m long, and 0.30m and 0.25m thick respectively (Figures 6 and 7, Plate 22). A little further down the slope in TPs 105, 107 and 108 the scree was much less densely packed and was mixed with colluvial soil deposits. In TP107 the scree was 0.13m deep and in TP108 only 0.08m deep and it had largely tailed off. In TP105 the relevant layers were 0.34m thick but there were only occasional blocks that came from the scree (Figure 8, Plate 23). Further down the slope in TP115 there was still some scree in the subsoil, but by TP106, about 42m from the open screes, there was no scree, only hill wash present. Axe working debris was present in TP106, so the activity area may extend further down the slope, even though there is no scree here.

TP109 was positioned close to the base of the crag in a hollow between slopes of natural scree. This test pit had 0.43m of scree within in it, composed of densely packed sub-angular stones up to 0.2m long (Figure 9, Plate 24). However, the fact that the scree was sub-angular rather than angular and the texture and even sound of the stones suggested that this was not the right quality of stone for axe making. Some recent flakes were found but only 5 Neolithic flakes were recovered from the test pit. TP109 was at the foot of part of the crag noted for closely spaced fracture lines and it appears that the texture and properties of this stone are not suitable for axe making (Plate 25).

TPs 110, 112 and 113 were positioned further north of TP109 and further down the slope. TP110 contained a 0.17m deep layer of colluvium mixed with shale fragments but no scree (Figure 10), while in TP112 this colluvial layer did contain some scree (Plate 26) and in TP113 there was a 0.3m thick layer of scree. However, in TP112 and 113 it appears that the scree was of the wrong stone. Six axe flakes were recovered from TP110, three from TP113 and only one from TP112. These are probably part of a general spread of flakes moved by erosion and other processes across the hill, and do not represent axe-making in the immediate vicinity.

TP114 was positioned to investigate a hollow in the hill slope, one of at least 5 in this area. In this test pit, under 0.05m of topsoil, there was 0.17m of scree with angular stones up to 0.48m long (Plate 27), but again this scree seems not to have been the right stone as there were only 3 rather uncertain flakes. The hollow is a D-shaped scoop into the hill slope with a slight build-up of material on the downhill side. It is up to 0.75m deep and measures about 6.5m by 4.0m. The hollow may have been caused by erosion or disturbance of the scree, but the lack of axe debris suggests that this was not due to axe-making activity.

[1] The casing of "lidar" follows Deering and Stoker 2014.

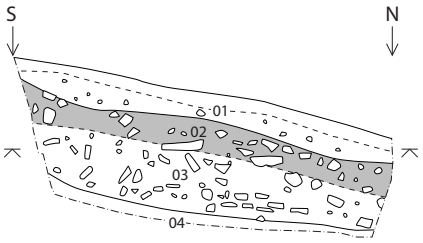


Figure 5. East facing section of TP108

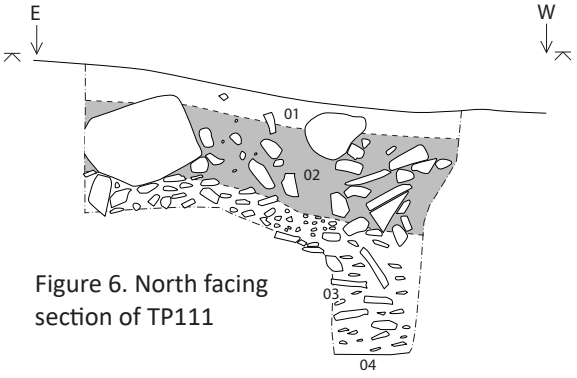


Figure 6. North facing section of TP111

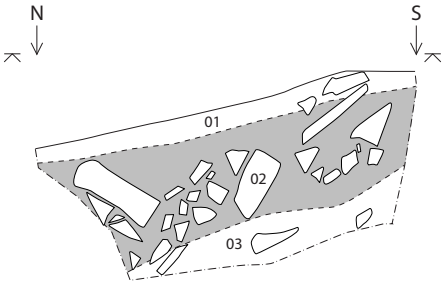


Figure 7. West facing section of TP104

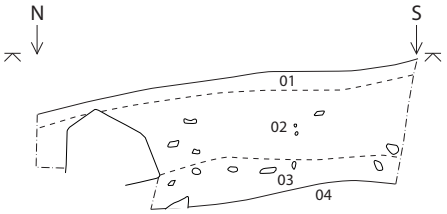
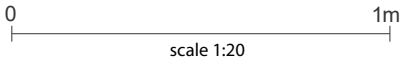


Figure 8. West facing section of TP105



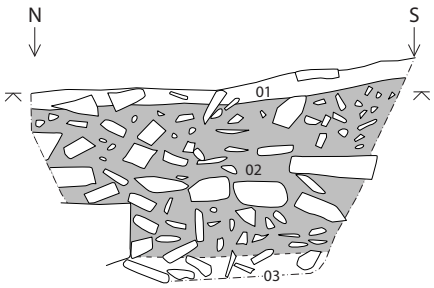


Figure 9. West facing section of TP109

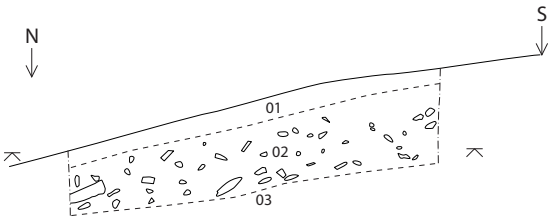
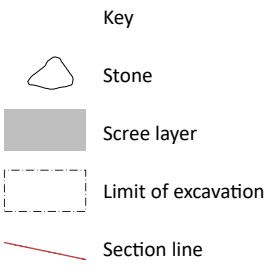


Figure 10. West facing section of TP110



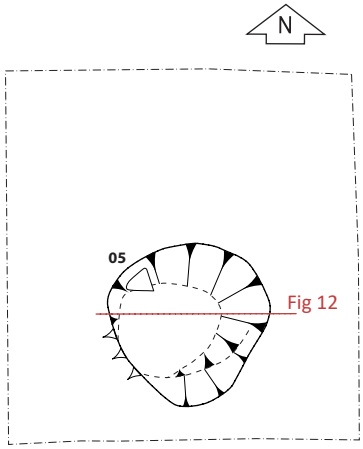


Figure 11. Plan of TP116 showing pit [11605]

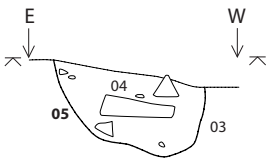
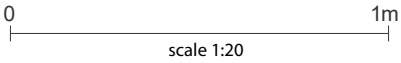


Figure 12. North facing section of pit [11605]



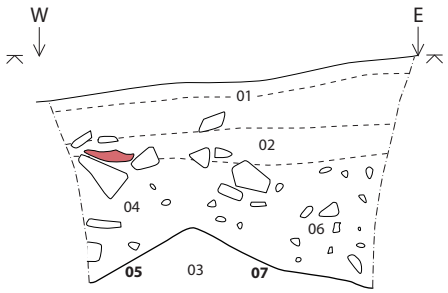


Figure 13. South facing section of TP117

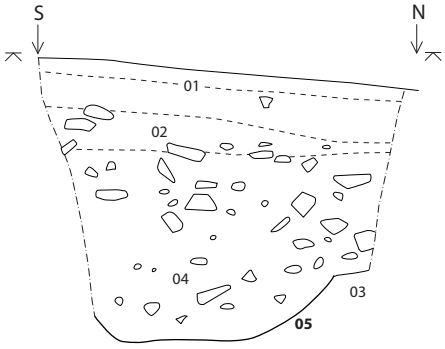


Figure 14. East facing section of TP117

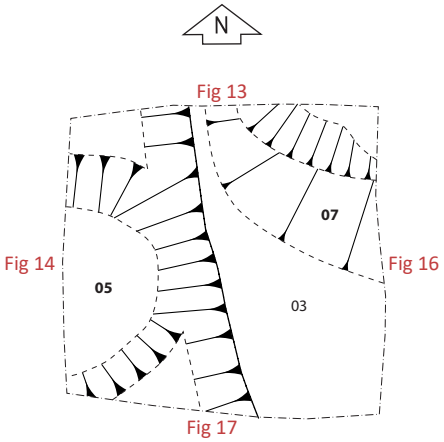


Figure 15. Plan of TP117 showing features [11705] and [11707]

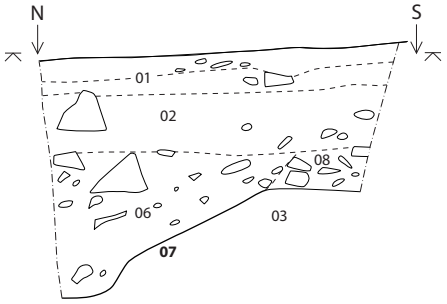


Figure 16. West facing section of TP117

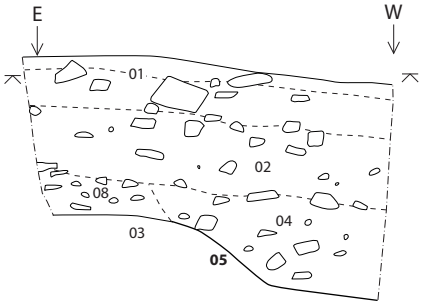
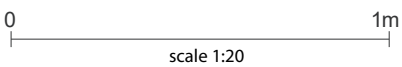
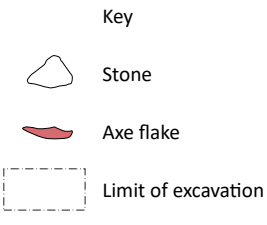


Figure 17. North facing section of TP117





The hill slope has several large erratic boulders scattered over it but generally these are of local stone and are fairly angular. One stone is much more rounded and has weathered to a white surface. This appeared to be a distinctive landmark. It was postulated that Neolithic people might have gathered at this landmark and could have sheltered behind it while making axes. A test pit (TP115) was placed immediately north-east of the stone in its lee (Plate 28). This test pit did produce a significant quantity of axe debris but there was no indication that it was *in situ* and may well have moved down slope with the scree within which it was mixed. Some axe debris was found in TP106, a little further downhill, showing that axe working was taking place in the general area, and it cannot be proved that the boulder was specifically used by the axe makers.

As axe debris seemed to be increasing towards the south-east two test pits (TP116 and 117) were placed further in this direction and these proved to be the most productive. The tail end of the scree was visible in TP116 as a layer 0.18m thick, but this was not particularly dense. However, 150 pieces of axe debris (9233g) were recovered from this test pit, suggesting that some of this material may have been brought down from productive scree a little higher up rather than sourced directly from the scree in the test pit. This test pit was of particular interest because it had a small pit in the base (Figures 11 and 12). The pit [11605] was sub-circular, 0.4m in diameter and 0.22m deep (Plates 29 to 31). It had fairly steep sides; the west side undercut but not the start of a burrow. The sides curved gradually into a rounded base. The fill (11604) was a dark brown clayey loam with c.10% angular stones up to 0.2m long and occasional pieces of charcoal. The longest stone lay horizontal in the middle of the feature. The stones were not obviously packing stones but there are a couple of long thin ones that might have performed that function but had been disturbed. Two axe flakes were found in the fill. This pit has been allocated PRN 103601.

The chance of a test pit locating an archaeological feature is low but TP117 also revealed features in its base. A curving rocky scarp about 60m long and up to about 1.4m high defines probably part of a very eroded sub-circular enclosure (PRN 103602) underneath the sheepfold (see Figure 4 for survey, Plates 32 and 33). Probably stone used to create a bank or wall for this enclosure has been robbed to build the sheepfold and the interior appears fairly level. An aerial photograph by RCAHMW (AP_2005_2847, Coflein NPRN 308677) shows this feature clearly and shows that there is a low stone bank on top of the scarp, which is probably the remains of a stone wall. TP117 was positioned just inside the scarp on the level platform. In the base of the fully excavated test pit was a straight slot about 0.25m deep [11705]. This ran along the western side of the test pit, roughly parallel to the enclosure scarp (Figures 13 to 17). In the base of this slot was what is probably a circular cut, though only half could be seen in the test pit (Plates 34 to 36). This was 0.5m deep overall, 0.68m in diameter, and it had fairly steep sides and a flat base. Although there were no post-packing stones, it is likely that this circular cut was a posthole for a substantial post. This seems to have been set in the base a shallower trench. It is suggested that this may be part of a palisade trench, although a much large area would have to be excavated to confirm this. In the north-east corner of the test pit was another hollow with more gently sloping sides [11707] but still nearly 0.35m deep. Both these features were filled with a mid-brown silt with c.30% angular stones up to 0.2m long, which was loose and very soft in places. This layer and the sub-soil or possible cultivation soil above were full of axe debris (206 pieces, 10742g).

The enclosure is probably Iron Age, and the test pit suggests it may have had a wooden palisade probably to keep cattle in. This enclosure was constructed over an area that had been intensively used for axe making and axe debris became incorporated into the fills of features relating to the enclosure. Centuries later the sheepfold was built over the top. This area would repay further investigation, not only to determine the nature of the Neolithic activity but to investigate the form and function and date of the enclosure.

Only one roughout was found in the Garreg Fawr test pits, probably because there were only two test pits dug into the densest concentration of activity. Casually retouched were quite widespread with one even coming from TP110, beyond the main area of activity. This may indicate other activities taking place, such as preparing food for consumption during axe-making. One small piece of flint debitage from TP106 could support that suggestion. TP117 produced several retouched pieces including a formal end scraper as well as more casually retouched items (see Figure 48).

Plate 27. NNW facing section of TP114

Plate 28. TP115 with large, rounded boulder, from north-east

Plate 29. TP116 with pit [11605] half sectioned, from the west

Plate 30. North facing section of pit [11605]

Plate 31. Pit [11605] fully excavated

Plate 32. Bank of enclosure PRN 103602, from NE

Plate 33. Bank of enclosure PRN 103602, from NNE

Plate 34. TP117 showing [11705] and [11707], from east

Plate 35. East facing section of TP117 showing section through circular cut in [11705]

Plate 36. North facing section of TP117 showing section showing linear slot part of [11705]

Summary of finds
Pieces of white quartz were collected in 2021 but all appeared to be natural, unworked stone. White quartz was therefore not collected in 2023 unless there was any suggestion of a piece being worked.
Table 1. Finds from Garreg Fawr Test Pits

Test Pit	Type of object	No of items	Total weight of items (g)
104	Axe debris	76	3535
105	Axe debris	12	438
106	Axe debris	66	1329
	Flint flake	1	<1
	Iron nail	1	1
107	Axe debris	76	2045
108	Axe debris	56	1170
109	Axe debris	5	70
110	Axe debris	6	197
111	Axe debris	16	744
112	Axe debris	1	13
113	Axe debris	3	45
114	Axe debris	3	11
115	Axe debris	31	1639
116	Axe debris (including 1 roughout)	150	9233
	Burnt stone	1	86
117	Axe debris	206	10742
	Burnt stones?	4	706

3.2. Cors y Carneddau (PRN 103604, centred on SH 7143 7473)

Topography and archaeology
The area investigated forms the south-western end of the Graig Lwyd outcrop and is on the chilled margins of the igneous plug. This is also on the northern margin of an extensive marshy, upland plateau called Waun Llanfair (Figures 2 and 18, Plate 6). The site is on a south facing slope, which generally slopes fairly gradually down from small rocky outcrops to the edges of the marsh (Plate 37). However, much of the lower part of that slope is covered with dense gorse, so the test pitting was concentrated on the higher parts where there is closely grazed grass but also extensive bilberry coverage (Plate 38). The location has wide views to the south towards Foel Fras and the Foel Ganol ridge on the opposite side of Waun Llanfair. There are also views to the south-east, to Tal y Fan, and to the east towards the Meini Hirion (Druids' Circle) (PRN 541), a prominent Bronze Age monument (Plate 39), though this is not quite visible from the area investigated. There are numerous other Bronze Age monuments in this area. To the south-west both Dinas and Garreg Fawr can be seen.

A large Bronze Age burial cairn (PRN 464) lies on the eastern end of this slope, and it is likely that this and other monuments marked a Bronze Age routeway across the hills. PRN 464 is in the western end of a large scheduled area (CN024), also including the Meini Hirion. The limit of this was marked out with canes to prevent any test pits accidentally being dug within the scheduled area but the test pits were positioned in a very rough grid running west from just outside the scheduled area. Scree is not visible on the surface in this area so it was difficult in advance to estimate where the most productive areas might be or indeed if any axe working would be found here.

Chance finds of flakes or roughouts and some archaeological excavation has indicated activity involving axe making around the edges of the Waun Llanfair (Figure 18). David T Jones has found axe flakes along the

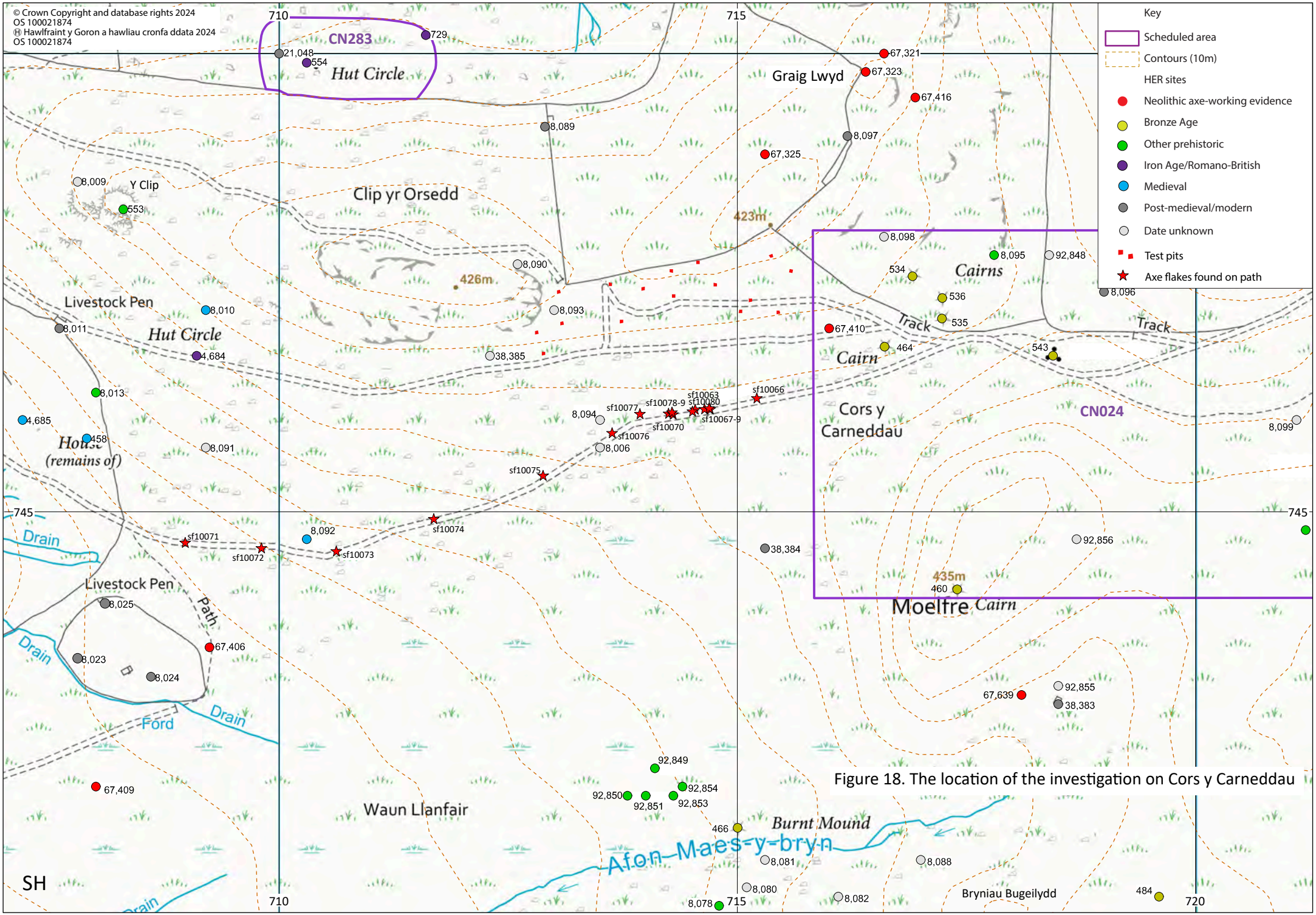


Figure 18. The location of the investigation on Cors y Carneddau

Plate 37. View looking east from the upper part of Cors y Carneddau towards the Meini Hirion, with Moelfre and Tal y Fan. The burial cairn (PRN 464) is towards the foot of the slope

Plate 38. Cors y Carneddau, showing gorse and bilberry cover

Plate 39. Volunteers visiting the Meini Hirion (Druids' Circle), PRN 541

western edge of Waun Llanfair, including PRN 67406, and he found a complete and finely worked axe roughout (PRN 24725). Hazzledine Warren mentions an axe working site (PRN 67409) on Waun Llanfair, though this cannot be located with much precision (Warren 1919, 342) and found a roughout between Clip yr Orsedd and Dinas (Warren 1922, 2). Excavations at two cairns within Waun Llanfair (PRN 470 and PRN 485) revealed axe-working flakes in buried soil under the cairns, and narrow pick of Group VII rock was found under PRN 485 (Caseldine, Roberts and Smith 2007, 5-8). There were also Neolithic flint tools at these sites suggests these could be significant settlement sites. Hazzledine Warren found what appears to be an axe-working floor (PRN 67410) on Cors y Carneddau. This is described as "to the west of Carneddau [the large burial cairn PRN 464] nearly every molehill was seen to have several small flakes upon it, and when one dug through the turf evidence of a true chipping-floor was at once apparent" (Warren 1919, 342) and "a great quantity of flakes near the Carneddau Cairn" (Warren 1922, 2). Both reports suggest an extensive axe-working area and intact flaking floors beneath the turf. David T Jones also found numerous flakes in this area in molehills. The finds suggest widespread Neolithic activity around Waun Llanfair, both close to and at some distance from the rock sources, with a high possibility of extensive working on Cors y Carneddau.

