DOCTOR OF PHILOSOPHY

Connections between the hillforts of the Clwydian Range and the wider landscape

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In loving memory of

Eric Vinton Robinson

1948-2018

Dad, friend, Santa…

SUMMARY

This study examines the characteristics and setting of the six hillforts of the Clwydian Range in north east Wales and considers other hills and hillforts within the surrounding area. It provides an assessment of the hillforts of much of north Wales and the borderlands as a group, to define connections or regional variations, in order to aid understanding of their function.

Sites have been investigated through the use of Geographical Information Systems and viewshed analysis to consider the extent of view, the features visible and intervisibility. The use of a control sample of non-hillfort sites considers why some hills were chosen to be hillforts but others not. Interrogation of the data to identify *what* the monument can see, not just how much, is fundamental in the interpretation of site selection and position.

Architectural features and dating evidence have been documented and examined. Former radiocarbon dating has been scrutinised and recalibrated to ensure consistency. A theme of stone, or the illusion of, is dominant across the study area and, despite previous reports, not limited to Gwynedd and a small number of outliers. Entrances and their evolution are distinctive to north east Wales and the borders, with possible links to northern England.

The hillforts of the Clwydian Range are distinctive with regards to their proximity and longevity, with multi-phase, multi-period use. In contrast to 'Central Place Theory', there is not an obvious 'main' hillfort dominating or suppressing the others. Instead, awareness of each other may have complimented their situation and therefore the area flourished. Changes in the hillforts' characteristics are essential in understanding the evolution of their function throughout the Iron Age; from initial community links and cultivation, to control and finally to conservation, which is a tradition which has continued to this day.

DECLARATION AND CONSENT

I hereby declare that this thesis is the results of my own investigations, except where otherwise stated. All other sources are acknowledged by bibliographic references. This work has not previously been accepted in substance for any degree and is not being concurrently submitted in candidature for any degree unless, as agreed by the University, for approved dual awards.

Yr wyf drwy hyn yn datgan mai canlyniad fy ymchwil fy hun yw'r thesis hwn, ac eithrio lle nodir yn wahanol. Caiff ffynonellau eraill eu cydnabod gan droednodiadau yn rhoi cyfeiriadau eglur. Nid yw sylwedd y gwaith hwn wedi cael ei dderbyn o'r blaen ar gyfer unrhyw radd, ac nid yw'n cael ei gyflwyno ar yr un pryd mewn ymgeisiaeth am unrhyw radd oni bai ei fod, fel y cytunwyd gan y Brifysgol, am gymwysterau deuol cymeradwy.

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I'm not sure how surprising it is that this section may actually be the hardest part of my thesis to write. Without the support of so many people, I wouldn't be writing it at all.

Firstly I would like to thank my main supervisor Raimund Karl. We first met during the establishment of the University of Bangor's excavation of Moel y Gaer Llanbedr hillfort, through the Heather and Hillfort Project, of which I was then their Interpretation Officer. Your belief, support, advice and, quite frankly, absolutely fascinating stories have been invaluable. And your patience with my obsessive planning and over-organisation is much appreciated too.

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I've also been lucky enough to meet and spend time with many of the hillfort experts I cite below and many more, through the Hillfort Study Group. Special mentions must go to those who have allowed me to invade their excavations and encountered my over-excitability when it comes to hillforts: Murray Cook and David Connolly at White Castle, Dan Garner and the Habitats and Hillfort Project team, Ian Brown with the Caer Drewyn Environs Project, Will Davies, Bob Sylvester and Caroline Pudney at Hen Caerwys, Rachel Pope and Richard Mason at Eddisbury and Penycloddiau and Gary Lock, Paul Riley and John Pouncett at Moel y Gaer Bodfari.

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Without access to certain archives and additional information, I would have struggled gaining all of the information I needed. To the team at National Museum Wales, especially Jody Deacon, the Royal Commission on the Ancient and Historic Monuments of Wales, especially Tom Pert, Flintshire Record Office, Jeff Davies at Aberystwyth University, Andrew Packwood at Bangor University and the HER teams, especially Rob Edwards in Cheshire and Jeff Spencer from CPAT who has just joined us at Cadw, thank you for all of your advice and time. It has been priceless. Thank you also to my employer Cadw, who allowed me to apply for a few extra days off for my research. Studying on top of a full-time job (and a few extra-curricular ventures!) has not been easy and those extra few days were incredibly helpful.

The life of a PhD student can be a pretty lonely one, but I have been extremely lucky to meet fellow students, mainly through Michele Underwood at Bangor's Academic Development Unit, who were studying a range of really interesting subjects. To my gorgeous group of 'Bangor girls', my darling Steph, Anna, Charlotte, Andrea, Helen and Heather, you have made this journey achievable. I class you all as life-long friends, even though we are now spread out across the globe. Thank you for your

listening skills, your dancefloor moves, all of the tea (and more importantly the cocktails) and your laughter. We made it!

My other long-suffering friends deserve an apology- for the social events I've sent my apologies for, for the constant yawning and for the sometimes months of silence. I promise to be a better friend, aunty and godmother in 2018.

So, to my wonderful family. From the moment we moved in 1988 to the mill under the Welsh castle on Offa's Dyke at the site of the Battle of Crogen, perhaps it was inevitable that I would become an archaeologist. You have seen me through my most amazing ups and thankfully not too many downs, we have the most amazing fun together and I didn't realise how lucky I was to have an entire family I also class as my friends. Mum and Dad, Melody and Eric, you are always there for me and I have learned so much from you; Mum your imaginative way with words has been so inspiring, and Dad your project management, time management and crash courses in excel spreadsheets over a bottle of red wine are only the tip of the iceberg! My brother Feritt's creativity is inspirational and my Aunty Marjorie has always believed in me. My sister and brilliant bestie Rebecca is my sounding board, my fellow explorer, my advice-giver and one of my favourite people in the world. Thank you for everything, you are 'bester than the best' and I honestly don't know what I would do without you. To my extended family, Anita & Bri, Gwyn & Margaret, Rich, Lynds, Scarlett & Rupert, Andy and Shaz, thank you for accepting me and my hectic lifestyle.

And, finally, saving the best until last: my husband Rhodri. Around eight years ago I asked you if you'd mind if I studied towards a PhD qualification. "*It'll only be three years*", I said. Sorry…

I can't put into words what you mean to me. You have been my best friend, chief comedian, DIY expert, you've looked after me, cleaned, cooked, been a mentor, an advisor, a therapist, a coach and all on top of more than one full-time job and business of your own too. I admire you so much. You mean the world to me. Thank you for being everything and for being you. This thesis is dedicated to you.

CONTENTS

LIST OF FIGURES

LIST OF TABLES

CHAPTER 1

INTRODUCTION

The Clwydian Range was designated an Area of Outstanding Natural Beauty (AONB) in 1985 and extended to include the Dee Valley in 2001. AONB management plans have been compiled to assist the management of the AONB alongside its historic importance (e.g. Clwydian Range AONB 2004; 2009). The historic environment is listed as a 'special feature' of the landscape, with its six hillforts specifically receiving note (Clwydian Range AONB 2004, 29 & 32; 2009, 20 & 32). The Clwydian Range was included within the Historic Landscape Register for the Vale of Clwyd, which examined the historic character of areas defined by the Register of Historic Landscapes in Wales.

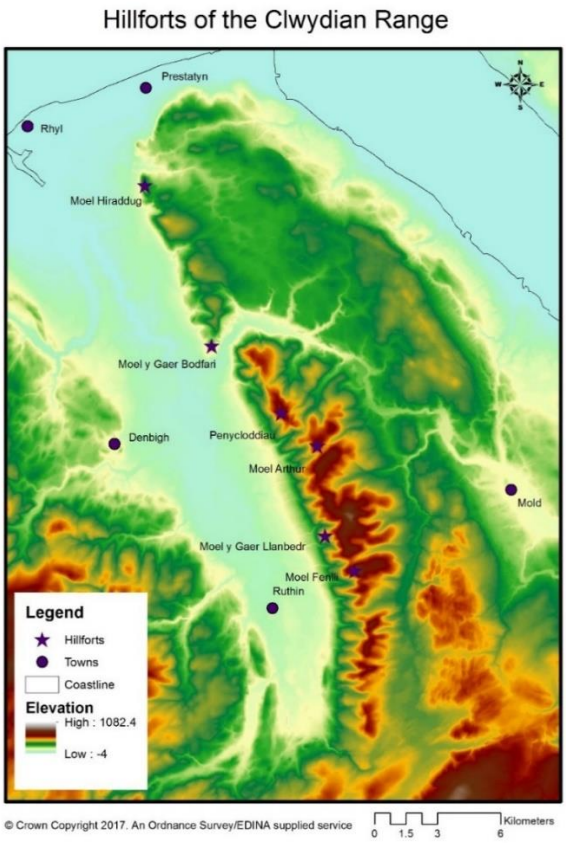

Figure 1.1. Map showing the hillforts of the Clwydian Range (stars) and nearby towns (dots), with the coast line depicted as a black line and the Digital Elevation Model (coloured) presenting the topography & elevation

The six hillforts of the Clwydian Range sit on a ridge of hills situated near Rhyl and Prestatyn in the north, running between the Welsh market towns of Ruthin, Denbighshire and Mold in Flintshire towards Llandegla in the south. The Clwydian Range runs a length of approximately 34 km, with the hillforts of Penycloddiau and Moel Arthur, for example, less than 2 km apart.

This project is designed to explore the six hillforts of the Clwydian Range and their setting, to investigate connections between the hillforts and other features in the landscape. This will be referred to as the 'core study area'.

These six hillforts are (from north to south):

Name	National Grid Reference	approx height mOD	approx enclosed area m^2 (hectares)
Moel Hiraddug	SJ063785	265	107378.30 (10.74)
Moel y Gaer Bodfari	SJ095708	206	18741.21 (1.87)
Penycloddiau	SJ128676	440	176960.94 (17.7)
Moel Arthur	SJ145660	456	16214.65 (1.62)
Moel y Gaer Llanbedr	SJ149618	339	25682.42 (2.57)
Moel Fenlli	SJ163601	511	82639.65 (8.26)

Table 1.1. Attributes of the hillforts of the Clwydian Range from north to south including their grid reference, height and the approximate area their ramparts enclose

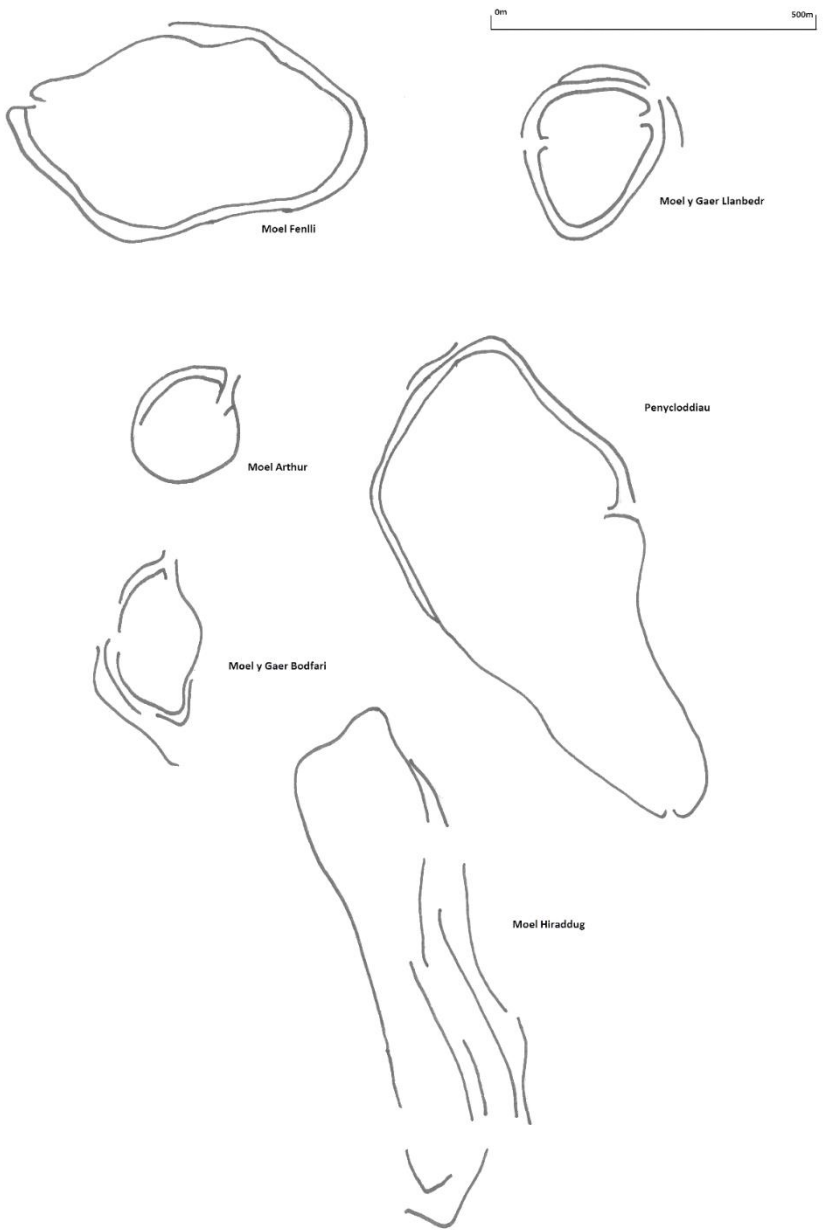

Figure 1.2. Simple line-drawn comparative plans of the Clwydian Range hillforts' rampart circuits

Despite these monuments now being comprehensively surveyed (Brassil et al 1982; Jones 2004; Brooks & Laws 2006-2009; Brooks 2011; Lock & Pouncett 2011) the hillforts of the Clwydian Range as a group remain poorly understood. Few modern excavations have been carried out, little dateable material has been found and, therefore, a chronology for these monuments remains enigmatic. Due to the few dateable finds in the area (Hemp 1928; Gardner & Savory 1964; Savory 1971b) and limited absolute dating samples (Brassil et al 1982; Karl et al 2015), the hillforts are

thought to date to sometime between the Late Bronze Age and the end of the Iron Age.

In 2001, five strategic areas were identified as areas for future research into the British Iron Age, covering England, Wales and Scotland, in a report prepared for the Iron Age Research Seminar and the Council of the Prehistoric Society (Haselgrove et al 2001):

- Chronological frameworks
- Settlement patterns and landscape history
- Material culture studies
- Regionality
- The nature of socio-economic changes

It was highlighted that even basic chronologies within the British Iron Age continued to present a problem. Further research was required into the spatial relationship and the understanding of Iron Age communities and their landscape and that evaluations of regional variations should be a key objective in future research (Haselgrove et al 2001, iv-v). Certain areas were noted as 'black holes', which had seen relatively little modern research beyond individual sites and listed Wrexham and Conwy in north Wales as examples (Haselgrove et al 2001, 24-5).

In 2003, the Institute for Archaeologists (IFA), which received its chartered status in 2014, Wales/Cymru branch published the proceedings of their 2001 conference under the title 'Towards a Research Agenda for Welsh Archaeology' (Briggs, C.S. 2003). Adam Gwilt presented a paper with emphasis on Welsh sites, research and current trends, relating to the British Iron Age agenda (Gwilt 2003). Gwilt highlighted the historical tendency for survey and excavation effort of Welsh Iron Age studies to concentrate on hillforts and defended enclosures with an 'invasionary' thinking (Gwilt 2003, 107), that Welsh Iron Age archaeology was still regarded as 'marginal' in the wider scope of British studies and that '*serious thought should be given into raising the profile of this subject area, over the coming years*' (*ibid.*). In addition, the need for a move towards a wider concept of perceived 'landscape' and perceptions of space and place was stressed (Gwilt 2003, 108). The use of individual small-scale excavation reports and surveys for wider interpretation and reassessment was

encouraged (*ibid.*). Described as a "*complex social mosaic of regionally constituted societies*", Gwilt proposed that to be able to understand the period, careful examination of regional evidence must be carried out and interpreted (Gwilt 2003, 112). He proposed that where a body of information is in existence, time should be spent interpreting the information as opposed to simple data gathering. He used hillfort studies as a specific example, with the need for reassessment with their regional diversity in mind (Gwilt 2003, 113). The documents are currently under review but underwent an initial review between 2011-2014. This exercise cited a number of published studies across Wales, but despite this, many of the initial issues were still outstanding (Karl & Gale 2014).

The most common practise of looking at groups of monuments in the past has been a normative exercise; classifying data to common patterns such as distribution maps (Chapman 2006, 18). In Wiltshire, for example, in the distribution of multivallate hillforts enclosing over 12 acres, "*a significant departure from randomness in the direction of uniformity of spacing"* was observed (Hodder 1977, 236). It was concluded that the identification of this indicated their contemporaneity and the competitive relationship between these sites would be worth examining in further detail (Hodder 1977, 236). The same could be put forward for hillforts in north Wales and the borders.

Past, modern approaches to landscape archaeology in the Clwydian Range include non-destructive methods such as mapping and survey. Excavation has most usually been undertaken when a site is at risk (Brassil et al 1982) or more recently for university research projects (e.g. Karl & Butler 2009; Brown & Karl 2011). Archaeological research into the Clwydian Range hillforts as a group includes site comparison (Alcock 1965; Forde-Johnston 1964a; 1965; Gardner 1926; Guilbert 1979c; Hogg 1972; Savory 1976; Stanford 1972a; 1972b), perception (Gale 1999) and visibility (Matthews 2006).

Common patterns that have been investigated in the Clwydian Range and hillforts in the surrounding area include size (Alcock 1965) and similar architectural features such as guardchambers within entrances (Guilbert 1979c). Qualitative aspects have also been explored. In Gale's 1999 study, she investigated 'Perception and the Clwydian Range', exploring factors which may have influenced the location of the

hillforts and their positive relationship with earlier monuments such as Bronze Age burial chambers (Gale 1999). More recently, the use of Geographical Information Systems (GIS) in archaeology have become increasingly popular. In 2006, Matthews studied the intervisibility between hillforts in the north Wales Marches; in Shropshire, Powys, Cheshire and north east Wales (Matthews 2006). Using Line of Sight analysis, he suggested that the most intervisible hillforts could have been tribal centres, as the patterns of intervisibility showed a correlation between the suggested confines of tribal boundaries known from contemporary Roman sources (Matthews 2006, 38).

These hillforts of the Clwydian Range received special note and attention between 2008 – 2012, being awarded a £2.3 million Heritage Lottery Funded Landscape Partnership Scheme, which aimed to conserve and maintain and to reconnect people to and increase their enjoyment of the heather moorland and hillforts of the Clwydian Range and Llantysilio Mountains.

1.1 Research Objectives

The research includes enquiry into the transition between the Late Bronze Age and early Iron Age, as noted in the Research Framework for the Archaeology of Wales (Cadw 2008, 9) and follows themes highlighted by the final document and reviews, such as chronology, settlement function, land-use and environment (Gale 2010, Karl & Gale 2014). The aims of this study are directly linked to the research agenda for the north east of Wales in the Late Bronze Age and Iron Age (Gale 2003; Karl & Gale 2014) and the research agendas for the Iron Age in Britain and in Wales (Haselgrove et al 2001; Briggs 2003) through a thorough assessment of a regional body of research, additional research to ‘plug the gaps’ through landscape studies and the inclusion of sites in the ‘black holes’ of Conwy and Wrexham.

The purpose of a comparative study of hillforts in north Wales and the English borders is an attempt to find any potential connections between sites through their physical remains and their setting. To do this, data for excavated hillforts within an approximate 30-mile (48km) radius of the Clwydian Range, to be referred to as the ‘wider study area’, was collected through the Historic Environment Record, the National Monument Record and excavation reports. After careful consideration of the data, features such as architecture and dating evidence have been documented

within a database. Radiocarbon dating evidence has been scrutinised and recalibrated to ensure consistency. Comparisons between sites has also been carried out through the use of GIS, investigating view, intervisibility and the use of a control sample of non-hillfort sites.

By including data from hillforts in the surrounding area of the Clwydian Range, a much larger sample of excavated and surveyed information has been utilised when investigating local and regional patterns. The radius of approximately 30 miles (48km) from the six Clwydian Range hillforts has been chosen as the wider study area to ensure a distance of maximum visibility and the approximate distance that can be walked in one day. Within this wider area, over 100 hillforts are listed within the Historic Environment Record (HER) and National Monuments Record (NMR), of which 39 are known to have been excavated.

1.2 Data Collection

Initially, data was collected to identify hillfort sites within the wider study area by utilising information available through HERs and the NMR of Wales. In the initial stages of data collection, Wales launched its website 'Archwilio', and as such, was the first country in the United Kingdom to have all archaeological records available online. The Royal Commission on the Ancient and Historic Monuments of Wales have also made available the NMR through the website 'Coflein' and in recent years Cadw launched 'Cof Cymru', making available records of the National Historic Assets of Wales online, such as scheduled monuments, listed buildings and protected wrecks, under the provisions of the Historic Environment (Wales) Act 2016.

In addition, and prior to the launch of Archwilio, Clwyd Powys Archaeological Trust (CPAT), which covers the majority of the wider study area, agreed to make records easily available for downloading online by creating an individual user profile to their records in order for me to access the HER as required and download records in .csv format, as well as arranging visits in person. During this period, HER teams and archaeology departments within local authorities were under much scrutiny and pressure; HER posts within the Merseyside area were reallocated during the initial period of data collection, for example. Data collection from Gwynedd Archaeological Trust (GAT) and Shropshire Council proved to be more problematic, due to a lack of

accessibility online and a lack of perceived 'trust' from teams responsible for data, especially from the local authority department. Many records were available from Cheshire through websites such as 'Heritage Gateway' and the record was visited in person, although these were physically moved to multiple locations around Cheshire (Chester & Cheshire West and Cheshire East Councils) during the time of study during relocations and restructuring within the local authorities.

In a handful of cases, more than one record was available for individual sites, including separate records for individual phases/eras of use at the location. This also included some sites which were included within both Welsh and English HERs due to their location, such as Llanymynech hillfort straddling both countries. In these cases, data was collected from as many sources as was available, but a decision was made as to which record's identification number to use to avoid accidental duplication and therefore skewing of results when quantifying certain features in groups. The differing naming conventions and spelling differences for hillforts and their features also needed to be considered, as well as differentiating between hillfort sites and those which had been logged under the hillfort category within the HER[1] but since discounted.

This initial data collection from HERs and the NMR provided a basis for site identification and locational data. It also provided preliminary signposting for related publications and references in order to find more substantial data from reports, surveys, excavations and other investigations, some of which were easily available electronically within the HER, especially in Wales following the launch of Archwilio, and/or in print within their archive.

Much use was made of libraries and archives at Bangor University, including the utilisation of the interlibrary loans system and Linc y Gogledd, a reciprocal borrowing scheme between north Wales' public and academic libraries.

Archives held at the National Museum of Wales – Amgueddfa Cymru and Flintshire Record Office in Hawarden, especially the Bevan-Evans archive, proved to be particularly useful and intriguing whilst researching unpublished and partially published excavations within Wales. Where possible, insightful conversations were

[1] For example, some places had been recorded as possible hillfort sites due to field names including the word 'caer', meaning 'fort' in Welsh, prompting investigation.

held with the original excavators of the archaeological investigations, such as Dr Jeff Davies at the University of Aberystwyth, Ken Brassil and Graeme Guilbert. Ongoing excavations were visited in person and on occasion contributed to, such as Moel Fodig and Moel y Gaer Bodfari hillforts.

The collection of original, uncalibrated radiocarbon dates for recalibration proved problematic, as did the retrieval of archaeological context for some which rendered those results useless. In many cases the original laboratories had closed and therefore could not be contacted in order to search their archives. However, in many cases, the original sources of data, such as lab reports, were found in the HER or were available in publications such as *Radiocarbon* journal after some searching. The addition of these references within the HER would make future investigations and scrutiny much easier and data-collection much less time-consuming. Original uncalibrated dates were recalibrated using OxCal version 4.2 and later re-examined in version 4.3.2, developed by Oxford University's Radiocarbon Accelerator Unit, to ensure consistency.

Locational data was initially gathered using the National Grid Reference logged within the HER and/or NMR. This was quickly realised to be inconsistent and occasionally imprecise, especially considering the size of the monuments in question covering a large area. When examining geographical data concerning the 'high point' of monuments and hills, this was user-generated by inspection of data on Ordnance Survey (OS) maps, including contour data, and the Digital Elevation Model (DEM) of the topography. When considering the whole monument, multiple points were also selected by the user to create a user-generated polyline to represent the broader area of the monument/s in question. These points were selected at certain features across the monument including ramparts and entrances, found by scrutinising data available from the OS in Edina Digimap and archaeological surveys, such as topographical and geophysical surveys, geo-located as an overlying layer within ArcGIS.

As data was collected, it was inputted into a Microsoft Access database recording fields such as the data collected from excavations including dimensions and phases, and any outputs and results from investigations and calculations within the study, such as recalibrated radiocarbon dates and viewshed analysis results. When

scrutinising results, in most cases, it was exported from Access into a Microsoft Excel document for ease of manipulation. These tables can be found in Appendix Three.

1.3 Aims

This study will provide a considered and long-overdue assessment of the hillforts of north Wales and the borderlands as a group.

- To investigate the hillforts, their landscape and their relationship one to another.
- To review the features and dates of hillforts on the Clwydian Range and surrounding area, to examine whether the hillforts of the Clwydian Range, or within the wider area, form a distinctive group.
- To test whether the hillforts' setting was a determining factor in site location.

To achieve these aims, I first look at the history of research on the hillforts within the core study area and wider study area in chapter 2.

Thereafter, in chapter 3 I examine the main architectural characteristics of excavated hillforts within the wider study area in detail in the form of their ramparts and their entrances.

Subsequently, I re-examine dating evidence from excavations at the hillforts in chapter 4, with particular emphasis on and recalibration of radiocarbon dating.

Following this, findings from and a discussion of research into the setting of the hillforts, including an investigation into visibility, is reported on in chapter 5.

Finally, the findings and discussions from previous chapters are brought together and considered as a whole in an overall discussion of the results in chapter 6. This includes lessons learned and some concluding remarks and interpretations, suggesting themes of function and engagement throughout the period/s the hillforts were in actively in use, interacted with and/or modified.

CHAPTER 2

THE HILLFORTS' STORY UP TO NOW

References to hillforts in north Wales and the borders have a varied history, beginning with visiting and invading Romans in the First Century AD, to the first historians' artistic interpretations of battle and blood-shed on the ramparts. The term 'hillfort' itself suggests a defensive nature to the enclosures and its relevance is debated. Although there have been a number of research projects into groups of hillforts in recent years, large scale excavation is scarce and so interpretations must be made through gathering information on all previous work, including historical sources, small-scale excavation and survey.

This chapter will provide a brief introduction and history to approaches to the study of hillforts in Britain, followed by an overview of written sources and work carried out over the core study area of the Clwydian Range hillforts and those within the wider study area across much of north Wales and the borders. This will begin with the earliest written sources in the First Century AD and will include folklore associations, interest by antiquarians and, ultimately, research by archaeologists as the study of archaeology has itself developed.

2.1 Hillfort studies in Britain

2.1.1 Invasionary

During the latter half of the 19th Century to the mid-20th Century, studies into the British Iron Age came of age. Stone's large-scale excavations at the settlement sites of Standlake, Oxfordshire (Riley 1946-7, 36) and Highfield, Salisbury (Cunliffe 2005, 4) took interest in pits and middens, highlighting the wealth of information that could be gleaned from investigation of these features into the lives of the people who lived there, not just the militant function of the architecture. During General Pitt Rivers' excavations at a number of hillforts in southern Britain, he not only excavated the ramparts, but also cleared out pits revealing a wealth of artefacts which helped him to interpret the lives of the hillfort's inhabitants (*ibid.*). His excavations at hillfort and settlement sites, namely Caburn, Sussex in 1877-78 (Pitt Rivers Lane Fox 1881) and Winklebury, Hampshire in 1888 (Corney & Payne 2006, 131) were revolutionary; exceptionally detailed and highlighted the use of strata for dating as well as the need

for regional studies (Cunliffe 2005, 4). This work was to greatly influence contemporary archaeologists, including Sir Mortimer Wheeler who introduced the grid system for excavating, most notably during the great excavations at Maiden Castle hillfort in Dorset in the 1930s (Roskams 2001, 13).

Up to this point, a number of theories had been made, all concluding that the change in architecture, metal work, art and pottery (i.e. 'culture') was due to invasion and immigration from the Continent. As the wealth of information grew, due to more sites being excavated and more artefacts being found, this interpretation was becoming increasingly difficult. In 1931, Hawkes proposed a new scheme for dating which was to take the main elements of earlier invasion models, supplemented with new information and additional proposals and the 'ABC system' of the Iron Age was born (Hawkes 1931, 60-97). This model was to influence Iron Age studies in Britain for the next thirty years. The system drew on the theories that the changes were due to invasions, but that people came in large waves, the first beginning in the Seventh Century BC, reaching its height in the Sixth Century BC which brought people from central and northern Europe with the Late Hallstatt culture (Iron Age A peoples), the second early in the Fourth Century BC as the La Tène I (Iron Age B peoples) and the third wave of immigration in around 75BC, consisting of refugees from the Roman advance (Iron Age C peoples) (Cunliffe 1991, 10).

Due to the wealth of sites now excavated across Britain and new information gleaned, Hawkes revised his ABC system and presented this advanced model to the Council for British Archaeology's conference entitled 'The Problems of the Iron Age in Southern Britain' in 1958, which was also published in the journal Antiquity (Hawkes 1959, 170).

In 1960, Hodson presented some challenges to the ABC theory (Hodson 1960, 138-40). Hodson's criticisms of the inflexibility and complexity of the ABC structure suggested that sites and the information they held should be looked at, primarily, before defining them to a model that they would be said to fit into. Hodson put forward the three chronological divisions; the first, being the earliest pre-Roman Iron Age, the second or earlier pre-Roman Iron Age and the third or later pre-Roman Iron Age, based on the presence of imported metalwork (Hodson 1960, 140).

2.1.2 New archaeology

In 1966, Graham Clark presented an attack on the invasion theory (Clark 1966), which coincided with the advent of 'new archaeology', exemplified by David Clarke's use of systems theory and scientific, quantitative reasoning. Evidence to challenge hypotheses and create testable theories around evidence was now favoured over searching for evidence to confirm existing theories. Processual archaeology asked not just 'what', but 'what does it mean', adopting a more interpretative approach to explain the past and shifted away from individual site research to regions and landscapes.

In 1971, Hill and Jesson brought together a series of papers presented to Sir Mortimer Wheeler to mark his 80th birthday and by 1976, Harding had published 'Hillforts: Later prehistoric earthworks in Britain and Ireland' (Hill & Jesson 1971; Harding 1976). These edited publications presented landscape research with the inclusion of scientific methods. With the development of radiocarbon dating in the post-war years and the increase in environmental dating, the methods of calibration were able to place everything into perspective[2].