Test pits

Sixteen test pits were dug across this area (Figure 19). Some aimed to investigate immediately below or on top of rock outcrops and other to test how far down the slope screes and working extended. TP120 found fractured bedrock (12003) under 0.48m of peaty soil (Figure 20, Plate 40). The soil appeared to be a largely undisturbed podsol with a dark, peaty upper layer (12001) and a leached lower horizon (12002). There was a considerable quantity of axe-working debris and scree in the peaty upper part of the soil (12001). There were stones up to 0.38m long within the soil layer, but it is possible that stone was being prised from the bedrock, though no unequivocal evidence of this was seen. The rest of the test pits showed that although there is no scree visible on the ground surface it could be found across the slope, though generally it was not deep. At the foot of small crags or bedrock outcrops TP126 revealed scree 0.20m deep, including a large block that had been struck (Figure 21). Under the scree was a shaly colluvial layer, overlying the yellow-brown glacial clay. TP119 and TP122, high up on the slope and close to the bedrock had a thin layer of scree (0.14m and 0.16m thick respectively) over the stony, orange-brown silty clay that formed the glacial deposits (Figure 22, Plate 41). Across much of the area investigated the glacial deposits were quite gravelly, as well as stony.

At the mid level of the slope TP121 and TP123 had a thicker deposit of scree than the higher test pits (Figures 23 and 24). In TP121 the scree was about 0.25m deep (Plate 42) and in TP123 an upper disturbed scree and a lower undisturbed scree were together over 0.35m deep (Plate 43). TP130, at a similar level, only had 0.1m of scree, but that did include a boulder, under which there was an axe flake, suggesting movement of the scree while axe-working was taking place. TP124 had up to 0.19m depth of scree but it was less dense, with scree pieces mixed into the sub-soil (Figure 25). Here the scree was also underlain by a shaly colluvial deposit over the glacial clay. TP124 was positioned in the lee of a distinctive rounded boulder but there was not enough axe debris from this location to prove that this had been used for shelter or as a landmark and attracted knapping rather than other locations (Plate 44). In TP123, where the scree was densely packed there was evidence of the scree having been disturbed. The way that some of the scree stones were piled up or sloping into a hollow, probably created by the removal of a larger block (Figure 24), suggested the scree had been sorted through in search for suitable pieces for axe-making.

Further down the slope in TPs 118 and 132 the scree was tailing off at a depth of 0.11m and 0.15m (Plate 45). In TP118 the glacial deposit had few stones but in TP132 it had a high proportion of shale fragments as seen elsewhere in the colluvium. TP125 showed that there was still a significant scree component to the sub-soil forming a layer 0.18m deep.

TP127 was different to other test pits in this area. It was located on a slight plateau at the same altitude as TP119 but not as close to the bedrock outcrops. This had 0.2m of scree with a brown silt matrix (12702) (Figures 26 to 28). This also had evidence of the scree having been disturbed with some pieces appearing to be stacked (Plate 46). However, under this was more densely packed scree, but with an orange-brown gritty silt matrix (12703). The colour of the matrix suggested that this had not been disturbed, but some axe flakes were recovered from within this deposit, possibly having slipped down from higher up. The total scree depth was therefore above

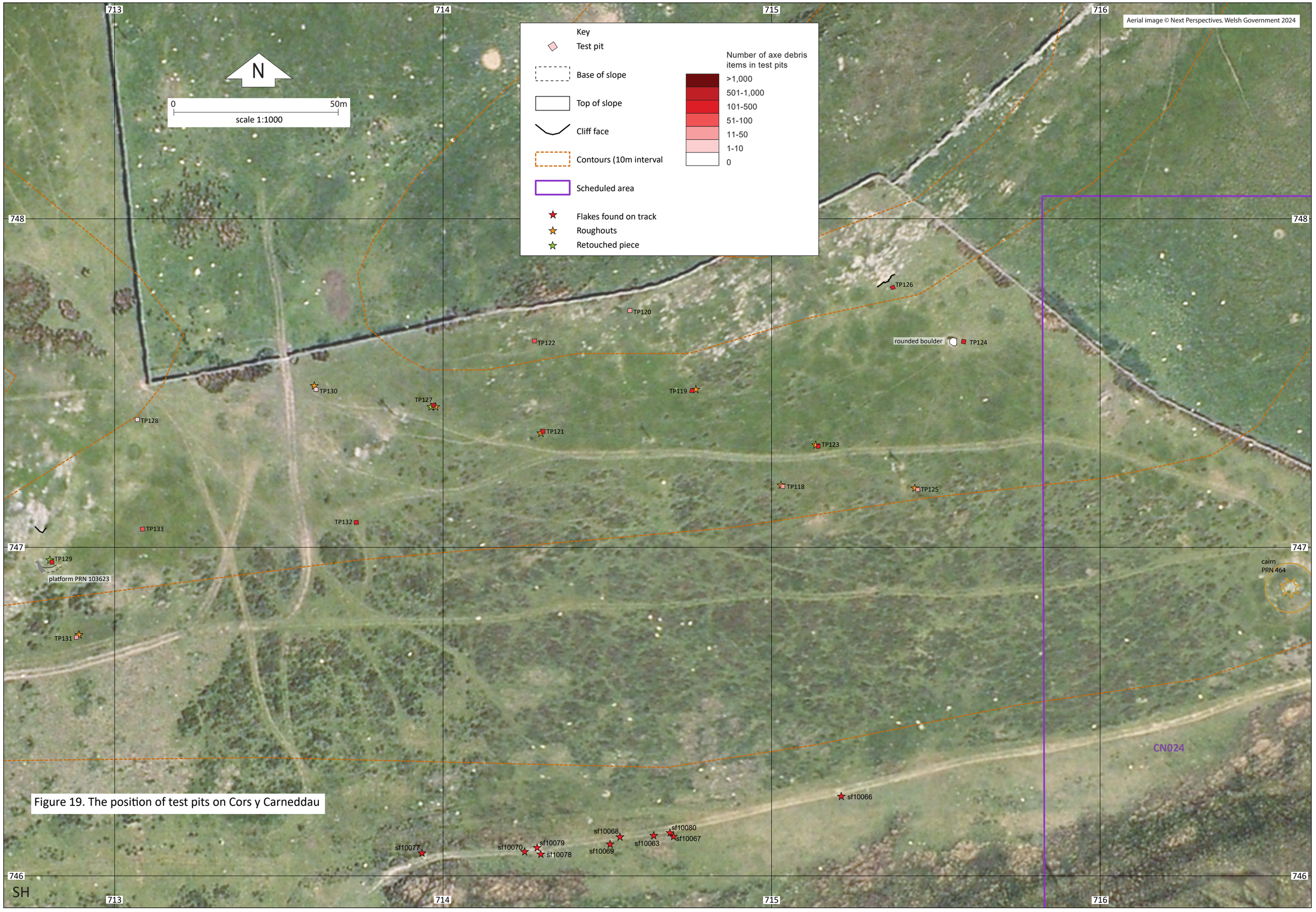


Figure 19. The position of test pits on Cors y Carneddau

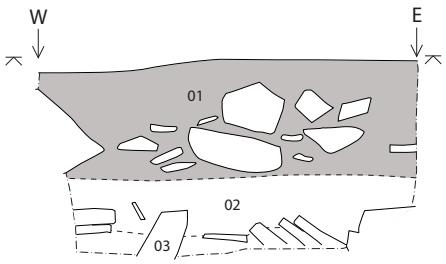


Figure 20. South facing section of TP120

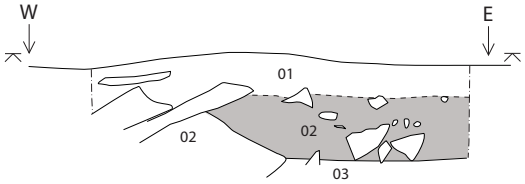


Figure 21. South facing section of TP126

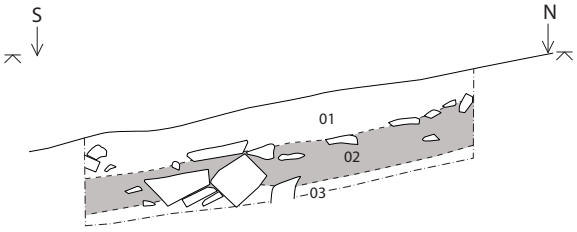


Figure 22. East facing section of TP119

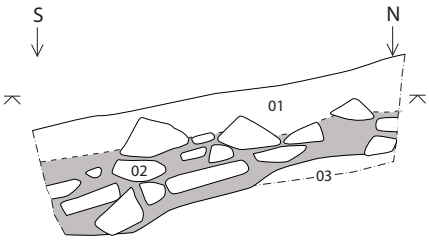


Figure 23. East facing section of TP121

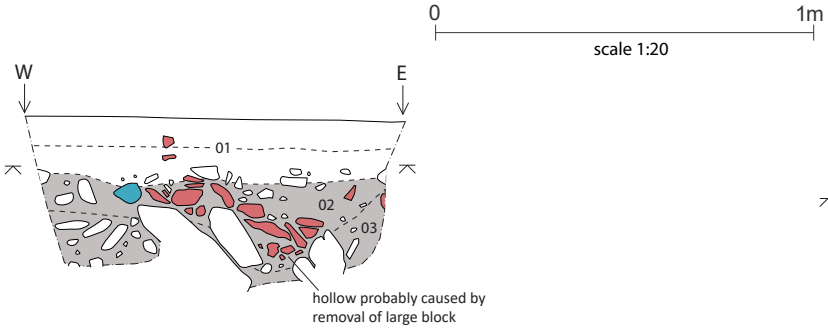


Figure 24. South facing section of TP123

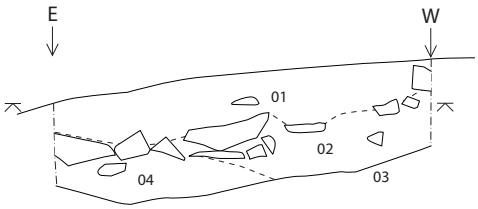


Figure 25. North facing section of TP124

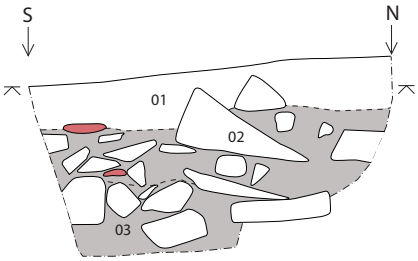


Figure 26. East facing section of TP127

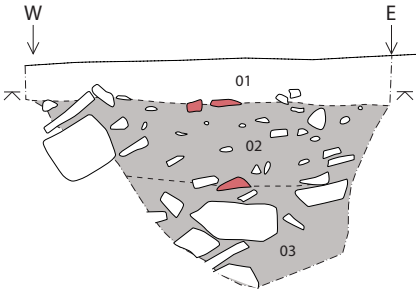


Figure 27. South facing section of TP127

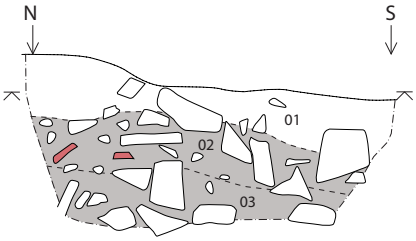


Figure 28. West facing section of TP127

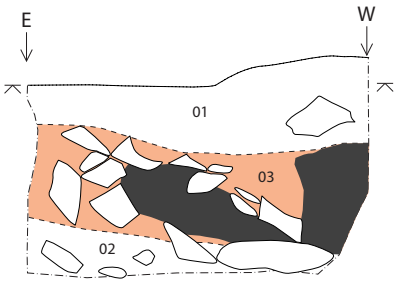


Figure 29. North facing section of TP129

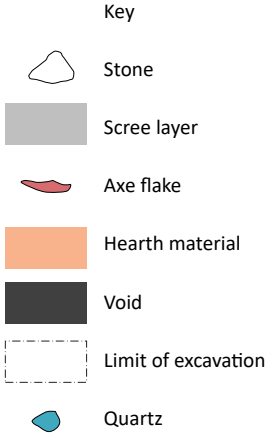


Figure 30. East facing section of TP129

Plate 40. South facing section of TP120

Plate 41. West facing section of TP122

Plate 42. East facing section of TP121

Plate 43. South facing section of TP123

Plate 44. Location of TP124 on leeward side of rounded boulder, from north-east

Plate 45. South facing section of TP118

Plate 46. East facing section of TP127

Plate 47. Sub-rounded scree in TP133, from the east

0.45m, and it was not possible to reach the base of the scree in the test pit. It is likely that the underlying topography caused scree to collect and build-up to a greater depth in places. This test pit produced 578 pieces of axe debris including particularly large flakes and some large struck pieces. It appeared that the scree here contained a greater proportion of large pieces of good quality stone and was probably particularly targeted as a source of large flakes as blanks for roughouts. Some of these large pieces may have been from quarried rock, naturally fractured pieces from the surface of the bedrock that had been prosed out.

Further west, in the col between the Graig Lwyd ridge and the Clip yr Orsedd ridge there was an area with little or no suitable stone. In TP133 scree was visible but this was noticeably less angular than elsewhere (Plate 47). It was densely packed, but the pieces were sub-angular or sub-rounded and the crystals in the stone were more prominent, seen to be shining in the sun. The stone in the scree therefore appeared to be less suitable for axe-making. However, 72 items of axe debris were recovered, suggesting that there was activity in this area. TP128, positioned in the col, had only 0.12m of scree mixed with colluvium (Plate 48), but much of this was small pieces and few convincing axe flakes were recovered from this test pit. Scree generated from outcrops on the eastern end of Clip yr Orsedd and moving downhill to the east and south-east therefore did not appear to be suitable for axe production.

On the southern face of the eastern end of Clip yr Orsedd there are small cliffs and outcrops that do appear to be of good stone (Plate 49). Some of these have fractures that may have been produced by people striking flakes directly from the bedrock. To investigate whether this stone had been used TP129 was positioned on a flat area under the crags. However, this proved to be flat because this was a deliberately created platform (PRN 103623), measuring about 5.4m by 2.4m (Plate 50). The platform had a scarp up to 0.47m high on the southern side and the remains of a rough wall running down the slope on the western side. It appeared to have been created for a small rectangular structure, possibly a hafoty.

TP129 was dug to a depth of 0.6m, at which point it was too unstable to dig further but the glacial deposits had not been reached. Under 0.20m of turf and peaty topsoil was an unconsolidated dump of angular stones up to 0.25m long with a very dark grey-brown organic silt matrix or often voids between the stones (12902) (Figures 29 and 30). These stones were scree that had been moved downhill to create the platform, but the stone was good axe-making quality and included a high proportion of axe debris (110 pieces, 16115g). Over the top of the stone dump was a layer of strong orange-brown gritty silt (12903) which had slipped down amongst the upper most stones (Plates 51 and 52). This layer contained charcoal and pale speckles suggestive of ash deposits and appeared to be the remains of a hearth. The construction and use of this platform has caused the natural scree to be moved and disturbed but the quantity of axe debris within it shows that axe-making took place in this area, with the scree and debris probably originating only a short distance up the slope.

Downhill from TP129 was TP131. Here the scree deposit was only 0.15m deep with the lower part of that embedded in yellow-brown silty clay derived of the natural glacial clay. There were fewer axe flakes from this test pit, but it did produce one roughout, indicating working in the general area.

In addition to the test pits axe flakes were found over a wider area. As the volunteers walked up the path from Llanfairfechan they spotted axe flakes in the path or eroding out of its edges. These flakes have been collected and their locations recorded by GPS (Figure 18). While some of these may have been moved down the path during its use, they are likely to indicate axe working in the rough area in which they were found. This suggests that axe debris can be found all down the slope beneath the location of the test pits, but also that the area of working is much more extensive and is likely to extend, at least sporadically, west of the area investigated until the rocky outcrop (Y Clip) at the western end of Clip yr Orsedd.

Roughouts were fairly common from the test pits in this area, occurring in test pits with fewer flakes as well as those with many flakes. This supports the impression of extensive axe-making activity. Only the finds from test pits TP127 and TP129 were assessed, so the number of retouched pieces in this area is currently unclear. However, in the two assessed test pits there were retouched pieces, with TP127 producing four pieces. The presence of casually retouched pieces may, therefore, be widely expected. There was only one small piece of flint debitage present (in TP119), but this may indicate flint tools being manufactured on the site.

Plate 48. TP128, from the south

Plate 49. Small crags on the eastern end of Clip yr Orsedd, from the south

Plate 50. Built platform into which TP129 was dug, from the east

Summary of finds
Pieces of white quartz were collected in 2021 but all appeared to be natural, unworked stone. White quartz was therefore not collected in 2023 unless there was any suggestion of a piece being worked.

Table 2. Finds from Cors y Carneddau Test Pits

Test Pit	Type of object	No of items	Total weight of items (g)
118	Axe debris (including 1 roughout)	43	4485
119	Axe debris (including 1 roughout)	274	35279
	Flint	1	
120	Axe debris	89	3734
121	Axe debris (including 1 roughout)	162	16443
122	Axe debris	78	4847
123	Axe debris (including 2 roughouts)	438	20280
	Quartz	1	11
124	Axe debris	153	5490
125	Axe debris (including 2 roughouts)	86	11484
	Quartz	45	2470
	Possible hammerstone	1	1092
126	Axe debris	134	4550
127	Axe debris (including 3 roughouts)	578	78228
	Other stone	1	21
128	Axe debris	9	427
129	Axe debris	110	16115
	Quartz	1	871
130	Axe debris (including 1 roughout)	47	7552
131	Axe debris (including 1 roughout)	21	1161
132	Axe debris	143	5540
	Possible hammerstone	1	786
133	Axe debris	72	9002
	Possible hammerstone	1	2089

3.3. Ty'n y Llwyfan (PRN 81634, overall site centred on SH 6978 7397, this year's work centred on SH 6980 7402)

Topography and previous work
Much of the southern, eastern, and western sides of Dinas are covered in natural screes that are bare and unvegetated. However, further north, where the slopes are covered in grass, there is still scree under the vegetation. In the improved fields below the western side of the hill the continuation of scree under the turf is indicated by the uneven ground surface, with glacial till forming the substrate under the rest of the fields. However, it is not always possible to identify the presence of scree from the surface when ploughing has caused the formation of lynchets across the slope.

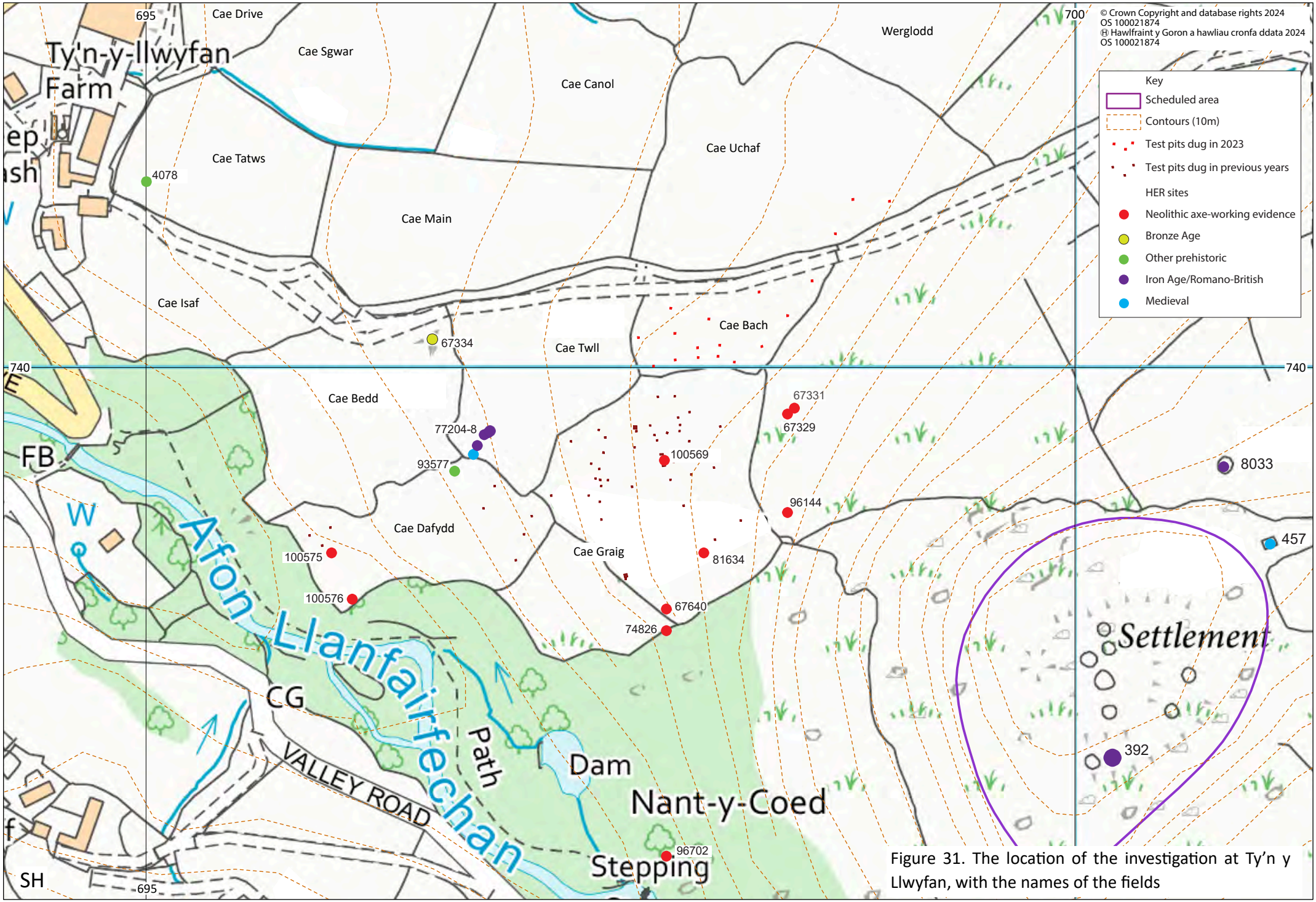


Figure 31. The location of the investigation at Ty'n y Llwyfan, with the names of the fields

Figure 32. The position of test pits at Ty'n y Llwyfan

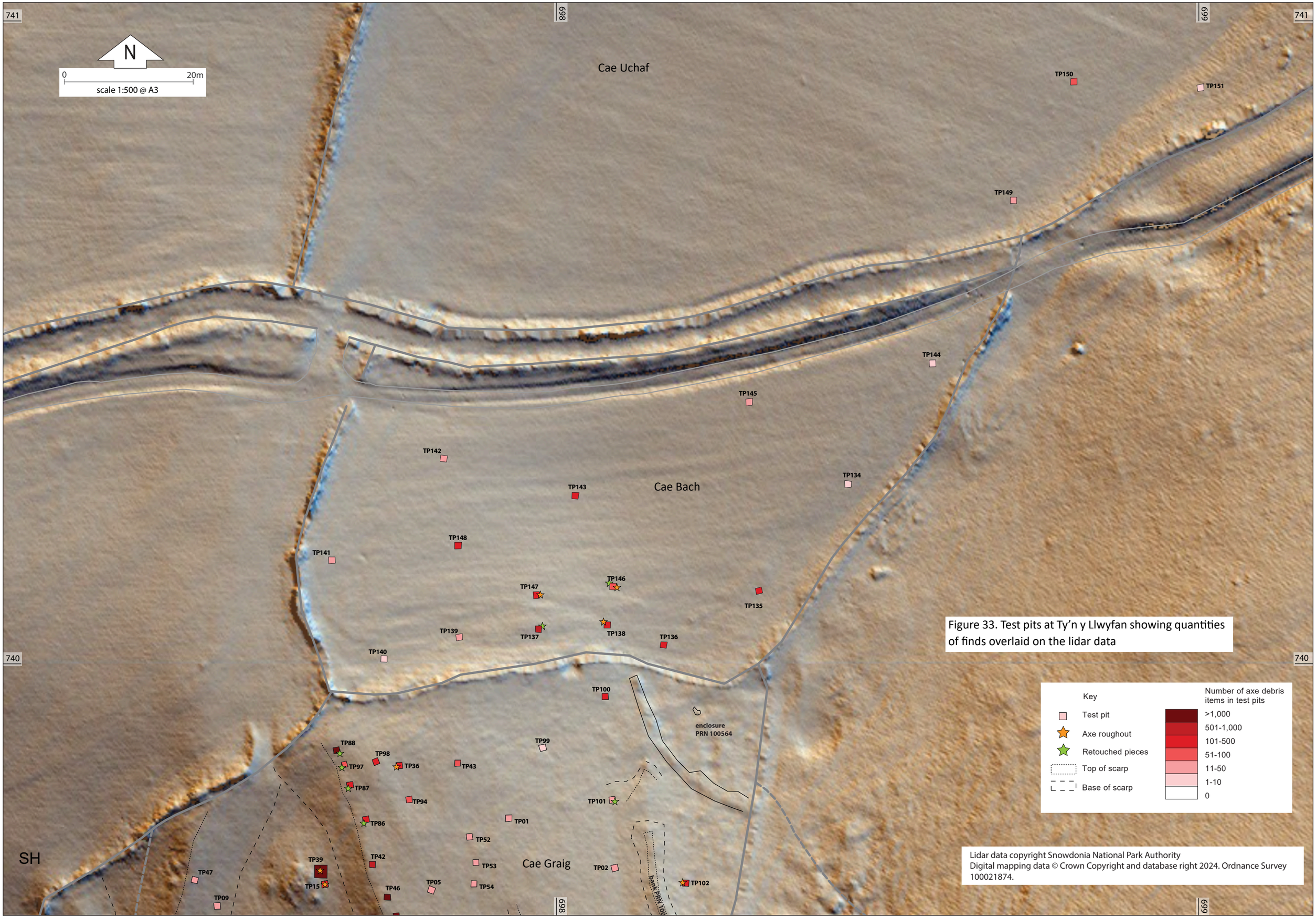


Figure 33. Test pits at Ty'n y Llwyfan showing quantities of finds overlaid on the lidar data

All the fields have names used by the Jones family, and Roland and Gareth Wyn Jones kindly informed the author of the names. These are shown on Figure 31 and will be used in this report to identify the fields. Previous seasons of the project have concentrated on a field (Cae Graig) that lies just on the boundary between scree and glacial till at the western foot of Dinas (PRN 81634) (Figure 31). Sixteen test pits were dug across Cae Graig in 2019 and 23 test pits in 2021. In 2022 twenty-one test pits and four small trenches were dug here. In 2022 investigation continued into a field (Cae Dafydd) further west, down the slope, where 8 test pits were dug (PRN 100575).

The lower part of Cae Graig slopes steeply but running across it are two lynchets, probably of Iron Age date, forming narrow terraces. Test pitting showed quantities of axe debris in test pits over the screes along the eastern and south-eastern sides of the field, but also concentrations of activity off the screes. The lynchets show how much soil movement there has been since at least the Iron Age, and the concentrations of activity are not *in situ,* but material must have moved down slope from higher up the field. The main concentration of activity was along the upper lynchet, towards its northern end. Some axe debris had also collected in the lower lynchet, again towards the northern end.

These traces of ploughed lynchets and enclosures show that although this is a steep field it was used for agriculture in the past and this will have influenced the distribution of axe debris found. The latest ploughing of the field occurred in the 1970s when even the steep lynchet scarps were ploughed (Gareth Wyn Jones, pers. com.). However, surface evidence suggests that the rough scree margins of the field, along the south-eastern and eastern sides have never been ploughed. Along the south-eastern side of the field there is exposed scree or scree under a thin layer of soil, and it is covered with oak trees of considerable age.

Cae Dafydd produced less evidence for axe-making but there were flakes scattered over the field and two roughouts were recovered. Twenty-seven flakes (PRN 93577) previously found along the route of a water pipeline across this field adds to the evidence (Dean and Cooke 2019). This suggests that axe-making also occurred much further from the screes but that the test pitting failed to locate the focus of activity. A small Neolithic pot sherd from a test pit in this field hinted at Neolithic settlement somewhere nearby. The steep gorge formed by the Afon Llanfairfechan runs along the southern side of this field, with one of the few access routes into the gorge leading down from this field.

There has been no methodical search for roughouts on the western side of Dinas, but this whole area is likely to have been used for sourcing stone for making axeheads. A roughout was found and reported to the Portable Antiquities Scheme in 2022 from the lower part of the Nant y Coed woodland (PRN 96702).

Test pits

In September and October 2023 eighteen test pits were dug in the fields to the north of Cae Graig (Figures 32 and 33). These aimed to find the limits of the extents of the working on this side. The test pitting showed that unexpectedly there were deep deposits of scree under the southern part of Cae Bach and that axe-making had been active in this area. TP136 had scree embedded in the glacial clay (13603) (Figure 34, Plate 53), while TP138 had over 0.68m of scree in the form of densely packed sub-angular stones up to 0.3m long with a mid orange-brown clayey silt matrix (13802) (Figure 35, Plate 54). It was not possible to dig down to the glacial clay in this test pit as there was not room between the large stones in the base. TP146 had 0.30m of similar scree above glacial clay with scree embedded in it (14603) (Figure 37, Plate 55), and TP147 had 0.70m of scree (14702) over glacial clay (14703) (Figure 36). However, while TP137 had 0.68m of mid orange-brown clayey silt (13702), this had no large pieces of scree within it (Figure 38, Plate 56). This layer appeared to be a build-up of ploughsoil, effectively a lynchet that formed against the scree deposits. The scree and ploughsoil have created a slight platform. Two large boulders within TP147 appeared to be possibly part of a revetment to this platform but are likely to be just a natural part of the scree (Figure 39, Plate 57). Within this area a considerable quantity of axe debris was found with TP137 having 818 pieces (26536g).

Further west the deposits are much shallower and contain much less scree. TP139 had 0.09m of topsoil over 0.15m of ploughsoil. Some of the stones mixed into the ploughsoil were probably from the scree but there was no undisturbed scree layer in the test pit. TP140 was similar but with only 0.09m of ploughsoil (Figure 40). There was much less axe debris in this area.

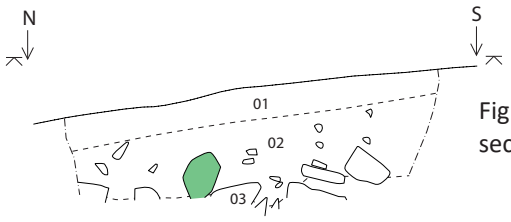


Figure 34. West facing section of TP136

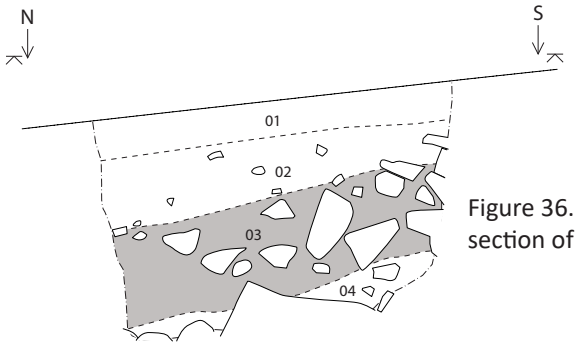


Figure 36. West facing section of TP146

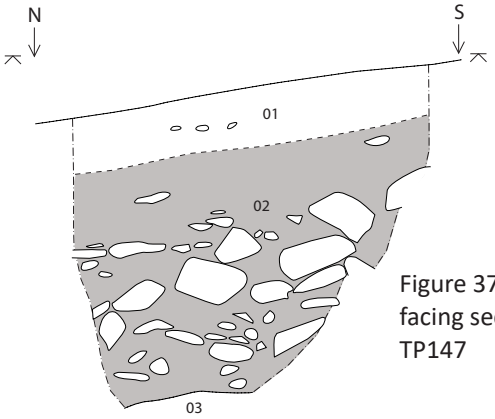


Figure 37. West facing section of TP147

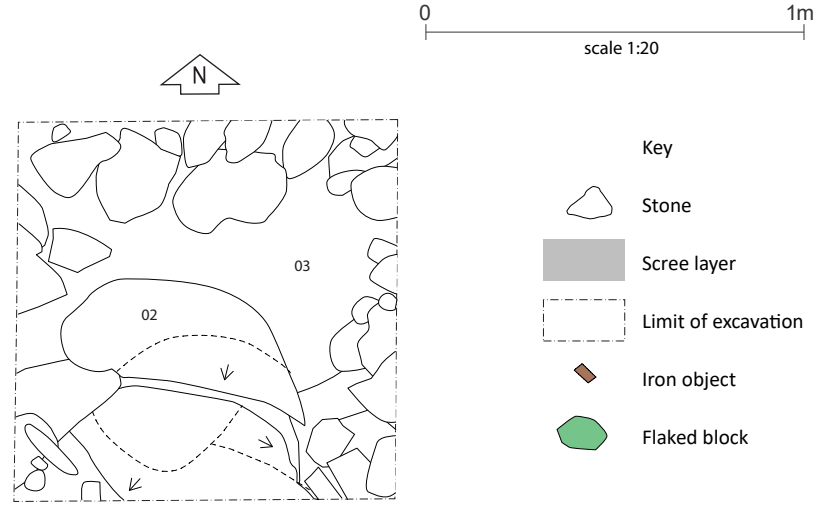


Figure 39. Plan of TP147 showing boulders

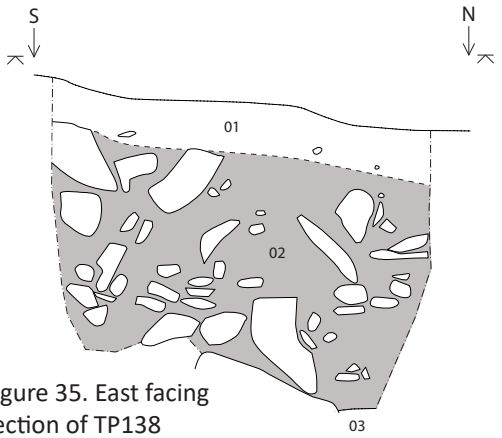


Figure 35. East facing section of TP138

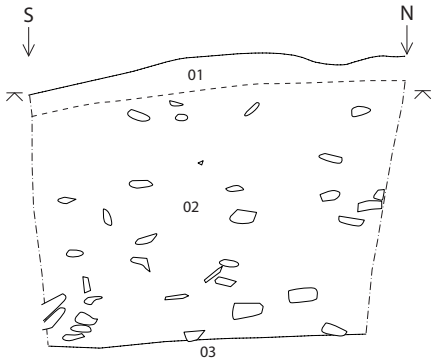


Figure 38. East facing section of TP137

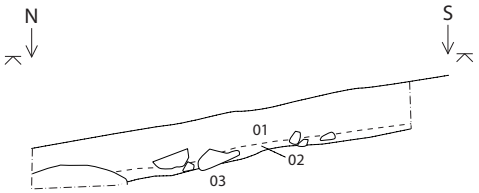


Figure 40. West facing section of TP140

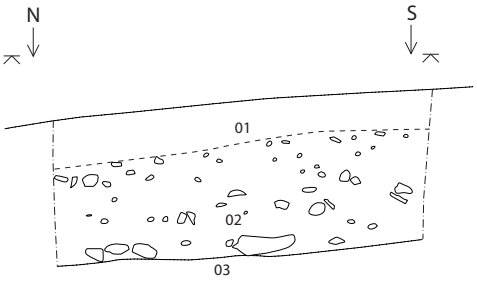


Figure 41. West facing section of TP148

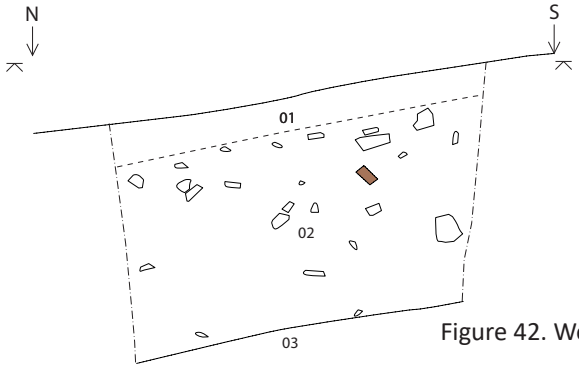


Figure 42. West facing section of TP143

Plate 51. Hearth deposit (12903) over loose, voided stone deposit (12902), from the east

Plate 52. North facing section of TP129

Plate 53. TP136 from the west

Plate 54. West facing section of TP138

Plate 55. West facing section of TP146

Plate 56. West facing section of TP137

Plate 57. Large stones in TP147, from the N

Plate 58. West facing section of TP145

Plate 59. West facing section of TP143

Plate 60. West facing section of TP151

Plate 61. North facing section of TP150

6984
6985
7394
7394
7393
7393
7392
7392
7391
7391
226m
227m
228m
229m
230m
231m
232m
233m
234m
235m
236m
237m
hawthorn trees
Tr 31
erosion terracing
PRN 67785
Key
Stone (accurately drawn)
Exposed scree (stylised representation)
Scree under bracken (stylised representation)
Axe-working flake or stone with flakes removed
Granite pebbles
Upstanding wall
Contours (0.5m intervals)
Trench dug in 2021
N
0
5m
SH
6984
6985

Figure 43. Location of evaluation trench 31

Figure 44. Orthomosaic of trench 31 at end of excavation showing sondage on north-east side

Further north there was no scree. TPs 143 and 148 had a significant quantity of axe debris but there was very little further north and north-east. In TPs 134, 135, 141, 142, 144, 145, and 148 the ploughsoil was between 0.14m and 0.34m thick with little or no stones from the scree and few flakes (Figure 41, Plate 58). TP143 had a deeper deposit of ploughsoil (0.51m) and a significant number of axe flakes (Figure 42, Plate 59). Some of this deposit is probably ancient ploughsoil or colluvium filling a hollow in the natural topography and this movement of soil has probably brought axe debris into this area from upslope to the south.