Early use of the processual approach 'sorted' and categorised data in a scientific approach. This guided the development of the use of Thiessen polygons, where landscape was 'measured' and territories defined to illustrate regions of power and 'central places' (Hogg 1971; Cunliffe 1971). This led, in part, to the publication of the first edition of Barry Cunliffe's 'Iron Age Communities in Britain' in 1974, now in its fourth edition (Cunliffe 2005, ix). Cunliffe's work on and his interpretation of Danebury hillfort put forward a model where high-status principal hillforts of elite tribal chiefs centralised exchange and distribution in hierarchical, 'clientship' allegiances with subordinate members of the society (Cunliffe 1984).

2.1.3 Post-processual archaeology

Post-modernist perspectives shaped a number of new approaches in the 1980s and 1990s, often collectively termed post-processual archaeology. This placed emphasis

[2] This was especially beneficial for north Wales due to the lack of pottery and coins in the area, the use of VCP (very coarse pottery), and an acidity of soils which makes survival of artefacts improbable. However, the time of study coincides with a large plateau in the calibration curve between 800 and 400 BC making dating accurately between these years difficult (Van der Plicht 2004, 45).

on the different, diverse social groups of the past and their individual experiences, concepts and beliefs, including symbols and meanings. In relation to hillforts, this new approach questioned defensive interpretations and the centralised, elite status of the monuments. In 1995, J. D. Hill's paper on Iron Age societies and hillforts queried many popular theories by asking "*What if"* and questioned many popularly held assumptions regarding Iron Age society at the time, including Cunliffe's Central Place Theory, hillforts' use for defence, chiefdoms, and the 'Celtic' community (Hill 1995b). Societies and their communities alongside their beliefs was now a key consideration in Iron Age studies. Hillfort 'defences' were now considered as symbolic, the enclosure a place to gather socially and for communal activities. The 'Celtic' elite model was rejected in favour of an egalitarian society.

Hill contemplated 'a different Iron Age', questioning the significant divide between 'monumental' interpretations of Neolithic and Bronze Age societies compared to such 'practical' interpretations of the Iron Age by archaeologists (Hill 1989). Phenomenological approaches were also established during the 1990s, emphasising personal 'experiences' of and within landscapes. Hillfort architecture was considered through cosmology, orientation and meaning, rather than through a functional role. Landscapes were considered subjective, created by people through their own experience, through space and through time (Bender 1993).

Post-processual archaeology also argued for more regionally based research, emphasised in the 1995 Theoretical Archaeology Group conference session theme and subsequent publication *Northern Exposure: Interpretative Devolution and the Iron Age of the British Isles*. The session highlighted the reliance of Iron Age interpretations on data from sites in south east Britain and Wessex which may not be accurate or relevant for central and northern Britain. A need for regional research and models was stressed (Bevan 1999).

2.1.4 Research agendas

In 1996, English Heritage called for the development of regional research strategies for England. The research agenda for the British Iron Age was produced to give a detailed study of the topic and to identify research priorities and strategies for future work across Britain (Haselgrove et al 2001).

Regionality was highlighted as one of five strategic themes for future research into the British Iron Age, along with basic chronology, landscapes and settlement patterns, material culture and socio-economic changes (Haselgrove et al 2001).

Similar themes were highlighted in Wales' response towards a Welsh research agenda, discussed above in chapter 1 (Briggs 2003). Following recent review, many of these issues are still considered unresolved (Karl & Gale 2014).

This chapter will now outline previous research into the hillforts within the wider study area. This is presented chronologically from the earliest contemporary sources up to the 21st Century. Previous research activity has arisen in a number of guises, adopting and being influenced by a number of theoretical perspectives highlighted above and includes academic research, rescue archaeology and funded landscape schemes.

2.2 A chronological account of hillfort studies in the study area

2.2.1 Antiquity

The first mention of the wider study area defined by the hillforts of the Clwydian Range and their neighbouring hillforts could be said to overlie three different tribal boundaries as highlighted by Roman sources.

In AD50, the annals of Tacitus describe the Roman attack on the tribal area of the "*Deceangi*"[3] of north east Wales by Publius Ostorius Scapula (Yardley 2008, 433-434), governor of Britain AD47–52. Tacitus noted that the natives were unwilling to 'risk battle' so their "*lands were plundered, and booty carried off in all areas… and their trickery was punished if they tried to harass the column from concealed positions*" (Yardley 2008, 433). The final statement suggests some initial resistance from the natives, making use of their knowledge of the topography of the land to use guerrilla warfare on the attacking Romans.

The word 'DECEANGL' has been found on several pigs of lead found across Cheshire and Staffordshire. These are thought to have originated from the lead mines on Halkyn Mountain, Flintshire. The most intact Deceangl pig found at Tarvin

[3] In this instance spelt without the 'l' but known as the 'Deceangli'

Bridge, Cheshire, bears the inscription: IMP[ERATOR] VESP[ASIANVS] V [CONSUL] T[ITVS] IMP III COS [= CONSUL]. DECEANGL (in the fifth consulship of the Emperor Vespasian and the third Emperor Titus) (Davies 1949, 146) and has been suggested that the local tribe's name should read 'Deceangli' (Higham 1993, 32).

In the Second Century AD, Ptolemy notes certain towns, or civitates, in Britain in relation to tribal areas. The Deceangli are not cited, but it is said that the area in question was inhabited by the tribe of the Cornovii, with Chester and Wroxeter within their country (Horsley 1732, 368). Higham believes that modern scholars may have been 'over hasty' to dismiss this assumption. He suggests that as in the Medieval period, the Marches, i.e. the boundary between England and Wales, would have been a fluid boundary between the two tribes of the Ordovices, to the west and the Cornovii (Higham 1993, 30). Savory (1980, 306) suggests that the Deceangli would have been the subjects of the Cornovii, who would have had control of the copper and lead ores which are present in north Wales. He suggests that as these resources were exploited in both the Bronze Age and during the Romano-British period, it is likely that this was also the case during the Iron Age.

Higham believes that the inclusion of Deva (Roman Chester) within Cornovian territory by Ptolemy and the name he gives to the Mersey estuary, 'Seteia' relating to the Setantii, would suggest that the Cornovian northern territory was bounded by the Mersey (Higham 1993, 31). To the west of the Clwydian Range, in Gwynedd, the tribe said to be present during the Late Iron Age/Romano-British transition, was named as the Ordovices by Tacitus. Higham suggests that the Ordovices "*encompassed several local tribes among whom the Deceangli and the Gangani can be identified*" (Higham 1993, 33). This might also suggest that the Ordovices and its tribal components including the Deceangli, could reflect the tribal identity of the study area in the Late Iron Age.

In contrast to the north east of Wales, the lands attributed to the Ordovices are mentioned in a number of texts written by the Romans and are said to have occupied lands in Gwynedd and southern Clwyd. Tacitus' Annals report that the exiled Caratacus led the tribes of the Silures (of South Wales) and the Ordovices against Pubilus Ostorius Scapula (Gordon 1737, 469). Caratacus was said to be defeated in

battle in AD51. Tacitus describes the scenes, where Caratacus chooses the site of the battle to be in the territory of the Ordovices, an area where both advance and retreat would be difficult for the Romans, but habitual for the natives. The natives were located on a hill-top and are said to have built up boulders as a rampart wherever the slope was less steep. It is described how the leaders of the tribes encouraged and boosted morale of their tribes, whilst Caratacus (Caradoc/Caradog) inspired courage by declaring that the battle would lead to their freedom and bring the tribes together as one; *"Never to yield to arms, nor wounds, nor aught save death"* (Gordon 1737, 470). The location is also described to have been by a river of varying deepness and the sight of the tribes unified and resistant. The river, the rampart and the hill were said to have daunted the Roman general. However, a bloody battle continued; the ranks of the natives were broken, and the Romans took victory. Two hillforts of the name '*Caer Caradoc'* lie in the general area; one situated at Cerrigydridion and another, often referenced when discussing Caratacus' battle, located near Church Stretton in Shropshire.

In late AD60, Mona (Anglesey) became the focus for the Romans. Tacitus describes the island as having 'a considerable population of its own' and also as a haven for refugees (Tacitus Annals XIV, xxix). It has been suggested that the Iron Age burial found at Brynsiencin, buried with a sword, could have been one of these refugees (Lynch, F. 2012, 'Anglesey in the Iron Age' talk at Oriel Ynys Môn, 6 September).

Tacitus' report on the attack of Mona describes how Suetonius Paulinus instructed his men to construct a bridge of 'flat-bottomed boats', and as infantry and cavalry approached the island, they were met by men, women and druids. Tacitus describes a violent and bloody scene, followed by the destruction of groves growing on the island which were used for ritual purposes, describing how the natives covered altars with the blood and entrails of their captives to speak to their Gods (Tacitus Annals XIV, xxix-xxx). However, as this was underway, Cassius Dio, in his History of Rome, reports that the East Anglican tribe of the Iceni, led by Queen Boudicca[4], were in revolt and Paulinus was forced to withdraw from Anglesey (Foster 2004, LX11.7-8).

[4] Local legend believes that Boudicca is buried within Gop Hill, the second largest prehistoric mound in Britain located near Prestatyn, although apparently upon excavation no chamber nor finds were revealed (Davies 1949, 156-62).

Tacitus reports of the Ordovices again in the AD70s, when they rebelled against and massacred a Roman garrison in their lands. Agricola took the Twentieth Legion into north Wales, massacred the Ordovices and conquered the stronghold of the druids on Mona in a single campaign in the late summer of 78AD (Tacitus *Agricola* 18).

The writings of contemporary authors must be interpreted with caution because, not only are the references fleeting and solely in relation to and in reference of warfare, but also they were written during the Roman attack of Britain. These communities and convergences could, potentially, have been formed specifically in preparation of the Roman invasion. Therefore, the reports cannot be confidently used to describe the social aspects of life at this time, nor for the whole of the Iron Age and the time before this perceived 'threat'. Nevertheless, these extracts do allow insight into the politics during the First Century AD, providing the earliest references and thus an initial basis for building an interpretation for life in the Iron Age in this area.

2.2.2 Folklore

Other early sources include poetry and folklore. Caer Drewyn, located in south Denbighshire, on the western limits of Llantysilio Mountains south of the Clwydian Range, is said to have been a cattle enclosure, noted in the Royal Commission on the Ancient and Historical Monuments of Wales' (RCAHMW) 1921 inventory. The Royal Commission make note of the tale that "*Drewyn Gawr made Caer Drewyn in Deyrnion, the other side of the river from Corwen. And to his sweetheart he made that Caer, to milk her cows within it*." (RCAHMW 1921, 13). A similar reference is made to this end by Edward Lluyd in Parochialia, describing the enclosure as "*a round stone wall about an acre of ground where they kept their cattel in war time*" (Morris 1911, 44). As the hillfort proper measures over seven acres, these sources, presuming they are referring to the same part of the fort for the use of cattle enclosure, are referring to what is presently known as 'the annexe', which lies as a separate enclosure to the main hillfort, abutting the eastern wall to the south of the entranceway. Although the ditch and bank associated with this feature has been attributed to an earlier phase of the hillfort, the stone wall which encloses the annexe has been suggested as being later (Brooks & Laws 2006a, 5). Moel Fenlli hillfort, located on the Clwydian Range, is also subject to tales of giants, being associated

with Benlli Fawr, a king of Iâl in the Fifth Century AD (Gardner 1921, 249) and the sacking of the enclosure by fire.

2.2.3 Antiquarians and geographers

The geographers and the early antiquarians of the 17th Century, such as William Camden in his 1607 Britannia (Gibson 1695) and Edward Lhuyd's Parochialia in 1699 (Morris 1911), make reference to some of the hillforts, including a little information as to their size. However, little useful interpretative information is gleaned from these sources except that the hillforts are obvious features in the landscape. In these early sources written by historians and geographers, they are recognised as and referred to as 'camps'.

Pennant, in his 'Tours of Wales' in 1783, begins to note features of the 'camps', speaking of the ditches, their depth and even noting certain topographical features and the functions they may have had. At Moel Arthur hillfort on the Clwydian Range, he explains the 'terrace' on the west side of the hillfort as "*a place of exercising the possessors*" (Rhys 1883, 60).

Interestingly, there is no mention of the large, stone hillfort of Moel Hiraddug in any of the publications before the 18th century, even though the hill it sits upon, 'Moel Yriadug', is mentioned in Parochialia as on the boundary of three parishes (Morris 1911, 63) and even earlier in Domesday appearing as 'Raduch' (Hemp 1928, 254). Possibly the first mention of the hillfort itself is in Pennant's Tours of Wales, describing "*the first that forms this chain [of camps] is Moel Hiraddug*" (Rhys 1883, 61-62). He later refers to the neighbouring hill of Marian and its mineral wealth of iron (Rhys 1883, 114-115). Ongoing exploitation of Moel Hiraddug's own natural resources were eventually to lead to the hillfort's destruction in the 1970's and 80's through quarrying.

It was through quarrying at this site that some of the best-preserved artefacts from any of the Clwydian Range hillforts were discovered. In 1872, whilst building a new road into the hillfort to the iron ore quarry, a hoard of metal items was discovered within the eastern rampart collapse (Hemp 1928). The items have been described as parts of a shield, metal plates of 'Celtic design' and two pieces of a sword blade (Hemp 1928, 255). The hoard is thought to date from approximately the turn of the

First Century AD and, following re-excavation of the find site, proposed to have been located between the inner and middle ramparts, sealed by collapse which must have occurred soon after its deposition due to the preservation of the artefacts, possibly a deliberate burial and linked to an attack on the fort (Houlder 1961, 9-10; 18-20).

A few years earlier, in 1833, Lewis published his Topographical Dictionary of Wales (Lewis 1833a; 1833b). This publication went into greater detail about the camps and speaks of their features as being 'defensive' structures. Penycloddiau is described as the "*principal and most extensive of the [Clwydian Range 'military posts' and] occupies the summit from which its strong foundations were called Bryn y Cloddiau or 'the hill of the ditches'... and defended according to the facility or difficulty of access by single, double or triple and quadruple entrenchments*..." (Lewis 1833b, see LLANDYRNOG).

Moel y Gaer Llanbedr is referred to as being "*an outwork to the camp or principle station of Moel Fenlli*" (Lewis 1833b, see LLANBEDR), suggesting that Lewis believed them to be contemporary and that Moel Fenlli was the 'hillfort proper'. Moel Fenlli boasts sweeping views over many counties in all directions (Matthews 2006, 31 Table 4). It is doubtful that Moel Fenlli would particularly *need* an outwork for defensive reasons. Lewis himself describes "*The ascent to this station, which is so strongly guarded on every side as anciently to have been impregnable, is by a circuitous path round the western side of the mountain*" (Lewis 1833b, see LLANBEDR). As Moel y Gaer Llanbedr is somewhat smaller and overlooked, it could be that these two hillforts were built with different functions in mind.

When referring to Moel y Gaer Bodfari, Lewis explains its situation as "*probably constructed for the purpose of defending the pass through the Clwydian Mountains*" (Lewis 1833a, see 'BÔDVARI'). Interestingly, many of the hillforts in the area, and almost all of the hillforts of the Clwydian Range, could be said to be overlooking or close to a pass and/or water course of some kind, so Lewis's observation warrants further investigation into its situation.

The work of the geographers and antiquarians of the 17th to mid-19th Century created the backbone to hillfort studies in the area. Even though their interpretations of the 'camps' were certainly with a military function in mind, their initial explorations recorded information regarding the sites and made them more widely accessible for

the first time, along with helping to preserve place names and inspire further study as archaeology became an academic profession as the years progressed.

2.2.4 The beginnings of archaeology

Development of excavation techniques between the latter half of the 19th Century and the mid-20th Century resulted in more information becoming available to interpret the social life within the hillforts. Alongside this, the means of accessing this information progressed with the establishment of many journals, including the publication of the first edition of the new Welsh journal, Archaeologia Cambrensis in 1846; the first archaeological journal in and for Wales. A short report on a coin hoard found on the hillfort of Moel Fenlli was written in Archaeologia Cambrensis' second year of publication in 1847 (Jones & Williams 1847, 108-111). Archaeology was beginning to flourish, especially in Wales and increasingly so for hillforts and their social status.

Three of the Clwydian Range hillforts were subject to small excavations by Wynne-Ffoulkes in 1849. His report, published in Archaeologia Cambrensis, begins with an imaginative setting of the scene, describing the hilltops as "*the natural barriers of this part of Wales*", noting their setting with extensive views across Wales, Cheshire and Lancashire, and their history as "*a time when a race, brave and more hardy, whose only toil was war, their home the camp, breathed their invigorating air*" (Wynne-Ffoulkes 1850a, 82). During his excavations of Moel Fenlli in the late summer of 1849, Wynne-Ffoulkes determined that the southern 'entrance' at Moel Fenlli was not original, noted the spring in the centre of the fort "*in front of which there appears, from embankments still visible, to have been a circular reservoir*", uncovered what seemed to be a roadway with artificial surface made up of "*stones of some size, laid flatways as a rude pavement*" (Wynne-Ffoulkes 1850a, 83) and found a series of artefacts. Most of his findings can be attributed to the Romano-British period, such as Samian ware. He also found much of what he described as 'coarse', 'peculiar' and 'ill-tempered' pottery, some of which was white, some red, found throughout the site, one piece of the white pottery found "*just under the rampart and below the original surface*" (Wynne-Ffoulkes 1850a, 85). These artefacts have since been lost and so cannot be studied today to determine a date, but at the time, these were also attributed to the Romano-British period by Professor R. C. Bosanquet FSA of the

Royal Commission, during the time they were kept at Ruthin Castle after being exhibited locally (RCAHMW 1914, 90-91). A ‘stone knife’, a corroded iron object, glass, a leaden ornament, a brass or bronze ring and fragments of arrow heads were also found (*ibid.)*.

Wynne-Ffoulkes, taking into account his own findings and also the coin hoards discovered on the site during the early 1800’s (Lewis 1833b; Jones & Williams 1847, 109-110) suggested that Moel Fenlli was a post held by the ‘natives’ built to defend themselves from the Roman invasion. He also suggests, due to the dating of the artefacts found, that Moel Fenlli could have been built by the Romans, or that they managed to ‘take’ the fort. He describes Moel Fenlli as “*of Cambro-British origin, existing at the time of the Roman invasion*” (Wynne-Ffoulkes 1850a, 88).

Wynne-Ffoulkes’s report on his excavations at Moel y Gaer Llanbedr and Moel Arthur were published later that year in the Archaeologia Cambrensis July edition of 1850. Moel y Gaer, although overlooked on a spur from Moel Famau “*like a promontory*”, was said to be of a ‘more advanced’ construction to Moel Fenlli and particular attention was displayed upon the ditches; Moel y Gaer was found to have flat bottomed ditches, Moel Fenlli V-shaped (Wynne-Ffoulkes 1850b, 175). All that was found in the shape of artefacts was a piece of Roman pottery and this was located at the bottom layer of the ditch infill, on the original ditch bottom, below a layer of stone in some ashes. A piece of pottery “*a lid for some vessel*”, and also a ‘peculiar shape’ of limestone were also found (Wynne-Ffoulkes 1850b, 178-9). From his findings, Wynne-Ffoulkes stated that Moel y Gaer Llanbedr was either not contemporary with Moel Fenlli or that “*they were made by different races*”. He was confident to state that Moel Fenlli was a post of the Ordovices, i.e. ‘native’, but suggested, albeit with a certain amount of trepidation, that Moel y Gaer could be of Roman date due to the uniformity of its construction and the pottery found. He does, however, state that the pottery find was not evidence enough to say that the Romans occupied, built or visited the camp.

Wynne-Foulkes concluded that Moel y Gaer, Llanbedr, would never have been permanently occupied as there was no trace of spring or well inside the ramparts (Wynne-Ffoulkes 1850b, 181). He also concluded that Moel y Gaer, Llanbedr, was a later build than Moel Fenlli, due to its construction techniques being ‘more uniform’

(Wynne-Ffoulkes 1850a, 181). The lack of artefacts during the Iron Age in this area of Britain is a trait, with no coins in circulation and pottery[5] scarce; subtle clues to any occupation or activity in the Iron Age could easily have been missed during these early excavations.

Moel Arthur hillfort, a few miles north of Moel y Gaer, Llanbedr, and Moel Fenlli on the Clwydian Range, was the final excavation that year carried out by Wynne-Ffoulkes, although at the end of his paper he described the wealth of archaeological sites that remained to be investigated to the north of the Clwydian Range and other sites nearby. He compared Moel Arthur directly with Moel Fenlli, with both the ramparts and the ditches being of "*exactly the same character*" and made a note that from the summit, a number of other hillforts could also be seen in Flintshire but did not go into detail into any suggestions of relevance for this (Wynne-Ffoulkes 1850b, 183). Artefacts recovered from Moel Arthur included two pieces of Roman pottery, some fragments of worked flint, some corroded iron and two "*curious pieces of stone work*", measuring 6ft and 14ft in length, resting against the rampart. After their destruction, he concluded that they were 'a mere mass of stone walling' and regretted pulling them down. He was unsure whether they were 'relics of antiquity' but suggested that they could have been even older than the fort itself. This insinuates that he believed there were different phases of use upon the hilltop, but he does not venture into any interpretation as to why or what he thinks they may have been (Wynne-Ffoulkes 1850b, 184). The author concludes his report on the site as of 'Cambro-British' construction, as at Moel Fenlli, which he describes as a 'counterpart'; Moel y Gaer, incidentally, is described as a 'contrast' to both (Wynne-Ffoulkes 1850b, 186). He concludes that Moel Arthur had more traces of habitation than at Moel y Gaer, was probably visited by the Romans, but not of permanent dwelling due to the lack of a spring or well on the mountain. This fort was almost certainly "*made for the protection of the pass… on the southern side of the mountain*" (Wynne-Ffoulkes 1850b, 184-5).

During Stapleton's 1908 excavation of Moel y Gaer, Bodfari, a few miles north of Moel Arthur above the village of Bodfari, the western ditch was found to be 'V-shaped' but of different depths across the site (Stapleton 1909, 235). A small gap

[5] Apart from VCP (very coarse pottery) which would have been used to contain salt, brought from Cheshire.

existed in the ramparts in the south western rampart and an excavation at this point revealed a line of stones across the gap, running into the rampart at either side (Stapleton 1909, 236). Stapleton suggested that this was possible evidence of the blocking up of an earlier entranceway. He concluded that due to the lack of finds, the fort was never occupied by the Romans (Stapleton 1909, 237).

After its establishment by Royal Charter in 1908, the Royal Commission on the Ancient and Historical Monuments of Wales, published itineraries to Flintshire, Denbighshire and Merionethshire amongst others (RCAHMW 1912; 1914; 1921). The itineraries included comprehensive lists of many of the monuments in the counties. Moel Hiraddug hillfort is once again absent from the listings. However, these publications go into detail; each site reported on individually. The hillforts of the Clwydian Range (Moel Hiraddug excepted) and their neighbours are reported on in detail, describing the features of the sites for the entire circumference, the approach, the interior and also their environs, some with comprehensive plans of the sites.

Willoughby Gardner's presidential address to the Cambrian Archaeological Association in 1926 entitled 'The native hillforts of North Wales and their defences' (Gardner 1926) provides a comprehensive overview to the work and general thought on north Welsh hillforts and their defences of the time, noting general features as well as differences between sites. Gardner provided some new ideas and argued against some earlier theories which he believed were unfounded. One of Gardner's initial statements was that "*many people are in the habit of calling [the hillforts] Roman"* (Gardner 1926, 230) and continued to demonstrate that this may not be the case, using a Roman fort as an example to highlight how Roman forts and hillforts differ (Gardner 1926, 229-230). Note the use of the word 'native' within the paper's title. Gardner's overall view on the hillforts was primarily defensive, using words such as 'command', suggesting that the defences were sited where they were to make it 'difficult for assailants to rush', and even providing a wonderfully interpretative description on what it would have been like to attack a hillfort, describing how the features of the hillforts would have contributed to its overall defence from attack. This included a note on the entrances mostly having right hand side approaches, to ensure that any attacker would be unprotected by their shield, which would have been worn on the opposite arm (Gardner 1926, 267).

Gardner also attempted a chronology for the hillforts based on the knowledge available at the time, which was comprehensive despite the lack of archaeological evidence compared to today. His general thoughts were that hillforts were developed and improved over time and that hillforts with closely spaced ramparts and ditches dated to earlier times than those which were spaced out; his logic being that this 'improvement' was something discovered by trial and error; that a 'spaced out' rampart and ditch provided a better defensive face and was therefore a later design. Gardner quoted Caesar using this type of defence in Gaul and stated that the Gauls would 'copy' things they saw and that those in Britain would have been no different (Gardner 1926, 280). This comparison to Roman design is referred to several times again in his address, including when considering rectangular guardchambers he had excavated at Dinorben's second-phase south eastern entrance, see Figure 3xxiv, the north eastern entrance of Penycorddyn Mawr and also at Caer Drewyn, suggesting that this design had been influenced by the Romans, and so must be later phases (Gardner 1926, 267-273). An argument he put forward for this theory was that these types of guardchambers are completely unknown in Ireland, and this was because the Romans did not settle there (Gardner 1926, 273). However, as there are plenty of examples in other places the Romans did reach that did not adopt this style. Gardner's logic, in this case, does not stand firm.

Gardner uses Caer Drewyn as an example of a stone hillfort in the area and makes note of the earthen bank, suggesting it is a later feature, as stone hillforts generally have no ditch and therefore, they could be said to be the most primitive design of hillforts (Gardner 1926, 260-266). Gardner also suggests that some of the features of stone hillforts, such as stone banquettes and wall walks, could have been copied from Roman design and are therefore later features, such as the final phase of Dinorben hillfort which he dated to the end of the Third Century AD (Gardner 1926, 260-266).

His final remarks on the hillforts of north Wales, after a section describing how the hillforts of the area do not contain native pottery and are therefore a 'backwards civilisation' (Gardner 1926, 278), he looks at the latest possible date for hillforts. Gardner examines the artefacts which have been recovered, most of them Roman, and suggests that contrary to former opinion, the presence of these does not mean that the Romans necessarily lived on the site, but that this clearly shows that

‘natives’ were in contact and trading with the Romans, possibly in nearby Deva (Chester) (Gardner 1926, 281). Using information from the coin finds, he suggests that as no ‘minims’ were found on the sites, which would have been a very common feature of a later date, the hillforts could not have been in use after the Fifth Century AD (Gardner 1926, 279). He supports this information by stating that, as after the Fifth Century AD, churches were being built and that if the hillforts were still in use at this time, churches would have been established on the sites (*ibid.*).

Gardner concluded that, as we have no definitive proof for them being earlier, many hillforts would have been built in preparation for the Roman invasion and used in the Second, Third and Fourth Centuries, as in Gaul (Gardner 1926, 280). He poses the thought that some hillforts were constructed later and were simply copies of earlier, ‘more primitive’ sites (*ibid.*). Gardner (1926, 281) accepts that from the artefacts recovered, the sites were in use during the Romano-British period, but he is confident that this was by ‘natives’. However, he puzzles over how the residents of Dinorben, for example, could rebuild the fortified enclosure with strong defences so close to the Roman military road from Chester to Caernarfon during the Romano-British period (Gardner 1926, 281).

The publication of Canon Ellis Davies’s Prehistoric and Roman Remains in Denbighshire (Davies 1929) and separately for Flintshire (Davies 1949) were able to indulge even further than the Royal Commission’s itineraries from a few years earlier, with comprehensive descriptions within the introduction of the publications into the different ages, classifications and background into the names of some of these sites; caer, din, castell, etc and the finds within the county at archaeological ‘sites’ and chance finds. In the Denbighshire edition in 1929, Davies explains how the Iron Age began there in around 500BC and that the only artefactual evidence in the county was for this time onwards, noting La Tène culture (Davies 1929, 22). By 1949, with the publication of the Flintshire edition, the Iron Age was then updated to commence at 700BC and Davies coherently described the different periods within the Iron Age; Hallstatt/La Tène/Late Celtic or ‘Early’, ‘Middle’ and ‘Late’ (Davies 1949, 19), following on from the publication of Hawkes’ ABC Iron Age in 1931 (Hawkes 1931), discussed below.

With each site described and classified within their ‘communities’, each site was broken down into subheadings including the ramparts, the entrances, interior, approach, finds etc (Davies 1949, 37; 96; 267; 270). He also included comprehensive lists of past references to the sites, some also included detailed plans. Davies was also keen to correct errors that had been published previously, such as in the description of Moel Fenlli, where he was keen to confirm the area of the hillfort to be 24 acres, whereas Lewis had stated it to be 63 acres, with subsequent writers quoting this same error (Davies 1929, 183). He also states, pointedly, in reference to prior writings, that simply because ‘Roman’ artefacts had been found, such as the coin hoards and pottery, this did not mean that the Romans possessed the site at any time, but it simply showed that the natives were in contact and traded with them (Davies 1929, 185), just as Gardner had recently stated.

Most importantly, Davies questions the defensive theory for hillforts. He stated, for example, that the walls at Hiraddug were nowhere near ‘formidable strength’ and that the trenches “*do not seem to have played an important part in the scheme of defence”* (Davies 1949, 96). However, with Moel y Gaer, Llanbedr, Davies explained that if the outer rampart had not been constructed, the land it protected would have been a weakness to attack: “*had it had been left unfortified, would have afforded a resting place for an enemy attacking the position*”, which reflects back towards the then more widely-held military context for the monuments (Davies 1929, 187).

Within the description of Moel y Gaer, Llanbedr, a comparison is made with Caer Euni in southern Denbighshire, as burnt stone had been found at both sites (Davies 1929, 187). Davies compares the burnt stone evident at Moel y Gaer in the 1920s with the similar deposit at Caer Euni which he describes to have led “*certain archaeologists to the erroneous conclusion that the ramparts were vitrified*” (Davies 1929, 187); his theory confirmed during later excavations at Moel y Gaer (Karl & Butler 2009, 13).

2.2.5 Modern excavation

Many hillfort excavations had been concentrated in southern Britain up to this point, but the rest of the country soon followed, and a number of hillforts were excavated in north Wales and the borderlands. Varley excavated Maiden Castle, Cheshire in 1934-5 (Varley 1935; 1936a), Castle Ditches, Eddisbury in 1936-8 (Varley 1950) and

Old Oswestry in 1939-40. His findings alongside other recent, local excavations, enabled him to publish an overview of the hillforts in the Welsh Marches as a regional study (Varley 1948), although the excavations at Old Oswestry were never fully published by Varley himself (Hughes 1994). In his regional study, Varley suggested that the fashion for contour forts began in Hampshire, Wiltshire and Dorset, and over a period of time, before 100BC, it reached the Welsh Marches and surrounding areas. His discovery of 'Wessex Iron Age A' pottery at Old Oswestry led him to propose that univallate hillforts may have first appeared at the beginning of the Third Century BC, and bivallate hillforts approximately 100 years later (Varley 1948, 57). He noted another 'diffusion' around 100BC from the south west and the Bristol Channel (Varley 1948, 58).