In Cae Uchaf, to the north, the steep slope, covered further south in scree, continues. To test whether there was still scree on this slope TP151 was dug. This showed a build-up of 0.60m of topsoil and colluvium over fractured mudstone (Plate 60). The mudstone is the bedrock here and there was no trace of scree over the top of this. However, TP149 and TP150 at the base of the slope did show a loose scree deposit (0.23m and 0.30m thick) below the ploughsoil (Plate 61). Within this were axe flakes, with TP 150 producing 96 flakes and TP 149 had 137 flakes. This suggests that wherever the scree was found it was used. This scree is probably a tail of material coming down from scree on the main slope to the south of the track.

Three roughouts were recovered, all from test pits that produced large quantities of axe debris, emphasising the focus of axe-making activity near the southern boundary of the field. Casually retouched tools were also found in this area. TP138 produced an object made of Group VII stone which appeared to have flakes taken off from various angles as if trying to create a roughly spherical shape (see Figure 48 (SF138.03)). George Smith did not think that this was done in a way suggestive of it being a core, so it may have been to deliberately shape the stone. This test pit also contained a few blades (flakes at least twice as long as wide). It is unclear if these were being deliberately produced as blanks for tools.

Evaluation trench

The evaluation trench provided a view through the scree beyond the area of agricultural disturbance (Figure 43). Most of the scree was removed, recovering the axe debris within it, but there was not sufficient time to fully excavate layer 3103. A sondage was dug against the north-east side of the trench to investigate lower deposits (Figure 44, Plates 62 and 63). The scree proved to be a maximum of 0.40m deep, accounting for layers 3101, 3102 and 3103, which were arbitrary spits through the scree (Figure 45, Plate 64). The area investigated was on a fairly steep slope of about 30 degrees and there was evidence of scree movement down this slope as there was a tendency for larger items to collect lower down (Plate 65). However, this sorting was not entirely consistent as larger pieces were also found higher up the slope and it is possible that much of the movement could be accounted for by people turning over the scree looking for good pieces rather than the whole body of scree moving down the slope causing general sorting. Localised disturbance of the screes during the Neolithic period was also suggested by the distribution of flakes. When the surface of the scree was exposed in 2021 a concentration of small flakes was found in the south-eastern corner of the trench (Figure 46). This appeared to be largely intact knapping debris. Larger flakes were recorded from lower down the trench. This upper layer represents the last knapping activity on the site and appeared to be undisturbed. Lower down in the scree such patterning was not found, with flakes fairly evenly distributed. There remained a general tendency for larger flakes to concentrate at the lower end of the trench but otherwise there were no specific concentrations. It is suggested that this is due to the disturbance of the scree in the Neolithic period causing movement of scree and flakes. Many flakes slipped down between the scree to collect just below the main body of scree, in the lower part of layer 3103.

Below the scree were colluvial or solifluction deposits that had probably formed at the end of the last ice age. There were few flakes within these deposits. Layer 3105 did produce a few flakes, but this was a very loose deposit and flakes had probably been introduced by root action or animal burrowing. Generally, the stones in these deposits were all orientated at the same angle of slope and the whole deposit appeared to have slipped downhill. Layers 3105 and 3107 had high proportions of shale pieces, with 3107 being largely composed of shale with little matrix. Deposit 3106 was firmer than the other deposits and sloped down much more steeply. It is possible that the steep slope was due to this slumping over a boulder but layer 3107 extended underneath 3106, and it may be that 3106 was a consolidated block of deposit slipping down slope together. The complex natural processes of slumping and probably freeze/thaw action make relationships between these deposits less easy to interpret than would be expected for anthropogenic deposits. The quantity of shale in 3107 suggests that

Figure 45. South-west facing section of evaluation trench 31

Plate 62. Trench 31 at completion of excavation showing sondage, from NW

Plate 63. SW facing section of trench 31 in sondage

the shale bedrock was not much further down, but the depth of the sondage made it unsafe to continue further excavation.

The trench therefore revealed solifluction deposits of late glacial or early post-glacial age over which the scree had slipped or fallen. This scree was extensively used as a source of stone for making axeheads, which were knapped directly where the source scree was collected. It appears likely that the search for suitable pieces of scree resulted in the screes being disturbed and turned over, so that only the latest knapping episodes might be expected to survive as intact knapping floors.

Overall, 19 pieces recorded as roughouts have been recovered from the evaluation trench, showing that there is a fairly high density of roughouts in the screes.

Summary of finds

Pieces of white quartz were collected in 2021 but all appeared to be natural, unworked stone. White quartz was therefore not collected in 2023 unless there was any suggestion of a piece being worked.

Finds from test pits

Table 3. Finds from Ty'n y Llwyfan Test Pits

Test Pit	Type of object	No of items	Total weight of items (g)
134	Axe debris	9	189
	Iron nail	1	4
135	Axe debris	110	3591
136	Axe debris	220	4456
137	Axe debris	818	26536
	Chert	1	15
	Burnt stone	1	94
138	Axe debris (including 1 roughout)	456	27709
	Possible hammerstones	2	1567
	Quartz	1	12
	Burnt stone	1	40
139	Axe debris	34	683
140	Axe debris	9	156
141	Axe debris	25	463
142	Axe debris	37	1611
	Post-medieval pot sherd	1	27
	Possibly worked stone	1	626
143	Axe debris	287	8792
	Possible hammerstones	2	511
	Post-medieval pot sherd	1	<1
	Iron object	1	17
144	Axe debris	5	165
	Iron objects	2	28
145	Axe debris	19	556
146	Axe debris (including 1 roughout)	447	24304
	Possible hammerstone	1	3362

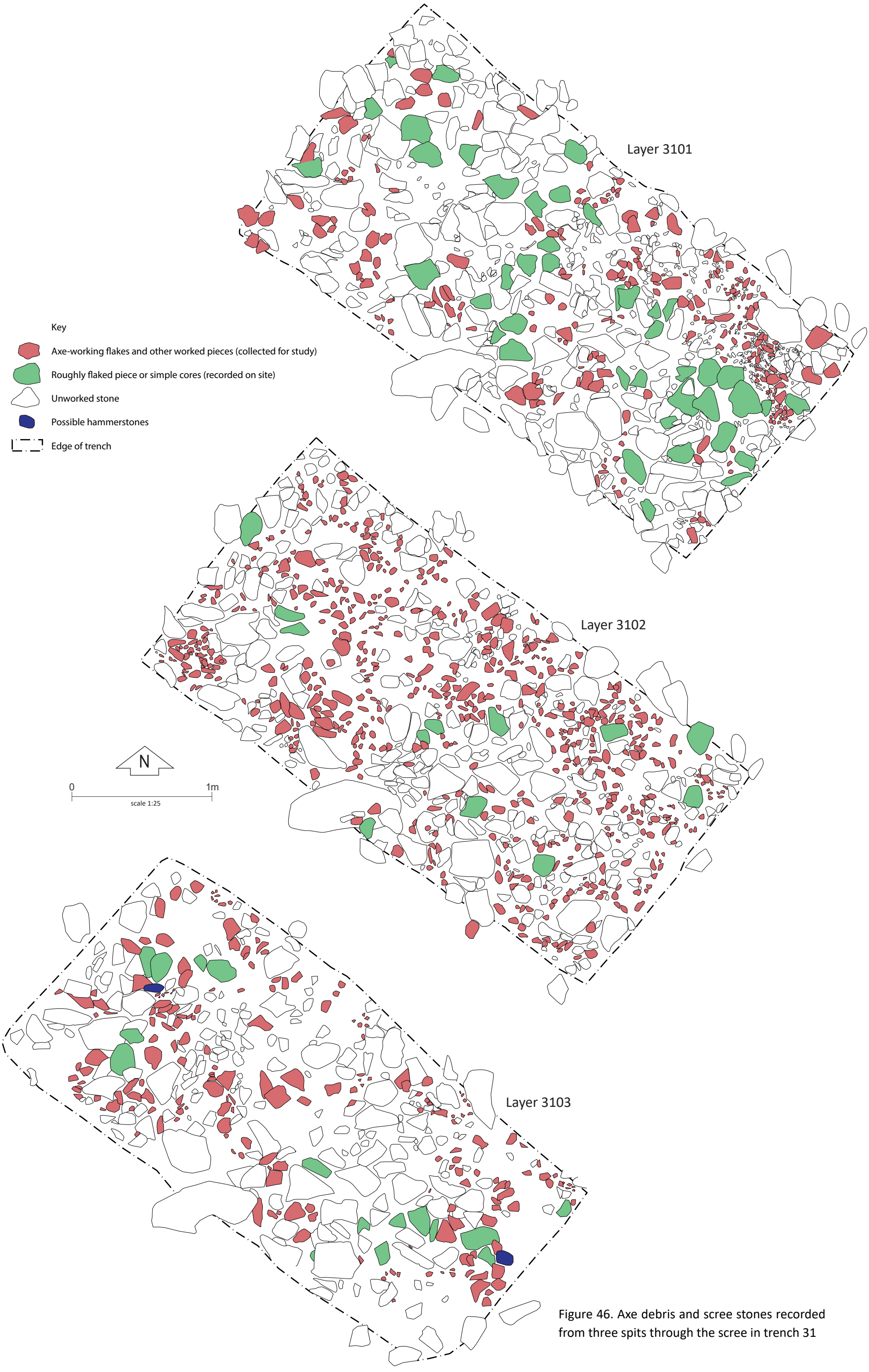


Figure 46. Axe debris and scree stones recorded from three spits through the scree in trench 31

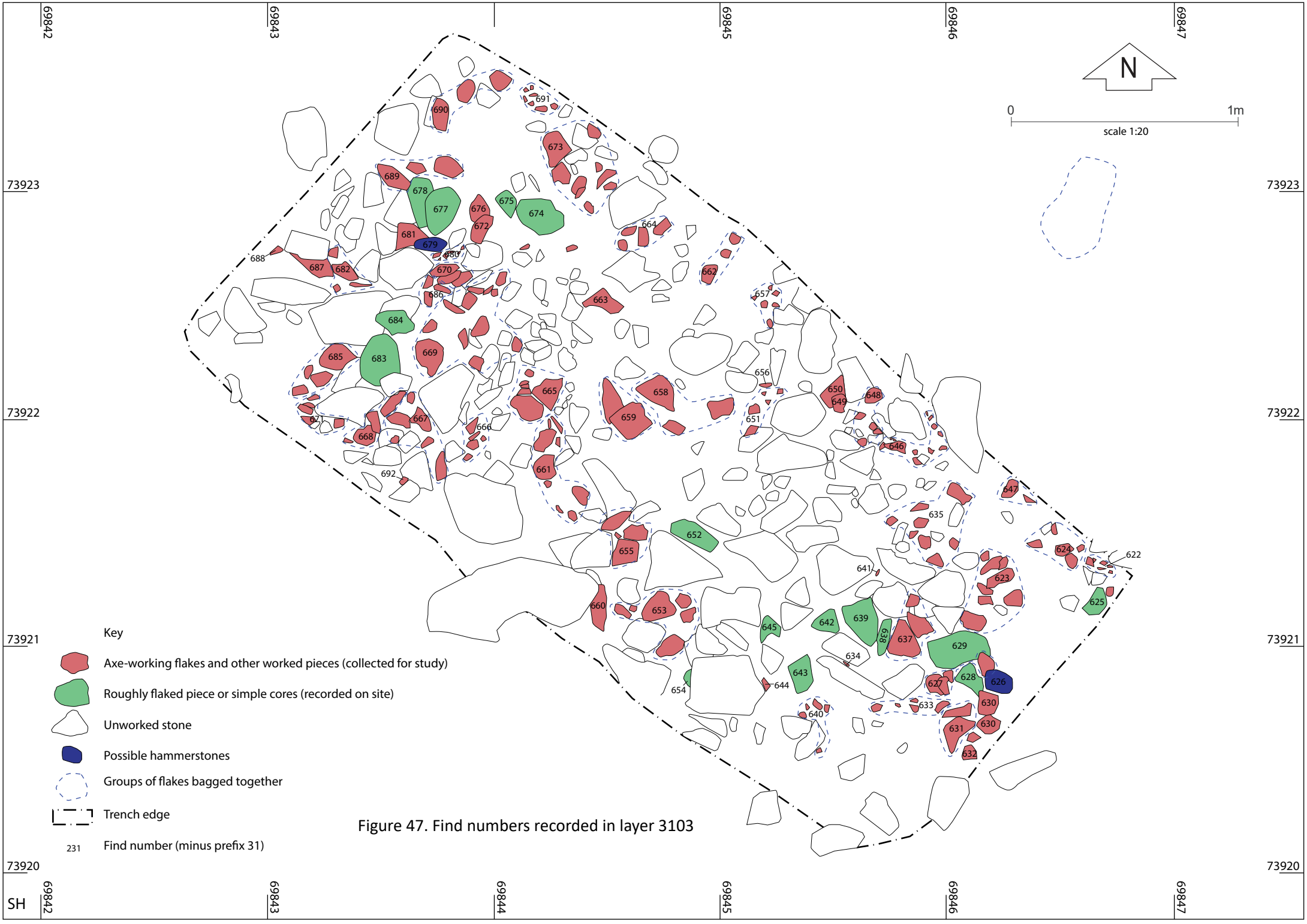


Figure 47. Find numbers recorded in layer 3103

Test Pit	Type of object	No of items	Total weight of items (g)
147	Axe debris (including 1 roughout)	230	15219
	Possible hammerstones	3	2820
148	Axe debris	268	3350
	Flint	1	<1
149	Axe debris	37	763
	Possible hammerstone	1	406
150	Axe debris	96	7256
	Possible hammerstones	2	1438
151	Axe debris	4	94
	Possible hammerstone	1	1590

Finds from evaluation trench (T31)

Table 4. Finds from Ty'n y Llwyfan Evaluation Trench (T31) from both 2021 and 2023, listed by layer

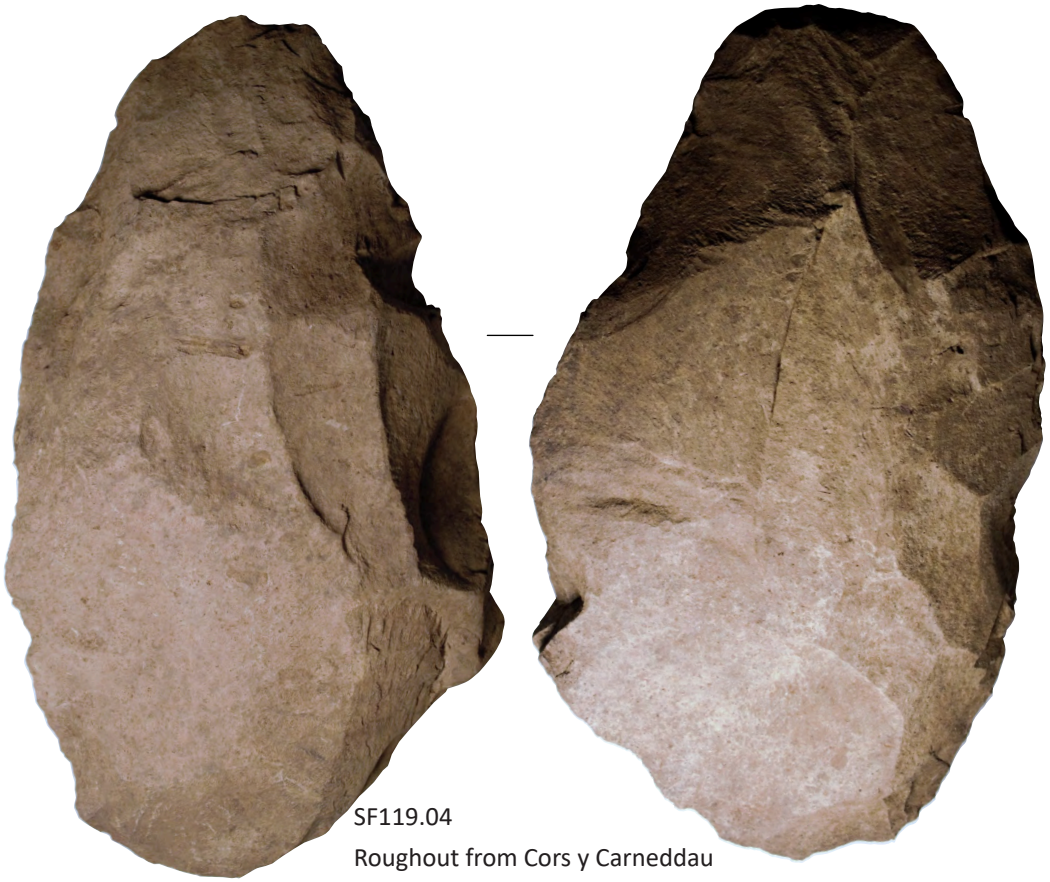
Layer	Type of object	No of items	Total weight of items (g)
3101	Axe debris (including 3 roughouts)	546	27263
3102	Axe debris (including 6 roughouts)	2276	242794
	Quartz	1	170
3103	Axe debris (including 10 roughouts)	2563	237004
3104	Axe debris	1	107
3105	Axe debris	7	534

3.4. Soil samples

Bulk soil samples were taken where charcoal was seen within sealed contexts that could provide dating evidence. The samples were collected in 10 litre tubs. A sample was taken from the small pit in the base of TP116, which may be of Neolithic date, and another sample was taken from the hearth deposit in TP129. This last deposit is not Neolithic but a date on charred remains would be useful in determining the date of the hearth and the building platform that it was deposited on. In both cases all the unmixed portion of the deposit was sampled, this gives less than 100% sample as the upper parts of the deposits and the edges of the pit had some mixing with other deposits.