Although only one hillfort on the Clwydian Range, Moel Hiraddug, was excavated and published[6] during the remainder of the 20th Century, (Houlder 1961; Brassil et al 1982), some major excavations took place within the surrounding areas of north Wales and across the border into Cheshire and Shropshire (Kenyon 1942; Stanford 1984, Musson et al 1991; and others), most of which due to the risk to sites and rescue operations.

Excavations by Kenyon in 1939 at the Wrekin, a large hillfort in Shropshire, were undertaken on the defences (Kenyon 1942). Findings included that the inner rampart had two phases of construction; the second following a period of destruction of the initial phase. The south west entrance also had two phases; initially with a 'revetted inturn' then lengthened and included an additional guardchamber, and a pre-rampart occupation layer (Mudd 1998, 4-5). The Wrekin was also excavated in 1973 by Stanford in a small area in advance of a transmission station being erected on the hilltop (Stanford 1984). From the discovery of signs of occupation in the form of hearths and four-post structures repeatedly being rebuilt as well as radiocarbon dates, this led to the conclusions that the hillfort was initially occupied c.900BC; the outer enclosure's ramparts were destructed by "*disastrous fire*" (Stanford 1984, 83) and deserted around 420BC, then reoccupied in the Second Century BC and then finally destructed during the Romano-British occupation (Stanford 1984, 83-87). These excavations were reported during the application for Scheduled Monument

[6] Two hut platforms within Moel Fenlli were excavated in 1959, but the results were never published (Hayes 1959a; 1959b; 1959c; 1959d; 1959e)

Consent for the development of the transmitting station and it was noted that the coarse pottery found, alongside the "*lack of Malvernian ware and other typical Iron Age fabrics... does not appear to support the sequence interpreted...*" (Mudd 1998, 5). However, if these finds are compared with the hillforts north of the Wrekin, into the northern Marches of Wales, a lack of these materials and a dependence on coarse pottery and possibly perishable materials, such as wood or leather, may indicate connections northwards.

Wooden artefacts including bowls and a sword were recovered from the hillfort of the Breiddin, 20 miles (32km) west of The Wrekin also in the mid-Marches, in a pond which was enlarged during the Iron Age to form a cistern (Britnell & Earwood 1991, 161-172). Other finds included pre-rampart deposits, a Late Bronze Age rampart constructed of paired posts with a core of soil and stones, an Iron Age rampart with a front facing of boulders (Musson et al 1991, 17-54) and evidence of pits, furnaces and metalworking activity, as well as roundhouses, four-posters and a wealth of radiocarbon dates (Musson et al 1991, 55-82).

The multivallate site of Llanymynech Hillfort, approximately 5 miles (8km) north of the Breiddin, has been partially excavated several times, mainly due to the establishment of a golf course which now sits on the hilltop (Musson & Northover 1989). These excavations revealed occupation debris pre-dating the innermost rampart, and three ramparts at the point of excavation; the innermost, and previously unknown rampart, being made up of loose limestone rubble and a ditch lying 15m in front of the bank (Musson & Northover 1989, 17-19). Radiocarbon dates from a bowl furnace 204BC-AD130 (CAR-534), suggest metal working, and a pit was dated to 384-52BC (CAR-535) (Musson & Northover 1989, 19-20). Excavation near to the north gate in 1994, revealed a third rampart made of a dump of limestone blocks with no associated ditch (Burnham et al 1995, 328). Human remains, dating to 753-366BC[7] (OxA-6824) were also discovered during excavation.

Six miles (9.7km) to the north of Llanymynech hillfort, the multivallate site of Old Oswestry is to be found, excavated by Varley in 1939-40 (Hughes 1994). The full findings of Varley's work at the site was written up over 50 years after the excavation by the Cambrian Archaeological Society (*ibid.*), praised by Havercroft "*despite the*

[7] Recalibrated, see Chapter 4 for further details

variable quality of the archive" (*ibid.*, 46). Varley was "*painfully aware of the fact that [his and O'Neil's] work [at Old Oswestry had] not yet been completed"* (Varley 1948, 4) and provides some tentative conclusions suggesting five periods of occupation with four phases of defence building within his 1948 article on hillforts of the Welsh Marches (*ibid.*, 51). The conclusions made by Hughes after the writing up of Varley's report also included the five chronological phases of use alongside at least four roundhouses, pits and coarse ware, with fragments of Cheshire VCP and Wessex fine ware (Hughes 1994, 53-61).

Part of the interior and the hillfort's ramparts at Beeston Castle was extensively excavated between 1968-1973 by Keen and between 1975-1985 by Hough, and the results of these were published by Ellis (Ellis 1993). Evidence was found for Late Bronze Age occupation (*ibid.*, 20-24) and subsequent rebuilding phases dating throughout the Iron Age (*ibid.*, 21-2). As many as 146 postholes were excavated in the outer ward, associated with the Late Bronze Age or Iron Age, alongside Late Bronze Age pottery and VCP (*ibid.*, 35). During a desk-based assessment of the hillfort, Oxford Archaeology North (OAN 2008) noted that these excavations were carried out for management reasons on the site, primarily the impact of public access and specifically to target the medieval remains; the investigations designed for the prehistoric remains targeted the towers and outer gate, subsequently damaged by the medieval architecture (*ibid.*, 48).

The excavations from 1972 onwards at Moel y Gaer, Rhosesmor, Flintshire, have been partially published in two articles (Guilbert 1975b; 1976b) alongside short updates in Archaeology in Wales throughout the investigations (Guilbert 1972; 1973a; 1974a; 1975a; 1976a; 1978b; 1979b; 1981a) and Archaeology in Clwyd (Guilbert 1978a; 1979a). The shorter updates published in the annual journals allow identification of the general location of the trenches at Moel y Gaer after 1976 and that they had discovered that the original palisaded enclosure, at 3.8ha, was larger than the subsequent ramparted phase of 2.5ha at the site (Guilbert 1981a, 23) and that it covered the whole of the hilltop (Guilbert 1978b). There was also a desire to explore the eastern section more closely, as features identified were suggested as either further remains of the unfinished outer defences previously found, or possibly the remains of an earlier previously unknown entranceway (Guilbert 1981a, 23). It is unclear whether this was ever examined in detail. Topographical survey has

continued intermittently since (Guilbert, G. 2012. Site visit with Erin Lloyd Jones, 19 June) and the publication of his results is keenly awaited.

The large-scale excavations at the now-destroyed hillfort of Dinorben, between 1912-22 by Gardner, and between 1956-61 and 1965-69 by Gardner and Savory, discovered long, multi-phase occupation at the site (Gardner & Savory 1964; Savory 1971a; 1971b). The results of Gardner and Savory's initial excavations were published in 1964 (Gardner & Savory 1964) and initially, pre-rampart occupation layers with associated hut-floors, assigned to c.300-200 BC by Savory were found at the site, with the first rampart thought to date to c.200-100 BC (Gardner & Savory 1964, 75-78). Savory notes that the "*regional system of cultural and chronological classification... 'ABC of the British Iron Age' [had] been followed as far as possible...*" when discussing the findings (Gardner & Savory 1964, 75). This suggests that the findings have been interpreted to fit into this model, rather than patterns being discovered by the findings and this may have influenced the interpretation of the discoveries when reporting on the excavations at Dinorben.

Further excavations between 1965 and 1969 obtained charcoal samples for radiocarbon dating (Savory 1971b). These dates, alongside further exploration of hut platforms and the ramparts, lengthened the chronology of activity at the site, with evidence for activity in the Late Bronze Age, multiple dates from the Iron Age, an 'open settlement' in Romano-British period with associated coinage which followed deliberate demolition of the rampart (Savory 1971a, 252; 254-256) and possible evidence for 'Dark Age' activity with an aisled timber hall (Gardner & Savory 1964, 106-107). The recording of the excavations has been criticised, with many inconsistencies in Savory's report noted by Alcock, including stratigraphical discrepancies being found in different figures and scepticism on the interpretations of some features (Alcock 1972, 330). This included the designation of charcoal samples dated to the Period I rampart; they were not found within the feature which casts doubt on the validity of Savory's dating of the rampart in this area (Alcock 1972, 330). Savory interpreted postholes to be a 60-foot roundhouse; Alcock suggested that this could actually be evidence for Romano-British defence of the site as a palisade and internal tower, thought to be absent from the site by Savory (Alcock 1972, 330-331). However, the following year, Savory's monograph received high acclaim from Livens, praising Savory for the revisions to his findings from the

1964 edition and commenting on the importance of the dating results from Dinorben for the wider field of hillfort studies (Livens 1973, 114). Despite allowing for the inconsistencies within the report of the findings, the work at Dinorben provides a detailed *published* report of the excavations, allowing readers access to the findings and, as Alcock was able to do within the review, reinterpret the results. The radiocarbon dates assisted in widening the date range for hillfort chronology and the excavations at Dinorben have certainly helped increase the interest in hillfort studies since their publication and since the hillfort's entire destruction.

Other excavations within hillforts in the surrounding area of the Clwydian Range include Pen y Gaer, Llanbedr-y-Cennin, which is the only hillfort in the area with evidence of rare Chevaux-de-frise (Hughes 1906a), Penycorddyn Mawr which underwent comprehensive excavation for its time by Willoughby Gardner, including its entrances and large annexe (Gardner 1910), Braich-y-Ddinas where features were excavated in haste, as it was being quarried away and from which a number of artefacts were reported, including fragments of a late La Tène brooch and a number of Romano-British items including a silver 'convoluted snake' bracelet (Hughes 1912; 1915; 1922; 1923a; 1923b; 1930; 1931; 1932; 1934), Dinas Camp Llanfairfechan (Hughes & Bezant Lowe 1925), New Pieces, a defended enclosure or hillfort located c240m south east of the Breiddin (O'Neil 1937), Craig Rhiwarth (Richards 1938; Crew, Guilbert & Roe 2012), Castell Caer Seion excavated in 1951-2 and re-examined in 2012 (Smith 2012), Pen y Ddinas on the Great Orme excavated in 1960 and reassessed in 2009 (Smith 2009; 2012), Caer Estyn near Wrexham (Hayes & Sandford Evans 1960), Caer Caradog (Livens 1962; 1964; Smith & Livens 1991), Bryn y Gaer Broughton (Guilbert 1974b), Pendinas Llandygai (White 1975; 1977; 1992), Bryn y Castell, where multi-phase use of the stone hillfort was discovered, alongside metal-working activity and the first stake-wall roundhouses to be discovered in north west Wales (Crew 1979; 1980; 1981b; 1983; 1984; 1985) and Llwyn Bryn Dinas (Musson 1983; Musson, Britnell, Northover & Salter 1992).

Small scale excavations on the hillforts of the Cheshire Sandstone Ridge, include Maiden Castle on Bickerton Hill in Cheshire, by Taylor in 1980, unpublished (Taylor 1980/81; 1985; Miln 1991; Taylor 1993; Pearson undated; Jope 1986; OAN 2008, 65), Woodhouse near Frodsham by Webster and Powell in 1949 (OAN 2008, 12-14), Kelsborrow Castle near Kelsall by D. Coombes in 1973 (OAN 2008, 41-42) and

Helsby Hillfort by Bu'lock in 1955 (OAN 2008, 17) and followed by Forde-Johnston in 1963-4, (*ibid.*)

Most of these reports were published, but some, such as Forde-Johnston, were described only in letters and plans found in archives (OAN 2008, 17). It was also discovered during research on Eddisbury by Liverpool University, that Forde-Johnston had also excavated at Eddisbury hillfort after Varley, and his archive has recently been rediscovered (Mason & Pope, forthcoming). The fieldwork at the Cheshire hillforts were summarised and critiqued by Oxford Archaeology North in their desk-based assessment for the Habitats and Hillforts Project (OAN 2008).

Due to the threat of destruction by quarrying, Moel Hiraddug hillfort on the Clwydian Range was excavated between 1954-55 (Houlder 1961), and in 1960-67 by Bevan-Evans, Stead and Livens, 1969-72 by Davies and Bevan-Evans and by Brassil and Guilbert for Clwyd Powys Archaeological Trust (CPAT) in 1979-80, by which time a third of the hillfort at the northern end of the site had been destroyed by quarrying (Brassil et al 1982, 24). Houlder published his 1954-55 findings in the Flintshire Historical Society journal, where he explored the site where fragments of the Moel Hiraddug shield were found in 1872 within the eastern defences (Houlder 1961, 6-10) and also the ramparts on the eastern side, to investigate phases of construction (Houlder 1961, 10-12). Houlder also excavated the north west gateway where he found phases of construction including the narrowing of the passage, the thickening of the wall and the addition of a 'guard hut' (Houlder 1961, 12-16).

Following Houlder's excavations, the subsequent explorations were not fully published until Brassil et al (1982) published results from all excavations as well as their own, through CPAT, apart from the years between 1969-72, using notes from interim publications in Archaeology in Wales, other archives such as field diaries held at Flintshire Archives, Hawarden Record Office and correspondence with excavators (Brassil et al 1982, 24-55). In the case of some of these excavations, the exact locations of trenches could not be recognised, so their contents' significance was limited (*ibid.*, 26). The 1969-72 excavations were commented upon within Brassil et al's report, with brief information gleaned, such as the general location of 'four-posters' and "*[they refer to] post-built, probably rectangular houses in the interim notes, though no record of these survives in the archive"* (*ibid.*, 88). The

radiocarbon dates taken from these excavations were quoted, but it was stressed that the full significance of these results could not be accounted for until the true contextual significance had been fully published (*ibid.*, 84). This is also apparent within Archaeology in Wales 10, where Davies noted the discovery of two inhumed burials "*at latest of Iron Age date"* inside the main inner gate (Davies 1970a, 9-10), but no more information was publicly reported on, so their significance remained a mystery[8].

In 2011, a member of the public found a number of photographs of the Moel Hiraddug excavations in a 'junk shop'. These were scanned and archived by CPAT and are available online through the HER via Archwilio.org. The originals are also available to view, deposited at Flintshire Record Office. Photographs held in the archive, most of them dated with a brief description, range from 1960-64, plus a number from 1969, including the (unpublished) Main Inner entrance at different stages during its excavation in the September. The 1960-64 photographs also included wider landscape shots of the excavation and may prove useful in aiding more accurate location of the trenches.

Interpretations of groups of hillforts in the area has been attempted, but have only concentrated on certain aspects of the hillforts to try to put them into groupings, such as Chitty and inturned entrances (Chitty 1937), defences looked at by Varley (Varley, 1948) and Savory (Savory 1976), Alcock with function and population (Alcock 1965), Hogg and Stanford exploring size distribution (Hogg 1972; Stanford 1972b) and Stanford looking at ceramic and structural distribution (Stanford 1972a).

In 1964 and 1965, Forde-Johnston published two articles on the hillforts of north Wales (Forde-Johnston 1964a; 1965), the former describing his research on fieldwork on a selection of six hillforts in north east Wales, while the latter specifically dealt with hillforts on the Clwydian Range. Forde-Johnston was successful in comparing a number of features of the hillforts, such as siting, architecture such as entranceway features and ramparts, and comparing them to other hillforts in the area, such as the neighbouring hillforts in Cheshire (Forde-Johnston 1964a, 1-2; 5; 6). In 1965, his article on the 'Hillforts of the Clwyds' provided an in-depth, detailed

[8] The 1969-72 archives, including the two skeletons, artefacts and plans are in storage in Aberystwyth University. Jeff Davies kindly made the plans available and discussed these with me in 2016. They are discussed further in Chapters 3 & 4

account of the surface remains of the hillforts alongside previous work but does not provide a conclusion as to how they may relate to one another after looking at each one in detail (Forde-Johnston 1965). However, he makes clear within his introduction that this was not his aim, and he simply aimed to provide and make available a body of work reporting the surface analysis for others to make use of (Forde-Johnston 1965, 146).

Hogg's 1972 paper classified hillforts by size and distribution, identifying that distinct groups of small (under 0.7ha) enclosures had a markedly different distribution to larger hillforts (Hogg 1972). Stanford, within the same publication, published findings on the 'Central Marches', concentrating on Shropshire and Herefordshire, mainly due to the distinctive Malvernian ware of the area (Stanford 1972b). Using results from then recent research, Stanford examined relative and scientific dating evidence and gateway sequences, attempting a map of those which may have been contemporary and their territories, in ratio to hillfort size, assuming water-supply and arable land to be determining factors, and examining structural evidence such as roundhouses, four-posters and terraces (*ibid.,* 306-316). His conclusions speculatively proposed population densities throughout the Iron Age, but still at this time, assumed invasion as to the arrival and development of the sites, as well as the 'Malvernian potters' themselves (Stanford 1972b, 317-318).

In 1975 the National Committee for Rescue Archaeology of the Ancient Monuments Board of Wales published a paper within Archaeology in Wales to assist those assessing the importance of threatened monuments, namely hillforts and specifically stating that information was to be relevant to sites on both sides of the border and 'boundary' on the Marches (Hogg 1975). The collection of information on sites, such as gateway design and structural features, including their dates, was highlighted as ultimately contributing to discovering their importance (Hogg 1975, 14). It was a sign of the times that this paper, summarising how to deal with, recommendations for and how to prioritise a site under threat, was published following the imminent destruction of sites such as Dinorben and Moel y Gaer, Rhosesmor.

Savory's approach introduced a 'reappraisal' of Welsh hillforts, considering recent research including dating evidence, hillfort architecture including rampart evolution, entrance layout and other features. He noted that although at the time of writing, only

two sites in Wales had evidence for Late Bronze Age origins, it was likely to be much more widely spread, as evidenced by other sites in England (Savory 1976, 243-4). He believed that inland promontory forts, generally, may be found to have their origins by the end of the Late Bronze Age, noting Llanymynech and Craig Rhiwarth as possible early sites (Savory 1976, 247-8).

Guilbert, however, warned of misinterpretation of features identified and using these to explain the function of hillforts (Guilbert 1981c). He highlighted the importance of ensuring the location and function of all structures and their construction sequence before attempting hillfort population calculations (Guilbert 1981c, 104). He reminded that the evidence found does not categorically show, for example, a 'roundhouse' or a 'granary', and a structure that may not necessarily have a roof or possibly even walls could as coherently be interpreted as 'garages', animal pens or even 'corpse-exposure scaffolds' (Guilbert 1981c, 106-110). He continued that any 'hut platforms' identified are assumed to be building plots, but "*often lacking surface signs of any structure"* (Guilbert 1981c, 112) and that the terms used in interpretation of hillfort features should not be specific during interpretation of the evidence by the archaeologist:

> *"a stricter adherence to some such non-committal term as 'recessed platforms' might serve hill-fort studies better than the abundance of presumptuous epithets now in common use" (Guilbert 1981c, 118)*

2.2.6 21st Century research

In more recent years, due to funding and statutory protection of the sites, research into the hillforts in the area has become less focused on excavation and more on non-destructive techniques such as topographical and geophysical survey. With student projects and landscape-scale schemes, more information regarding hillforts' past is being uncovered without many being necessarily excavated, or through targeted research excavation often re-evaluating previously opened trenches.

Although now only a small percentage is left of the original structure due to quarrying and subsequent erosion, Crawford-Coupe's 2005 research into the hillfort of Burton Point on the Wirral, has provided new insights into the hillfort through survey. Ground survey (on the ditch, rampart and area to the north of the earthwork), contour survey

(on the scheduled area) and a geophysical survey (on the area 150m north of the settlement for any settlement or activity associated with the earthwork) were carried out through the University of Chester in and around the fort. On the higher ground to the north of the enclosure, a series of semi-circular platforms were revealed, but these were attributed to either quarrying or natural features within the geology. A trackway running through the fort was thought also to be associated with quarrying, droving, associated with the history of the site when it was a port or to the nearby farmhouse, but it was suggested that the location where the trackway truncated, the rampart could have been the original entrance to the fort, although this could not be determined without excavation (Crawford-Coupe 2005, 80). The contour survey of the site enabled the interpretation of the rampart to be said to resemble a Glacis style rampart (*ibid.*, 81) and this may explain the dating of the hillfort to after 300BC (*ibid.*, 88). The proximity of Burton Point to Moel y Gaer hillfort at Rhosesmor, on the opposite side of the Dee Estuary and overlooking Burton, is compared to Manx and Irish promontory forts (*ibid.*, 82; 84-85). Considering the small amount of the hillfort that still remains and the fact that geophysical survey was limited to the area outside the hillfort due to tree cover and root density, this research carried out as part of a BA dissertation provides a coherent and thorough introduction to the site and highlights both management and conservation issues as well as ideas for further research.

David Matthews's 2006 MA research provides an interpretation into the intervisibility of many of the hillforts in the mid Marches, using the 'Connectivity Index' after Hammond & McCullagh (1978). Matthews suggests that some of the more intervisible hillforts could have been major tribal centres and that hillfort communities within sight of each other could have shared a common socio-political identity as well as a sense of collective well-being. He also suggests that they could have aided transhumance of large groups of animals to summer pastures, or to aid the logistics involved with commodities such as salt being moved into north Wales from Cheshire, from evidence of VCP in the area (Matthews 2006). However, although many of the sites were visited to test the geographical mapping system's viewshed analyses on intervisibility, those not visited were only measured from one static point on the hillfort, which limits their visibility results accounted from different positions across enclosures.

Other projects have received funding for larger site and landscape scale projects, such as the Caer Alyn Archaeological & Heritage Project, which received both Heritage Lottery Fund and European funding (Cox 2006; Rogers 2009), and the Heather and Hillforts (Mrowiec 2005; Heather and Hillforts Partnership Board 2011) and Habitats and Hillforts (OAN 2008; Chiverell, forthcoming; Garner, forthcoming) Landscape Partnership Schemes, both funded by the Heritage Lottery Fund and project partners, such as local authorities and conservation organisations.

The Caer Alyn Archaeological and Heritage Project began as part of the Time Team Big Dig in 2002, and continued activity as a community archaeological project. The project area includes a small promontory fort and its surrounding area in Wrexham and volunteer work has provided more insights into the hillfort. Within the initial interim report, the location of Caer Alyn was noted to be within an area of concentration of hillforts, to the east of the Clwydian Range. They consider that this area may have lain at the eastern border of the 'Deceangli land' and, therefore, needed extra defence, noting other examples of Moel y Gaer, Rhosesmor, Caer Alyn, Caer Estyn, The Rofft, Y Gardden and Dinas Brân hillforts. This 'border-land' is also highlighted by this area showing high concentration of Bronze Age burial mounds, motte-and-bailey castles and the remains of Watt's Dyke as early boundary markers (Cox 2006). It was suggested that The Rofft, located at Marford, and Caer Alyn, just two miles (3.2km) south west, had many similarities and their proximity was of some significance with the forts both defending promontories, but The Rofft commands wider views of the surrounding countryside (Cox 2006, 9). A geophysical survey in collaboration with Chester University in 2008, revealed the interior of the hillfort to be 'fairly quiet' (Gondek 2008, 6). A square or rectangular enclosure with an interior sub-rectangular feature orientated north east/south east within the centre of the hillfort was interpreted as a possible Late Iron Age shrine (Gondek 2008, 6). The first rock art on a hillfort in north east Wales was discovered as cup marks on a boulder within the hillfort in 2008 dating to Early Bronze Age (Forster 2009, 5). A monograph of the work carried out by the Caer Alyn Project was published in 2009 (Rogers 2009), but although most of the results of the archaeological work is available via a website in blog format, it is difficult to access. A number of short publications of work outside the fort are in circulation. The majority of excavations carried out at Caer Alyn have been undertaken outside the ramparts (Rogers 2009,

9-10) and although this may appear limiting for discovering activity within the hillfort, work on the area outside hillforts is generally not as common and it may lead to discoveries identifying what was happening outside the ramparts, increasing our knowledge of the use of the hills and the significance of the ditches and banks as a 'boundary'.

The Heather and Hillforts Project based in north east Wales on the Clwydian Range and Llantysilio Mountains included six hillforts within the project area, four of which were located on the Clwydian Range. The planning and development phases of the project began in 2005, and in 2007 a series of topographical surveys were commissioned which unveiled many previously unseen features. Possible hut platforms were revealed, and the topography highlighted the phasing of some of the sites, such as Moel Arthur hillfort's inner rampart as a second phase to an univallate site (Brooks & Laws 2006b), see Figure 3i. The small ditch and bank at Caer Drewyn were shown to be the earliest phase of the site, with a possible two phases to the stone walled hillfort highlighted by a change in building techniques for the western and eastern parts of the enclosure and the small annexe being a later addition to the site (Brooks & Laws 2006a). The topographical surveys also suggested that Moel y Gaer, Llanbedr's annexe, was built at a later time to the main hillfort (Brooks & Laws 2007).

During the project inception phase (2008-2011), annual public geophysical archaeology weeks, school hands-on events and community study days were organised through the project in collaboration with Engineering Archaeological Services Ltd, and these unveiled evidence for many possible roundhouses at all the hillforts investigated, including some within enclosures (Brooks & Laws 2008, 5).

Erosion by Offa's Dyke Path National Trail on a mound within Penycloddiau hillfort prompted the commission of an excavation by CPAT to study its origins, unveiling it to be a probable Bronze Age burial mound (Grant & Jones 2008). Major erosion by illegal off-road use at Moel y Gaer, Llantysilio, and following geophysical survey of the interior of the hillfort showing many possible features including houses, hearths, rectangular structures and a possible trackway (Brooks & Laws 2009), the Heather and Hillforts project commissioned an excavation by CPAT within its interior showing many layers of occupation, two roundhouses and material for radiocarbon dating.

The shallow depth of the features below the topsoil highlighted their risk of destruction and a major illegal off-road campaign was carried out in partnership with North Wales Police to highlight the threat and encourage reporting by the public.

Survey work at Moel Arthur revealed previously unknown roundhouses including one proposed on the exposed summit of the hillfort (Brooks 2010). Heather management work in the spring of 2011 uncovered possible hut platforms on a plateau outside the hillfort which were subject to excavation in 2011 by the Clwydian Range Archaeology Group volunteers (Clwydian Range Archaeology Group 2011). No hut platforms were evident from the excavation, but this led to further geophysical survey on the site outside the hillfort, which showed more anomalies (Brooks 2011) which were explored further in subsequent years through an ongoing volunteer project.

The inception phase of the Heather and Hillforts project was initially funded for three years. Collaboration with universities allowed further research, such as additional geophysical work at Penycloddiau hillfort (Mason & Pope 2012), an excavation at Moel y Gaer, Llanbedr by Bangor University (Karl & Butler 2009), excavation and research into two enclosures on the Clwydian Range as part of an undergraduate dissertation at Bangor University[9] and the Caer Drewyn Environs Project led by Bangor and Oxford Universities (Karl & Brown 2010), many of which will be discussed in further detail in subsequent chapters.

In 2010, the Heather and Hillforts project was awarded a two-year extension to ensure the project had raised awareness with local residents and to ensure further research could be carried out by local groups and institutions. This included a two-year excavation at Moel Fodig hillfort (Williams et al 2012), the establishment of the Liverpool University Field School at Penycloddiau hillfort (Mason & Pope 2012 etc) and the excavation project at Moel y Gaer, Bodfari by Oxford University (Lock & Pouncett 2012 etc).

Excavations in 2011 and 2012 at Moel Fodig, as part of the Caer Drewyn Environs Project, were part-funded by the Heather and Hillforts project and the University of Wales Centre for Advanced Welsh and Celtic Studies, were conducted in collaboration with Oxford University, following a magnetometer survey carried out in

[9] Unpublished, but visited during excavation.

2010 (Williams et al 2012). Excavations revealed Late Bronze Age pottery and material for radiocarbon dating and that the site was a relatively short-lived univallate site, possibly Ninth to Seventh Century BC (although radiocarbon dating is still to take place), with a substantial ditch which appears to have been deliberately back-filled (Williams et al 2012, 42-43).

Moel y Gaer, Bodfari was returned to in 2011 by Oxford University, to carry out a full site survey, using a variety of geophysical survey methods, and in 2012, the team returned to begin a multi-year excavation project on the site (Lock & Pouncett 2012). In 2011, LiDAR survey enabled identification of the remains of a previously unknown rampart on the steep eastern edge of the hillfort, the remains of the entranceway showing inturns on either side of the passage and the extent of quarrying in and around the site. Geophysical surveys showed anomalies that suggested the site of a large roundhouse on a visible platform, just to the south and overlooking the entranceway, with possible pits within the interior. The topographical survey led to the interpretation that the gap in the western ramparts, identified by Stapleton as a possible earlier blocked entranceway, see Figure 3iv, was probably a later disturbance, possibly to make a trackway through to the fort for later quarrying activity (Lock & Pouncett 2011), although this may now be contested.

In 2012, a series of trenches were opened up to explore the circular ‘pit-like’ anomalies located within the interior of the fort and the possible roundhouse to the south of the entranceway. Many of the anomalies were found to be probably tree-root holes, possibly dating from when the hill was covered in woods, as shown by earlier Ordnance Survey maps. One of the anomalies appeared to have been a pit dug into the ground. Although many of the anomalies were proven to be not of antiquity, the exercise was able to show the strength and accuracy of the geophysical techniques, and the interpretation of the data, used on site (Lock & Pouncett 2013).

At the site of the roundhouse, excavations in 2012 determined the large cut into the bedrock to create the platform and also identified a series of boulders which surrounded the enclosure. Remains of daub were found, overlying the position of where the roundhouse was expected to be, and a spindle whorl; one of two found during the excavations to date, being the only two artefacts the hillfort has produced

during Oxford University's investigations (Lock, G. 2016. Conversation with Erin Lloyd Jones, 27 July).

At Penycloddiau, alongside the eastern rampart excavations discussed below, Liverpool University excavated the nearby site of a proposed roundhouse. The site was confirmed as a roundhouse, with a midden area between the house and the back of the terraced area, producing material for radiocarbon dating. In addition, very small pieces of pottery were found. 100% sampling of the material was undertaken and results forthcoming (Pope, R. 2016. Conversation with Erin Lloyd Jones, 9 August).

Findings from Moel Fodig, Moel y Gaer, Bodfari and Penycloddiau hillfort ramparts by Bangor, Oxford and Liverpool Universities will be returned to and discussed further in subsequent chapters.

The Habitats and Hillforts Landscape Partnership Scheme began the year following the inception of the Heather and Hillforts Project, its aims more focused on additional research into its six hillforts on the Cheshire Sandstone Ridge. Four of the six hillforts within the project area, Woodhouse, Helsby, Eddisbury and Kelsborrow, were excavated during the project (Garner, forthcoming). These excavations were carried out as training excavations for local students and members of the public and followed the blueprints of prior excavations at the sites. Full reports are yet to be published (Garner, forthcoming), but material was recovered for dating, including material from Woodhouse Hillfort which was dated using Optically Stimulated Luminescence (OSL) to 900BC (Garner 2009) and charred grain and oats from the interior of Helsby hillfort dating to around 200BC (Chiverell, forthcoming). The excavations at Eddisbury also uncovered a sandstone boulder with cup mark rock art on it, dating between the Late Neolithic and the Early Bronze Age, found within the entranceway to the hillfort (Garner, forthcoming).

Initially the project was given permission only to re-excavate what had been uncovered in the previous century's excavations but in some cases, small extensions were allowed by English Heritage, such as the interior of Eddisbury just before it was ploughed for its potato crop that year. The project also conducted surveys of many of the sites, comprising a comprehensive volunteer programme throughout the year (Garner, forthcoming). This work has shown that the promontory forts of Cheshire

may have much earlier origins than first thought, taking them back to the Late Bronze Age and earlier.

Prior to its establishment on Penycloddiau hillfort on the Clwydian Range, Liverpool University spent 2010 and 2011 for their Archaeology Field School on Eddisbury hillfort, exploring Varley's previous explorations on the east end of Eddisbury hillfort in the area known as Merrick's Hill (Mason & Pope, forthcoming).

These landscape-scale projects, such as Heather and Hillforts, although only running for a limited number of years, have ensured that exit strategies are in place to continue the work in the future. The Clwydian Range Archaeology Group continue to work with the Denbighshire County Archaeologist to continue research into the project area (Clwydian Range Archaeology Group 2011) and the Habitats and Hillforts Project established 'The Sandstone Ridge Trust Charity' to "*protect and enhance the natural habitats and historical heritage of the Ridge*" (Morris 2011). The work the projects set up with local universities has seen the establishment of new projects to continue work in the area into the future and they have also raised the profile of the area's hillforts and heritage on an international scale (Robinson & Soper 2011, 19-20). The 'Hillfort Glow', for example, brought over 250 volunteers together on ten hillforts across north Wales and the borders at dusk to conduct intervisibility experiments. Although the aim of the research was to test intervisibility, the lack of knowledge of their contemporaneity was fully acknowledged and the outcome of the experiment demonstrated an increase of engagement with each community's local site. In addition to local communities, the event also brought cross-border organisations together, including English Heritage, local county councils and landowners. The experiment gained international press and as deviser and organiser, I (then as 'Robinson'), was interviewed on radio stations including BBC Radio Wales, BBC Radio 4, Radio New Zealand, ABC Radio Perth Australia and CBC Radio America. More recently, the Hillfort Glow was featured in an article in the internationally renowned Archaeology Magazine, featuring the recent research and excavation work on the hillforts of the Clwydian Range, initiated by the Heather and Hillforts project (Powell 2015).

2.3 Conclusions

It is often stated that hillfort studies have been concentrated in southern England. Historically this is typical, but by compiling all of the research into hillforts in north Wales and the borderlands, a wealth of information is available. It is now time for the results of these piecemeal studies to be considered as a whole. The Clwydian Range hillforts must be discussed as a group to discover whether they are connected in any way apart from proximity. The inclusion of research from other hillforts within a 30-mile (48km) radius will supplement information on hillforts in their environs and will also aid interpretation into the Clwydian Range hillforts and whether they are typical for the area. The wealth of information available, once compiled, will facilitate research into architecture, dating and setting and, upon interpretation, will provide a new insight into the hillforts of the Clwydian Range and their surroundings.

This study will learn from these past approaches, bringing together former and new research through a number of considerations and techniques in chapters 3, 4 and 5 before being discussed as a whole in chapter 6. These include examining individual and regional features and patterns, related artefacts and scientific dating, and setting and landscape through quantitative and qualitative considerations. It will consider both functional uses and non-utilitarian meaning to the sites in an attempt to discover an understanding of how these monuments were used and experienced in the past.

Chapter 3 will now bring together and discuss the architectural features of hillforts in the study area. This will provide a comparison of the excavated information for the core and the wider study area to discover any similarities, relationships, diversities and variations within the group.

CHAPTER 3

ARCHITECTURE

Where chapter 2 provided an overview of the work carried out on hillforts to date and a benchmark for this study, this next chapter will compare the architecture of the hillforts, comparing and discussing excavated ramparts and excavated entrances in the wider study area across much of north Wales and the borders.

In section 3.1, existing knowledge of the ramparts of the Clwydian Range hillforts will be discussed, before providing a comparison of the excavated information for the wider study area. A discussion will deliberate these results and their meaning.

Subsequently, section 3.2 will review the evidence for the entrances of the Clwydian Range hillforts before reporting on and discussing the results of the comparison of excavated entrances in the wider north Wales and borders area.

Section 3.3 provides some concluding remarks which consider the hillfort architecture of the ramparts and entrances.

3.1 Ramparts

The roles and functions of hillforts in general have been much debated over the years (Collis 1981; Bowden & McOmish 1987; 1989; Hill 1989; 1995b; Cunliffe 2005 etc). Alongside the debate on the function of the monuments, many have searched for patterns within the hillforts, looking at size, location, development and dates, some attempting a typology and models that they may fit into (Forde-Johnson 1976; Varley 1948; Alcock 1965; Stanford 1972a; 1972b etc). This section will consider previous studies into the architectural characteristics in the wider study area before examining the architectural evidence from the six Clwydian Range hillforts. It will then widen its scope to look at information gleaned from and bringing together evidence from excavated examples from the wider study area. Results from excavations will provide examples for comparison and consideration of rampart architecture and development over time.

The architectural characteristics of the hillforts investigated in the wider study area can be used to test theories and suggestions previously put forward by others. The investigation into patterns of architectural characteristics of a number of the monuments may provide additional data to aid understanding of their function. This, and the possible *lack* of relationships, will also test models and ideas in hillfort studies and prompt reinvestigation and further scrutiny.

Cunliffe's "hillfort dominated zone" lies in central southern Britain stretching from Wessex to north Wales, and to which he adds an 'outlier' in the north east of England and the Scottish borders (Cunliffe 2005, 541). The large forts within this central zone, he suggests, dominate territories they sit within and provide a central function within these areas towards the end of the Middle Iron Age (*ibid.*, 533).

Cunliffe created a typology for the development of hillforts in Wessex and defines groups of the earliest hillforts dating to between c.800-600BC, and early hillforts dating to between 600-c.400/300BC. There is a change to what he terms 'developed hillforts' in the Middle Iron Age from c.400-300BC to 100BC, as many earlier hillforts became abandoned and the ones remaining in use are modified and refortified (Cunliffe 2005, 388).

Cunliffe uses the information gleaned from the limited excavations on the few sites in the Welsh borderlands, such as Moel y Gaer Rhosesmor, the Breiddin and Dinorben, to define patterns (Cunliffe 2005, 398). All three are examples of palisaded enclosures replaced by ramparts, continuing to be in use to the second half of the First Millennium BC and appearing to continue throughout the Middle and Later Iron Age (*ibid.*). Taking into consideration information from excavations further south on the borderlands of Wales, at sites such as the Wrekin, Cunliffe concludes that this area can be directly compared with the hillforts of Wessex (Cunliffe 2005, 399-400). He reports refortification and 'development' occurring in the Sixth or Fifth Centuries BC at southern Welsh borderland hillforts but suggests that this development may be restricted to this area. He proposes that 'developments' in the more northern borderland hillforts are due to local pressures instead. Here he highlights a north-south divide and suggests that this is also apparent in the material culture of the Middle Iron Age (*ibid.*). Cunliffe proposes that "*in those areas between which cultural contacts were strong, a degree of uniformity and parallel development prevailed.*

Where, however, areas of countryside were isolated by natural features, a greater regionalisation is apparent." (Cunliffe 2005, 377).

Cunliffe also believes that the availability of good building stone would have had an effect on the structure and the form of hillforts. He states that the stone forts of Gwynedd unite them as a regional type distinguishable from the hillforts of the north east of Wales, which are more comparable with those on the Marches (Cunliffe 2005, 376-77). With regards to the stone forts within north east Wales, these are mostly confined to the western limits, such as Caer Drewyn in Corwen, Conwy Mountain (Castell Caer Seion) and Penycorddyn Mawr near Abergele. It must be noted, however, that these examples also boast earthen banks in addition to stone walls.

Studies of groups of hillforts and their architecture in and around the wider north Wales area include the RCAHMW (1964), Davies & Lynch (2000), Smith (2005), and Waddington (2013). Hogg and Savory also studied comparisons of hillfort architecture in the local area in 1972 and 1980, respectively.

Although primarily concerned with the western area of the then county of Caernarfonshire, the third volume of the RCAHMW's Inventory of '*Caernarvonshire*' [sic] in 1964 also included a 'general survey' of monuments for the whole county. Broken down into periods/eras, hillforts dominate the section dedicated to the Iron Age. The hillforts are stated to have two main periods of building and a classification according to their architecture:

- Walled forts, 'strong'
    - and walled forts superimposed on a walled fort; stone with no ditches
- Bivallate forts
    - and bivallate forts superimposed on a walled fort; also classed as strong but with double ramparts of earthy rubble, usually accompanied by ditches
- Weak double ringworks
- And 'Others, mainly univallate forts' (RCAHMW 1964, lxx-lxxxi).

Within their dedicated pages to hillforts within their text on Late Bronze Age and Iron Age Wales, Davies & Lynch comment that the distribution of hillforts in relation to size is uneven across Wales. However, they note that large and strongly defended

hillforts are more common in central and northern Marches and on the north Wales coast. They group hillforts by size; under 1.2 ha, 1.2-6ha and over 6ha (Davies & Lynch 2000, 147-8) although it is not clear if this represents the enclosed area only or includes the ramparts. They report that the majority of 'walled forts' are univallate and those which are multivallate are likely to have been enlarged over multiple phases (*ibid.,* 149).

George Smith researched prehistoric defended enclosures in north west Wales in 2005. His study found that hillforts were more likely to occur on high, inaccessible hills and defended enclosures on lower hills. He grouped hillforts by size of their inner area, (0-1.2ha, 1.2-3ha, 3-6ha and over 6ha), shape and defence type; stone wall or bank. Most (38 out of 45) were within the size category 0-1.2ha. He noted that some elements with regards to phase and architecture, such as timberwork and earlier palisades, may no longer be visible so cannot be assumed absent in totality (Smith 2005, 36). With regards to distribution, large areas of upland are found with no defended sites, but significant examples of 'undefended' settlement are present. Smith proposed that this distinction between lowland areas with access to better resources had more focussed settlement and centres of authority/trade/community, compared with the upland areas with scattered settlement and lack of these 'centres' (Smith 2005, 41).

Waddington's study into Late Bronze Age to Early Medieval settlements of north west Wales listed three main categories for hillforts; small, medium and large with specific size classifications following Davies & Lynch's; under 1.2ha, 1.2-6ha and over 6ha. Waddington's groups were divided further, using up to eight sub-categories each, depending on multivallation and building materials. The majority of hillforts within the study were found to sit within the two groups of 'small univallate embanked hillforts' and 'small univallate stone-built hillforts'. Only six 'large' hillforts were reported in north west Wales. Waddington believes that this 'reflects different monument traditions' (Waddington 2013, 54).

Hogg specifically studied the size distribution of hillforts in Wales and the Marches which also took circuits of banks/ditches into consideration (1972). His study found that there were at least 11 separate groups of small, under 0.7-hectare enclosures which had a different distribution pattern from larger hillforts and therefore should be

considered a different class (Hogg 1972, 295). Using distribution, Hogg groups the enclosures by size of small (under 0.7ha), medium (0.7-1.2ha and 1.2-2ha), and large (2-6ha, 6-12 ha and over 12ha) breaking these size categories and sub-categories down further to univallate or multivallate enclosures. In his 1960 publication reporting excavations at Garn Boduan and Tre'r Ceiri, other hillforts in Caernarfonshire are discussed in relation including Castell Caer Seion on Conwy Mountain, Pen y Gaer Llanbedr-y-Cennin and Dinas Camp Llanfairfechan (Hogg 1960, 19-24).

Pen y Gaer and Tre'r Ceiri are cited together again, alongside Caer Drewyn Corwen and Craig y Ddinas near Barmouth, in relation to their stone construction and use of 'compound walls' by Hugh Pritchard (Pritchard 1887).

Gardner and Savory, with the further comparisons of Dinorben and Moel Hiraddug, consider that this could be a cultural group centring on north west Wales and influencing techniques in north east Wales (Gardner & Savory 1964, 80-81). Moel Hiraddug sits on the Clwydian Range, its stone walls distinguishing it apart from the other hillforts on the ridge, commonly thought to be earthen banked. Savory suggests that the north west Wales 'tradition' of stone walled forts without ditches stretched into north east Wales, such as Moel Hiraddug, Caer Drewyn and the Breiddin, and was part of a process of reassertion of local traditions; the drovers using the old Bronze Age trackways of north Wales to reach the Marches in peace time (Savory 1980, 302).

In Cheshire, the Habitats and Hillforts project carried out research into six hillforts along the Cheshire Ridge. The project undertook limited excavation, re-examining trenches originally opened by Varley in the 1930's (Varley 1935, 1936a, 1936b, 1950). Varley's investigations into the Cheshire hillforts and some additional non-excavation research into Welsh hillforts allowed him to compare sites, namely in his publications on the origins of Cheshire hillforts (1936b) and hillforts of the 'Welsh Marches' (1948). In the latter, Varley proposes a 'Hillfort Province', the northern stem of which extended from the 'Denbighshire plateau' down to the Wye (Varley 1948, 41). His paper aimed to take information gleaned from excavation of hillforts within this 'stem' and compared them as a group. The 12 sites included in his study were Almondbury (Castle Hill), the Wrekin, Ffridd Faldwyn, Titterstone Clee, Bredon Hill,

Llanmelin, and those also included within the wider study area of this paper; namely Penycorddyn Mawr, Dinorben, Eddisbury, Maiden Castle, Old Oswestry and the Breiddin. Varley noted that a key comparison with regards to rampart design included a period of elaboration and multivallation following their initial establishment, with a preferred architectural building style of the 'box rampart with external flat berm' (Varley 1948, 48). He also noted that 'in stone country', stone revetment was used but timber was utilised in guardchambers, gates and external wall bracing (*ibid.)*.

These initial investigations into connections between hillforts in north Wales and the borders hint at a north west/north east divide between the hillforts of north Wales, and a north/south divide between hillforts on the England/Wales border. The reason for the west/east divide may occur as a by-product of the confines of the areas the authors have chosen to study. The extent of this study aims to bridge the divide to include hillforts in north west Wales, north east Wales and along the border of England. The comparison of excavated information from hillfort ramparts at a range of sites across a broader area will attempt to highlight any trends or diversities which may exist.

3.1.1 Rampart architectural evidence from the Clwydian Range hillforts

In 2011, Liverpool and Manchester Metropolitan Universities conducted electrical resistivity tomography surveys on hillforts in north east Wales. This found Penycloddiau's inner rampart to be of dense reading suggesting a stone construction, whilst the outer ramparts with less resistance suggest earthen banks (See Edwards & Wilson, forthcoming and Mason & Pope 2012). Recent excavations at Moel y Gaer hillfort, Bodfari, uncovered multiple phases of stone wall within the middle rampart, previously thought to have been an earthen bank. It must be considered that without intervention, the architecture and building materials of ramparts cannot be identified by surface morphology.

Of those which have been excavated in the past but not in recent years, such as Moel Fenlli by Wynne-Ffoulkes, it is harder to extract the finer detail of the construction of these sites, but some information can be gleaned. For example, the ditches of Moel Fenlli, Moel y Gaer Llanbedr and Moel Arthur were subject to 'diggings' by Wynne-Ffoulkes in 1849 (Wynne-Ffoulkes 1850a & 1850b). He

described Moel Fenlli and Moel Arthur as '*fastigatae*' ditches, or of a 'V' shape (Wynne-Ffoulkes 1850b 175 & 183). Moel y Gaer Llanbedr was described as having a flat-bottomed ditch "*with sides perpendicular to it, or nearly so*" (Wynne-Ffoulkes 1850b, 175) at his excavation of the two outer ramparts on the eastern side of Moel y Gaer (*ibid.,* 175-6). Moel y Gaer's ramparts are described as being built with 'more skill' displayed when compared to Moel Fenlli (*ibid.,* 177) and surmises that it "*either was not contemporaneous with that on Moel Fenlli, or that they were made by different races*", feeling certain that Moel y Gaer was built at a time '*much more advanced*' than Moel Fenlli (*ibid.*, 180). Some caution must be advised when interpreting the findings of early 'explorations'. For example, Wynne-Ffoulkes' reasoning for the location of his excavation at Moel Fenlli is quoted as "*cutting trenches wherever the ground appeared inviting*" (Wynne-Ffoulkes 1850a, 84)!

3.1.1.1 Moel Fenlli

Whilst excavating the ramparts of Moel Fenlli, Wynne-Ffoulkes described the 'agger' as "*formed with earth and stones, heaped up promiscuously*" (Wynne-Ffoulkes 1850a, 83). There is no reference to facing stones. It is unlikely that any evidence to suggest original wooden lacing would have been recognised, especially considering the length of time the exploration continued for; 'about eight days' (Wynne-Ffoulkes, 1850a, 86). Within this short timescale, "*trench after trench was dug without success*" (*ibid.*, 84), suggesting that looking for finds took precedence, as was commonplace in these early days of archaeology and the importance of stratigraphy was not realised. The evidence suggests from this early antiquarian excavation that the ramparts could be of 'dump' construction.

3.1.1.2 Moel y Gaer Llanbedr

Here, in part, it is possible to compare Wynne-Foulkes' findings with modern day excavation. Wynne-Ffoulkes excavated sections of both the inner and outer ramparts, reporting 'flat bottomed ditches' (Wynne-Foulkes 1850b, 175) and traces of stone facing only on the inner rampart (*ibid.*, 177). Bangor University determined that the inner rampart was of single-phase dump construction with an outer stone face of the same period (Karl & Butler 2009, 12).

Bangor University excavated the hillfort following topographical, magnetic susceptibility, fluxgate gradiometer and resistivity surveys at the site through the Heather and Hillforts Project (Brooks & Laws 2007; 2008a). The topographical survey identified fifteen possible hut platforms and a series of quarry hollows, suggested that Moel y Gaer, Llanbedr's annexe, was built at a later time to the main hillfort and identified a line of boundary bank extending from the annexe's outer rampart into the neighbouring field (Brooks & Laws 2007). Burnt stone had been recorded just north of the eastern entrance previously (Wynne-Foulkes 1850b; Davies 1929, 187) and this was proposed as a possible earlier entrance destroyed by burning (Brown 2004, 72). During the 2007 survey, additional 'vitrified' material was identified, exposed within sheep scrapes (Brooks & Laws 2007, 3). The magnetic susceptibility survey found high areas of enhanced readings detecting high temperatures just north of the eastern entrance (Brooks & Laws 2008a, 4). The presence of an earlier entrance and/or of burning *in situ* to the north of the eastern entrance was invalidated by the lack of evidence of phasing or an earlier passage, and lack of evidence of the surrounding materials' exposure to heat. The concentration of burnt material within the rampart core, made up of pieces of 'bubbly flow slag', indicated that the material had been taken from an earlier, external iron smelting site and dumped on site during construction (Karl & Butler 2009, 13).

Upon excavation the rampart was found to have been 4 metres wide and would have stood to at least 2 metres in height but no more than 3 metres within the area excavated (Karl & Butler 2009, 12). Part of a dry-stone wall was discovered within the hillfort at the base of the rampart, potentially acting as a foundation (Karl & Butler 2009, 7-8). Material for radiocarbon dating was also retrieved during excavations and is discussed in chapter 4.

3.1.1.3 Moel Arthur

The ramparts were described at Moel Arthur to have "*exactly the same character, both in form and construction*" as Moel Fenlli; earth and loose stones heaped up 'promiscuously' and 'V-shaped' ditches (Wynne-Ffoulkes 1850b, 183). However, two stretches of stone work, described as "*built in a solid mass (like a wall) without cement of any kind, alongside the rampart*" was found to the south of the gateway (*ibid.,* 183). They did not enclose a space and the larger piece measuring 14ft long

by up to 8ft wide, was of irregular form and was ‘gracefully rounded’ at each end, resting its back against the rock which “*here rises within a few feet of the rampart*” (*ibid.,* 183-4). The second piece was of ‘triangular’ shape and sat around a foot in front of this rock and as their purpose could not be recognised, they were pulled down, which confirmed them to be “*a mere mass of stone walling*” (*ibid.*, 184). It is impossible to say what these structures could have been, whether contemporaneous with the original hillfort or not, but it could indicate stone facing and/or buildings within the hillfort.

Moel Arthur hillfort, although similar to the others in many ways as discussed above, does reveal one unexpected construction technique, that it is the *inner* rampart that is thought to have been built during a secondary building phase, see Figure 3.1. In many cases it is seen that a primary phase of hillfort building would consist of a univallate site, possibly with an outer counterscarp bank forming later in the hillfort’s life and this counterscarp being added to later in order to create a secondary ‘bank proper’. It appears to have been done ‘backwards’ at Moel Arthur (Brooks & Laws 2006b). Another example of the hillfort being made ‘smaller’ rather than being extended/expanded is at the Wrekin, just south of the wider study area in Shropshire (Stanford 1984).

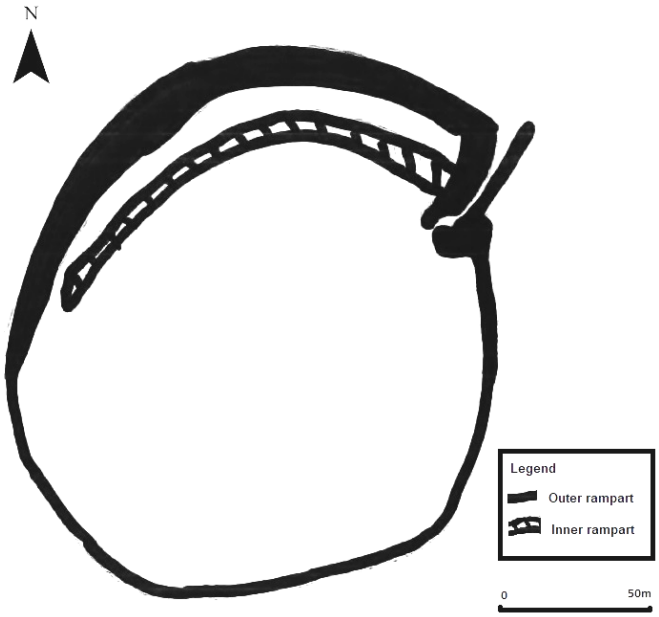

Figure 3.1. Moel Arthur ramparts phasing, where solid black represents the first, univallate phase and hachered area depicts the secondary, inner rampart addition. After Brooks & Laws 2006b

3.1.1.4 Penycloddiau

Penycloddiau hillfort's ramparts are not known to have been excavated before Liverpool University undertook the task in a section in the north east of the hillfort from 2012. Evidence of stone work on the banks are still visible to the naked eye today which suggested that it may have a similar construction to Moel y Gaer Llanbedr, with an earthen core with stone facing (Karl & Butler 2009, 12). The ongoing excavations of the rampart (associated quarry scoop, inner rampart, ditch and outer rampart) by Liverpool University have, to date, revealed that the core of the inner rampart consisted of an external and internal stone face and that the external stone face partially collapsed and was repaired and refaced (Mason & Pope 2015, 20-21, 24). Apparently, contemporary with and sitting between the inner rampart and rock-cut v-shaped 1.9-metre-deep ditch, a kerb-lined walkway was discovered (Mason & Pope 2015, 25).

The core of the inner rampart was found to have internal divisions and a mortar-like lime capping was found on the surface of the core (Mason & Pope 2015, 22).

Evidence for a stone-packed 'palisade-type feature' with a silt fill was found on the crest of the outer rampart, showing evidence for the timbers decaying in-situ before collapsing inwards (Pope, R. 2016. Conversation with Erin Lloyd Jones, 9 August). Evidence for construction within the outer bank found in 2016, has given rise to the theory that the previously regarded 'counterscarp' was a deliberately built bank (*ibid*.).

3.1.1.5 Moel y Gaer Bodfari

The hillfort was excavated in 1908 by local reverend Philip Stapleton, who opened up ten trenches across the site (Stapleton 1909), with three having reported detail. Trench 1 was cut across the middle rampart's outer ditch, which was found to be v-shaped (*ibid.*, 235). Trench 5 also cut across a ditch, but lay between the inner rampart and middle rampart, "*exposing a rampart of some 5ft in height*", which appears from the simple plan to be referring to the middle rampart, and a 4-5ft wide ditch (*ibid.* 235-236). Trench 4 was placed across a gap in the ramparts at the south west corner of the hillfort and revealed a line of stones across the gap and facing

stones on either side, see Figure 3.4, prompting Stapleton to conclude that this may originally have been an entrance, which was subsequently blocked (*ibid.* 233, 236).

In 2016, Oxford University opened up a trench to re-examine Stapleton's Trench 4 and possible original entrance. Preliminary findings include a possible posthole and facing stones and will be returned to in the next season (Lock, G. 2016. Conversation with Erin Lloyd Jones, 27 July).

Since 2011, Oxford University have been investigating the site with survey and excavation. Their manipulation of LiDAR data has prompted the suggestion that the 'precipitous topography' on the eastern side would have originally had a previously unidentified bank running along the edge, rather than the use of a promontory; the ramparts therefore completely enclosing the site (Lock & Pouncett 2011).

Within Oxford's Trench 3 at the southern end of the site, the now slight inner bank was found to have had a foundation of rounded boulders. The middle rampart had multiple periods of use and was dry-stone built from the local shale. An initial rampart was overlaid by a period 2 rampart, which widened the bank and sat on a slightly different alignment. A third phase of construction lay over the two earlier phases (Lock & Pouncett 2013). Material for radiocarbon dating was also found. The accompanying ditch, full of tumble from the middle rampart, was excavated and found to be 3 metres deep, cut into the bedrock (Powell 2015, 62).

3.1.1.6 Moel Hiraddug

Moel Hiraddug's construction from stone, making it appear different from the other five hillforts on the Clwydian Range, may be explained by its underlying geology of limestone, which lends itself to building much better than the shale mudstone elsewhere on the range. However, alongside these stone walls, Moel Hiraddug also boasts earthen banks.

Moel Hiraddug hillfort was extensively excavated prior to and during quarrying of the northern section of the hill in the 1960s and 70s (Houlder 1961 and Brassil et al 1982) which found that the multivallate site had several phases (Brassil et al 1982, 80). The hillfort is made up of a number of dry-stone walls, earthen ramparts and

ditches to create a multi-enclosure site. There was no ‘convincing sign’[10] for an earlier palisaded enclosure on the site (Brassil et al 1982, 82). The counterscarp bank was found to be of ‘dump’ construction with dry-stone front and back, the middle and outer ramparts being constructed using ‘cellular’ divisions (Brassil et al 1982, 81). As a complex site, the excavations deduced that the hillfort’s first phase was probably a single enclosure, but the relationship between the inner, middle, outer and counterscarp banks, as well as ditches, could not be proven stratigraphically (Brassil et al 1982, 81).

From the information available to us at this point, a few conclusions can be attempted to be drawn as to how these six hillforts compare to one another considering their ramparts. Many of the hillforts have evidence of multi-phase activity and construction. They are all multivallate and these ramparts are generally closely set. Field data also suggests that the earthen built hillforts may have had stone facing on the outer edges of their ramparts.

Tomographical data provided by Liverpool University in 2012 has suggested that, for Penycloddiau at least, the inner and outer ramparts may not have been constructed in the same fashion. This is also suggested at Moel y Gaer Llanbedr, with stone facing found on the inner rampart only (Wynne-Ffoulkes 1850b, 177).

The two sites of Penycloddiau and Moel Fenlli share particular similarities with regards to their multivallation in one particular characteristic at the least-steep sides of the fort. Here, the presence of smaller banks sitting within the main ramparts in this area, identified through topographical survey, could be remains of earlier phases of ramparts and not reused as part of the final phase of circuit. These two hillforts are also similar as they are not true ‘contour forts’ but are tipped to cut along the contours of the hill and also boast very obvious internal quarry scoops/ditches (Jones 2004; Brooks & Laws 2006a).

Recent excavation projects at some of the Clwydian Range hillforts have begun to re-examine the architecture of ramparts in this area for individual monuments. The expansion of the core study area to include a wider area of hillforts within a 30 mile or 48km radius from the Clwydian Range allows additional data from excavated

[10] This does not provide ultimate evidence that a palisaded enclosure did not exist on the site

hillforts to be considered. The comparison of data between these hillforts will allow scrutiny into the building practises of the hillfort builders when these monuments were being built, added to and modified and whether this data, as a group, can be considered as a whole.

3.1.2 Method for comparison of rampart architecture in the wider area

This project is designed to explore connections between the six hillforts of the Clwydian Range and other hillforts in the landscape surrounding the core study area. The purpose of a wider comparative study of hillforts in north Wales and the English borders is to attempt to identify possible relationships and connections between hillfort sites through their physical remains.

Data for 33 hillforts with excavated ramparts within the wider study area was collected through the Historic Environment Record, the National Monument Record and excavation reports.

The characteristics of the hillforts have been studied, considering information from local excavated examples, to seek uniformity and correlations which could suggest that the area has cultural contacts. If the results suggest that these hillforts do not follow a standardised pattern or that uniformity is not apparent, this may indicate a regionalisation within the area of north Wales and borderlands.

Out of all of the hillforts which surround and include the six hillforts of the Clwydian Range, 33 sites have published/available information on excavations which have taken place on their ramparts. The use of this information to compare rampart architecture may reveal connections or, alternatively, differences between the hillforts and will aid discussions of them as a group/s.

Some of the hillforts were excavated in antiquity and these will be treated with caution but not ignored. Excavation within the area is not commonplace so, where available, information from these early excavations can be utilised appropriately and where necessary.

All known phases of each of the excavated ramparts for each hillfort have been recorded. This is to ensure that the comparative study looks at more than just the ‘final phase’ of hillfort architecture. It will consider early structures on the site, such

as palisade fence enclosures, and the development of a site over time, such as the addition of material to the rampart structure and revetment.

Where the evidence is available, the building material for each phase has been recorded. This includes the use of wood and earth as well as stone. The properties of wood inevitably lead to poor or non-existent survival in the archaeological record, but clues to its prior location within ramparts are often now detected and recorded within modern excavations. However, these records cannot be taken as definite and can only suggest possible patterns with regards to wooden structures within ramparts. Records for earth include soil, turf and sand. Results for stone include slate, gravel and dry-stone walling.

Where multivallate sites have been dug, stratigraphy can be problematic when interpreting phasing and relationships between features. For example, the point where two ramparts merged was excavated in the north ramparts at Moel Hiraddug in an attempt to discover their relationship, but the results were inconclusive and so remain a mystery (Brassil et al 1982, 81). Furthermore, some ramparts display different building techniques within a single, linear rampart, such as at Caer Drewyn (Brooks & Laws 2006a, 4).