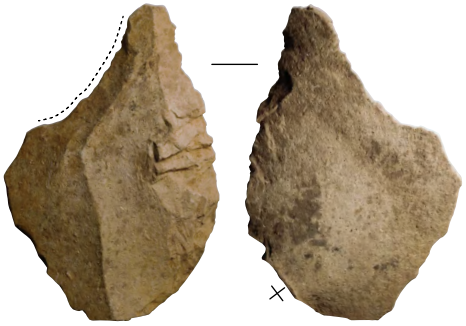
Table 5. Bulk soil samples taken in 2023

Test pit	Context	Quantity	Proportion of deposit sampled
116	11604	1.5 tubs	80%
129	12903	1.5 tubs	80%



SF119.04
Roughout from Cors y Carneddau

End scraper in SF117.04



Retouched tool in SF117.04

Serrated blade in SF117.04

Edge retouched knife? in SF104.02

SF116.04
Roughout from Garreg Fawr

Key
retouch
point of percussion
0 100mm
scale 1:2

Figure 48. Selected finds from the 2023 fieldwork

Object flaked from several directions SF138.03

4. LITHIC FINDS ASSESSMENT REPORT

By George Smith

4.1. Introduction

The work in 2023 consisted of test pitting in three areas, Garreg Fawr, Cors y Carneddau and Dinas, Ty'n Llwyfan. Cors y Carneddau is part of the Penmaenmawr outcrop, the largest of the microdiorite outcrops and the only one that has previously been investigated. The general aim of the project was to investigate these three areas of Neolithic stone axe-head production around three localised major outcrops of microdiorite. Exploitation of this rock took place for something in the order of a millennium and was the second largest source in Britain for the production of such axe heads, but how that was carried out within this wide landscape is not understood. This project aimed to provide answers as to where, how and perhaps when this production was carried out.

Two previous years' work comprised extensive test pitting at Dinas, Ty'n Llwyfan. That, and nearby surface collections, showed that axe-working debris was present very widely in the landscape. It also showed that there were some specific areas of high intensity manufacture that might be described as specialised knapping sites. However, the wider spread of material suggests a different type of activity such as occasional, non-specialised exploitation and production.

The three areas of outcrops are of very similar rock but one which is locally variable in quality and in topographical availability. The work provides a chance to compare the extent and types of working at these three rather different localities which might indicate different styles or periods of exploitation.

The work in 2023 involved excavation of 1m x 1m test pits, 14 at Garreg Fawr, 16 at Cors y Carneddau and 18 at Ty'n y Llwyfan (in an area there not investigated in previous years). Due to availability of time, and the large quantity of finds, a smaller proportion of test pit finds were assessed this year. This comprised all the test pit finds from Garreg Fawr (which produced fewer objects) and the finds from two of the most productive pits from each of Ty'n y Llwyfan and Cors y Carneddau. The general distribution of axe-head working material across all the test-pitted areas can be assessed from the numbers and weights of material recorded during the finds processing and presented in section 3 (above). The more detailed assessment here provides indications of the way that the rock was being exploited and processed and whether there were differences between the three areas. The assessment involved the discard of a few pieces that were identified as natural or recent so the total numbers of worked stone pieces from each pit are sometimes slightly less than initially recorded.

4.2. Assessment methods

The objects from each layer within each test pit were identified by basic type. All the debitage was of Graig Lwyd (Group VII) material and recorded according to basic types as Flake, Flake fragment, Irregular fragment, Core or core fragment. These were classified by size group, using maximum length: small, medium, large and extra-large. Other worked objects, such as axe-head roughouts were recorded individually and will be given individual find numbers. A few other objects were recorded, including retouched flake tools and pebbles or cobbles that might have been hammerstones and a few burnt stones.

4.3. Results

Group VII Debitage

The quantities and sizes of debitage pieces for all the test pits studied from all three areas are summarised in Table 6. The results from Garreg Fawr are informative in terms of areal distribution since the finds from all the pits were studied. The number of pieces from most of the pits were quite small except for two pits, 116 and 117 at the south-west end of the area while the test pits further to the north-east produced fewer and fewer pieces. The number of finds from pits other than 116 and 117 are comparable to those from previous work on the lower slopes at Ty'n y Llwyfan, where numbers reduced further away from the exposed scree. It seems that the area of axe working here was more restricted than had been found at Ty'n y Llwyfan in previous years. Observation of the exposed outcrop showed that this was probably because the best quality raw material was itself restricted in area.

The test pits chosen for more detailed study from Cors y Carneddau and Ty'n y Llwyfan were those that produced larger quantities of flaking material. In that respect they may not be representative of the whole. However, the total numbers for all the pits were recorded during finds processing. At Cors y Carneddau there were relatively high counts from all pits (See Table 2), indicating that it was a more widespread area and one of more intensive or repeated activity than Garreg Fawr. Two test pits, of which one, pit 127, was assessed, produced exceptional quantities of debitage suggesting they were part of areas of repeated knapping, perhaps multiple axe-head production.

At Ty'n y Llwyfan, test pits were excavated in two fields somewhat lower down the slope than those investigated in previous years, but still quite close to the steeper scree-covered slopes. Here the pits furthest up slope produced substantial numbers of debitage pieces and unexpectedly showed greater depths of deposits. This appeared to result from some kind of terracing on the slope but meant that some of this lithic material is the best stratified of that so far found.

Table 6. Summary of numbers of items in length classes of Graig Lwyd flaking debitage from studied pits

Garreg Fawr	***Graig Lwyd (Group VII) debitage***				
Pit no.	*Total*	*0-50mm*	*51-100mm*	*101-150mm*	*Over 150mm*
104	78	54	19	5	-
105	24	17	6	1	-
106	53	43	10	-	-
107	76	51	25	-	-
108	52	37	15	-	-
109	5	2	3	-	-
110	6	3	3	-	-
111	16	7	8	1	-
112	1	1	-	-	-
113	3	2	1	-	-
114	1	1	-	-	-
115	32	24	7	1	-
116	155	98	41	16	-
117	205	115	76	14	-
Cors y Carneddau					
Pit no.	*Total*	*0-50mm*	*51-100mm*	*101-150mm*	*Over 150mm*
127	590	291	219	69	11
129	111	37	52	22	-
Ty'n y Llwyfan					
Pit no.	*Total*	*0-50mm*	*51-100mm*	*101-150mm*	*Over 150mm*
137	823	514	290	19	-
146	465	333	111	21	-

The debitage was divided into size classes to provide a possible view into the production process within the time available. These can be regarded as representing stages in the axe-head manufacture and can be compared to the three stages of axe manufacture suggested by Hazzledine Warren (Warren 1922, 13).

The length classes can be approximately described as follows –
Over 150mm, (XL) very large primary pieces, large flakes or fragments that could be attempts at creating blanks, large enough to reduce to an axe shape.
101-150mm, (L) large flakes produced by rough initial reduction of a blank.
51-100mm, (m) mostly broad, thick, heavily struck flakes, occasionally blades, from initial shaping of an axe shape.

0-50mm, (sm) small, thin flakes from final axe rough-out shaping. These are mostly broad and some exhibit curving and or twisting profiles deriving from final bifacial axe shaping. This is a key feature and if present shows that axe-heads were being produced to a late, possibly finished stage.

Variations in proportions of the size classes within each, as shown by percentage is shown in Table 7.

Table 7. Summary of length classes of Graig Lwyd flaking debitage by percentage from studied pits plus main features present - • Axe roughout/frag/reject; o Curved/twisted flakes; + Retouched or Possible retouched flakes

Garreg Fawr			***Graig Lwyd (Group VII) debitage***				
Pit no.		*Other objects present*	*Total*	*0-50mm*	*51-100mm*	*101-150mm*	*Over 150mm*
104		+	78	69	24	6	-
105			24	71	25	4	-
106			53	81	19	-	-
107			76	67	33	-	-
108			52	71	29	-	-
109			5	40	60	-	-
110			6	50	50	-	-
111			16	44	50	6	-
112			1	100	-	-	-
113			3	67	33	-	-
114			1	100	-	-	-
115		+	32	75	22	3	-
116		• +	155	63	26	10	-
117		o +	205	56	37	7	-
Cors y Carneddau							
Pit no.		*Other objects present*	*Total*	*0-50mm*	*51-100mm*	*101-150mm*	*Over 150mm*
127		• o +	590	49	37	12	2
129		o +	111	33	47	20	-
Ty'n y Llwyfan							
Pit no.		*Other objects present*	*Total*	*0-50mm*	*51-100mm*	*101-150mm*	*Over 150mm*
137		o +	823	62	35	2	-
146		• o +	465	72	24	4	-

The variations in proportions within size classes can be regarded as showing what stages of manufacture are present, whether just initial shaping or the whole sequence to finished object. In fact, it seems likely that the complete sequence from blank to finished object was normal. Excepting the pits with very few pieces of debitage, the percentage divisions provide a more useful picture of the flaking process with around one third of the total devoted to preliminary work and the rest to final shaping. There is likely to be some variation in debitage between areas that used mainly scree pieces, which could be selected to be a ready-made useable size and shape and areas that used material quarried from the rock face. For instance, that could explain the differences in proportions of size classes between Ty'n y Llwyfan and Cors y Carneddau with the latter having higher proportions of larger pieces. Cors-y Carneddau seems to have used mostly quarried rock while Ty'n y Llwyfan used 'ready-made' scree pieces.

Table 8. Proportion of complete flakes within each size class (shaded) from the main test pit assemblages

	Sm			M			L			XL		
Garreg Fawr	No.	Total	%	No.	Total	%	No.	Total	%	No.	Total	%
Pit 116	16	98	16	21	41	51	11	16	69	-		
Pit 117	32	115	28	51	76	67	10	14	71	-		
Cors y Carneddau												
Pit 127	83	291	29	133	219	61	44	69	64	8	11	73
Pit 129	7	37	19	25	52	48	10	22	45	-		
Ty'n y Llwyfan												
Pit 137	104	514	20	172	290	59	16	19	84	-		
Pit 146	81	333	24	37	111	33	9	21	43	-		

A more refined view would be possible if all the pieces were individually measured as for flint and chert lithic analysis for flake measurement where flake proportions have some diagnostic possibilities of techniques and period. It is clear, however, that there had been much breakage due to trampling and there were relatively few complete flakes as shown in Table 8. The smallest proportion of complete flakes were those in the small size class, being the least likely to survive, because they were relatively thin. There must also have been variations between the amount of trampling and breakage in different areas and as can be seen in pits 117 and 127, both had higher proportions of complete small and medium sized flakes.

Axe roughout evidence

Despite the large amount of debitage recorded and the fact that eight pits produced curving flakes that signify bifacial working, only three axe roughout related objects were found in the pits represented here. The one from Garreg Fawr was the broken half of a nearly complete axe which must have been rejected because it had a twist that was impossible to correct (Figure 48, SF116.04). It may then have been deliberately broken in half. The one from Cors y Carneddau was a partially worked example, a large thick flake with some bifacial flaking. The one from Ty'n y Llwyfan was a possible axe-making practice piece. It is a large, thick flake with some invasive secondary flaking on the dorsal face only. Over-all it seems that the axe-making process did not produce many rejects. Medium sized flakes are mostly flat and not part of the actual shaping process. Two pits, 106 and 137 produced many flakes smaller than 25mm in length, indicating a greater emphasis there on final shaping than the norm. That size class was not individually recorded here due to time. However, it is the smaller flakes that are closest to the finished object so while the whole range of sizes of debitage shows how the reduction process worked it is the smaller flakes that should produce evidence of how the shaping was carried out. This can be compared to the facets found on some of the complete flaked axes found in this general area (Williams 2000). Understanding of the flaking process can be understood better by carrying out a number of controlled axe-making events with detailed recording of the products and their comparison with some of the excavated material.

Flake tools

A number of retouched tools or possible retouched tools made from flakes of Group VII microdiorite were found amongst the debitage of ten pits (Table 7, Figure 48). The presence of such tools in this area was first recorded during excavations at Graig Lwyd, Penmaenmawr by Warren (1922, 26-8). More recently, worked flakes were found in surface material, along with axe-head roughouts near Dinas, Ty'n y Llwyfan (Davies 1961, 3). Seven retouched pieces were also found during test pitting as part of the present project at Maes y Bryn, on the north side of the hill of Dinas (Kenney and Smith 2022). These included four very neatly produced end scrapers. Other retouched flake tools of Group VII material have been found further afield, for instance at the Neolithic settlement area at Bryn yr Hen Bobl, Anglesey. Their presence there was suggested to show that the stone was available there because Graig Lwyd axe heads were being imported for final finishing, as shown by the presence of an axe-head grinding stone (Lynch 1991, 106-8). The use of rocks other than flint for flake-based tools is one that needs more study in an area where local flint was available only as small and poor-quality pebbles.

The pieces found during the present project included a few obviously retouched pieces of regular form. Others have more with casual retouch that may have been deliberate, which was recorded where the secondary edge

flaking was unifacial, regular and continuous as opposed to bifacial, irregular and discontinuous, which is more likely to result from trample damage. These are summarised in Table 9.

Table 9. Retouched (rp) and casually retouched (crp) objects of Graig Lwyd (Group VII) rock from test pits

Garreg Fawr	***Graig Lwyd (Group VII)***		
Pit no.	*Type*	*Length class*	*Description*
104	crp?	L	Scraper? Steep retouch on a convex edge (secondary use)
	rp	M	Edge retouched knife
110	crp?	L	Possible reject edge retouched knife or axe-head making practice piece
111	pol	M	Thick flake with small areas of abraded polish on centre of both faces
115	crp?	M	Casual trimming on distal end
116	crp?	L	Cutting tool
	crp?	M	Not specific
117	crp?	M	Piercer
	Rp	L	Serrated blade
	rpf	M	End scraper on a blade
Cors y Carneddau			
Pit no.			
127	natural?	SM	Piece with parallel ridges, probably of geological origin
	crp?	M	Cutting tool. Retouched on a sharp, straight edge
	crp?	L	Possibly deliberate secondary edge flaking
	crp?	L	Possibly deliberate secondary edge flaking
	crp?	L	Possibly deliberate secondary edge flaking
129	crp?	L	Secondary flaking on a large chunk. Possibly an axe-head making practice piece
Ty'n y Llwyfan			
Pit no.			
137	rp	SM	Cutting tool. Regular, continuous retouch on a chance sharp edge
	crp?	SM	Cutting tool.
	crp?	M	Cutting tool.
	crp?	SM	Not specific
	crp?	SM	Not specific
	crp?	SM	Not specific
146	crp?	SM	Not specific

Identification is much less secure than would be the case if the objects were made from flint or chert because here the stone used is subject to surface dissolution. The majority of the pieces recovered are quite deeply weathered so although retouch is still visible any use wear that might be present on casually retouched pieces is no longer present. There is also the problem of damage from trampling demonstrated by the predominance of flake fragments over complete flakes (Table 8). A few of the deeper pits had better preservation lower in the deposits and these might be more informative. Also, at Cors y Carneddau at least two phases of working were present as shown by quite different degrees of weathering and in one case, from Pit 129, by obvious re-working of an earlier, much weathered flake. The degree of weathering must result from solution from acid rainfall/ground water and found similarly in all three areas. However, at the Maes y Bryn study area, where the deposits were shallower, the carefully retouched flake tools were in relatively fresh, unweathered condition (Kenney and Smith 2022). Whether that is because the soils there were less acidic or because the activity was of a much more recent period is one that needs to be explained.

The casually retouched pieces were probably *ad hoc* tools, made for use on-site but the more considered, retouched tools would have been made to keep and use elsewhere.

Objects of rocks other Graig Lwyd (Group VII)

Occasional pebbles and cobbles of rocks of quartzite, coarse igneous, conglomerate and sandstone were encountered. It was expected that hammerstones would be found as the splitting of larger rock fragments would have required heavy blows, even if all the subsequent shaping was carried out with antler hammers. Large, battered beach pebbles and boulders were reported to have been found at the early Graig Lwyd excavations (RCAHMW 1964, xlv). Similar material was found during a more recent re-excavation of some of Warren's trenches, but with no confirmation of features that would show if they were hammerstones or just chance pieces from the glacial drift (Williams and Davidson 1998, 13). Hammerstones have been found at the Langdale axe 'factory' in the Lake District and have been the subject of petrological study (Bradley and Suthern 1990), but their physical character was not studied, and no examples were illustrated. Modern replicated manufacture of axe-heads from Graig Lwyd stone using stone pebbles as hammerstones produces distinctive worn facets on the pebbles (Dilley, pers. com.). None the less, of the nine larger pebbles retained and studied as part of the present project, all but one lacked any signs of hammering in the form of battering or worn facets. The exception was a cobble over 150mm long of a coarse conglomerate from Pit 129 at Cors y Carneddau. This has one flat end facet, but this was not regular enough nature to have convincingly shown that it had been created artificially. Suitably sized pebbles and cobbles were also found in previous years' work as part of the present project but none with any pecked or worn hammering facets, so the absence of identifiable hammerstones is so far unexplained. Even if pebbles of a suitable hard rock for flaking were prized objects, curated along with the finished axes and not discarded on site, occasional fragments of broken ones should be present. Initial quarrying or breaking of large pieces of scree would also have required heavy impact by large hammerstones that would be more likely to have been left on site.

5. DISCUSSION

Garreg Fawr

On Garreg Fawr it appears that there were discrete, fairly small areas of axe working. The open screes to the north were an area of working (PRN 67328). Axe flakes can be seen eroding out of the turf uphill of the open screes but the amount of gorse in this area and the steepness of the slopes meant that test pitting would be difficult here and the extent of this area has not been tested. Between this area and the main crag, although some scree can be seen on the surface, it appears that there is no suitable stone and axe working did not take place. Even at the northern end of the crags the stone was not suitable and axe working is only present southwards from the middle of the crags. This working was mainly concentrated close to the deeper screes at the foot of the crags. It did extend at least 43m down the slope from the edge of the scree visible on the ground surface, but the quantity of axe debris reduces with the distance down the slope. How much further down the slope axe debris can be found has not yet been tested but the lack of scree in the lower test pits suggests that the working probably does not continue much further. The main focus of the activity was probably under the sheepfold and further south. Some of the stone in this area seems to be very good quality and there was a tendency to produce flat roughouts, possibly made on a large flake.

The lack of ploughing in this area means that there is a better chance of dug features surviving here than in some of the other areas investigated and this was proved by finding a small pit in TP116. Disturbance of the Neolithic deposits has occurred in some part of this area such as where the enclosure under the sheepfold has mixed axe debris into soil that built-up inside the enclosure or was moved to level the area. Quarrying of the crag has also caused loss of the original crag face in the area of the best stone, so possibly removing some evidence for removal of stone from the crag. The quarry waste has also hidden probably worked screes. However, there are areas of scree to the south of the crags that appear to have been worked and there is scree on the top of Garreg Fawr, and it would be interesting to see if this was also used.

The pit, if it proves to be Neolithic in date, along with retouched tools, including a scraper suggest activities other than axe making were taking place in this area. These activities could have been related to the axe making,

such as production of food to feed the axe makers. However, the scraper, as a typically domestic tool, does hint that there may have been occupation in this area.