In many cases, only one rampart has been dug at multivallate sites. As with Penycloddiau, different ramparts may have been built with different techniques and/or at different times, so the information for one rampart at a site cannot suggest the same is true for other ramparts enclosing the site. In addition, excavations only account for a small percentage of the site and rampart area. Therefore, the results from these excavations can only report on the area excavated. It provides material for interpretation but cannot be used as evidence for the whole site. For example, multiple building phases found within a section may account for large scale works and may simply represent repair in a certain area. Ramparts excavated with only one phase of activity may not expose other building activities elsewhere on the site. This remains the case for relationships between free-standing structures and features on the interior of the enclosure. Architecture of hillforts' excavated ramparts specifically will be compared in an attempt to interpret correlations between sites. Therefore, for all following results, where evidence is recorded and interpreted, please read 'for the excavated section'.

3.1.3 Rampart architecture results

Rampart excavation records have been located and scrutinised for 33 hillforts in the wider study area.

Of the 33 hillforts, to date, there is evidence for 61 ramparts which have been excavated and from them 90 building 'actions' recorded, ranging from palisades to building and modification of ramparts[11].

Almost half of the hillforts (15 out of 33) have, to date, revealed evidence for single phase building. This figure includes hillforts which have multiple circuits of ramparts, such as Moel y Gaer Llanbedr, where its inner rampart was found to be single phase, but its outer circuits and annexe may have been added at a later phase and the stratigraphical relationship between the multivallation is unknown. In addition, the inner, middle and outer ramparts at Pen y Gaer Llanbedr y Cennin were all found to be single phase in their individual construction, but as their construction methods differed (e.g. only the middle and outer were stone faced), it cannot be assumed that they were all built at the same time as a multivallate site. Only five hillforts appear to be single phase and univallate (with or without counterscarp).

The results show that on sites which have more than one rampart, evidence for multiple building activity is most likely to be found on the inner rampart. However, in many cases, the only rampart which has been dug is the inner bank, so this may not be a true reflection of the evidence. The third rampart at Old Oswestry shows two periods of building alongside the inner bank and at Moel y Gaer Bodfari the middle rampart showed multiple building phases upon excavation.

3.1.3.1 Wood

Evidence has been recovered for seven palisades[12], at five hillforts; Moel y Gaer Rhosesmor, see Figure 3.7, Beeston, Eddisbury, Old Oswestry and three palisade fences discovered at Dinorben (Guilbert 1979f), followed by the erection of ramparts, see Table 3.1.

[11] Entrance architecture discussed below
[12] Not including the possible palisade slot found on the outer bank at Penycloddiau in recent excavations (Mason & Pope 2015)

Three of these five hillforts, Beeston, Dinorben and Moel y Gaer Rhosesmor, have evidence for the use of wood within their later ramparts, following the enclosure of the site by a palisade, also seen in Table 3.1. This was not discovered at Eddisbury or Old Oswestry.

Nine hillforts out of all 33 excavated have so far revealed evidence for the use of timber in their core or framing with their ramparts' structure. The results show that it is more likely that a hillfort contained wood within its rampart structure if it had previously been enclosed by a wooden palisade fence. However, this result may reflect preservation at the site with regards to wooden survival and the identification of palisade postholes/slots.

Hillfort	Enclosure Phase	Palisade (P) or Rampart (R)?	Wood Inner Face?	Wood Outer Face?	Wood Core?
Beeston Castle	1	P			
Beeston Castle	2	R			Y
Beeston Castle	3	R			Y
Beeston Castle	4	R			Y
Breiddin	1	R			Y
Dinorben	1a	P			
Dinorben	1b	P			
Dinorben	1c	P			
Dinorben	2	R			Y
Eddisbury	1	P			

Kelsborrow	1?	R			Y
Maiden Castle	1?	R			Y
Moel y Gaer Rhosesmor	1	P			
Moel y Gaer Rhosesmor	2	R	Y	Y	Y
New Pieces	1?	R	Y		
Old Oswestry	1?	P			
Pendinas Llandygai	1	R			Y
Woodhouses	1	R			P

Table 3.1. Evidence of wood in enclosure architecture for excavated hillforts in the wider study area. Enclosure Phase shows the interpreted phase of building the wood evidence is associated with. P depicts evidence for a palisade and R for wood used within a rampart. If there is evidence for wood in the inner face, outer face or the core of the rampart, this is noted with a Y for yes or P for possible evidence

All five previously palisaded hillforts have evidence for ditches with ramparts following this phase, see Table 3.2. Beeston shows evidence for the ditch appearing during a *second* phase of rampart building and Dinorben's ditch predates the initial rampart.

Hillfort	Rampart Name	Rampart Phase	A Palisade?	Ditch?
Beeston Castle	Only?	1	Y	
Beeston Castle	Only?	2		

Beeston Castle	Only?	3		Y
Beeston Castle	Only?	4		
Dinorben	Inner	1a	Y	
Dinorben	Inner	1b	Y	
Dinorben	Inner	1c	Y	Y
Dinorben	Inner	2		
Dinorben	Inner	3		
Eddisbury	Inner	1	Y	
Eddisbury	Inner	2		Y
Eddisbury	Inner	3		
Eddisbury	Outer	1		Y
Moel y Gaer Rhosesmor	Inner	1	Y	
Moel y Gaer Rhosesmor	Inner	2		Y
Moel y Gaer Rhosesmor	Inner	3		Y
Old Oswestry	Inner	1?	Y	
Old Oswestry	Inner	1		Y
Old Oswestry	Inner	2		
Old Oswestry	2nd	1		

Old Oswestry	3rd	1		Y
Old Oswestry	3rd	2		
Old Oswestry	4th	1		
Old Oswestry	5th	Unknown		

Table 3.2. Evidence for ditches at earlier palisaded enclosures, listed interpreted associated phase and Y (yes) if there was also evidence for a palisade and/or a ditch

Almost half (16 in total, 48%) of the hillforts show evidence for a rampart with an inner face and all five hillforts which have evidence of an initial palisade phase were then built with ramparts with an inner face, see Table A3.2. At all but Moel y Gaer Rhosesmor, where the facing was wooden, the inner facing was made of stone.

In addition, the hillforts with an initial palisade construction were then followed by at least two subsequent periods of rampart building, with Beeston and Dinorben having at least three episodes of rampart construction within a single structure, also seen in Table A3.2. Those with multivallation may be evidence for additional building episodes but have either not been excavated (or the results are not accessible) or the stratigraphy/relationship cannot be determined between the structures.

3.1.3.2 Stone

Over 70% (24 in total) hillforts report evidence for earth (soil, clay, sand, turf etc) utilised within a rampart, see Table A3.2. In contrast, only one hillfort, Oakmere, a promontory camp in Cheshire, has *not* reported use of stone within the rampart or as inner or outer facing. The use of stone, whether as facing or as a building material within the core of the rampart, dominates with 97% of hillforts showing evidence for its use, also seen in Table A3.2.

85% of hillforts with excavated ramparts have been found to have at least one stone-faced rampart (including those of dry-stone wall construction), listed in Table 3.3. Three hillforts have not revealed evidence for stone-facing; Caer Caradog,

Kelsborrow and Oakmere, and the results reported at Moel Arthur and Moel Fenlli from their 19th Century excavations are inconclusive.

There are some hillforts where at least one rampart has stone-facing but also other ramparts without a stone face. For example, ramparts without evidence for a stone face where other ramparts with this feature are present are Helsby's outer rampart, Pen y Gaer Llanbedr y Cennin's middle rampart, Moel Hiraddug's southern rampart, Moel y Gaer Llanbedr's second (middle) rampart, Old Oswestry's second rampart (of five) and Penycorddyn Mawr's outer rampart, also seen in Table 3.3. This demonstrates that it is not always the inner or the outer rampart which has a stone face, if present. In addition, it does not necessarily mean that those with an inner stone face have revealed evidence for an outer stone face, as at Llanymynech for example. This was also reported at Moel y Gaer Bodfari's middle rampart, where a stone face was evident on the inner face of the rampart but not on the outer edge (Lock & Pouncett 2013, 9-10); this may be explained by the amount of stonework discovered which had fallen in the ditch immediately below. However, the use of an inner stone face without the presence of an outer stone face highlights that an alternative suggestion is needed to the proposal that the facing is applied for 'show' to those on the exterior of the rampart.

Nevertheless, 26 (79%) hillforts have evidence for an outer stone face, 41 of the ramparts excavated (67%) have an outer face of stone, see Table 3.3. This includes Penycloddiau's inner rampart, which, until recent excavations by Liverpool University, was not apparent/conclusive from the surface evidence.

Hillfort	**Rampart Name**	**Rampart Phase**	**Stone Inner Face?**	**Stone Outer Face?**	**Stone Core?**
Beeston Castle	Only?	1			
Beeston Castle	Only?	2			
Beeston Castle	Only?	3			

Beeston Castle	Only?	4	Y		Y
Breiddin	Inner?	1			Y
Breiddin	Inner?	2	Y	Y	Y
Breiddin	ii	1	Y	Y	Y
Breiddin	iii	1	P	P	
Bryn y Castell	Only	1		Y	Y
Bryn y Castell	Only	2		Y	Y
Bryn y Gaer	Only	1		Y	Y
Caer Caradog	Only	1			Y
Caer Estyn	Only	1		Y	Y
Caer Estyn	Only	2		Y	Y
Castell Caer Seion	Inner Bank interior	Unknown			Y
Castell Caer Seion	Main east and south	1		Y	Y
Castell Caer Seion	Main west initial	1			Y

Castell Caer Seion	West Outer/outwork	1	Y	Y	Y
Castell Caer Seion	West Outer/outwork	2		Y	
Castell Caer Seion	Western enclosure Inner	1	Y	Y	Y
Craig Rhiwarth	Inner	1			Y
Craig Rhiwarth	Inner	2		Y	Y
Dinas Llanfairfechan	Inner	1		Y	Y
Dinas Llanfairfechan	2nd	1		Y	Y
Dinas Llanfairfechan	Lower	1		Y	Y
Dinorben	Inner	1a			
Dinorben	Inner	1b			
Dinorben	Inner	1c			
Dinorben	Inner	2	Y	Y	Y
Dinorben	Inner	3	Y	Y	

Eddisbury	Inner	1			
Eddisbury	Inner	2	Y	Y	
Eddisbury	Inner	3			
Eddisbury	Outer	1		Y	Y
Helsby	Inner	1		Y	Y
Helsby	Inner	2		Y	
Helsby	Outer	1?			
Kelsborrow	Only	1?			Y
Llanymynech	Inner	1?	Y		Y
Llwyn Bryn Dinas	X	1		Y	Y
Llwyn Bryn Dinas	Y	2			Y
Llwyn Bryn Dinas	Z	3			Y
Maiden Castle	Inner	1?	Y	Y	
Maiden Castle	Outer	Unknown		Y	

Moel Arthur	Inner	Unknown			
Moel Arthur	Outer	Unknown			Y
Moel Fenlli	Inner	Unknown			Y
Moel Fodig	Only	1		Y	
Moel Hiraddug	Eastern main inner	1	Y	Y	Y
Moel Hiraddug	Eastern middle	1	Y	Y	Y
Moel Hiraddug	North	1		Y	
Moel Hiraddug	North	2	Y	Y	Y
Moel Hiraddug	Outer	1	Y	Y	Y
Moel Hiraddug	South	1			
Moel y Gaer Bodfari	Inner	1		Y	Y
Moel y Gaer Bodfari	Middle	1		Y	Y
Moel y Gaer Bodfari	Middle	2		Y	Y
Moel y Gaer Bodfari	Middle	3			Y

Moel y Gaer Llanbedr	Inner	Unknown		Y	Y
Moel y Gaer Llanbedr	2nd	Unknown			Y
Moel y Gaer Llanbedr	Annexe	Unknown			
Moel y Gaer Rhosesmor	Inner	1			
Moel y Gaer Rhosesmor	Inner	2		Y	Y
Moel y Gaer Rhosesmor	Inner	3			
New Pieces	Inner	1?		Y	Y
New Pieces	Outer	1?	Y	Y	Y
Oakmere	Only?	1?			
Old Oswestry	Inner	1?			
Old Oswestry	Inner	1	Y	Y	
Old Oswestry	Inner	2			Y
Old Oswestry	2nd	1			Y

Old Oswestry	3rd	1		Y	Y
Old Oswestry	3rd	2			Y
Old Oswestry	4th	1			Y
Old Oswestry	5th	Unknown			Y
Pen y Gaer Llanbedr y Cennin	Inner	1		Y	Y
Pen y Gaer Llanbedr y Cennin	Middle	1			Y
Pen y Gaer Llanbedr y Cennin	Outer	1		Y	
Pen y Gaer Llangollen	Only?	1?		Y	Y
Pendinas Llandygai	Only	1	Y	Y	Y
Pendinas Llandygai	Only	2			Y
Penycloddiau	Inner	Unknown		Y	
Penycloddiau	Outer	Unknown			

Penycorddyn Mawr	Inner	1	Y	Y	Y
Penycorddyn Mawr	Outer	1			Y
Penycorddyn Mawr	Annexe	Unknown		Y	Y
The Berth (main)	Only?	1			Y
The Berth (main)	Only?	2		Y	Y
Woodhouses	Only?	1	Y	Y	Y

Table 3.3. Evidence for the use of stone within excavated ramparts, with rampart name, interpreted associated phase and Y (yes) or P (possible) for excavated evidence for stone facing and/or stone within the rampart core

At New Pieces Enclosure, there was evidence of an outer stone face and a wooden inner revetment. At Moel y Gaer Rhosesmor, the outer stone face also included a wooden structure; "*its front face was built in a combination of vertical timbers and drystone walling*" (Guilbert 1975b, 110). With its remarkable preservation and excavation, these may present examples of a more widely used construction technique but missed by early excavations or on sites where preservation was of a much lesser standard.

3.1.3.3 Additional material

Four hillforts have evidence for a final phase of a dump of earth on top of an existing structure; Old Oswestry, Moel y Gaer Rhosesmor, Pendinas Llandygai and Eddisbury. Interestingly, the secondary dump of material at Pendinas was heavily vitrified (White 1992, 159-166) which may suggest it reused earlier material. The reuse of earlier vitrified material was found during the excavations of Moel y Gaer Llanbedr within the main stone-faced rampart (Karl & Butler 2009).

Three ramparts, at the three separate sites of Old Oswestry, Moel y Gaer Rhosesmor and Maiden Castle, have produced evidence for ‘capping’ on top of a rampart, in stone, timber or both. In recent excavations, the inner rampart at Penycloddiau has revealed a mortar-like lime capping on the inner rampart structure (Mason & Pope 2015, 22).

3.1.4 Discussion

Of the 33 hillforts, there is evidence for around 90 phases or ‘instances’ of building activity recorded to date, including palisades and ramparts, see Table A3.2. This number will likely continue to rise as excavations, such as at Penycloddiau by Liverpool University, reveal results. This was the case at Moel y Gaer Bodfari, where the middle rampart was excavated recently to reveal at least three phases of building.

The study has demonstrated that despite scant surface evidence, ramparts contain highly complex development. For example, in 2016, the ‘counterscarp’ bank at Penycloddiau was found to have elements of construction and a possible palisade on top, this evidence ‘promoting’ the structure from ‘counterscarp’ to a purposefully built outer bank of the hillfort. In addition, univallate sites can reveal development and as complex stratigraphy as multivallate sites, despite appearing topographically simpler with only one circuit of ramparts.

Where only one rampart has been excavated at multivallate sites in the past, the lack of evidence for relationships between ramparts means that interpretation of their phasing is almost impossible. Although this practise is less common in modern investigations, where encountered, it makes identifying a sequence of activity at the site problematic. However, the use of early excavation reports is still vital, and attempts must be made to glean information from them as information on hillforts is rare. As long as they are used appropriately, and their interpretations vigorously critiqued, it is important not to disregard this scarce information.

The use of electrical resistance tomography at sites may prove to aid the identification of the use of stone in ramparts across Wales, not just in Gwynedd, as has been demonstrated. The identification of stone within the inner rampart at Penycloddiau by tomography was realised upon excavation by Liverpool University.

The widespread use of stone on many hillforts may be demonstrated through survey and without excavation.

In spite of this, the results of the study have shown that without excavation, it is impossible to extend the typologies solely through identification through surface evidence. In many cases, the results from excavation have revealed multifaceted sites with evidence which could not have been predicted through topographical or geophysical survey.

With over half of all of the hillforts revealing evidence for multiple building phases, this suggests a pattern of continuity and renewal at site, whether part of a larger programme of rebuilding or simply repair. Although information about the relationships and phasing between multiple ramparts is often unavailable, the presence of multivallation at many sites, coupled with the topographical interpretation at sites such as Moel Arthur hillfort, can suggest that this indicates different building periods surrounding a site. This result of just five hillforts showing evidence for only one building event and being surrounded by one rampart, highlights the complex structures and histories of the vast majority of the hillforts demonstrated through their architecture. These findings are similar to Driver's discoveries in north Ceredigion and mid-Wales, where complex, monumentalisation is consistently seen across the region, described as going "*above and beyond the requirements of basic enclosure and defence"* and referred to as 'prehistoric architectural symbolism' (Driver 2013, 129; 133). In fact, Driver highlights the similarities between Moel Arthur hillfort and Castell Tregaron in north Ceredigion, where both display "*two sweeping and impenetrable façade ramparts blocking direct access to a summit",* an example of his 'Cors Caron' façade, implying communication of ideas and design concepts (Driver 2013, 133).

A result has been found that where multiple phasing is evident, it is most likely to occur on the inner rampart, see Table A3.2. This may be due to the inner rampart often being the favoured rampart to have been excavated and so this requires further research. Nevertheless, this result may suggest that the inner rampart is either the initial rampart on site which is later added to (with mass and/or by other ramparts) or that it is regarded as the 'prominent' rampart and therefore undergoes more development than the others on site.

The matter of a lack of dating evidence is prominent with this issue. In some cases, the discovery of a layer of natural build-up can suggest a gap in time between building episodes, but this is not always evident. As is the case at Moel y Gaer Bodfari, it is possible that two of the phases of the middle rampart, within one section, could be defined as one building episode and account for a 'murus duplex', or double walling and batter to strengthen the structure (Lock, G. 2015. Conversation with Erin Lloyd Jones, 31 July). Dating evidence for each 'episode' within the rampart would aid with the interpretation of the length of time between these, and, therefore, how the site was used and attended to over time.

Different periods of ditch clearing are often recorded in excavations, (e.g. Garner 2012b), which suggests that these sites were maintained. This maintenance procedure may also have been seen as an act of continuity, similar to adding to ramparts by height or by number. Increasing and developing existing structures demonstrates the continuing conservation of the sites by different generations. In the single-phase site at Moel Fodig, the single-phase ditch appeared to have been deliberately backfilled in an act of destruction (Karl, R. 2012, Meeting with Erin Lloyd Jones, 31 October). The act of destroying, or closing-down of a site, has been discovered at two double ringwork enclosures on the Llŷn Peninsula; at Castell Odo and Meillionydd, where their banks have been deliberately slighted (Waddington 2013, 210; 217).

In hillforts' final period, or phase of rampart building activity, four sites have shown evidence for a dump of earth on top of an existing structure. In addition to this, evidence has also been recorded of a 'capping' of material on top of ramparts at four sites. These acts of adding a final layer of building on top of existing structures, by dump or by 'capping', may be related. This additional act of 'developing' the hillfort could be interpreted as an act of community, ancestry or memory. It may represent a resource-efficient way to re-establish the rampart, or to repair or strengthen it/part of it, or a need to re-demonstrate the symbolism of the site and its representation. This may also form another example of Driver's non-utilitarian 'prehistoric architectural symbolism' in mid-Wales (Driver 2013, 129; 133).

The use of earlier material in ramparts, as at Pendinas and Moel y Gaer Llanbedr, may suggest that the act of adding to and building the rampart may have been more

important than the physical function of the feature and representative of something less tangible. The material which made up the north eastern rampart at Moel y Gaer Llanbedr included burnt and vitrified stone with pieces of iron slag. It has been proposed that this material was intentionally brought to build the rampart from an off-site iron smelting midden, indicating the continuation or adoption of a Late Bronze Age tradition of the deposition of metalworking debris (Karl & Butler 2009, 13-14). Similarly, at Pendinas Llandygai, the foundation of the rampart included vitrified material and may indicate a similar practise. Later, a dump of vitrified material placed on top of the rampart could symbolise the significance of metalworking and/or ancestry at hillforts after its establishment.

The discovery of a lime mortar at Penycloddiau hillfort provides additional evidence for the 'capping' of ramparts, although this is thought to have been undertaken within the same phase as the rampart core structure (any potential phases of building the rampart are still to be determined). The existence of a mortar-like substance before the Romano-British occupation of Britain is unusual in itself; the act of depositing it may also represent a new sequence of rampart architecture and building process at the site; an act representing the renewal of an already established hillfort undergoing a new lease of life and restoration by a new generation.

This ongoing tradition of building on or adding to ramparts and ditch clearing certainly represents an element of conservation. The continued development of the ramparts, as shown in the archaeological record, clearly demonstrates a relationship with the sites, whether continuous or returned-to. The conservation carried out on hillforts and other archaeological and historic sites today demonstrates a similar tradition of caring for places we share a heritage and cultural relationship with. History and heritage sites are often used as an avenue and tool to reconnect with our ancestors and learn for the future. Considering the generations of and multiple phases of use of the hillforts, the hillfort builders - at any one phase - were undoubtedly using and looking after the sites in the same vein. The hillforts may have represented a site of cultural importance, as they still do today. The preservation, conservation and regeneration of the ramparts acted as a continued act of respect and responsibility towards their, and our, ancestors. The regeneration of the sites may too be interpreted in a similar way to how we utilise historic sites in regeneration in the 21st Century. The renewal of sites and change of use and

promotion as tools for economic regeneration may also aid interpretation of the people developing hillforts in prehistory. The renewal of a site may have increased its status in the community and aided its promotion and use after a period of neglect or a lack of investment, in time or otherwise.

The use of timber does appear in the archaeological record. It is unclear as to whether the low numbers of references to its use are due to poor survival and identification or the fact that it was not as widely used as stone, for example. The presence of palisades enclosing a site prior to ramparts may also aid this interpretation. There is an increasing body of evidence indicating continuity of use and development at hillfort sites. Five hillforts have revealed evidence for an initial palisaded enclosure on the site, see Table 3.1. Interestingly, over half of these hillforts then go on to build their ramparts using wood. Although the sample is not large, it may suggest that these hillforts had a good supply of wood near to sites and that this natural resource was utilised over many years. Mercer has demonstrated that for Hayhope Knowe, later Iron Age palisaded enclosure of 12-15 houses in the Bowmont Valley would have needed 1-2.5ha of woodland to construct, amounting to a loss of around 2.5% of surrounding woodland, according to pollen analysis (Tipping 2010, 186-187). Peat core analysis at Moel Llys y Coed on the Clwydian Range demonstrates that towards the beginning of the Iron Age alder dominates, but oak begins to decline, and hazel takes a sudden decline following a burning episode seen at around 2600BP, around 650BC. By the turn of the millennium, hazel recovers and encounters a low peak (Grant 2009, 18, 25). The Bronze Age had already seen a widespread decline of shrub cover and trees, with woodland most probably confined to steep valley slopes in this area, and this general trend is seen to continue with a more open landscape predominating (Grant 2009, 24-25).

All these five hillforts also show evidence for the use of ditches either with or following the palisade upon the erection of ramparts, see Table A3.2. Information on ditches is not commonplace within the results of the excavated ramparts. The development of a site from a simple (in relative terms) wooden enclosure to a hillfort proper, and the reason behind this need, may have necessitated the requirement for additional protection or show of a highly defended/visible site.

Intriguingly, all of these sites were then followed by at least two or more episodes of rampart building and development, some with three episodes of building within a single rampart structure, see Table A3.2. There appears to be development and attention to the improvement or conservation of the hillfort architecture especially on those sites which have early origins. This could suggest that the antiquity of an 'original' site warranted longevity by the communities. The prior, early establishment of a site necessitated its continuation and maturity by future generations.

All five hillforts which were previously palisaded enclosures show evidence for an inner face on at least one rampart as well as a ditch, see Table A3.2. The existence of these two features at all sites with earlier origins may suggest a perception for an additional architectural need. The identification of an inner face at hillforts in the wider study area has only occurred at around half of the sites and is not always accompanied by an outer face. It is possible that the presence of facing is to aid strength and stability of a rampart bank, but an outer face is not always present when a bank is built above a ditch; therefore, is not necessarily present to prevent slump into the ditch. The occurrence of inner facing alone could suggest that the facing or revetment of a rampart was for more than just strength or for show from the exterior of the hillfort. The act of enclosure was an indication of marking out a particular area, with appearance and display being just as important as the functionality of enclosing a space; an act of monumentality (Smith 2005, 34). If a facing was constructed for show, or to create the illusion of a great stone wall or an impressive, sheer wooden barrage, could the same function for an interior rampart apply for those on the inside of the hillfort? In which case, this interpretation suggests that it was still important to demonstrate wealth, power and display to those on the interior, or, alternatively, that once they were inside, the prospect of departure may have been just as intimidating as their entry.

The use of revetment is common, even on sites where the surface evidence does not reveal so and when good building material for stone revetment is not available within the underlying geology. 85% of hillforts excavated have revealed evidence for stone facing. This high percentage will aid interpretation for hillforts in general, especially their depictions within the landscape. Many hillforts would have been seen as being surrounded by large walls, not just 'banks', which would have added to their significance in the landscape and their visual appearance and impact.

Stone is a key building component in most hillforts. Despite some sites being located on poor building material, such as shale as is the case at Moel y Gaer Bodfari, stone is still utilised. The use of stone prevailed, even on these sites with poor underlying geology for building purposes. Furthermore, ramparts which have a stone face are most likely to have also been built with a stony core.

Savory (1980) and Cunliffe (2005) have both suggested that the stone hillforts of Gwynedd are of a certain united type and are distinguishable from the hillforts of north east Wales. Where stone walled forts do occur in north east Wales, Cunliffe lists those which are on the western limits. From the results, it has been demonstrated that many hillforts which have been subject to excavation show a mix of building materials and also a mix of rampart structures on multivallate sites. For example, the hillfort on Conwy Mountain, Castell Caer Seion, combines a mixture of stone wall with stone facing, earthen banks and ditches, and use of a promontory. A mix of architecture can also be seen at Moel Hiraddug and Caer Drewyn. On the Clwydian Range, it has been demonstrated that Penycloddiau and Moel y Gaer Llanbedr utilised stone facing on their ramparts, which would have mimicked a stone walled hillfort without necessarily the accessibility to good building stone. Moel y Gaer Bodfari, within the middle rampart, utilised the local geology and had its middle rampart made out of shale in a dry-stone wall technique, utilising boulder erratics for its (earlier?) inner rampart.

The results show that across much of north Wales and the northern borders, most ramparts use stone, see Table 3.3. Those which utilise an earthen rampart also has preference for a stone facing. Rather than Gwynedd being united for having so many examples of stone forts, this union appears to sweep over a much wider area. With regards to those which utilise a stone facing against a bank, rather than the more typical stone wall of Gwynedd, this could indicate an attempt to mimic a stone wall. Gardner & Savory (1964) suggest that the walled hillforts of Gwynedd influenced the building techniques in north east Wales, and it is possible that the addition of a stone outer face on hillforts to the east demonstrates this. It may be that the lack of building material from the underlying geology limited those in north east Wales to build the stone walls and necessitated the use of a façade. The multiple building phases of Moel y Gaer Bodfari's middle rampart, and the amount of shale which was found in its accompanying ditch, may represent unsuccessful attempts to build stone walls

using the local geology, instead, needing multiple phases of repair, batter and rebuilding. Those which did have access to better underlying geology for building, such as Moel Hiraddug and Caer Drewyn, do utilise stone walls.

However, this interpretation assumes that the hillforts in north east Wales are attempting to imitate those in Gwynedd/north west Wales. The use of a rampart with a wooden or stone facing may as well have been an initial building process, which Gwynedd, with its stony geology, aspired to, but instead, had to utilise the time-intensive dry-stone walls which are more common there. The early beginnings of many of the forts in north east Wales and the borderlands, for example Eddisbury, Old Oswestry and Moel y Gaer Rhosesmor, are examples of already established enclosures, with multiple periods of activity both on the ramparts and within the interior. This too can be said for Gwynedd, but it is the smaller double ringwork, multi-phase enclosures of Meillionydd and Castell Odo which provide the early evidence. Within Waddington's study area, out of 18 excavated hillforts 10 are stone built and eight embanked (Waddington 2013, 52-54), demonstrating that the distribution of hillforts with stone-walled ramparts and faced ramparts may not have as clear a divide as has been expressed and reported on in the past.

Returning to the stone-walled hillforts of Castell Caer Seion, Moel Hiraddug and Caer Drewyn, the hillforts have evidence for both stone walls and stony/earthen ramparts. Caer Drewyn, despite not being excavated, appears to change architectural style half way around its circuit and be built half-and-half. Could the hillforts which demonstrate both walls and banks be the missing 'evolutionary' link between the two? This then raises the question of 'which came first', and therefore which was the preferred style, and which was, potentially, the compromise?

Cunliffe proposed the theory of the rise of developed hillforts in Wessex, but many of the sites in north Wales and borderlands show early activity with multiple phases of activity and therefore development. This demonstrates that Cunliffe's theory is not represented fully within this area of Britain. Additionally, the term 'developed hillforts' requires review. The list of larger sites which have the addition of ramparts and continued use can be accompanied by sites which may not have been multivallate, such as Beeston Castle, but show periods of use from an early palisade and the rampart being built upon throughout the Iron Age. The findings of multiple periods of

building activity in the middle rampart of Moel y Gaer Bodfari, only 3.6 hectares in size, and the decrease in internal area at Moel Arthur in a secondary phase, demonstrates that the 'development' of the sites may not be represented by large sites nor of increasing the footprint. Many of these hillforts do not fit into the category of 'developed hillfort' according to Cunliffe (2005, 388) but demonstrate a large amount of activity on their rampart architecture over a period of time. The retrieval of dating evidence to establish how long these periods were, and if they span the Iron Age or were abandoned before the Middle/Late Iron Age, is vital to this interpretation.

As Cunliffe highlights, the northern borderland of Wales may not be responding to the same phenomenon of developing hillforts seen in Wessex and southern Welsh borderlands at this time, but adjusting accordingly to local pressures, such as climate change, external intervention, disease and population growth (Cunliffe 2005, 400; 582). It is possible that similar, local pressures in north Wales and its borderlands were happening at an earlier stage to their southern neighbours, suggesting an earlier date for their development of hillforts. Taking into consideration the early dates from radiocarbon dates for the nearby sites in Wales and those in Cheshire such as Eddisbury, Woodhouse and Helsby (see below, chapter 4), the hillforts of the Clwydian Range alongside their developed architecture may have much earlier beginnings altogether.

Waddington's results, the area of which overlaps slightly with this wider study area, lists six 'large' (over 6ha) hillforts, as with this study area. Other hillforts within her study predominantly lie in the size category of under 1.2ha. Within this wider study area, incorporating excavated hillforts within the surrounding area in north east Wales and the Marches, the distribution between under 1.2ha sites and 1.2-6ha size sites is much more evenly spaced. Waddington's majority groups were small univallate embanked hillforts and small univallate stone-built hillforts. The use of stone, whether as a stone wall or the use of a stone wall as revetment, also predominates this wider study area, but multivallation is much more common. The fact that the presumed counterscarp bank at Penycloddiau has been found to be a built structure in the north east corner, rather than a by-product of ditch clearing, also highlights the issue of assumption without excavation and the complexity of the rampart architecture. At Moel Fodig, a counterscarp was thought to exist alongside a

shallow ditch, but upon excavation no counterscarp bank was found; however, the ditch was revealed to be 1.5m deep, around 3m wide and of the same, single phase (Williams et al 2012, 43).

The key findings of this study are that, even where the geology is not ideal, stone predominates, and, contrary to previous reports, this is not confined to Gwynedd. The use of 'earthen banks' in north east Wales has been commonly reported due to the surface evidence appearing so. From those hillforts which have been excavated, the majority show evidence for a facing of the rampart, namely stone. Moel Arthur and Moel Fenlli sit within the minority. During its 19th Century excavation, Moel Arthur's ramparts revealed evidence of a 'dry-stone wall', but this was not recognised as revetment by the excavator, to the extent that it was pulled down, and not reported on in detail. These early excavations could have revealed further knowledge on the use of stone at sites such as these. In addition, during excavations at Moel y Gaer Llanbedr, part of a dry-stone wall was discovered within the hillfort at the base of the rampart and may have acted as a foundation (Karl & Butler 2009, 7-8).

Multivallation within the area is common and within rampart structure multiple phases of building are evident, see Table A3.2. This is seen throughout the record, across the wider study area and is not confined to sites of a particular size. Although over half of the hillforts have at least one rampart which appears to be single-phase, only five hillforts are univallate and can truly be considered a single (rampart building) phase site. For those hillforts with multiple circuits of single-phase ramparts, as relationships between these additional circuits cannot be confirmed, it cannot be assumed that multivallation occurred as a phased introduction to the hillfort, even though Davies & Lynch suggest that this is so (Davies & Lynch 2000, 149). If these multivallate hillforts are indeed all of a single phase, this again demands re-interpretation of Cunliffe's developed hillfort theory. Any information as to the date of this single activity of building multivallate hillforts in this area would be key in understanding this massive undertaking and the role of hillfort architecture in north Wales and the borders. The fact that many of these examples have banks with subtle yet apparent differences within their architecture, such as Moel y Gaer Llanbedr, New Pieces enclosure, Pen y Gaer Llanbedr y Cennin and Maiden Castle, suggests that these were not all built in a single episode nor by the same people.

Just as this study has commonalities with Varley's 1948 comparative study and Driver's 2013 research, for example, with the progression of more fieldwork, future research will continue to contribute to the knowledge of hillfort rampart architecture. However, as research continues, it is important not to look at hillfort sites in isolation, but as a group. The merging of results with other studies in similar, overlying geographical areas will increase the capacity to compare sites across a wider area and aid interpretation of hillforts as a whole.

The upcoming Hillfort Atlas will publish a compiled database of all hillfort sites in the British Isles and will provide a single point of information to compare records. With the complexities of, and threat to, individual Historic Environment Records (HERs) in England, the correlation and assemblage of this data is important for the continuing field of hillfort studies. As with the HER, it is important that the Hillfort Atlas is an organic resource, which can be updated and maintained as and when new research comes to light. It is also important that both HER and the Hillfort Atlas are clear to acknowledge what has been found by excavation and what is understood following non-invasive archaeological methods. It has been clearly demonstrated that the results of excavation reveal a much more complex structure than can be recognised from the surface evidence.

This section has provided a comparison of data from excavated ramparts from the wider study area, highlighting the complexity of their construction and their importance for more than just 'function'. Another main architectural feature of hillforts, and a subject of much interest to excavators in the past, is the hillfort's entrance. A comparative study of excavated entrances within the wider study area will now be reported on.

3.2 Entrances

Hillfort entranceways have been the subject of much discussion within hillfort studies. This section will bring together previous studies of hillfort entrances within the wider study area, using data from excavated examples in a comparative study to search for patterns, nuances and variations.

All the hillforts of the Clwydian Range have evidence of inturned entrances. Within north east Wales specifically, Savory suggests that the defences and elaborate

gateways of these hillforts emphasise a highly organised and centralised community from the beginning of the Early Iron Age (Savory 1980, 300). Ralston suggests that an inturn would increase the hillfort's defensibility, creating a long funnel with increased control of any incomers, keeping visitors approaching in range for longer and giving a height advantage to the defenders (Ralston 2006, 67). The 'Pen Dinas' façade identified in mid-Wales displays similar traits, with a long journey past impressive horizontal defences to get to the gateway, thus heightening the visual impact (Driver 2013, 137-138). In contrast, the 'Cors Caron' façade displays a more direct sight of the gate but is still surrounded by elaborate vertical defences (*ibid.*).

Moel Hiraddug (10.7ha enclosed), Penycloddiau (17.7ha) and Moel y Gaer Llanbedr (2.6ha) on the Clwydian Range have multiple entrances. Considering the area these hillforts (in their final phase) enclosed, one could assume that the larger areas of Moel Hiraddug and Penycloddiau could warrant multiple entranceways due to their size. However, Moel y Gaer Llanbedr is one of the smaller hillforts of the Clwydian Range and has two entrances, one of which demonstrates impressive outworks. Moel Fenlli (8.3ha), encloses over three times the area and has only one inturned entranceway with no additional features apparent, apart from a possible stock enclosure utilising the berm between the inner rampart and the counterscarp south of the entrance (Brooks & Laws 2006a, 9).

Forde-Johnston suggested that the use of guardchambers, or 'large recesses' within the entrance passage, flourished in this area (1964, 5). In his paper on 'The Hillforts of the Clwyds', he states that guardchambers are a 'feature' of north Wales and the Welsh Marches (Forde-Johnston 1965, 152). Bowden has proposed that these recesses might be sought on the north Wales coast (Bowden 2006, 424) and noted that they have mainly been found on sites in north Wales and the Welsh Marches (*ibid.,* 423). Although most remain unexcavated, all six hillforts on the Clwydian Range have at least one inturned entrance and most of these appear to have 'guardchambers' within the inturns[13] for at least one phase of the hillfort's use. Bowden warns that guardchamber features themselves can be difficult to recognise in terms of surface morphology and questions whether they could have been

[13] Due to lack of excavation, possible guardchambers which stand separate from the inturn and gateway may not be accurately interpreted or identified. Where suggested, these will be termed 'guard houses/huts'.

deliberately backfilled, giving Eddisbury and Penycorddyn Mawr as examples (Bowden 2006, 426). This may be evidence of deliberate destruction or slighting of a site, as proposed at the earlier phases of Dinorben (Gardner & Savory 1964, 40).

Nevertheless, some surface morphology is usually still identifiable by eye for those entrances with skewed gaps, inturns and outworks, and associated features such as hollow ways. On those hillforts made of dry-stone walling, previous entrances which have since been blocked up can also be identified, such as at Castell Caer Seion (Smith 2012), Bryn y Castell (Crew 1985) and Moel Hiraddug (Brassil et al 1982, 83).

This chapter will examine evidence for excavated entrance architecture and search for any correlations between sites in the wider study area. Similarities between gateways have been explored in the past, for example by Gardner & Savory (1964, 87-90), Guilbert (1979c) and Cunliffe (2005). Sites with noted comparable entranceway development include Moel Hiraddug, Penycorddyn Mawr and Dinorben.

Any data available for the six sites of the Clwydian Range will be collated and discussed, alongside any previous conclusions and theories.

Only Moel Hiraddug on the Clwydian Range has entrances which have been comprehensively excavated[14]. Therefore, a thorough breakdown of all data collected through published reports on excavated entranceways for hillforts in the wider study area, within a radius of approximately 30 miles of the Clwydian Range, will be compared and examined.

Following this, conclusions will be drawn as to whether the Clwydian Range and area surrounding shows any trends and characterisation between hillfort entrances, including whether guardchambers are indeed a ‘feature’ of north Wales and the Marches and whether hillforts in this area can be described as ‘typical’ or otherwise.

[14] Wynne-Foulkes (1850a; 1850b) excavated three hillforts in the Clwydian Range in the mid-19th Century, but without accurate information on exactly where this was carried out his results may only be used with due caution for accuracy. During his excavations of the site in the early 20th Century, Stapleton reported a possible blocked entranceway at the south west corner of the Moel y Gaer Bodfari, see Figure 3.4, (Stapleton, 1909, 236), currently being re-explored by Oxford University.

3.2.1 Evidence from the Clwydian Range

3.2.1.1 Position

A complex entranceway with a dog-legged approach is located at Moel y Gaer Llanbedr at the access point to the enclosure on the arm of the spur which adjoins it to the main ridge of the Clwydian Range (Brooks & Laws 2007, 3). The hillfort is described "*more highly developed than others on the Clwydian Range*" (Brooks & Laws 2007, 2).

Its western entrance is unusual with regards to its position; located on a steep slope both overlooking the Vale of Clwyd and below a step face within the hillfort (Brooks & Laws, 2007, 3) making it difficult to access. The entranceway itself appears to be a simple inturned entrance creating a corridor of c.15m in length (Brooks & Laws 2007, 3). Brooks & Laws suggest that this entranceway could be secondary, due to the inner rampart on its southern side appearing to turn inwards slightly before it reaches the gateway. They suggest that an earlier, simpler gateway could have been located here and that the inturned entrances, on both the western and the north eastern entranceways, were a later addition during a more developed phase of the site (Brooks & Laws 2007, 4). A similar arrangement is seen at the eastern entrance with a slight break between the inturns and the ramparts suggesting they were added on to a simpler gap (Brooks & Laws 2007, 4).

The question remains as to why an entranceway was built at the western position of the site, at the top of such a steep slope where access is difficult. The entrance was described as 'clearly not functional' during research of the site by Bangor University (Karl & Butler 2009, 3). One suggestion could be to provide a focal point of the hillfort from the valley below, making it appear inaccessible and formidable. Additional evidence for where a hillfort's entrance may have been used for display is seen at Moel Arthur, where the ramparts appear to have been heightened "*presumably to create a more impressive gateway*" (Brooks & Laws 2006b, 3). However, another consideration for the location of Moel y Gaer Llanbedr's western entrance would be whether it would only appear inaccessible for approaching traffic but could be in a prime position for anyone wanting to exit the fort and have rapid access down the western slope to the Vale of Clwyd below.

A similar but less extreme arrangement can be seen at Moel Fenlli where the sole original entranceway is located at the western edge of the hillfort overlooking the Vale of Clwyd. The easiest approach to the hillfort is on the flatter, eastern side, where the hillfort boasts multivallation, but there is no evidence apparent for there ever having been an entranceway feature on the eastern edge of the hillfort, although phasing has been suggested at this point (Brooks & Laws 2006a, 9). The western entrance is currently accessed by the Offa's Dyke Path National Trail which leads from the pass of Bwlch Pen Barras to the north. This line of footpath was reported by Wynne-Ffoulkes during his 1849 'exploration' of the site, where he undertook numerous 'diggings' and where he also refers to finding a metalled trackway at the entrance (Wynne-Ffoulkes 1850a, 83).

The original entranceway would have been an obvious feature seen from the valley below and has relatively easy access to the important pass through the Clwydian Range at this point. The eastern edge would not have been as directly accessible to the Bwlch Pen Barras pass to the north or the pass to the south, which could explain the siting of the entranceway on the steeper western side.

Another feature which could have made the entranceway more obvious in the landscape is the area to the south of the entrance, where the counterscarp bank changes course away from the inner rampart to enclose a berm, which has been interpreted as a possible stock enclosure (Brooks & Laws 2006a, 9).

In reference to the situation of the entrance, another feature of note on Moel Fenlli is the Bronze Age burial mound which sits on the summit of the hillfort, close to the eastern edge. The entranceway is at the furthest point from the burial chamber, and this could suggest a respect or ritual, which meant that an entranceway at the eastern edge would have been too close to this monument (Gale 1999, 92). This is mirrored at Penycloddiau which also encloses a Bronze Age burial tomb at the summit (Grant & Jones 2008), its two entranceways being located far away from this feature. However, during a drone survey of the hillfort in 2015, Pope and Mason suggested the possibility of a third entranceway, to be confirmed, located in the north west corner of the hillfort, and much closer to the burial mound (Pope, R. 2016. Conversation with Erin Lloyd Jones, 9 August).

Evidence for at least six entrances has been found at the multiple enclosure site of Moel Hiraddug and multi-phase use of some of these has also been discovered through excavation (Brassil et al 1982, 19). The Main Inner gateway shows at least four phases, the first phase being a single gap in the wall later blocked and moved a few metres to the west, see Figure 3.2, which appears to have been positioned strategically to increase the visibility from the rampart to both approach tracks to the entrance (Brassil et al 1982, 20).

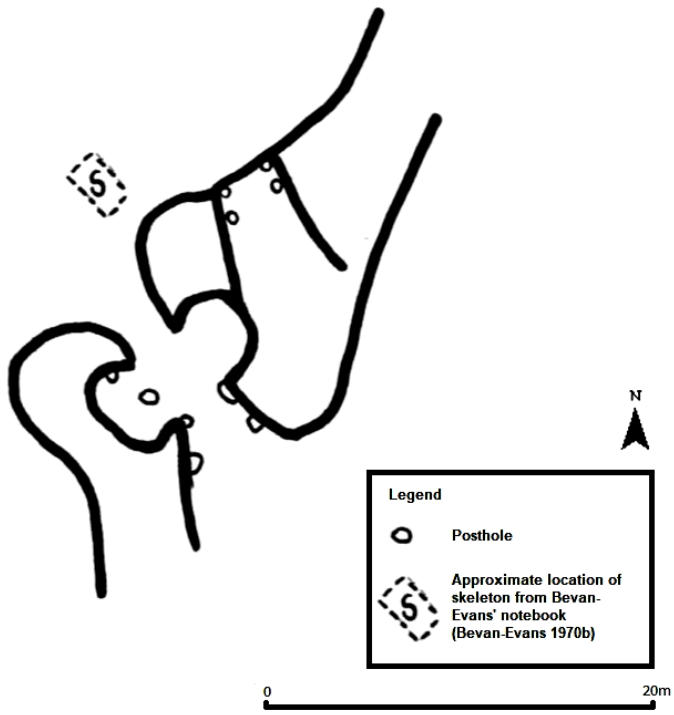

Figure 3.2. Moel Hiraddug's Main Inner entrance, first (blocked) simple gap entrance to the right and (relocated) final phase with inturns and guardchambers, to the left, and approximate location of two inhumations discovered beneath a metalled trackway. After Brassil et al 1982 & Bevan-Evans 1970b

The north west gateway shows at least three phases and is constructed at an offset angle through the wall which, in itself, creates the illusion of its own longer passage (Brassil et al 1982, 83, fig 29), see Figure 3.3.

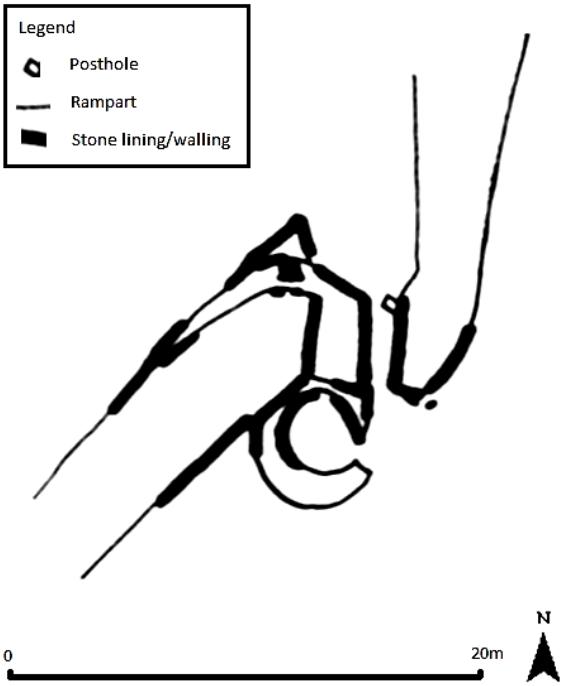

Figure 3.3. Moel Hiraddug's north western entrance phasing with initial simple gap, additional revetment creating an inturn and addition of a stone hut on the western terminal. After Houlder 1961

The southern gateway shows a similar arrangement, forcing anyone entering the enclosure to follow a specific route, in this case, following the line of the south rampart (Brassil et al 1982, 19). The second phase of the north west gateway makes the passage much narrower with the addition of a stone revetment, also creating a slight inturn towards the hillfort interior; the third phase being the addition of a stone guardchamber, discussed below (*ibid.*), see Figure 3.3. This 'skewing' of the entranceway seen at the north west and southern entrances would drive incomers in a certain direction when entering or exiting the site, suggesting an attempt at controlling visitor flow inwards towards a certain feature or outwards, possibly towards a pathway. The original location of the Main Inner gateway was slightly relocated as the entranceway developed, see Figure 3.2. Another blocked entrance, also appearing to sit at an oblique angle, has been discovered on the eastern side of Moel Hiraddug in the middle rampart, but this particular example has not been explored further (Brassil et al 1982, 21).

During his excavations of Moel y Gaer Bodfari in the early 20th Century, Stapleton reported a possible blocked entranceway at the south west corner of the hillfort, see Figure 3.4 (Stapleton 1909, 236). In 2011, Oxford University conducted an extensive survey across the whole site, as well as looking at areas Stapleton had previously explored (Lock & Pouncett 2013). These surveys were able to assist the conclusion that the possible secondary entranceway on the western side of the hillfort, recorded by Stapleton (1909, 236), may not have been an original gap in the ramparts. However, upon excavation of this thoroughly disturbed area, initial investigations revealed a number of structures previously unidentified and an earlier entranceway may exist in the vicinity (Pouncett, J. 2015. Conversation with Erin Lloyd Jones, 31 July).

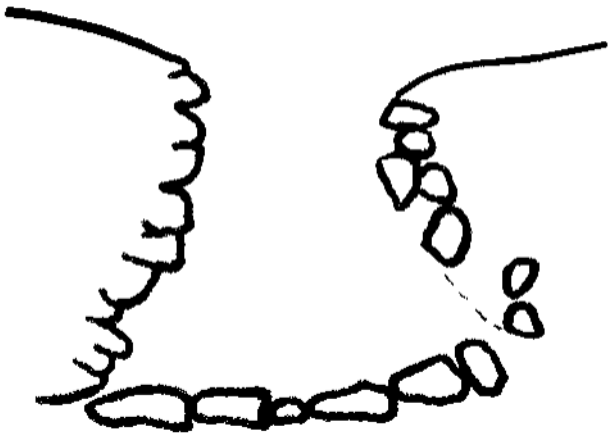

Figure 3.4. Moel y Gaer Bodfari possible blocked western entrance. After Stapleton 1909, no scale or alignment provided in original.

Orientation data from the thirteen known entrances on the six hillforts of the Clwydian Range (see Figure 3.5 below and Table A3.1) indicates that there is a preference for entranceways towards an easterly aspect, as 7 entrances are orientated with a north east, east or south east aspect. This takes into account the oblique angles of some of the entrances such as Moel Hiraddug's north western entrance's north aspect and its Main Inner entrance, which appears to have been built on such an angle to have maximum view over approaching paths (Brassil et al 1982, 20) and to control visitor flow, as discussed above.

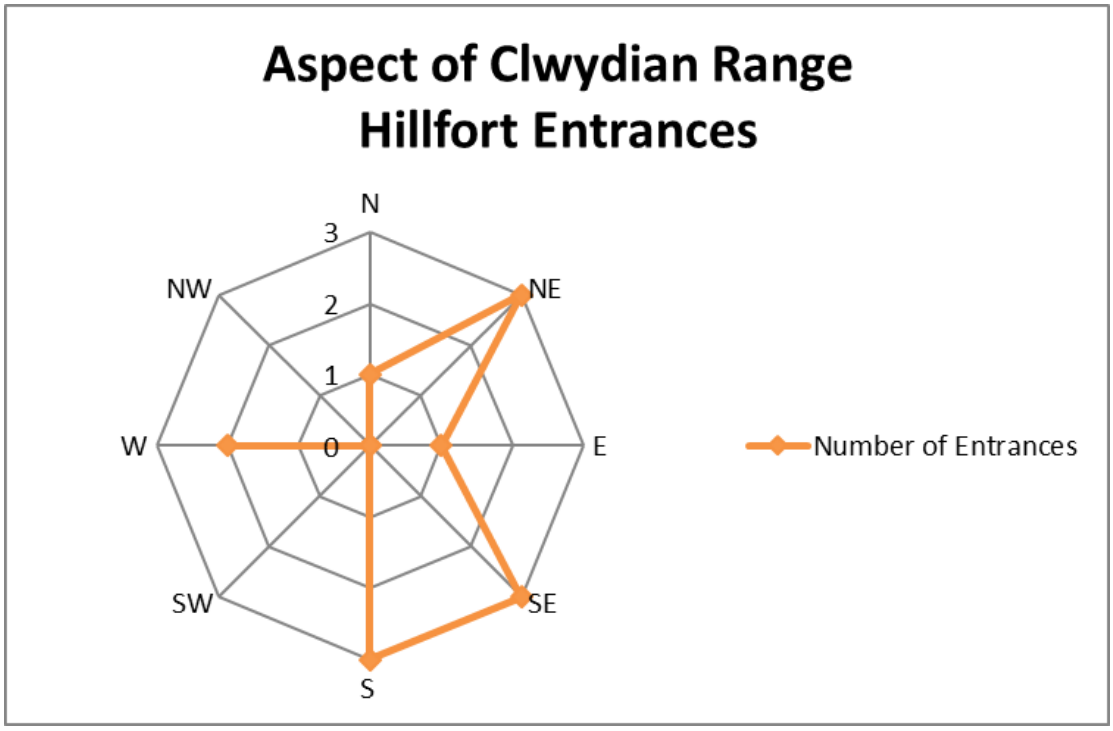

Figure 3.5. Aspect of known entrances on the hillforts of the Clwydian Range, showing a preference for entranceways to be orientated towards an easterly aspect

Interestingly, even though the north west gateway and Main Inner gateway of Moel Hiraddug both have multi-phase construction, the earlier phases of simple gaps in the ramparts still show this 'skewing' of the gap to create an angled approach to the hillfort (Brassil et al 1982, 82-84). All of Moel Hiraddug's entrances appear to have been built at an oblique angle to the approach, following the contours, and it is suggested that this was done strategically to increase control and surveillance of those approaching (Brassil et al 1982, 20), where the design of the offset entrance terminals is described as 'clever' and "*similarly contrived... each designed to lengthen, and thereby strengthen, the defended approach to the... gate itself, at the same time producing reasonably graded approach tracks*" (Brassil et al, 1982, 21).

At Moel y Gaer Bodfari, the entrance also utilises steep slopes by sitting closely to the eastern edge of the hill (Brown 2004, 76) and is slightly offset to the main ramparts. It is approached by a curving pathway, determined by an outer work to the north of the entrance and a T-shaped club end to the inner rampart on the western side of the entrance with a simpler inturn on the eastern side (Forde-Johnston 1976, Figure 129; Lock & Pouncett, 2011, 4). This slight curve to the approach may have

inhibited the approacher's view of the actual entrance of the hillfort and the large roundhouse located on a cut platform directly opposite the entrance, discovered during survey and excavations by Oxford University (e.g. Lock & Pouncett 2011).

Lengths of bank along the approach to hillfort entrances are also seen at Moel Arthur and Penycloddiau's eastern entrance. At Penycloddiau's eastern entrance a length of bank to the south of the entranceway appears to act as a hornwork to the entrance and has been interpreted as an attempt to block access to the south of the entrance; the reason for this potentially explained by a large deep cwm or gully in the hillside a few metres from the entrance (Forde-Johnston 1976, 241). At Moel Arthur, the entrance passage appears to curve slightly so that, on approach, the traveller is made to follow the passage to the right, where the entrance proper is out of sight around the corner. This may also have meant that the people inside the hillfort at the entrance would not have been able to see the approachers, see Appendix Two. Here, however, the ramparts at this location appear to have been heightened (Brooks & Laws 2006b, 3) and this height would have increased the visibility of the approach track from atop.

The approach to Moel y Gaer Llanbedr's inturned eastern entrance is determined by multivallation and approached through a 90-degree dog-leg turn to the left and then another to the right to reach the entrance proper (Forde-Johnston 1976, 237). This entranceway is the most complex on the Clwydian Range, but its location is significant in the fact that the north eastern entranceway to the hillfort is along a relatively flat spur from the main ridge of the Clwydian Range. Where other hillforts have a relatively flat area surrounding the ramparts, such as to the north of Penycloddiau hillfort or east of Moel Fenlli hillfort, we see the similarity of multivallation in both cases, but their entranceways placed in much 'less-accessible' positions on the hills, with steeper approaches. It cannot be discounted that Moel y Gaer Llanbedr's north eastern entranceway is this complex in order to slow down "enemies" as suggested in the Royal Commission's Inventory in the early 20th Century (RCAHMW 1914, 88). The question that then presents itself is why the hillfort constructors built the entrance at this position. One possibility is that it may be due to the incredibly steep slopes surrounding the site in all other locations, rendering other directions of approach unusable or less functional, as is seen at the western entrance.

3.2.1.2 Inturns

Following survey, 11 out of 13 known entrances in their final phase have been identified as inturned and this high percentage, 85%, in the six hillforts of the Clwydian Range demonstrates that this was a common feature in this particular area.

There is the possibility that some of the hillfort entrances which display evidence of inturns would have had earlier phases which may not have included inturns and that these were a secondary phase, such as is suggested by Brooks & Laws at Moel y Gaer Llanbedr (Brooks & Laws 2007, 4). This may indicate that those entrances without inturns in the locale, i.e. the blocked entranceway within the eastern rampart at Moel Hiraddug, are of an earlier phase. Incidentally, the two entrances which do not have inturns are both at Moel Hiraddug.

Although the inturned entrance suggests some uniformity between these hillforts, other features within these entrances show that they differed in style.

3.2.1.3 'Guardchambers' and Guard Huts

Some entranceways of the Clwydian Range hillforts have been found upon excavation to be multiphase features, such as the Main Inner gateway at Moel Hiraddug, see Figure 3.2. Although most remain unexcavated, all six hillforts on the Clwydian Range have at least one inturned entrance and most of these appear to have 'guardchambers'[15] within the inturns for at least one phase of the hillfort's use. In addition to guardchambers, some topographical surveys of the sites have noted platforms which could be associated with the entrances, possible evidence of huts or structures associated with the entrance but not actually built into the entrance structure itself[16].

For the information available through excavation and non-invasive survey, the amount of entrances with associated features, such as guardchambers, guard huts and associated platforms, possibly for free-standing guard huts, can be considered,

[15] For the purpose of this paper, the term guardchamber will be used although their use by a 'guard' is not assumed.
[16] Due to lack of excavation, possible 'guard huts' which stand separately from the inturn and gateway may not be accurately interpreted or identified.

see Figure 3.6, below. Reference will be made to both 'guardchambers' and 'guard huts', where 'guardchambers' are defined as recesses within the inturns of the entranceway and 'guard huts' are features which are not recessed within the entrance feature but thought to be associated albeit sit completely separate to the entranceway 'proper' and difficult to relate (Brassil et al 1982, 85, fn 149).

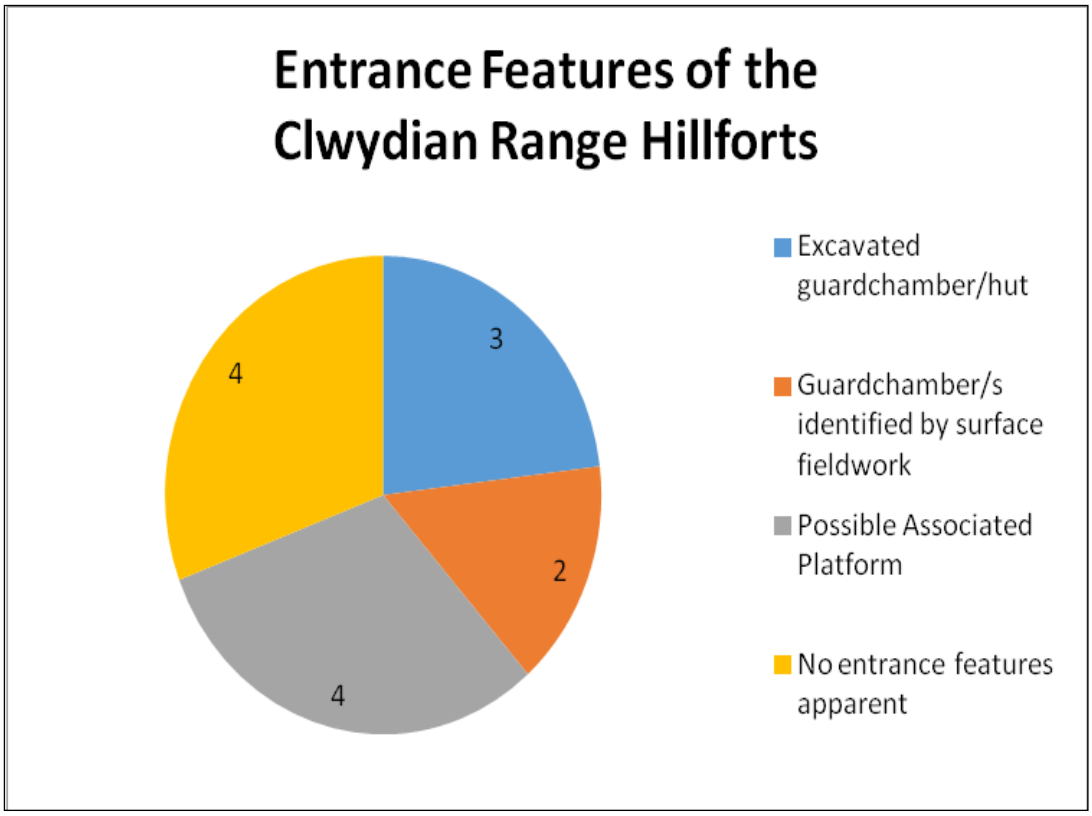

Figure 3.6. Entranceway features of Clwydian Range Hillforts showing those with guardchambers/huts confirmed by excavation, those with the features identified through unintrusive survey, those with possible associated features and those without guardchambers/huts/associated platforms apparent

If one assumes all possible associated platforms to be guard huts, the results show that almost 60% of hillfort entrances in the Clwydian Range may have associated buildings. The remainder have no associated features found (to date). The first of the two 'possible' guardchamber sites lie at Penycloddiau's southern entrance, where a guardchamber is thought to lie at the end of the terminal of the eastern inturn, identified by both Forde-Johnston (1964a, 20) and CPAT (Jones 2006, 3) as a feature. The other lies at Moel Hiraddug's Main Middle Entranceway within the western inturn, where Forde-Johnston stated that there appeared to be 'slight

hollows' within the inturns of both this entranceway and the Main Inner (Forde-Johnston 1965, 177). These were found to be present at the Main Inner, see Figure 3.2, but not within the eastern inturn of the Main Middle, in its latest phase at least (Brassil et al 1982, 20).