Cors y Carneddau

Test pitting on Cors y Carneddau has demonstrated that stone from the southern slopes of the Graig Lwyd ridge was also used for axe-making. Even though no scree is visible on the surface today a thin layer of scree exists below the turf across most of the upper part of this slope, though between the Graig Lwyd and Clip yr Orsedd ridges the scree is not of a type of stone suitable for axe-making. In places the depth of scree was much greater, and this seems to have been particularly targeted, though axe-working had taken place everywhere that there was suitable scree. Although the hill slope has probably never been ploughed some of the axe debris may have moved down slope where the surface was exposed through tree throws or erosion, but in many cases the axe debris is found amongst large scree pieces that have probably not moved significantly since they were produced at the end of the ice age. In some places however the scree did appear to be disturbed by Neolithic activity, with a suggestion of the removal of some large pieces in a search for suitable pieces for roughouts. It must be assumed that in the Neolithic period all this scree was exposed, allowing it to be used as a stone source, as there was no evidence of pits being dug to access it.

None of the test pits produced the density of flakes suggested by Hazzledine Warren's description of a knapping floor near the large cairn. As this area is within the scheduled area it was avoided by the test pits, but the results may suggest that the densest and least disturbed areas of working might be found here. However, the density of gorse on the lower slopes meant that much of the hillside at the same level as the cairn was not investigated and dense working might be spread more extensively on this lower slope. The finds of flakes from the path also suggests working down the slope.

It is possible that some stone may have been removed directly from the bedrock by prising small blocks out or striking flakes from protruding outcrops, though the test pits did not provide indisputable evidence of this. Scree was again the main source of stone, and it was extensively exploited. TPs 129 and 131 showed that there was axe-making from scree below Clip yr Orsedd, but the current work could not explore far along this area. Future test pitting might be used to determine how far working extends to the west. Axe flakes found on the path suggest that working did continue to the west.

Ty'n y Llwyfan

The concentration of axe-making activity in the northern part of Cae Graig continues into the southern part of Cae Bach along with significant scree deposits. Where scree deposits do not exist over the rest of the field there is much less evidence for axe working. The test pits in this area have found a clear limit to the area of working, though TP149 and 150 do suggest that other small areas of working might be present where there were small pockets of scree. This year's work suggests a concentration of activity in the very northern part of Cae Graig and the southern part of Cae Bach, which is separate from the main concentration in Cae Graig along the upper lynchet (Figure 33). Possibly this is due to the movement of axe debris down the slope with ploughsoil, with some moving to the north and some to the west from an activity area somewhere around TP99. The material that moved west has become concentrated in the lynchet. However, it is possible that these two concentrations do represent separate original foci of activity, and especially in the northern area the debris has not moved so far.

Artefacts

Work this year, as well as during previous years, has shown that there are relatively few roughouts for the quantity of axe debris recovered. This suggests that knapping was efficient, with scree carefully chosen so that failures were few. Increasing familiarity with the material has led to more retouched pieces being identified and a reassessment of finds from the earlier work would probably increase the number of retouched pieces identified. Most of these are casually retouched pieces, possibly used for activities taking place during while axe-production is being undertaken. However, the scrapers recovered indicate more formal tools, possibly for use elsewhere. The identification of stones used as hammerstones is still proving difficult as few working facets are seen. In some cases, this is due to the hardness of the stone meaning that only slight facets were produced and also from the loss of surfaces due to weathering. Without facets visible it is difficult to prove which stones were used, even when some may seem to have been suitable as hammerstones.

6. FURTHER WORK

There is much further work that could be done within this landscape. On Garreg Fawr the southern extent of the working area has not been defined and it is suspected that there may be suitable screes and therefore working on the summit of the hill. The extent of the working to the north-west of Dinas has been fairly well explored but the extent of working or even suitable stone along the open screes on the steep slopes on the west, south and south-eastern sides of the hill needs to be established. Occasional flakes have been found in molehills in the Iron Age fields east of Dinas and test pitting or even a thorough molehill survey here could define the area of activity on this side. The results from Maes y Bryn suggest that a very extensive area away from the source screes was also used for axe production as well as settlement.

More test pitting would be needed to establish whether there is suitable stone and therefore axe production along Clip yr Orsedd, as appears likely and how far this extends along the south-western side of the volcanic intrusion. While there are screes above Blaen Llwyn Farm there are areas that do not appear to have suitable rock exposures and there may be large gaps in activity until the extensive site on Ffridd Tan y Graig is reached.

Waun Llanfair has a high potential for Neolithic settlement and axe-making sites away from the sources. Finding there will not be easy but explorative test pitting might reveal evidence. Areas that have already produced roughouts or flakes could be targeted. The drier land and sheltered hollows around Bryniau Bugeilydd might be a potential location for settlement. Inspecting areas of erosion, especially along the streams, could reveal axe debris or other locations that appear topographically suitable for settlement. It is possible that somewhere around or within Waun Llanfair grinding and polishing of axeheads was taking place and the identification of polissoirs is a possibility.

The study of the assemblages produced by this project has the potential to add considerably to the knowledge of how the working was carried out and the type of objects that were being produced. Comparisons will be possible between several source sites to determine if working in different locations has different characteristics.

7. COPYRIGHT

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APPENDIX I: LIST OF HER SITES AROUND LLANFAIRFECHAN AS SHOWN ON FIG 2

HER sites shown on Figure 2. Sites later than the medieval period are not shown on this figure.

PRN	Site name	Period	Site type	NGR
248	Enclosed Hut Group, Carreg Fawr	Roman	Hut circle settlement	SH68527364
249	Enclosed Hut Group, Carreg Fawr	Roman	Hut circle settlement	SH68547311
250	Enclosure, Carreg Fawr	Roman	Hut circle settlement	SH68457335
251	Enclosure, Carreg Fawr	Roman	Hut circle	SH68717324
252	Hut Group and Field System, Pont y Teiryd	Prehistoric	Hut circle settlement	SH69527353
255	Hut Group, Gwern y Plas, Llanfairfechan	Roman	Hut circle settlement	SH68657484
373	Long Huts, Remains of, Nant y Pandy	Early medieval	Long hut	SH68867405
374	Hut Platform, South of Camarnaint	Medieval	Long hut	SH69647308
377	Cairn, Carreg Fawr	Unknown	Clearance cairn	SH68657355
378	Cairn, Carreg Fawr	Bronze age	Cairn	SH68427364
379	Cairn, Carreg Fawr	Unknown	Cairn	SH68387361
386	Arrow Stone, South-West of Camarnaint	Prehistoric	Arrow sharpening stone	SH69567315
392	Dinas Camp Hillfort, Llanfairfechan	Roman	Hillfort	SH70027379
457	Platform House, S of Llanfairfechan	Medieval	House platform	SH70107391
458	Long Huts, Waun Llanfair	Unknown	Long hut	SH70797458
465	Waun Llanfair Barrow, Llanfairfechan	Bronze age	Barrow	SH70527412
498	Hut Circle Settlement, Dinas Camp	Unknown	Hut circle settlement	SH70127394
553	Cairn, Clip yr Orsedd	Prehistoric	Cairn	SH70837483
554	Hut Circle, Clip yr Orsedd	Unknown	Hut circle	SH71037499
2491	Axe Heads, Findspot, Garreg Fawr	Prehistoric	Findspot	SH690735
4067	Field System, Carreg Fawr	Roman	Field system	SH685733
4075	Perforated Stone Axe Hammer, Findspot	Prehistoric	Findspot	SH699734
4078	Perforated Stone Axe Hammer, Findspot, Ty'n y Llwyfan	Prehistoric	Findspot	SH695741
4091	Stone Tool (Mace), Findspot, N of Dinas Fort	Prehistoric	Findspot	SH698743
4094	Graig Lwyd Roughout, Findspot, The Close, Llanfairfechan	Prehistoric	Findspot	SH68487482
4684	Hut Circle, Waun Llanfair	Roman	Hut circle	SH70917467
4685	Long Hut, Remains of, Waun Llanfair	Medieval	Long hut	SH70727460
4720	Axe-working site, Maes y Bryn, near Dinas	Neolithic	Findspot	SH705738
5416	Enclosures, Garreg Fawr	Unknown	Enclosure	SH69407315
5417	Terraces, Garreg Fawr	Unknown	Terraced ground	SH69557330
5419	Long Hut, Garreg Fawr	Unknown; medieval	Settlement; long hut	SH69657334
5420	Cultivation Terraces, Garreg Fawr	Unknown;	Terraced ground;	SH69637345

PRN	Site name	Period	Site type	NGR
		medieval	cultivation terrace	
5473	Enclosed Hut Group, Ffridd Forfudd	Unknown	Hut circle settlement	SH70287329
7444	Enclosure, SE of Gwyllt Road	Unknown	Enclosure	SH68477341
7460	Possible Long Hut, Garreg Fawr	Medieval	Long hut	SH68437345
7461	Hut Circle, Possible, Near Garreg Fawr	Roman	Hut circle	SH68427336
7462	Enclosure, Near Gwyllt Cottages	Unknown	Enclosure	SH68347335
7463	Circular Enclosure or Hut, W of Garreg Fawr	Unknown	Circular enclosure; hut circle	SH68367317
7464	Hut Circle, Near Garreg Fawr	Roman	Hut circle	SH68407319
7466	Sub-Circular Enclosure, Near Garreg Fawr	Unknown	Enclosure	SH68547322
7467	Rectangular Enclosure, Near Garreg Fawr	Unknown	Enclosure	SH68467320
7468	Cairn, Possible, Near, Garreg Fawr	Unknown	Cairn	SH68437316
7469	Enclosures, Near Garreg Fawr	Unknown	Enclosure	SH68467316
7470	Enclosure, Near Garreg Fawr	Unknown	Enclosure	SH68507314
7472	Oval Enclosure, Near Garreg Fawr	Unknown	Enclosure	SH68777311
8007	Hut Circle, W of Clip yr Orsedd	Prehistoric	Hut circle	SH70537491
8008	Poss. Hut Circle, W of Clip Yr Orsedd	Prehistoric	Hut circle	SH70497493
8009	Enclosures, W of Clip yr Orsedd	Unknown	Enclosure	SH70787486
8010	Hafods, W of Clip yr Orsedd	Unknown; medieval	Structure; hafod	SH70927472
8012	Cultivation Ridges, SW of Clip yr Orsedd	Unknown	Ridge and furrow	SH70647469
8013	Possible Hut Circle, Waun Llanfair	Prehistoric	Hut circle	SH70807463
8015	Field Boundary, SE of Blaen Llwyn	Unknown	Field boundary	SH70377465
8016	Oval Enclosure, Blaen Llwyn	Unknown	Enclosure	SH70307467
8018	Former Field Boundary, Nr Waun Llanfair	Unknown	Field boundary	SH70547460
8020	Field Boundary, Near Waun Llanfair	Unknown	Field boundary	SH70267442
8022	Hut Circle and Enclosure, N of Waen	Prehistoric	Hut circle	SH70107438
8023	Sheep Shelter, Waun Llanfair	Prehistoric; post medieval	Hut circle; sheep shelter	SH70787434
8026	Field Boundaries, Llanfairfechan	Unknown	Field boundary	SH70397433
8027	Hut Circle, N of Dinas Hillfort	Unknown	Hut circle	SH70317426
8028	Circular Enclosure, N of Dinas Hillfort	Unknown	Enclosure	SH70317418
8029	Field Clearance Cairns, Possible, North-East of Dinas	Unknown	Clearance cairn	SH70257425
8030	Field Boundary/Holloway, NE of Dinas	Unknown	Earthwork	SH70187423
8031	Hut Circle and Enclosure, NE of Dinas	Prehistoric	Hut circle	SH70157403
8032	Hut Circle, NE of Dinas	Prehistoric	Hut circle	SH70137398
8033	Hut Circle, Near Dinas Hillfort	Prehistoric	Hut circle	SH70087394
8034	Area of Cultivation, E of Dinas	Unknown	Cultivation ridge	SH70137388

PRN	Site name	Period	Site type	NGR
	Hillfort			
8035	Hut Circle, SE of Dinas Hillfort	Prehistoric	Hut circle	SH70147377
8036	Long Hut, Possible, SE of Dinas Hillfort	Unknown; medieval	Structure; long hut	SH70187381
8037	Hut Circle, Possible, East of Dinas Hillfort	Prehistoric	Hut circle	SH70217394
8038	Long Hut, E of Dinas Hillfort	Medieval	Long hut	SH70327390
8039	Area of Cultivation, E of Dinas Hillfort	Medieval	Field system	SH70457386
8040	Long Hut/Platform House, E of Dinas Hillfort	Medieval	Long hut	SH70477380
8041	Circular Enclosure, E of Dinas Hillfort	Unknown	Enclosure	SH70427376
8046	Possible Hut Group, W of Ffridd Forfudd	Prehistoric	Hut circle settlement	SH70087342
8047	Field System, W of Ffridd Forfudd	Unknown	Field system	SH70257354
8048	Platform, W of Ffridd Forfudd	Bronze age; unknown	Burnt mound; platform	SH70217348
8049	Circular Enclosure, W of Ffridd Forfudd	Unknown	Enclosure	SH70247339
8054	Possible Hut Group, N of Ffridd Fadog	Prehistoric	Hut circle settlement	SH70027325
8055	Cultivation Terraces, Ffridd Fadog	Unknown	Cultivation terrace	SH70087318
8066	Burnt Mound, Ffridd Forfudd	Bronze age; unknown	Burnt mound; natural feature	SH70677316
8070	Possible Burnt Mound, E of Maes y Bryn	Bronze age; unknown	Burnt mound; natural feature	SH71167369
8092	Enclosure, S of Clip yr Orsedd	Unknown; medieval	Feature; enclosure	SH71037447
8102	Burnt Mounds, Possible, Near Waun Llanfair	Bronze age	Burnt mound	SH70657451
8103	Burnt Mound, Near Waun Llanfair	Bronze age	Burnt mound	SH70677446
19156	Stone Axe Fragment, Findspot, Llanfairfechan	Neolithic	Findspot	SH70027440
24139	Graig Lwyd Roughouts, Findspot, Blaenau	Neolithic	Findspot	SH702742
24725	Graig Lwyd Axe, Findspot, Llanfairfechan	Neolithic	Findspot	SH7037774076
24735	Stone Axes, Findspot, Garreg Fawr	Neolithic	Findspot	SH6905073578
27502	Cup Marked Stone, Camarnaint	Prehistoric	Cup marked stone	SH69397308
31690	Hut Circle, Possible, Tyddyn Drain	Roman	Hut circle	SH68907483
59873	Field system, Garreg Fawr	Prehistoric; medieval	Field system	SH685734
67328	Stone Axe Working Area, Garreg Fawr, Llanfairfechan	Neolithic	Stone axe factory	SH69067359
67329	Stone Axe Working Area, Ty'n y Llwyfan, Llanfairfechan	Neolithic	Stone axe factory	SH6984573975
67331	Stone axe found at foot of Dinas, Llanfairfechan	Neolithic	Findspot	SH6984973978

PRN	Site name	Period	Site type	NGR
67334	Barrow, Ty'n-Y-Llwyfan	Bronze age	Barrow	SH69667401
67406	Axe-working flakes, Pen Cefn	Neolithic	Findspot	SH7092474352
67409	Axe working site, Waun Llanfair	Neolithic	Stone axe factory	SH708742
67414	Stone axe findspot, Llanfairfechan	Neolithic	Findspot	SH6855474268
67640	Stone axe roughout, Ty'n y Llwyfan	Neolithic	Findspot	SH69787387
67641	Stone axe roughout, Tyddyn Drain	Neolithic	Findspot	SH68877478
67778	Stone axe roughout, Dinas	Neolithic	Findspot	SH7074
67779	Stone axe roughout, Llanfairfechan	Neolithic	Findspot	SH684747
67782	Stone axe-hammer, Park Nant, Llanfairfechan	Bronze age	Findspot	SH6874074277
74826	Stone Axe Roughout, Findspot, Dinas	Neolithic	Findspot	SH6978073858
77204	Ditch, Llanfairfechan	Early medieval	Ditch	SH6967673953
77205	Ditch, Llanfairfechan	Roman	Ditch	SH6967873958
77206	Pit, Llanfairfechan	Roman	Pit	SH6968273964
77207	Gully, Llanfairfechan	Roman	Ditch	SH6968473965
77208	Pit, Llanfairfechan	Roman	Pit	SH6968573966
81634	Stone Axe Working Area, Ty'n y Llwyfan Farm	Neolithic	Findspot	SH697739
92341	Axe Roughout, Findspot, Garreg Fawr	Neolithic	Findspot	SH69077360
93577	Worked Stone Assemblage, Findspot, Llanfairfechan	Prehistoric	Findspot	SH6966673944
96143	Axe-working flakes, Ty'n y Llwyfan Farm	Neolithic	Findspot	SH7674873826
96702	Roughout, Findspot, Nant y Coed	Neolithic	Findspot	SH6978073737
100569	Feature composed of stone and axe debris, Ty'n y Llwyfan Farm	Neolithic	Stone working site	SH6977973950
100575	Stone Axe Working Area, Ty'n y Llwyfan Farm	Neolithic	Stone axe factory	SH69607390
100576	Axe roughout, Findspot, Ffridd Tan y Graig, Llanfairfechan	Neolithic	Findspot	SH6961173875

APPENDIX II: TEST PITS AND TRENCHES

Grid references for test pits rounded to the nearest metre. All test pits measured 1m by 1m.

Garreg Fawr

TP104
Location: SH 68895 73340
Height OD: 316m
Maximum depth of test pit: 0.43m

Context No.	Depth (m)	Description	Colour & Composition
10401	0.05	Turf and topsoil	Dark grey clayey silt with occasional stones
10402	Up to 0.3m	Scree	Mid orange-brown silt with c.70% small to large.
10403		Natural glacial clay	Pale orange-brown clayey silt with c.50% angular stones

TP105
Location: SH 68882 73354
Height OD: 312m
Maximum depth of test pit: 0.36m

Context No.	Depth (m)	Description	Colour & Composition
10501	0.07	Turf and topsoil	Dark brown humic silt with occasional small stones
10502	0.17m	Sub-soil with a little scree	Mid brown clayey silt with c.20% small angular stones.
10503	0.17m	Sub-soil with a little scree	Mid orange-brown clayey silt with c.40% small and medium stones.
10504		Surface of natural glacial clay	Mid orange-brown clayey silt with c.40% angular stones

TP106
Location: SH 68868 73371
Height OD: 308m
Maximum depth of test pit: 0.39m

Context No.	Depth (m)	Description	Colour & Composition
10601	0.06	Turf and topsoil	Dark brown sandy silt with occasional stones
10602	0.33m	Sub-soil/hill-wash	Mid orange-brown silt with c.10% sub-angular stones. Also includes lenses of light grey silty clay and occasional charcoal flecks.
10603		Natural glacial clay	Pale orange-brown silty clay with stones

TP107
Location: SH 68900 73359
Height OD: 314m
Maximum depth of test pit: 0.32m

Context No.	Depth (m)	Description	Colour & Composition
10701	0.05	Turf and topsoil	Dark grey clayey silt with no stones
10702	0.13m	Sub-soil with tail end of the scree	Mid brown silt with c.30-40% sub-angular small and medium sized stones.

Context No.	Depth (m)	Description	Colour & Composition
10703		Natural glacial clay	Orange-brown clayey silt with c.60-70% medium and large stones. More shale in eastern half of test pity, notable difference in geology between east and west.

TP108
Location: SH 68903 73371
Height OD: 312.5m
Maximum depth of test pit: 0.40m

Context No.	Depth (m)	Description	Colour & Composition
10801	0.15	Turf and topsoil	Dark brown humic silty clay with c.20% small and medium stones. Mottled with pale grey.
10802	0.08m	Tail end of the scree	Pale orange-brown silt with c.50% small angular stones and slatey plaques.
10803	0.17m	Lower sub-soil/solifluction deposit	Mid orange-brown silty clay with c.40% small and medium stones. Exposed in sondage along W side of test pit.
10804		Shattered upper surface of shale bedrock	Mid orange-grey clay with c.60% small and medium sized shale plaques and some manganese flacks.

TP109
Location: SH 68927 73367
Height OD: 317.5m
Maximum depth of test pit: 0.50m

Context No.	Depth (m)	Description	Colour & Composition
10901	0.07	Turf and topsoil	Dark brown sandy silt with few stones
10902	0.43	Scree	Mid grey-brown sandy silt with c.70% sub-angular stones up to 0.2m long.
10903		Natural glacial clay	Orange-brown silty clay with c.20% sub-angular stones.

TP110
Location: SH 68920 73397
Height OD: 311m
Maximum depth of test pit: 0.25m

Context No.	Depth (m)	Description	Colour & Composition
11001	0.08	Turf and topsoil	Dark brown clayey silt with few stones. Slightly gleyed with iron panning at base.
11002	0.17	Colluvium/hillwash. Mixture of glacial till and weathered shale.	Yellow-brown clayey silt with c.60% small shale fragments.
11003		Shattered upper surface of shale bedrock. Shale fragments lying at various angles suggesting that this has moved under freeze/thaw conditions.	Orange-brown silty clay with c.80% shale fragments.

TP111
Location: SH 68908 73360
Height OD: 315m
Maximum depth of test pit: 0.65m

Context No.	Depth (m)	Description	Colour & Composition
11101	0.07	Turf and topsoil	Dark brown silty loam with few stones.
11102	0.25m	Scree	Yellowish grey-brown clayey silt with c.80% angular stones and one boulder.
11103	0.40m	Lower sub-soil/solifluction deposit	Yellow-brown clayey silt with c.90% rock fragments, mainly shale, and mostly lying horizontally. Exposed in sondage along W side of test pit.
11104		Shattered upper surface of shale bedrock	Shale pieces with a little yellow-brown clayey silt as a matrix. Very compact horizon of bedded shale.

TP112
Location: SH 68911 73416
Height OD: 306m
Maximum depth of test pit: 0.26m

Context No.	Depth (m)	Description	Colour & Composition
11201	0.05	Turf and topsoil	Dark brown sandy silt with a very few stones.
11202	0.18	Colluvium/hillwash with some scree	Mid yellow-brown sandy silt with c.50% small and medium stones.
11203		Natural glacial clay	Mid orange-brown clayey silt with c.40% stones.

TP113
Location: SH 68931 73434
Height OD: 306m
Maximum depth of test pit: 0.45m

Context No.	Depth (m)	Description	Colour & Composition
11301	0.06	Turf and topsoil	Pale brown, leached silty clay with dark brown humic layer in upper part, with a very few stones.
11302	0.30	Scree	Mid orange-brown silt with c.60% small and medium stones.
11303		Natural glacial clay	Mid orange-brown silty clay with c.60% angular stones.

TP114
Location: SH 68918 73447
Height OD: 301m
Maximum depth of test pit: 0.27m

Context No.	Depth (m)	Description	Colour & Composition
11401	0.05	Turf and topsoil	Dark brown sandy silt with few stones.
11402	0.17	Scree	Mid orange-brown sandy silt with c.40% angular stones up to 0.48m long.
11403		Natural glacial clay	Pale orange-brown clayey silt with c.60% angular stones.

TP115
Location: SH 68875 73368
Height OD: 308.5m
Maximum depth of test pit: 0.30m

Context No.	Depth (m)	Description	Colour & Composition
11501	0.10	Turf and topsoil	Pale brown, leached silty clay with dark brown humic layer in upper part, with few stones.
11502	0.20	Sub-soil with tail end of the scree	Mid brown slightly gritty silt with c.25% angular stones up to 0.20m long.
11503		Natural glacial clay	Yellow-brown clayey silt with c.30-40% angular blocks up to 0.35m long and small shale fragments.

TP116
Location: SH 68851 73334
Height OD: 309m
Maximum depth of test pit: 0.30m

Context No.	Depth (m)	Description	Colour & Composition
11601	0.12	Turf and topsoil	Pale brown, leached silty clay with dark brown humic layer in upper part, with few stones.
11602	0.18	Sub-soil with tail end of the scree	Mid brown silt with c.30% angular stones up to 0.3m long.
11603		Natural glacial clay	Yellow-brown clayey silt with c.30% medium sized angular stones and small shale fragments.
11604	0.22	Fill of cut 11605, under 11602.	Dark brown clayey loam with c.10% angular stones up to 0.2m long and occasional pieces of charcoal. The longest stone lies horizontal in the middle of the feature. The stones are not obviously packing stones but there are a couple of long thin ones that might have performed that function but have been disturbed.
11605	0.4m diameter, 0.22m deep	Small pit or possibly a posthole.	Sub-circular cut with fairly steep sides. West side undercut but not the start of a burrow. The sides curve gradually into a rounded base.

TP117
Location: SH 68853 73309
Height OD: 312m
Maximum depth of test pit: 0.74m

Context No.	Depth (m)	Description	Colour & Composition
11701	0.18	Turf and topsoil	Mid brown, leached silt with dark grey humic layer in upper part, with c.10% stones.
11702	0.15	Sub-soil or possible cultivation soil	Mid brown silt with c.10% small angular stones.
11703		Natural glacial clay	Yellow-brown clayey silt with c.30% small shale fragments, becoming more compact with depth.
11704	0.60	Fill of cut 11705, under 11702.	Mid brown silt with c.30% angular stones up to 0.2m long. Loose, stony silt, very soft in places. Difficult to distinguish from 11702, but distribution of larger stones shows that 17704 is present only 0.18m below ground surface.
11705	c.0.70m diameter, up to 0.60m deep	Possible post-trench	Sub-circular cut about 0.7m diameter (though only part was seen in the test pit) in base of a linear feature >0.45m wide, running nearly N-S.

Context No.	Depth (m)	Description	Colour & Composition
11706	0.38	Fill of cut 11707, under 11702.	Mid brown gritty silt with c.20% angular stones up to 0.15m long. Difficult to distinguish from 11704, so it is not possible to determine the relationship between 11705 and 11707.
11707	0.38	Hollow or pit.	A quarter of a possibly circular cut seen in corner of test pit. The sides slope gradually to an irregular base.
11708	0.10	Interface layer resulting from merging of 11702 and 11703. Cut by 11705 and 11707.	Yellowish brown silt with c.30% small stones and shale fragments.

Cors y Carneddau

TP118
Location: SH 71503 74719
Height OD: 404m
Maximum depth of test pit: 0.25m

Context No.	Depth (m)	Description	Colour & Composition
11801	0.06	Turf and topsoil	Dark brown sandy silt with a few stones.
11802	0.11	Sub-soil with tail end of the scree	Grey-brown sandy silt with c.20% small, medium and large stones.
11803		Natural glacial clay	Orange-brown silty clay with few stones, but occasional manganese flecks.

TP119
Location: SH 71476 74748
Height OD: 409m
Maximum depth of test pit: 0.35m

Context No.	Depth (m)	Description	Colour & Composition
11901	0.13	Turf and topsoil	Mid grey, leached silt with dark grey humic layer in upper part, and few stones.
11902	0.14	Sub-soil with tail end of the scree	Mid yellow-brown silt with c.40% angular stones.
11903		Natural glacial clay	Orange-brown silty clay with c.70% stones, including large angular stones and small gravel and grit.

TP120
Location: SH 71457 74772
Height OD: 416.5m
Maximum depth of test pit: 0.48m

Context No.	Depth (m)	Description	Colour & Composition
12001	0.26	Turf and topsoil	Smooth black silty peat with c.40% stones up to 0.38m long.
12002	0.22	Sub-soil	Mid yellow-brown silty clay with c.10% angular stones.
12003		Fractured bedrock	Blue-grey fractured rock.

TP121
Location: SH 71430 74735
Height OD: 406.5m
Maximum depth of test pit: 0.30m

Context No.	Depth (m)	Description	Colour & Composition
12101	0.10	Turf and topsoil	Dark grey clayey silt with few stones.
12102	0.25 max.	Scree	Dark to mid brown silt with c.75% angular stones up to 0.25m long. A jumble of angular stones sloping downhill.
12103		Natural glacial clay	Compacted yellow-brown clayey silt with numerous shale fragments and some larger stones up to 0.25m long.

TP122
Location: SH 71428 74763
Height OD: 414m
Maximum depth of test pit: 0.31m

Context No.	Depth (m)	Description	Colour & Composition
12201	0.08	Turf and topsoil	Dark brown sandy silt with few stones.
12202	0.16	Scree	Light grey-brown sandy silt with c.25% large sub-angular stones densely packed together.
12203		Natural glacial clay	Orange-brown gritty clayey silt with c.40% shale fragments and larger sub-angular stones. Blocks embedded in clay with shale fragments between.

TP123
Location: SH 71514 74731
Height OD: 405.5m
Maximum depth of test pit: 0.45m

Context No.	Depth (m)	Description	Colour & Composition
12301	0.17	Turf and topsoil	Dark brown clayey silt with few stones.
12302	0.24 max.	Re-worked scree with evidence of blocks being removed and scree being picked over and turned.	Mid yellow-brown gritty silt with c.40% sub-angular stones up to 0.3m long with one block >0.4m long. Also contained some lumps of quartz.
12303	Excavated to 0.1m deep	Undisturbed scree in gravelly matrix.	Mid orange-brown gravelly silt with c.50% sub-angular stones up to 0.3m long.

TP124
Location: SH 71558 74763
Height OD: 407m
Maximum depth of test pit: 0.24m

Context No.	Depth (m)	Description	Colour & Composition
12401	0.12	Turf and topsoil	Dark brown silt with few stones.
12402	0.19m max.	Sub-soil with tail end of the scree	Mid brown silt with c.30% gravel and small and medium stones.
12403		Colluvium/glacial clay mixed with fragmented shale from bedrock	Orange-brown clayey silt with c.50% shale fragments.

Context No.	Depth (m)	Description	Colour & Composition
12404		Natural glacial clay	Yellowish grey clayey silt with numerous shale fragments.

TP125
Location: SH 71545 74718
Height OD: 403.5m
Maximum depth of test pit: 0.37m

Context No.	Depth (m)	Description	Colour & Composition
12501	0.19	Turf and topsoil	Dark brown sandy silt with c.50% small and medium stones.
12502	0.18	Sub-soil/colluvium	Mid orange-brown clayey silt with c.40% angular stones up to 0.3m long.
12503		Natural glacial clay	Mid yellow-brown clayey silt with c.50% gravel and small stones.

TP126
Location: SH 71537 74779
Height OD: 412.5m
Maximum depth of test pit: 0.32m

Context No.	Depth (m)	Description	Colour & Composition
12601	0.11	Turf and topsoil	Very dark brown silt with occasional stones up to 0.3m long. Slight gleying.
12602	0.20	Scree	Mid red-brown gritty silt with c.40% angular stones up to 0.6m long.
12603	0.13	Shaley colluvium	Orange-brown gravelly clayey silt with c.60% shale fragments and occasional larger stones.
12604		Natural glacial clay	Yellow-brown silty clay with occasional large stones. Only exposed in SW corner of test pit.

TP127
Location: SH 71397 74743
Height OD: 409m
Maximum depth of test pit: 0.60m

Context No.	Depth (m)	Description	Colour & Composition
12701	0.15	Turf and topsoil	Dark grey organic silt with occasional small stones.
12702	0.20	Scree	Mid brown silt with gravel and c.60% angular stones up to 0.35m long. Stones generally sloping downhill.
12703	>0.25	Lower, undisturbed scree	Orange-brown gritty silt with c.80% densely packed angular stones up to 0.3m long and shale fragments.

TP128
Location: SH 71307 74739
Height OD: 410m
Maximum depth of test pit: 0.25m

Context No.	Depth (m)	Description	Colour & Composition
12801	0.09	Turf and topsoil	Very dark brown silty loam with few stones.
12802	0.12	Scree in colluvium	Mid brown clayey silt with c.40% angular small and medium stones.
12803		Natural glacial clay	Mottled orange-brown silty clay with occasional stones embedded in it.

TP129
Location: SH 71281 74696
Height OD: 402.5m
Maximum depth of test pit: 0.60m

Context No.	Depth (m)	Description	Colour & Composition
12901	0.20	Turf and topsoil	Very dark brownish grey organic gritty silt with c.50% angular stones up to 0.2m long.
12902	>0.5m	Unconsolidated dump of stone. Building platform.	Very dark grey-brown organic silt with c.80% angular stone up to 0.25m long. Many voids between the stones.
12903	0.26m max	Hearth deposit between 12901 and 12902. Possibly from a peat fire.	Strong orange-brown gritty silt with c.60% stones up to 0.2m long. Also contains charcoal and pale speckles suggestive of ash deposits. Overlies 12902 and fills gaps between the stones in this deposit.

TP130
Location: SH 71361 74748
Height OD: 407m
Maximum depth of test pit: 0.26m

Context No.	Depth (m)	Description	Colour & Composition
13001	0.04	Turf and topsoil	Dark brownish grey silty loam with c.10% medium to large angular stones.
13002	0.05	Scree	Mid brownish grey silt with c.40% angular small and medium stones.
13003	0.04	Lower scree	Pale yellowish orange clayey silt with c.40% small and medium stones and a large boulder in the centre of the test pit. A flake was found under the boulder.
13004		Natural glacial clay	Mid orange-brown silty clay with c.20% small and medium stones.

TP131
Location: SH 71288 74673
Height OD: 397m
Maximum depth of test pit: 0.25m

Context No.	Depth (m)	Description	Colour & Composition
13101	0.09	Turf and topsoil with weathered scree	Dark brown sandy silt with c.80% angular stones.
13102	0.15	Scree	Mid orange-brown sandy silt with c.80% angular small and medium stones.
13103		Lower scree mixed with glacial clay	Yellow-brown silty clay with c.40% angular stones

TP132
Location: SH 71374 74708
Height OD: 402m
Maximum depth of test pit: 0.25m

Context No.	Depth (m)	Description	Colour & Composition
13201	0.10	Turf and topsoil	Dark brown silt with few stones.
13202	0.15	Colluvium with some scree	Mid brown clayey silt with c.30% angular stones up to 0.3m long.

Context No.	Depth (m)	Description	Colour & Composition
13203		Natural glacial clay with shale from bedrock	Orange-brown silty clay with c.80% shale fragments

TP133
Location: SH 71309 74706
Height OD: 403.5m
Maximum depth of test pit: 0.30m

Context No.	Depth (m)	Description	Colour & Composition
13301	0.10	Turf and topsoil	Very dark grey organic silt with few stones.
13302	0.15	Scree	Very dark brown organic silt with c.75% densely packed angular and sub-angular stones up to 0.2m long. Stones rather eroded and have crystals not seen in other Graig Lwyd stones. Appear to be wrong sort of stone for axes.
13303		Undisturbed scree mixed with glacial clay.	Yellowish brown gritty clay with c.80% angular and sub-angular stones up to 0.3m long. Compact clay deposit with stones embedded in it.

Ty'n y Llwyfan

TP134
Location: SH 69845 74028
Height OD: 212m
Maximum depth of test pit: 0.29m

Context No.	Depth (m)	Description	Colour & Composition
13401	0.06	Turf and topsoil	Mid brown silty clay with few stones.
13402	0.23	Ploughsoil with elements of scree mixed in.	Mid grey-brown clayey silt with c.50% shale fragments and scree stones <0.2m long.
13403		Natural glacial clay	Mid orange-brown clayey silt with c.80% shale fragments and some other stones up to 0.25m long.

TP135
Location: SH 69832 74011
Height OD: 212.5m
Maximum depth of test pit: 0.24m

Context No.	Depth (m)	Description	Colour & Composition
13501	0.10	Turf and topsoil	Mid brown sandy clay with few stones.
13502	0.14	Ploughsoil with elements of scree mixed in.	Mid orange-brown sandy clay with c.50% small and medium sized stones.
13503		Natural glacial clay	Mid yellow-brown silty clay with c.10% angular scree stones up to 0.25m long.

TP136
Location: SH 69817 74003
Height OD: 210.5m
Maximum depth of test pit: 0.36m

Context No.	Depth (m)	Description	Colour & Composition
13601	0.12	Turf and topsoil	Dark brown humic loam with few stones.
13602	0.16	Ploughsoil with elements of scree mixed in.	Dark brown silty loam with c.25% shale fragments and small stones.
13603		Scree embedded in glacial clay	Yellow-brown clayey silt with c.95% angular scree stones up to 0.25m long.

TP137
Location: SH 69797 74005
Height OD: 209.5m
Maximum depth of test pit: 0.76m

Context No.	Depth (m)	Description	Colour & Composition
13701	0.09	Turf and topsoil	Mid brown silty loam with few stones.
13702	0.68	Probable built up of ploughsoil in a lynchet, no large scree.	Mid orange-brown clayey silt with c.30% angular stones up to 0.2m long.
13703		Natural glacial clay	Mid yellow-brown silty clay with few stones.

TP138
Location: SH 69808 74006
Height OD: 209.5m
Maximum depth of test pit: 0.70m (not fully excavated)

Context No.	Depth (m)	Description	Colour & Composition
13801	0.15	Turf and topsoil	Mid brown clayey silt with very few stones.
13802	0.68	Scree	Mid orange-brown clayey silt with c.70% densely packed sub-angular stones up to 0.3m long. Large stones in base of test pit prevented excavation down to glacial clay.

TP139
Location: SH 69785 74004
Height OD: 208m
Maximum depth of test pit: 0.25m

Context No.	Depth (m)	Description	Colour & Composition
13901	0.09	Turf and topsoil	Dark grey-brown clayey silt with few stones.
13902	0.15	Ploughsoil with elements of scree mixed in.	Dark grey-brown sandy silt with c.25% angular stones, some large.
13903		Natural glacial clay	Pale yellow-brown gritty clay with c.60% stones of all sizes and one big, shattered boulder lying horizontally.

TP140
Location: SH 69773 74001
Height OD: 208m
Maximum depth of test pit: 0.25m

Context No.	Depth (m)	Description	Colour & Composition
14001	0.10	Turf and topsoil	Mid orange-brown clayey silt with few stones.
14002	0.09m max	Shallow ploughsoil	Mid orange-brown clayey silt with c.20% gravel and small stones.
14003		Natural glacial clay	Pale yellow-brown clay with c.50% small stones and occasional larger stones.

TP141
Location: SH 69765 74016
Height OD: 205m
Maximum depth of test pit: 0.46m

Context No.	Depth (m)	Description	Colour & Composition
14101	0.10	Turf and topsoil	Mid brown silty loam with few stones.
14102	0.28	Ploughsoil	Mid orange-brown silt with c.25% small stones up to 0.1m long.
14103		Natural glacial clay	Mid yellow-brown silty clay with c.40% stones up to 0.4m long.

TP142
Location: SH 69782 74032
Height OD: 204m
Maximum depth of test pit: 0.38m

Context No.	Depth (m)	Description	Colour & Composition
14201	0.13	Turf and topsoil	Mid orange-brown clayey silt with c.20% small and medium stones.
14202	0.25	Ploughsoil	Mid orange-brown silty clay with c.30% small stones up to 0.15m long. Large scree absent.
14203		Natural glacial clay	Pale yellow-brown silty clay with c.10% small stones up to 0.1m long.