However, these results may be misleading. At the north west entrance of Moel Hiraddug, a possible associated hut platform was identified to the north east (Houlder 1961, 16). Upon excavation it was found to be a natural feature defined by the limestone outcrop (*ibid.*). Care must be taken when attempting identification of features prior to excavation due to the underlying geology.

Therefore, 40% of entrances have *proposed* guardchambers recognised by excavation and topographical survey; but less than a quarter of entrances in the Clwydian Range confirmed by excavation alone. This confirms the need for a wider study area to utilise additional entranceway excavation results.

Brassil suggests that fewer guard huts are known compared to guardchambers (Brassil et al 1982, 20), but this may simply be due to them being harder to identify. Many 'associated platforms' have been reported as 'platforms' as there is no firm evidence to suggest their role. One example of a potential 'guard hut' was excavated at nearby Moel y Gaer Rhosesmor, relative to a gap in the palisade fence, see Figure 3.7. It has been interpreted as a guard hut due to it being the sole roundhouse within the cluster of huts whose entrance is orientated towards the gap in the palisade rather than to the east as with the others present (Guilbert 1977a, 47).

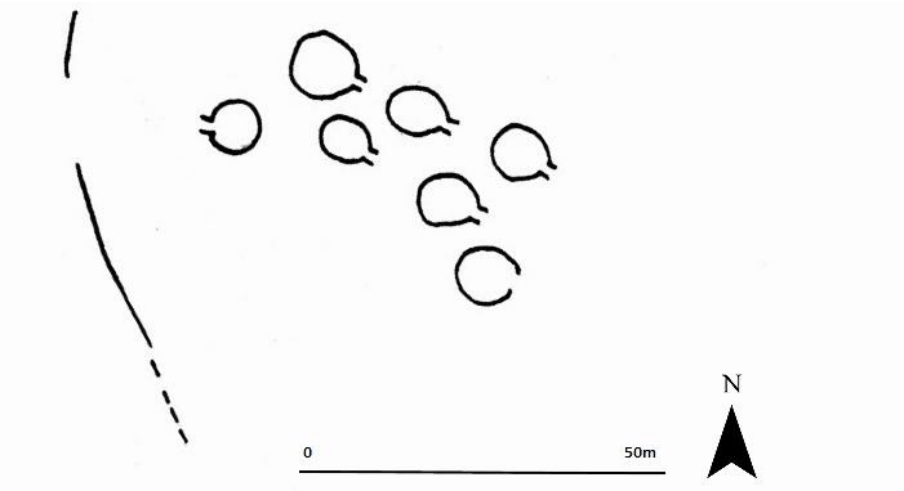

Figure 3.7. Moel y Gaer Rhosesmor palisade showing gap at eastern edge and internal buildings including one hut with entrance aligned to the west facing the palisade entrance gap, where all other excavated huts were found to have entrances facing south east. After Guilbert 1977a

Of the Clwydian Range hillforts, guardchambers have been reported at Moel Hiraddug's Main Inner gateway, see Figure 3.2 (Forde-Johnston 1965, 177; Brassil et al 1982, 20). What is described as a 'guard hut' is located at the north western entrance for its final phase, excavated in 1954-55 (Houlder 1961, 12-16; Brassil et al 1982, 84-85). It is described as a 'guard hut' rather than a guardchamber as it has been 'tacked on' to the hillfort entranceway, rather than being recessed into the inturn of the entrance, see Figure 3.3 (Brassil et al 1982, fn 149). Whilst guard huts appear to be less common than guardchambers, another example is thought to exist at nearby Conwy Mountain hillfort, Castell Caer Seion (Brassil et al 1982, fn 149).

Moel Arthur displays clear examples of 'recesses' within its entrance inturns which can be identified by eye, corroborated by topographical survey (Brooks & Laws 2006b) but remain unexcavated.

Guardchambers are suggested at Penycloddiau; described as being present at the southern entrance by Forde-Johnston but with no evidence for guard-chambers at the eastern entrance (Forde-Johnston 1965, 166-7). This is questioned by Nigel Jones who, during the topographical survey of the site, suggests that two levelled areas on the north side of the track at this eastern entrance may have been positions for round huts (Jones, 2006, 3) suggesting the presence of 'guard huts' rather than 'guardchambers'.

The topographical survey at Moel Fenlli shows no sign of guardchambers within its inturned entranceway but did reveal a possible associated platform just inside the entrance passage (Brooks & Laws 2006a; 2007). A similar occurrence is seen at Moel Hiraddug, where a recessed platform behind the western terminal of the South Gateway could have been for a building and therefore may suggest the presence of a guard hut at this position (Brassil et al 1982, 19 fn. 12).

In addition, there was no evidence for guardchambers apparent at either of the entrances at Moel y Gaer Llanbedr (Brooks & Laws 2008a, Figures 2 & 7) and, although it is seen that the 'inturns' at both entrances appear to be a secondary phase to an original gap through the ramparts, the eastern entrance is both a complex entranceway with a dog-leg turn and the addition of an 'annexe' at this point. Therefore, although the entranceways do not boast guardchambers, this may suggest an additional phase to the site that the other hillforts on the Clwydian Range did not experience.

In recent years, the only entranceways and therefore guardchambers which have been excavated on the Clwydian Range are some of those of Moel Hiraddug. Excavation of the Main Middle gateway at Moel Hiraddug revealed limestone blocks in the passage way which are proposed to have been in such a location they would have prevented the presence of a guardchamber in at least the eastern inturn, certainly for its final phase, as mentioned above (Brassil et al 1982, 20). The guard hut of the north western gateway at Moel Hiraddug was explored by Houlder in 1954-5 and was thought to have been built on to the entrance passage at the same time as the narrowing of the passage (1961, 12-16). Houlder found that it was "*of poor construction*" and, as it sat on a slope, the ground had been raised using rubble; the occupation level "*...consisted of a trodden layer of greyish clay, containing flecks of charcoal, but with no trace of a hearth*" (Houlder 1961, 14-16). It was thought that a gap in the walling facing east-south east was probably where the entrance to the hut lay (Houlder 1961, 16). A fragment of very rough, red, poorly fired pottery was found below the guard hut (Houlder 1961, 17).

The published plan of the north west gateway was re-examined by Brassil et al (1982). It was suggested that this third phase at the entranceway, with guard hut following a second phase of narrowing, would match the addition of guardchambers

at the Main Inner gateway. This indicates that the radiocarbon dates, 430+/-60bc (CAR-374) and 410+/-64bc (CAR-373)[17], taken from the blocking of the earlier period 1 passage at the Main Inner, provided a potential terminus post quem (TPQ) for the introduction of guardchambers at both entrances (Brassil et al 1982, 84-85).

The Main Inner gateway at Moel Hiraddug was explored over four seasons by the not fully published excavations of Bevan-Evans in the 1960s and Davies 1969-72 (Brassil et al 1982, 26). Davies suggests that the initial period 2 arrangement at the Main Inner gateway comprised of just one sub-rectangular guardchamber recessed into the eastern inturn which, like the north west gateway, would have sat on the right-hand side when entering the passage (Davies 1972, 12-13). A hearth was found, associated with the rear of the 'guardchamber gate' which sat on top of the demolished western terminal of the earlier phase which would have sat 6m to the east of the later gate (Davies 1971, 8-9). The hearth was multi-phase through each development of the relocated phase 2 entrance (Davies, J. L. 2016. Meeting with Erin Lloyd Jones, 25 November). Beneath this hearth, an iron swan's neck pin was found, which could date back as far as the Sixth Century BC, giving a TPQ for the gateway pre-guardchambered phase (Davies 1971, 9). A 'heavily metalled roadway' was found to run from the Main Inner gate and which had sealed "*two inhumed burials immediately inside the gate and on the axis of the gate passage*", see Figure 3.2 (Davies 1970a, 9-10). Although there was no dating evidence for the inhumations, they were believed to be contemporary and of Iron Age date at the latest (Davies 1970a, 10)[18]. In a subsequent phase, the guardchamber was reduced in size and then in its final phase, it was developed with the addition of a guardchamber on the western terminal, ultimately comprising of two semi-circular guardchambers (Davies 1972, 13).

This observation is particularly interesting as it has been stated that rectangular recesses can sometimes replace sub-circular recesses, but never the other way around (Bowden 2006, 426). This theory is disproved at this particular entrance at Moel Hiraddug. Gardner and Savory suggest that there was a local evolution from sites with semi-circular or rectangular chambers, such as those at Caer Drewyn and Eddisbury Phase I, to rectangular chambers with wall-fronted ramparts as seen at

[17] Recalibrated and discussed further in chapter 4
[18] Discussed further in chapter 4

Penycorddyn Mawr and Dinorben III, and a still later date of sloping fronted ramparts with guardchambers, as seen at Dinorben's final phase and at the further afield Wrekin Phase II (Gardner & Savory 1964, 90).

3.2.2 Excavated entranceway results

In total, nine hillforts within the wider study area have had entrances excavated and published to a useable standard[19]. Of these nine hillforts, 15 entrances[20] with 37 separate phases of entrance construction were identified, including in some cases destruction, repair and relocation. Four of the hillforts have had more than one entrance excavated, but Old Oswestry, for example, had its western entrance excavated but not its eastern.

3.2.2.1 Location and Aspect

A high proportion of entrances, of excavated hillforts within the wider study area, are located at an easterly location within the hillfort defences, see Figure 3.8 and Table A3.4. Nine entrances were located in the north east, east or south east of the hillfort. A further three were located at the north west, west and south entrances. The hillforts with entrances which are placed in a south or westerly position also have entrances in an easterly position. However, not all hillforts with eastern entrances also display other entrances elsewhere within the site. In the case of hillforts which have been excavated, this shows a preference for an entrance located in the east.

[19] Wynne-Foulkes (1850a, 1850b) and Taylor (1980/81; 1993), for example, have not been classed as 'useable' for this exercise.
[20] Entrances which have been found to have been relocated are classed as one 'entrance' with multiple phases. For this statement, the two entrances at Bryn y Castell have been treated as two separate entrances, although it is proposed that one replaced the other, relocated.

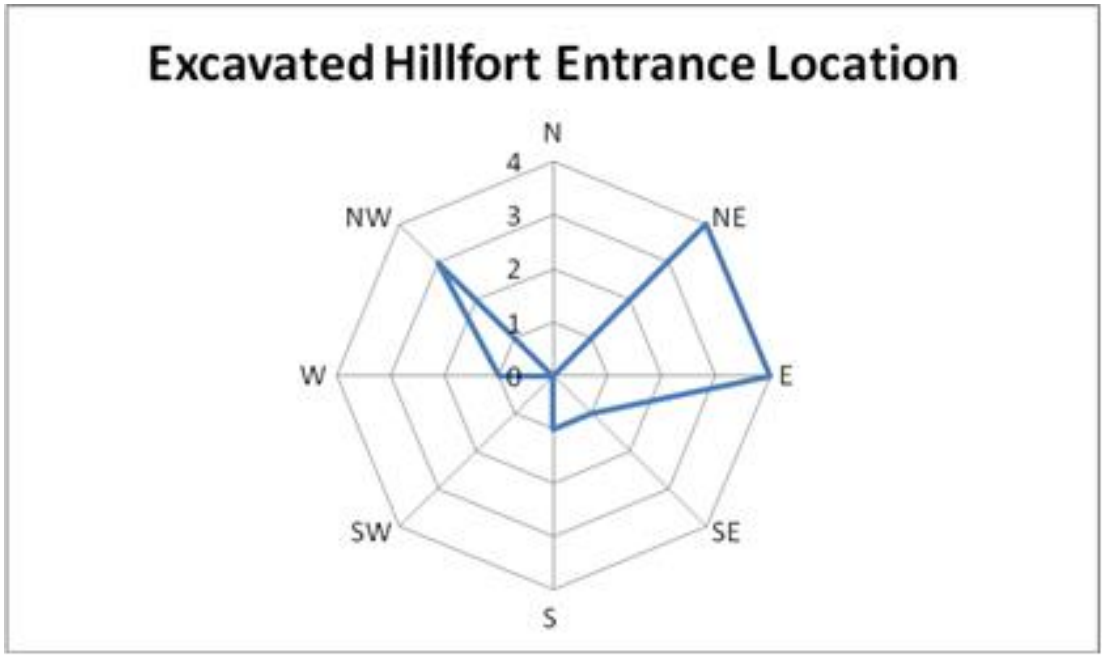

Figure 3.8. Excavated hillfort entrance locations, showing a high proportion of entrances being situated in an easterly location

Despite *locations* of entrances being relatively clear by investigating simple maps of sites, the *aspects* of the entrances differ. For example, some entrance passages were angled or overlapped which altered the aspect from the entrance to a direction different from its location within the ramparts.

Similarly, nine entrances had an easterly (north east, east, south east) aspect but have a more even distribution across the compass points, see Figure 3.9 and Table A3.4. The five remaining entrances had aspects of north, west, south and two north west. As well as location, a preference for an easterly aspect from the site can be seen.

Ralston 2006 discusses the choice of entrance orientation, such as the influence of cosmology. Although in some cases, accessibility to route-ways, resources or defensibility may be obvious reasons for the placing of an entranceway at a certain position within the enclosure, he notes that this theory does not always correspond with the evidence. Examples are given, notably in southern Britain and especially for earlier Iron Age hillforts, of entranceways positioned on the east or the west, relating to the sun, irrespective of the above factors. Other features within the landscape may also be a factor, such as at Traprain Law, East Lothian, where the main entrance on

the north side of the inner defence is oriented directly with the neighbouring fort of North Berwick Law (Ralston 2006, 40-41).

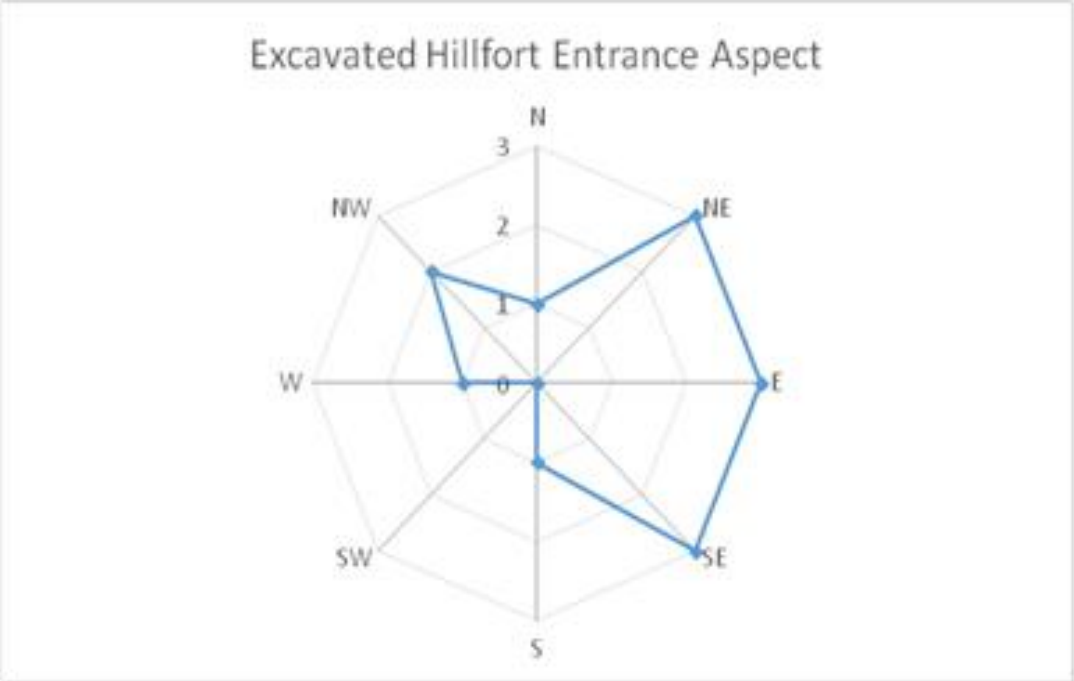

Figure 3.9. Excavated hillfort entrance aspect, showing a preference for an easterly aspect

3.2.2.2 Types of Entrance

Three general types of hillfort entranceway can be categorised within the excavation record; simple gap, inturned entranceway and inturns with guardchambers. Further details can be offered within these themes, such as angled gaps, club ended ramparts, incurved and overlapped ramparts at entranceways. Where a rampart is seen to turn into the enclosure, whether as a curved or a sharp-angled inturn, this will be described as an 'inturned entrance'. Within a larger sample, these two varieties may warrant separate categories.

Additional 'types' listed with the excavation results are the blocking and deliberate destruction of entranceways as well as episodes of repair. Where entranceways are seen to be blocked, some show evidence of being relocated to a nearby location within the ramparts.

3.2.2.3 Phasing

Two thirds of entrances excavated showed evidence for at least two phases of building and amendment, see Figure 3.10. Three of the nine hillforts, making up five of the entrances within the study, reported single activity phase of building at the entranceway.

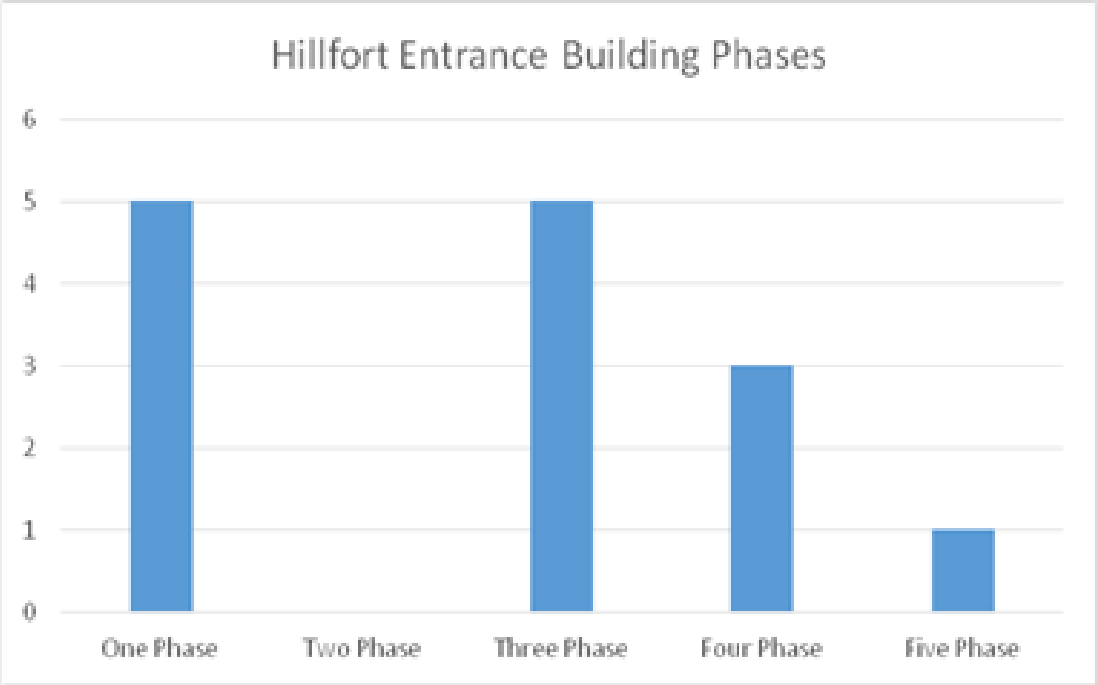

Figure 3.10. Building phases at hillfort entrances, suggesting that hillfort entrances were either built in one phase or had multiple (i.e. more than two) building phases

Nine entrances showed at least three phases of building activity, including possible fire destruction at Eddisbury, narrowing and blocking at Dinorben and relocation at a number of sites.

Interestingly, entrances which showed more than one phase of building activity showed at least three events, see Figure 3.10. Some of the phases of activity are seen in the style of building and architecture. The time between these events is unclear. Some architectural features can be seen to supersede but respect others, but not being clearly different phases of use. In such cases, such as dry-stone walling being inserted between postholes at Eddisbury's eastern entrance, they have been treated as one phase.

Amendments to existing entrances include the addition of features such as bastions, inturns and guardchambers, blocking, reduction in size, repair, relocation and apparent deliberate destruction.

In their corresponding chapter in their publication on prehistoric Wales, Davies & Lynch suggest that in Wales, stone-walled forts tend to have multiple 'posterns' in addition to main gates (Davies & Lynch 2000, 149). Although the definition of a 'postern' instead of an 'entrance' is not defined, this theory stands true for the Clwydian Range hillforts. Moel Hiraddug has multiple entrances, some of which appear to be less defined as other (main?) entrances. Following the excavation of its middle rampart by Oxford University, Moel y Gaer Bodfari can now be included within the category of 'stone-walled hillforts' (Lock & Pouncett 2013). Its original, early 20th Century original excavation suggested that in addition to its north entrance, a second, blocked entrance may have been situated on the western ramparts, see Figure 3.4 (Stapleton 1909, 233, 236). This is being investigated again by Oxford University and preliminary results suggest features in this location (Pouncett, J. 2016. Conversation with Erin Lloyd Jones, 27 July).

The discovery of a previously unrecorded entrance in this location will not only add to the number of hillforts with blocked entranceways in this area, but also correspond with Davies & Lynch's suggestion regarding stone-walled hillforts having multiple gateways. Whether this potential gap can be classed as a 'main gate' or a 'postern' remains to be seen. Penycloddiau and Moel y Gaer Llanbedr, with stone faced ramparts are also of note within this discussion. Although not stone *walled* forts, their stone revetment certainly gives the impression of stone-walled hillforts for those on the exterior. Both have two entranceways, and each has one entranceway which could be considered as a 'main entrance' over the other. Moel Fenlli and Moel Arthur, whose ramparts were reported to be of dump construction without stone facing upon excavation (Wynne-Foulkes 1850a, 1850b), have one main entrance and no additional others known. Of others excavated within the wider study area a mix of stone walled and stone-faced hillforts have multiple entrances, including Eddisbury (stone-faced), Old Oswestry (stone-faced) and Penycorddyn Mawr (stone-wall) and the blocked entrances at Castell Caer Seion (a mixture but mainly stone-wall), Dinorben (stone-faced) and Bryn y Castell (stone-wall).

This, however, is not conclusive. Many hillforts' ramparts have been found to have a stone face and the result may simply show that hillforts in this area are likely to have more than one entrance. Moreover, some hillforts with stone-faced ramparts still only appear to have one entranceway, such as Beeston Castle (final phase, stone-faced).

3.2.2.3.1 Gaps

Eight entranceways show evidence for having an initial or early phase of a simple gap entranceway, without features such as inturns, see Table A3.3. All eight demonstrate evidence for amendment at a later phase. However, all of these amendments differ in some way.

Four gap entrances are eventually blocked, and three of these are said to relocate to form a new entranceway nearby within the ramparts, also seen in Table A3.3. Two additional entranceways show evidence for destruction, but this takes the form of dismantlement at the Breiddin and possibly at Beeston Castle, rather than blocking. The exact form of amendments to Beeston's entrance is unclear due to later medieval building of the castle, but a later phase of the proposed initial simple gap entrance shows that large timber posts to the rear of the entranceway are removed and the holes backfilled.

3.2.2.3.2 Relocation

Evidence for the relocation of entranceways within the hillforts show the blocking of a relatively simple gapped entranceway. This is evidenced at Dinorben, Bryn y Castell and Moel Hiraddug. At Moel Hiraddug's Main Inner entrance, Dinorben and Bryn y Castell, see Figures 3.2, 3.11 & 3.12, the entranceway has been moved (approximately) to the west of the original gap; at Moel Hiraddug's north west entrance it has been moved east. Due to the orientation of the entranceways, this is 'left' (as you look at the hillfort) at Dinorben and both of Moel Hiraddug's and 'right' at Bryn y Castell so it is not clear whether the direction of the relocation has any significance apart from, potentially, functionality.

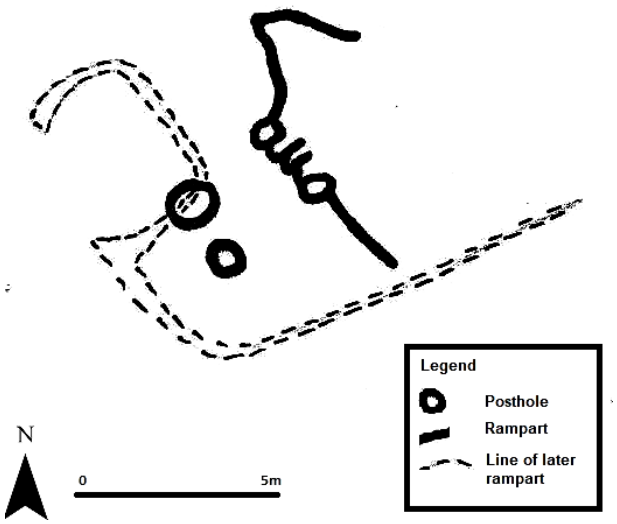

Figure 3.11. Initial simple gap entrance at Dinorben's east entrance (in bold) with subsequent, relocated inturned entrance with guardchambers to the left (hachered). After Gardner & Savory 1964

At Bryn y Castell the simple gap entrance is relocated 9 metres to the west by another entrance which appears initially to take the form of a simple gap, see Figure 3.12. This is later repaired after drainage damage and other postholes are possibly associated with an/other structures here.

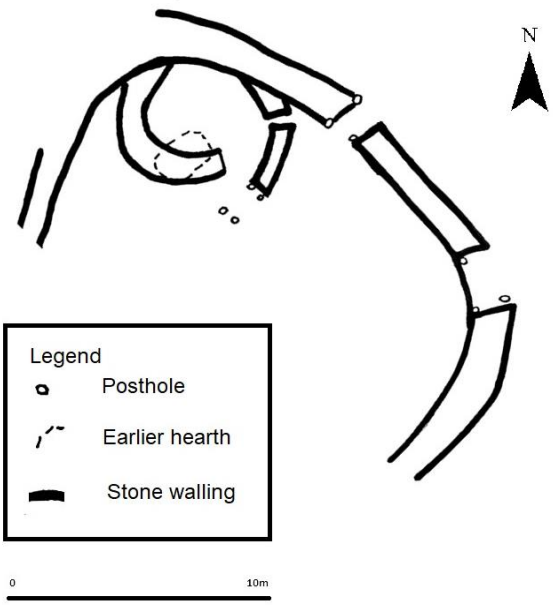

Figure 3.12. Bryn y Castell entrances at north east (blocked) and north, internal 'snail' structure with underlaying hearth (hachered) and associated postholes. After Crew 1984; 1985

At Dinorben and Moel Hiraddug the relocation of the entranceway is superseded by a more embellished structure with inturns and guardchambers, see Figures 3.2 & 3.11. Dinorben is relocated 5 metres to the west/left and Moel Hiraddug 6 metres to the west/left. In both cases the entranceways are complex with a pair of guardchambers and inturns. The blocked, relocated entrance at Dinorben (Gardner & Savory 1964, 25) and Moel Hiraddug's Main Inner entrance had not been previously identified prior to excavation (Davies, J. L. 2016. Meeting with Erin Lloyd Jones, 25 November).

A possible earlier entranceway phase was proposed at Moel y Gaer Llanbedr, after burnt stone was found within the rampart (Brown 2004, 72) and subsequently magnetic susceptibility survey found high areas of enhanced readings, detecting high temperatures (Brooks & Laws 2008a, 4). However, following excavation the high readings were attributed to burnt material brought into the site from elsewhere to construct the rampart (Karl & Butler 2009).

In the case of the remaining six hillfort entrances which have not revealed evidence for an earlier simple gap, see Table A3.3, the three at Penycorddyn Mawr are reported to be single phase, as are Maiden Castle and Eddisbury north west. Eddisbury's eastern entrance shows evidence of an earlier phase, but this is currently thought to have consisted of an inturn with one guardchamber, with a later phase incorporating two guardchambers. This result could suggest that entranceways which began as complex structures did not require the further amendments in the future, as seen at simpler initial gaps, and therefore could be later features overall.

However, the five entrances listed above, reported as single phase, were all dug before 1940. It is possible that these early excavations did not identify or did not excavate a large enough area to identify any earlier phases. At Eddisbury's eastern entrance, for example, Varley suggested the earlier phasing for the entranceway but missed other elements, such as the larger footprint of the southern guardchamber, discovered during Garner's excavation in 2012, see Figure 3.13.

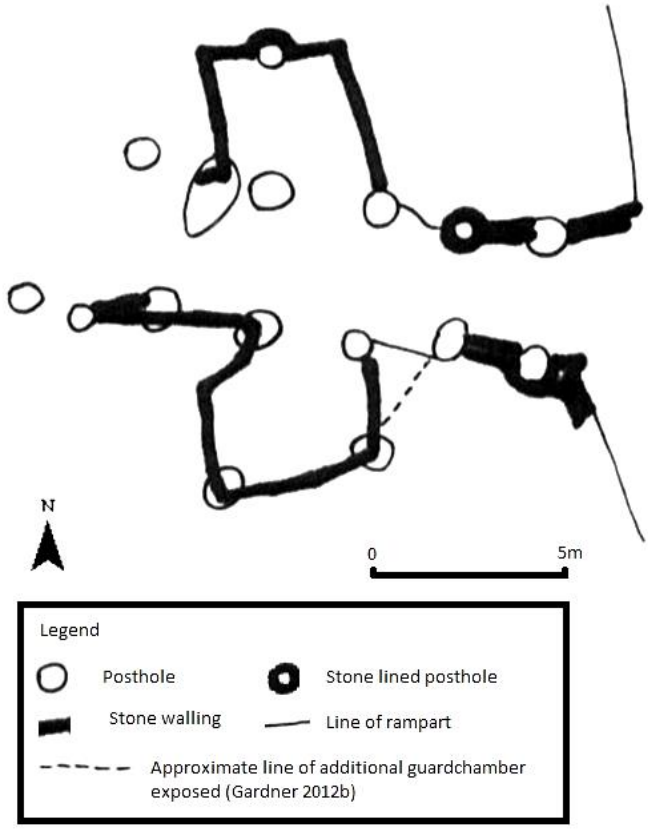

Figure 3.13. Eddisbury hillfort's eastern entrance showing postholes and rectangular guardchambers excavated by Varley and additional curved area of southern guardchamber discovered by Garner, with stone lining in bold. After Varley 1950 & Garner 2012b

At Maiden Castle, unpublished excavations by Taylor in the 1980's appear to have found evidence of a blocked entrance in the south west of the hillfort. Unfortunately, data gathered from limited correspondence in the HER provides radiocarbon dates but little context (Taylor 1980/81; 1985; Jope 1986; Taylor 1993; Miln 1994; Pearson undated).