TP143
Location: SH 69803 74026
Height OD: 206m
Maximum depth of test pit: 0.60m

Context No.	Depth (m)	Description	Colour & Composition
14301	0.14	Turf and topsoil	Mid grey-brown clayey silt with few stones.
14302	0.51	Ploughsoil/ colluvium	Mid brown clayey silt with c.5% stones up to 0.20m long.
14303		Natural glacial clay	Pale yellow-brown silty clay with few stones.

TP144
Location: SH 69858 74047
Height OD: 213m
Maximum depth of test pit: 0.30m

Context No.	Depth (m)	Description	Colour & Composition
14401	0.10	Turf and topsoil	Mid grey-brown silty loam with few stones.
14402	0.20	Ploughsoil	Dark grey-brown gravelly silt with c.15% small stones up to 0.10m long.
14403		Natural glacial clay	Yellow-brown silty clay with numerous shale fragments and occasional angular stones up to 0.15m long.

TP145
Location: SH 69830 74041
Height OD: 209m
Maximum depth of test pit: 0.39m

Context No.	Depth (m)	Description	Colour & Composition
14501	0.10	Turf and topsoil	Mid brown silty loam with few stones.
14502	0.29	Ploughsoil, contained 2 sherds of modern pottery	Mid orange-brown clayey silt with c.20% stones up to 0.17m long.
14503		Natural glacial clay	Pale yellow-brown silty clay with c.5% shale fragments.

TP146
Location: SH 69809 74012
Height OD: 209m
Maximum depth of test pit: 0.70m

Context No.	Depth (m)	Description	Colour & Composition
14601	0.10	Turf and topsoil	Dark grey-brown clayey silt with few stones.
14602	0.29	Ploughsoil	Dark brown clayey silt with c.10% stones up to 0.12m long.
14603	?	Solifluxion deposit with scree	Yellow-brown clayey silt with numerous stones up to 0.3m long. Stones at all angles, no obvious orientation.
14604		Glacial clay mixed with large scree	Brownish yellow silty clay with c.85% stones up to 0.4m long.

TP147
Location: SH 69797 74011
Height OD: 208.5m
Maximum depth of test pit: 0.80m

Context No.	Depth (m)	Description	Colour & Composition
14701	0.10	Turf and topsoil	Mid orange-brown clayey silt with c.10% small stones.
14702	0.70	Scree	Mid orange-brown silty clay with c.70% small to large stones with two boulders up to 0.65m long.
14703		Natural glacial clay	Pale yellow-grey sandy clay. Stone content not known. Deposit only visible in small areas between boulders.

TP148
Location: SH 69785 74018
Height OD: 206m
Maximum depth of test pit: 0.47m

Context No.	Depth (m)	Description	Colour & Composition
14801	0.10	Turf and topsoil	Mid orange-brown clayey silt with few stones.
14802	0.34	Ploughsoil	Mid orange-grey sandy silt with c.20% small stones.
14803		Natural glacial clay	Pale yellow-grey sandy silt with c.20% stones and gravel.

TP149
Location: SH 69871 74072
Height OD: 213m
Maximum depth of test pit: 0.53m

Context No.	Depth (m)	Description	Colour & Composition
14901	0.13	Turf and topsoil	Grey-brown loamy silt with few stones.
14902	0.16	Ploughsoil	Mid brown slightly clayey silt with c.10% small and medium stones.
14903	0.23	Thin, loose scree deposit	Mid brown gritty silt with c.40% angular stones up to 0.2m long and some sub-angular stones, not densely packed. Becomes sandier towards base with some lenses of manganese.
14904		Natural glacial clay with some fresh-looking blocks of scree embedded in the surface.	Yellow-brown gritty silty clay with c.50% shale fragments and 25% stones up to 0.35m long.

TP150
Location: SH 69880 74090
Height OD: 213m
Maximum depth of test pit: 0.65m

Context No.	Depth (m)	Description	Colour & Composition
15001	0.14	Turf and topsoil	Dark grey-brown loamy silt with occasional small stones.
15002	0.30	Ploughsoil	Dark brown slightly clayey silt with c.10% small and medium stones.
15003	0.30	Loose scree deposit	Dark brown slightly clayey silt with c.60% angular stones up to 0.3m long, not densely packed.
15004		Natural glacial clay	Yellow-brown silty clay with c.50% shale fragments and 10% angular stones up to 0.2m long.

TP151
Location: SH 69900 74090
Height OD: 216.5
Maximum depth of test pit: 0.60m

Context No.	Depth (m)	Description	Colour & Composition
15101	0.15	Turf and topsoil	Dark brown loamy silt with occasional stones up to 0.2m long. Full of bracken rhizomes.

Context No.	Depth (m)	Description	Colour & Composition
15102	0.45	Subsoil horizon with much bioturbation but probably never ploughed/ colluvium	Yellow-brown slightly clayey silt with very few stones. Full of bracken rhizomes and animal burrows.
15103		Bedrock	Grey shale/mudstone bedrock. Laminated bedrock sloping gradually down towards NW. Surface of the bedrock fragments into small shaly pieces.

APPENDIX III: LITHIC ASSESSMENT CATALOGUE

Key to abbreviations

Material

bc black chert
cig coarse igneous
fe iron
gl Graig Lwyd
mix mixed rock types
nig non-igneous
sst sandstone
tuff tuff?
unc unclassified
vq vein quartz

Object class

angf angular frag
anv anvil/working slab
axr axe roughout
bs burnt stone
charc charcoal
cr core reject
f/ff struck flake/frag
hst? Possible hammerstone
pf struck primary frag
rp retouched piece
sl slag
sp split pebble
up ?pecked/utilised pebble

Trench	Find No.	Context	Class	No. of items	Material	Comment	0-50mm	51-100mm	101-1500mm +	1501mm +
104	10401	10401	f/ff	1	gl	Discard 13 fresh, modern quarry waste	0	0	1	0
104	10404	10401	discard	0		Discard, fresh, modern quarry waste	0	0	0	0
104	10402	10402	f/ff	42	gl		32	10	0	0
104	10402	10402	crp?	1	gl	Large flake with steep retouch on one edge, but retouch later than the flake shown by different patination	0	0	1	0
104	10402	10402	f/ff	26	gl	29 of the discards are modern waste	18	7	1	0
104	10402	10402	rp?	1	gl	poss edge retouched knife	0	1	0	0
104	10403	10403	f/ff	7	gl		4	1	2	0
105	10501	10501	f/ff	10	gl		6	3	1	0
105	10502	10502	f/ff	2	gl		2	0	0	0
106	10601	10601	f/ff	12	gl		9	3	0	0
106	10602	10602	f/ff	53	gl	Noticeable number of small pieces under 25mm L, suggests final finishing	43	10	0	0
107	10701	10701	f/ff	13	gl	discard 7 modern quarry waste	11	2	0	0
107	10702	10702	f/ff	62	gl	Considerable edge-chipping suggests much trampling and all pieces very weathered	39	23	0	0
107	10703	10703	f/ff	1	gl		1	0	0	0
108	10801	10801	f/ff	20	gl	all v weathered	18	2	0	0
108	10802	10802	f/ff	32	gl	all v weathered and edge damaged	19	13	0	0

Trench	Find No.	Context	Class	No. of items	Material	Comment	0-50mm	51-100mm	101-1500mm +	1501mm +
108	10803	10803	Geol sample	5	gl	scree sample 157g	0	0	0	0
108	10803	10803	Geol sample	11	sh	platey shale shatter 262g	0	0	0	0
109	10901	10902	f/ff	1	gl	discard 3 modern quarry waste	1	0	0	0
109	10902	10903	f/ff	4	gl	I small flake with twist	1	3	0	0
110	11001	11001	f/ff	1	gl		0	1	0	0
110	11002	11002	f/ff	5	gl		3	2	0	0
111	11101	11101	f/ff	4	gl	14 discards are modern quarry waste	2	2	0	0
111	11102	11102	f/ff	12	gl	9 discards are modern quarry waste	5	6	1	0
111	11103	11103	Geol sample	9	sh	platey frags	0	0	0	0
112	11201	11201	bf	0	gl	1 gl discard. Shattered by heath fire not ancient	0	0	0	0
112	11202	11202	f/ff	1	gl	1 modern gl flake discarded	1	0	0	0
112	11203	11202	peb/hst?	1	qte	natural, no use wear	0	0	0	0
113	11301	11301	bf	2	gl	poss from a m flake	2	0	0	0
113	11302	11302	f/ff	1	gl	blade	0	1	0	0
113	11303	11302	peb/hst?	1	qte	natural. No use wear	0	0	0	0
114	11401	11401	f/ff	1	gl	Also 2 small heat-fractured frags	1	0	0	0
115	11501	11501	f/ff	8	gl	Discards include 3 frags of modern quarry waste	7	1	0	0
115	11501	11501	crp?	1	gl	crp? Is a broad flake trimmed at the distal end	0	1	0	0
115	11502	11502	f/ff	23	gl	discards are 15 heat-shattered gl frags, 5 shale and 4 gl scree frags	17	5	1	0
116	11601	11601	f/ff	27	gl		10	14	3	0
116	11601	11601	crp?	1	gl	possible ad hoc cutting tool	0	0	1	0
116	11602	11602	f/ff	64	gl		50	12	2	0
116	11602	11602	cf	2	gl	core frags	0	2	0	0
116	11602	11602	crp?	1	gl	possible ad hoc cutting tool	0	1	0	0
116	11602	11602	f/ff	43	gl		33	8	2	0
116	11602	11602	f/ff	14	gl		5	2	7	0
116	11604	11602	axrof	1	gl	near to complete ro probably rejected as it is twisted and then deliberately broken	0	0	0	0
116	11603	11604	f/ff	2	gl	fresh, unweathered	0	2	0	0
116	11605	11604	peb/hst?	1	sst	frag of a larger pebble. Possible hst	0	0	0	0

Trench	Find No.	Context	Class	No. of items	Material	Comment	0-50mm	51-100mm	101-1500mm+	1501mm+
117	11701	11701	f/ff	41	gl		33	8	0	0
117	11705	11702	peb	2	mig	small subrounded pebbles. Natural, not utilised	0	0	0	0
117	11702	11702	f/ff	60	gl	one large flake is a blade	35	24	1	0
117	11702	11702	crp?	1	gl	Poss pcr	0	0	0	0
117	11702	11702	rp?	1	gl	Poss serrated blade, large	0	0	0	0
117	11702	11702	f/ff	54	gl	some small flakes are twisted	31	17	6	0
117	11702	11702	f/ff	29	gl		14	12	3	0
117	11703	11704	f/ff	17	gl		2	13	2	0
117	11704	11706	f/ff	1	gl		1	0	0	0
117	11704	11706	rpf	1	gl	end scraper. Abrupt retouch on the end of a blade	0	0	0	0
117	11706	11704	peb/hst?	2	sst	pebbles broken by heat but could have been hsts	0	0	0	0
127	12701	12701	f/ff	29	gl		18	7	4	0
127	12701	12701	f/ff	21	gl	all v weathered and edge damaged	0	15	6	0
127	12701	12701	f/ff	2	gl	some edge damage	0	0	1	1
127	12701	12701	cf	1	gl	large frag with cortex back and front but with 2 v large removal facets	0	0	0	1
127	12701	12701	f/ff	1	gl	large thick primary flake with eraillure facet	0	0	0	1
127	12701	12701	f/ff	1	gl	large thick primary flake	0	0	0	1
127	12701	12701	f/ff	2	gl	large secondary flake and extra-large primary flake	0	0	1	1
127	12702	12701	?Inscribed frag	1	gl	small flat frag with parallel linear grooves. For further study. Probably natural	1	0	0	0
127	12703	12702	f/ff	24	gl		11	12	1	0
127	12703	12702	f/ff	13	gl		6	3	4	0
127	12703	12702	f/ff	18	gl		6	8	4	0
127	12703	12702	f/ff	5	gl	all 3 large flakes have possible casual retouch	0	2	3	0
127	12703	12702	crp?	1	gl	poss casual retouch on one sharp edge	0	1	0	0
127	12703	12702	f/ff	44	gl	some small flakes twisted	32	12	0	0
127	12703	12702	f/ff	55	gl		35	20	0	0
127	12703	12702	f/ff	21	gl		3	15	3	0
127	12703	12702	f/ff	36	gl	small flakes mainly not	23	12	1	0

Trench	Find No.	Context	Class	No. of items	Material	Comment	0-50mm	51-100mm	101-1500mm +	1501mm +
						curving				
127	12703	12702	f/ff	8	gl		0	4	4	0
127	12703	12702	f/ff	42	gl	large frag is heat fractured	34	7	1	0
127	12703	12702	f/ff	24	gl	one large frag is heat fractured	12	8	4	0
127	12704	12703	f/ff	1	gl	v thick primary chunk	0	0	0	1
127	12704	12703	f/ff	1	gl	secondary flake	0	0	0	1
127	12704	12703	f/ff	1	gl	v thick primary flake	0	0	1	0
127	12704	12703	f/ff	10	gl		0	5	5	0
127	12704	12703	crp?	1	gl	large blade with 4 secondary flakes on one long edge. Poss edge retouched knife	0	0	1	0
127	12704	12703	f/ff	1	gl	Flake from large chunk of scree using natural platform	0	0	0	1
127	12704	12703	f/ff	51	gl	1 large primary f and 4 sec	24	22	5	0
127	12704	12703	f/ff	43	gl		17	24	2	0
127	12704	12703	up	1	gl	medium flake with UW polish on small areas on both sides	0	1	0	0
127	12704	12703	f/ff	62	gl	some small flakes are curving	49	13	0	0
127	12704	12703	f/ff	2	gl		0	0	0	2
127	12704	12703	f/ff	3	gl	2 phases of weathering possible	0	0	3	0
127	12704	12703	f/ff	26	gl		15	10	1	0
127	12704	12703	f/ff	2	gl		0	0	2	0
127	12704	12703	f/ff	31	gl		6	17	8	0
127	12705	12703	c?	1	gl	extra-large detached block. Presumably unused core block	0	0	0	1
127	12706	12703	f/ff	1	gl	thick, straight flake, not a rough-out	0	0	1	0
127	12707	12703	axrof	1	gl	thick flake, partly bifiacially worked	0	0	1	0
127	12708	12703	f/ff	2	gl	Not rough-out fragments. Both are primary flakes with no secondary flaking	0	1	1	0
127	12709	12703	peb/hst?	1	cig	Hst? Heavy ig peb but no UW	0	1	0	0
127	12710	12703	peb/hst?	2	cig	2 poss hst. No hst facets. No evidence of use	0	1	1	0
129	12901	12901	f/ff	11	gl	v irregular pieces, prob not from axe making	2	7	2	0
129	12902	12902	f/ff	19	gl	1 small f twist. Discards are scree frags or frost/heat	7	9	3	0

Trench	Find No.	Context	Class	No. of items	Material	Comment	0-50mm	51-100mm	101-1500mm +	1501mm +
						shattered				
129	12902	12902	f/ff	25	gl	Discards are scree frags or frost/heat shattered	10	13	2	0
129	12902	12902	f/ff	32	gl	Discards are scree frags or frost/heat shattered	12	16	4	0
129	12902	12902	if	1	gl	piece of scree with one large f removed. Poss just walling stone	0	0	1	0
129	12902	12902	if	3	gl	irregular struck primary pieces, poss from walling	0	0	3	0
129	12903	12903	f/ff	1	gl		0	0	1	0
129	12903	12903	crp?	1	gl	Thick, irregular chunk with steep, irregular retouch along all of one sharp edge	0	0	1	0
129	12903	12903	f/ff	3	gl	Gl discards 1 burnt frag, 1 pce scree	0	2	1	0
129	12904	12902	peb/hst?	0	cong	quartz-rich conglomerate with a possible pecked area	0	0	1	0
129	12903	12903	f/ff	8	gl	gl discards 1 scree frag, 3 modern burnt frags	0	5	3	0
129	12903	12903	f/ff	7	gl	2 small curving f. large piece with recent burnt facets. Gl discard scree	6	0	1	0
137	13701	13701	f/ff	67	gl	includes some v small twisting flakes. All v weathered	61	5	1	0
137	13702	13702	f/ff	143	gl	strangely, v few small curving	119	24	0	0
137	13702	13702	f/ff	84	gl	some small curving	72	12	0	0
137	13702	13702	f/ff	56	gl		28	27	1	0
137	13702	13702	f/ff	46	gl		6	38	2	0
137	13702	13702	f/ff	47	gl		30	17	0	0
137	13707	13702	peb/hst?	1	sst	Pebble, poss hst, heat-fractured	0	1	0	0
137	13703	13702	f/ff	29	gl	1 large flake may be from a recent fracture	7	19	3	0
137	13703	13702	f/ff	34	gl		20	11	3	0
137	13703	13702	f/ff	22	gl		2	16	4	0
137	13704	13702	f/ff	46	gl		33	13	0	0
137	13704	13702	bf	4	glbf	burnt frags	4	0	0	0
137	13704	13702	f/ff	44	gl		16	26	2	0
137	13708	13702	bf	1	glbf	flake heat potlid	0	1	0	0
137	13705	13702	f/ff	79	gl	small flakes all appear to be flat not curving	55	24	0	0
137	13705	13702	rp?	1	gl	rp cutting?, abrupt retouch on one straight, sharp edge	1	0	0	0

Trench	Find No.	Context	Class	No. of items	Material	Comment	0-50mm	51-100mm	101-1500mm+	1501mm+
137	13705	13702	f/ff	80	gl		54	24	2	0
137	13705	13702	crp?	1	gl	crp cutting?	1	0	0	0
137	13705	13702	crp?	1	gl	crp cutting?	0	1	0	0
137	13705	13702	f/ff	40	gl		9	30	1	0
137	13705	13702	crp?	3	gl	3 possible crp	0	3	0	0
146	14601	14601	f/ff	25	gl		20	5	0	0
146	14601	14601	crp?	1	gl		1	0	0	0
146	14602	14602	f/ff	60	gl	a few small curving flakes, some much fresher, suggesting multi-phase working	41	18	1	0
146	14602	14602	f/ff	105	gl	a few small curving flakes	89	16	0	0
146	14603	14602	f/ff	2	gl	2 small curving and one twisting flakes	2	0	0	0
146	14604	14602	axro rej/practice pce	1	gl	large thick flake with some secondary thinning flaking on the dorsal face only	0	0	1	0
146	14605	14603	f/ff	28	gl		21	6	1	0
146	14605	14603	peb/hst?	1	sst	large cobble. No use wear so unlikely to be a hst	0	0	1	0
146	14606	14603	peb/hst?	1	brec	large cobble. Some onion skin flaking but no visible use wear	0	0	1	0
146	14602	14602	f/ff	20	gl		0	10	10	0
146	14602	14602	c	1	gl	large angular block with negative flake facets	0	0	1	0
146	14607	14602	f/ff	127	gl	a few small, twisted flakes. 2 phases of weathering and perhaps working, some very fresh	101	24	2	0
146	14607	14602	f/ff	48	gl	2 phases of weathering	30	15	3	0
146	14608	14602	f/ff	2	gl	both are blades but from different phases of working if weathering is seen	0	2	0	0
146	14609	14603	f/ff	45	gl	mainly of the fresher patina	28	15	2	0

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