3.2.2.3.3 Addition of inturns

The addition of inturns onto an entranceway passage will inevitably increase the length of the said passage. However, four entranceways show evidence for reduction in size, namely width, of the passage through the ramparts, see Table A3.3. In addition, two entranceways, at Moel Hiraddug and Dinorben, demonstrate reduction and amendment to their guardchambers, see Figure 3.23. There is no evidence for more complex entranceways to be destroyed in some way and

amended to become a simple gap, suggesting that more complex gateways were thought of as an ‘improvement’. With the number of entranceways reduced in width, narrowing of the passageway can also be suggested as a measure for improvement.

However, the lengthening of the passage and the narrowing of the passage does not appear to be mutually exclusive. The evidence for both techniques at the same entrance are only recorded at Dinorben’s south east entrance and then not within the same phase of building activity. Therefore, it can be suggested that improvement, or enhancement of an entranceway can take the form of lengthening or narrowing the passage.

Eleven entranceways can be termed ‘inturned’ entranceways, see Table A3.3. Five of these have evidence for an earlier phase of an entrance ‘gap’ and there is evidence for an earlier layout at the eastern entrance at Eddisbury.

Three entrances, at three separate hillforts, show evidence for a single inturn, or incurve, rather than a pair, and can be seen at entrances at The Breiddin (to the right as you enter the fort), Penycorddyn Mawr (to the right), see Figure 3.14, and Moel Hiraddug (to the right).

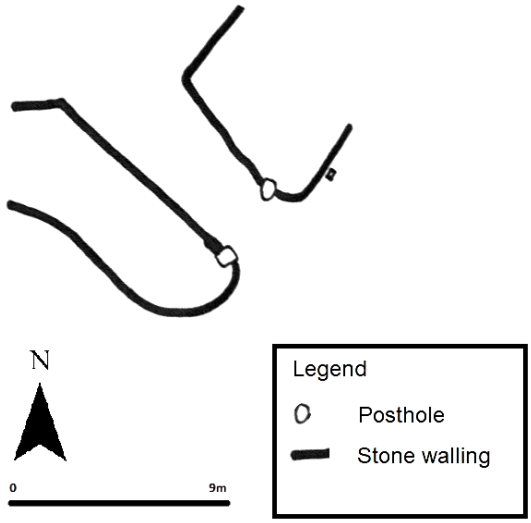

Figure 3.14. Penycorddyn Mawr north west entrance, showing inturn and postholes. After Gardner 1910.

3.2.2.3.4 Addition of Guardchambers

Guardchambers, plus the built-in guard hut at Moel Hiraddug's north west entrance, have been found at five of the eleven excavated inturned entranceways, see Table A3.3. Guardchambers are usually built as a later phase to the entranceway, but all but one entrance (Penycorddyn Mawr north east) are entrances with more than one phase of building and only Eddisbury's eastern entrance currently suggests that it was initially built with a single guardchamber (as opposed to Moel Hiraddug's Main Inner entrance which was originally a simple gap which was later relocated in a second phase to include a single guardchamber, see Figure 3.2). However, the possibility of an earlier structure underlying the phases excavated to date cannot be ruled out altogether.

The provision of inturns and guardchambers are not mutually exclusive, but at four of the five guardchamber entrances, see Table A3.3, the guardchambers are reported to have been added at the same time as the inturns. This suggests that if guardchambers are present, they are likely to have been added at the same time as the inturns. Two of these demonstrate further developments of their guardchambers at a later stage. The outlier is seen at Moel Hiraddug's north west entrance, where an early gap is amended to an inturned entrance and the 'tacked on' guard hut is added at a later stage.

In only one example does a hillfort show a single phase inturned guardchambered entrance, namely at Penycorddyn Mawr north east, see Figure 3.15. There are three possible explanations for this; firstly, the hillfort is a late design and was able to accommodate the 'latest design' in entrances when being built, secondly, the excavation failed to identify an earlier building phase, or, thirdly, an earlier blocked entrance gap is located outside of the excavated area.

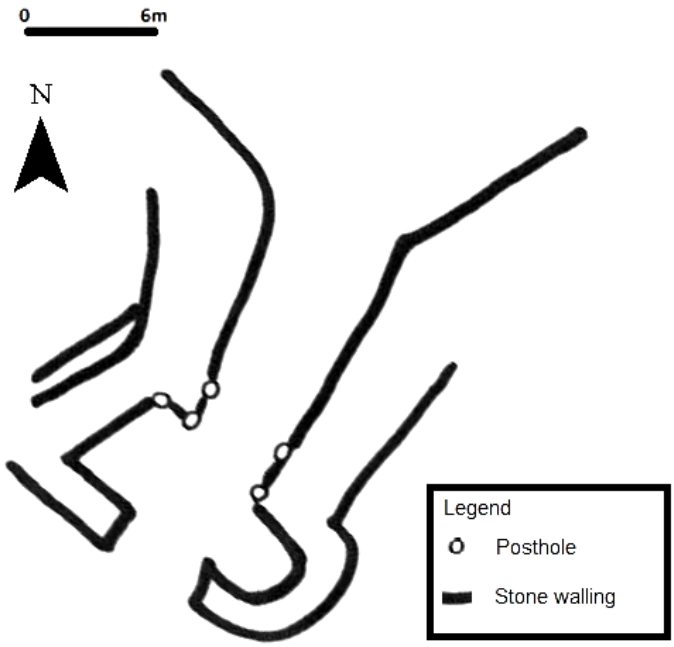

Figure 3.15. Penycorddyn Mawr north east entrance showing inturns, guardchambers, postholes and 'compound wall'. After Gardner 1910.

3.2.2.4 Features

3.2.2.4.1 The Passageway

Simple gap entranceways have an average length through the ramparts of 2-3m. The width of the gap ranges from 1m – 4.5m, with an average of 2.75m considering different phases, some of which show narrowing of the passageway.

Inturn lengths vary between hillforts, individual entrances and phases of these entrances. The length of the passageway the inturns create has an average of approximately 9m and range from 3.7m – 16m at the final phase of Eddisbury's eastern entrance, see Figure 3.16 and Table A3.5. These results do not appear to have other correlations with factors such as size or location of the hillfort.

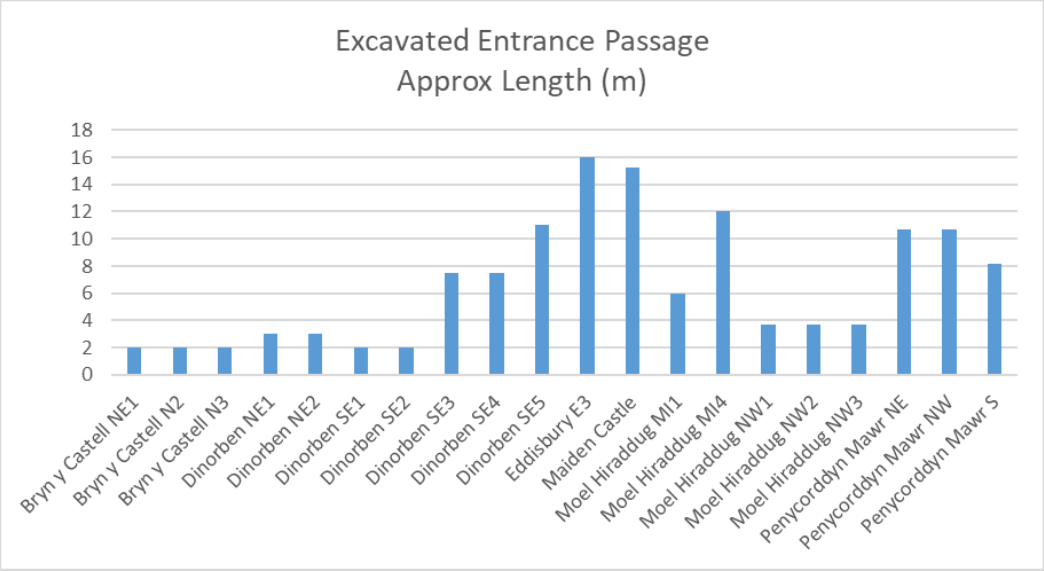

Figure 3.16. Entrance passage length at excavated hillforts for different entrances at different phases. The hillfort name is followed with the location of the entrance (e.g. N – north, SE – south east, MI – Main Inner) and the phase of the entrance (e.g. Ph2 – Phase 2)

There is less of a variation of width of entrances, see Figure 3.17 and Table A3.5, showing an average of 2.7m and ranging from 1.5m at Moel Hiraddug north west to 4m at Penycorddyn Mawr, but with a cluster of widths between 2.7 and 3m.

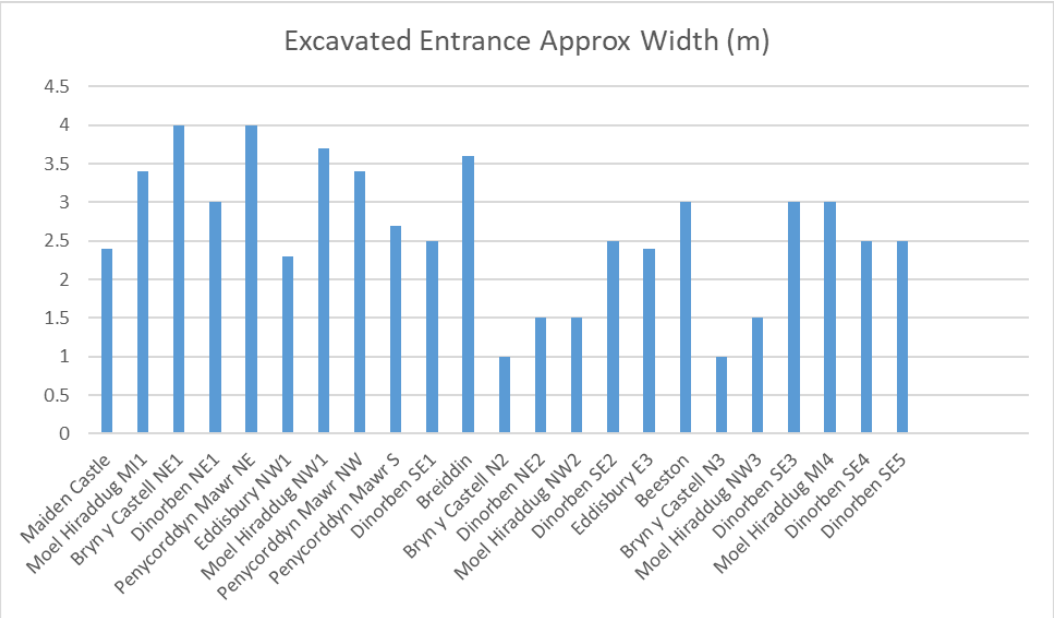

Figure 3.17. Entrance passage width at excavated hillforts for different entrances at different phases. The hillfort name is followed with the location of the entrance (e.g. N – north, SE – south east, MI – Main Inner) and the phase (e.g. Ph2 – Phase 2)

3.2.2.4.2 Guardchambers

Although there does not appear to be a standard size or design for guardchambers, dimensions do not differ enormously, see Figure 3.18 and Table A3.6.

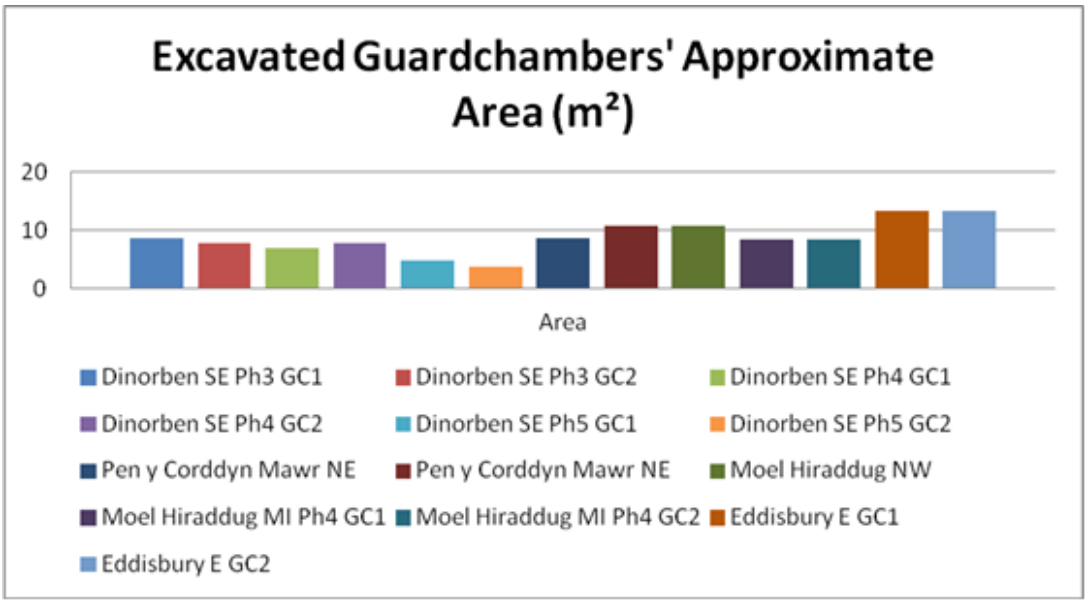

Figure 3.18. Guardchamber area, calculated using Abπ. The hillfort name is followed with the location of the entrance (e.g. N – north, SE – south east), the phase (e.g. Ph2 – Phase 2) and where two guardchambers have been found/measured, the number depicting the guardchamber itself (e.g. GC1 – guardchamber 1). Figures can be found in Table A3.6

The average size of guardchamber is 3.5 x 3.1m. These results, however, include the three phases at Dinorben, as the guardchambers were made smaller in each phase. Using data from the first/only phase of guardchamber, the average area is calculated as 4 x 3.6m (11.3m^2). Using data only from the final/only phase of building, guardchambers have an average size of 3.6 x 3.2m (9m^2). In Dinorben's final phase, the two guardchambers cover an area of 2.1 x 3m and 1.8 x 2.7m (4.9m^2 and 3.8m^2), see Figure 3.19. This is significantly less than any other phase of guardchamber in any of others excavated within the wider study area.

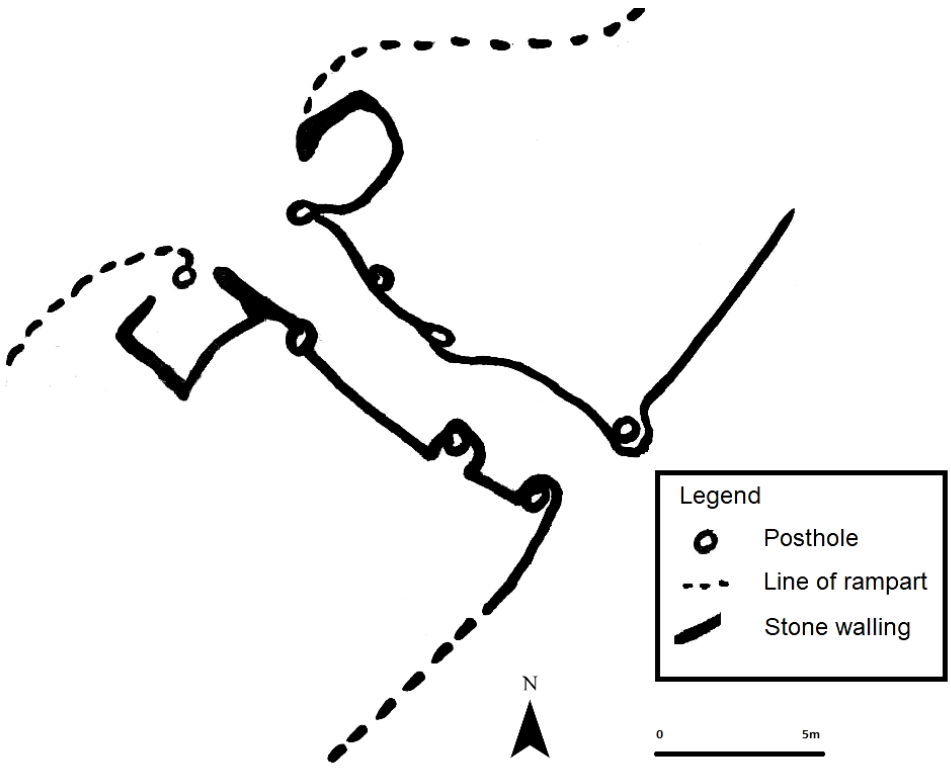

Figure 3.19. Dinorben south east entrance final phase showing approximate rampart line and trackway (hachered), stone wall lining (bold), postholes and guardchambers. After Gardner & Savory 1964.

There is a cluster of dimensions measuring 2.7-3.3m for breadth and another between 3.7-3.8m for width of excavated guardchambers within the wider study area. The majority of breadths/widths range between the two extremes of 2.7m and 3.8m, see Figure 3.20 and Table A3.6. The two examples which are smaller than this are from the two guardchambers built in Dinorben's final phase, see Figure 3.19. Three examples are larger than this average range, with Penycorddyn Mawr's guardchamber (single phase entrance) measuring 4.6 x 3m (10.8m^2) and Eddisbury East two guardchambers (single phase guardchambers within an entrance with possible earlier phase) both measuring 4.6 x 3.7m (13.4m^2).

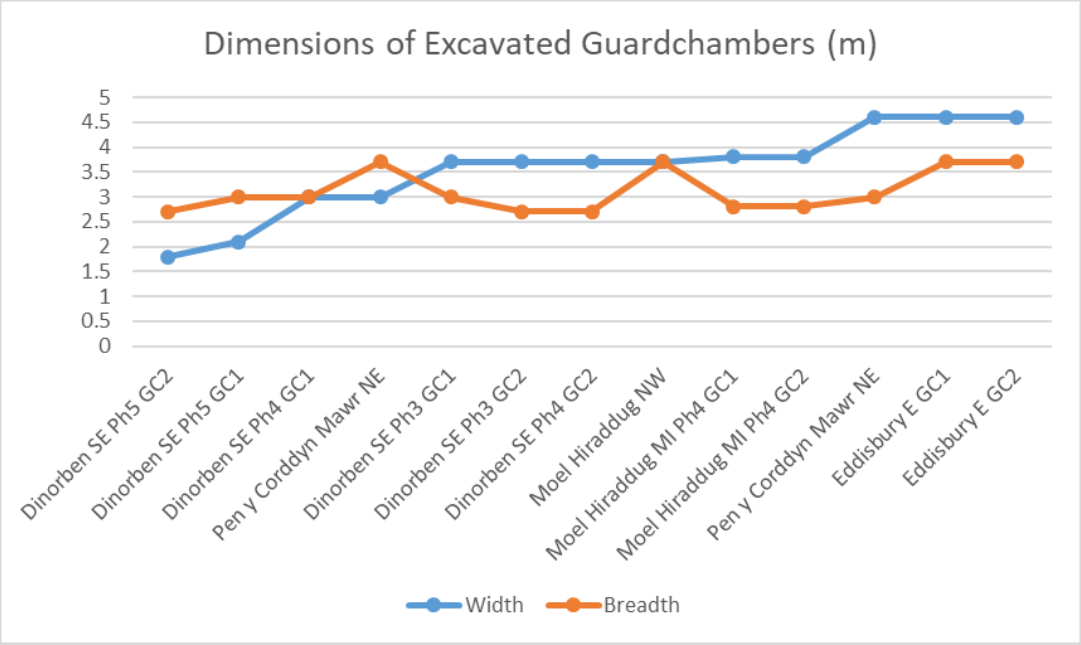

Figure 3.20. Guardchamber dimensions, presenting the width and breadth of recorded excavated guardchambers in the wider study area. The hillfort name is followed with the location of the entrance (e.g. N – north, SE – south east), the phase (e.g. Ph2 – Phase 2) and where two guardchambers have been found/measured, the number depicting the guardchamber itself (e.g. GC1 – guardchamber 1). The graph shows two main clusters of measurements; between 2.7-3.3m for breadth and 3.7-3.8m for width.

The use of the word 'guardchamber' for these features conjures up an image of a sentry guard or a porter's lodge, but Ralston, amongst others, is unconvinced that this term is correct (Ralston 2006, 74). He notes that these features generally only appear in a single entrance even in forts having more than one entranceway. Moel Hiraddug, for example, does not strictly fit this rule as guardchambers were found at the Main Inner entrance and the guard 'hut' at the north western entrance (Brassil et al 1982) but are certainly not present at *all* entranceways at the site.

An alternative explanation for 'guardchambers' is discussed by Bowden (Bowden 2006). He highlights the fact that the term assumes a military function (*ibid.,* 424). The orientation of these recesses is discussed, where he presents examples of these features looking towards the inside the fort, including Dinorben, rather than having a view of who is approaching the enclosure, see Figure 3.19 (Bowden 2006, 428; 433). He also refers to the Amba people in Uganda, who have a pair of 'spirit houses' immediately inside each entrance to their thorn-hedge enclosed villages. Bowden's discussion reinforces the ritual or ceremonial aspects of hillfort entrances

rather than military, and other functional uses such as ‘porters’ lodges’ and ‘cloakrooms’, for the storage of items which may not have been permitted within the enclosure proper (*ibid.,* 433-4). In addition to this argument, Ralston also notes that if defence was a main function of the hillforts, the entrances would need to be as narrow as possible (Ralston, 2006, 68). Considering the pastoral community that was present at the time, in the area and on the uplands surrounding the hillforts (Grant, 2009), entrances may have had to have been wide enough to drive cattle though without damaging the architecture (Ralston, 2006, 68).

3.2.2.4.3 Postholes

The number of postholes found located within the entrance passage varies from site to site, see Figure 3.21. This could be due to preservation issues and possibly also development of the site throughout phases. They have been found on simple gaps, inturned entranceways and entrances with evidence for guardchambers.

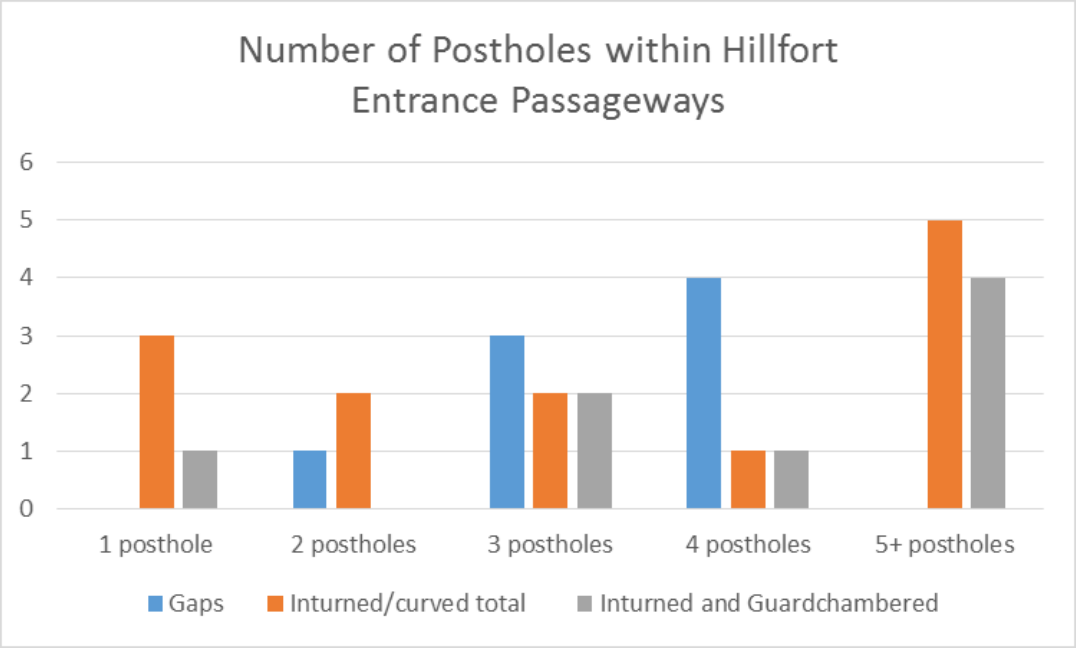

Figure 3.21. Postholes within hillfort entrances; simple gap entrances, inturned/incurved entrances and those inturned with guardchambers

In two instances, there is evidence for a central post located within the centre of the passageway. One was discovered at Eddisbury’s north west entrance and a second at the Breiddin. However, the Breiddin example differs again as this possible central posthole, described by O’Neil as “*an oval hollow (3 feet by 2 feet), 1 foot 6 in. deep (Posthole No. 4)*”, is sat within a 1-foot deep trench crossing the entrance passage

filled with stones and soil, connecting two postholes thought to have originally contained double posts (O'Neil 1937, 103-104).

Postholes are not always found in pairs and, even when existing as an even number, are not always located directly opposite each other.

Throughout the development of the entranceway at Moel Hiraddug's north western entrance, only one posthole was discovered at each phase; at the initial phase located on the northern rampart terminal and at the second inturned and third guardchambered phases show the reuse of a posthole located on the western terminal.

Two postholes have been found within the third phase entrance passage at Bryn y Castell[21] and at the single-phase entranceways of the south and north west entrances at Penycorddyn Mawr, see Figures 3.14 & 3.22. At Bryn y Castell, the two postholes are both located on the western side of its northern entrance. They sit at the two corners of this side of the passageway. At Penycorddyn Mawr, however, the two postholes sit on either side of the passageway. Both are located towards the inner end of the passageway; the southern entrance having postholes opposite each other before the passageway turns to an angle towards the outer edge. The north western entrance's postholes are slightly offset from each other.

[21] Two postholes, reused in a second phase, were located at either end of the entrance passage on the western side. An additional possible posthole was located at the inner edge of the passage on the eastern side. Four additional postholes were located just inside the entrance, but their relationship is unclear.

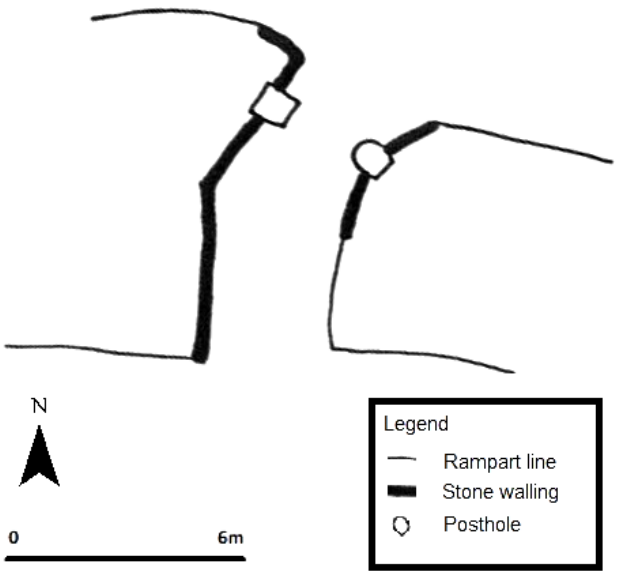

Figure 3.22. Penycorddyn Mawr south 'skewed gap' entrance with postholes and stone walling (bold). After Gardner 1910

The evidence for three postholes is more common and seen at the first phase of Bryn y Castell and at its relocated entrance, see Figure 3.12, phase 3 and 4 of Dinorben's south east entrance, see Figure 3.23 and Moel Hiraddug's Main Inner entrance, see Figure 3.2, during the first phase. These phases of entrance at Dinorben both incorporate guardchambers and two of the postholes are located on the outer corner of the guardchamber doorway, the third is located on the east rampart towards the outer end of the passageway.

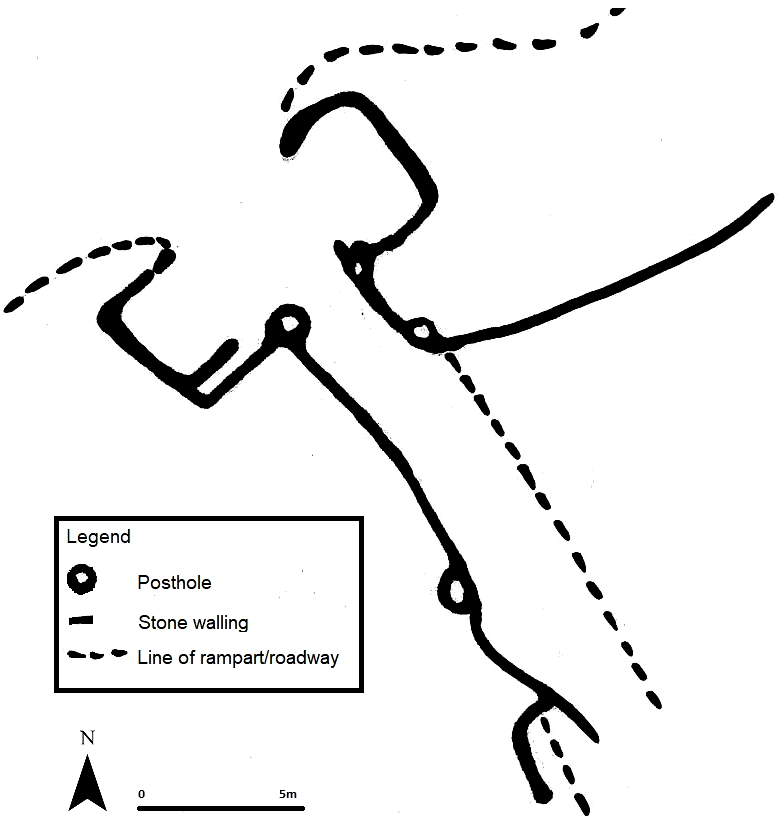

Figure 3.23. Dinorben south east entrance, first phase following relocation, showing line of ramparts and trackway (hachered), postholes, stone wall lining, with additional inner wall in western guardchamber. After Gardner & Savory 1964.

Here, the position of the postholes could indicate a double-leafed door across the entrance passage or, alternatively, doors across the guardchamber doorways. It is possible, also, that they served a dual purpose and catered for both options, if the doors at the passage were to open inwards, they would essentially block access to the guardchambers and this could be intentional.

Following excavation, guardchambers across Britain have been found to have had repaired floors, some with hearths inside, but some have been found to have been completely obscured if the hillfort entrance gates had opened inwards (Ralston 2006, 74; Bowden 2006, 424). In reference to the opening of the gates to obscure the 'guardchambers', consideration must be taken into how these gates may have opened. "*It appears likely that even one leaf of a double-leafed gate, when opened, would effectively block them, rendering them entirely ineffective as recesses in which to position guards*" (Ralston 2006, 75). This could suggest that these recesses were only for use when the doors were shut and for letting people *out* not *in*.

The use of postholes at the outer corner of guardchambers for this purpose is supported by the addition of posts, possibly for doors, added to some guardchambers' inner corner. The use of the posts on the outer corner posts as doors for the guardchambers, and *always* present in this position when guardchambers are present, is supported by additional postholes, possibly for doors across the passage, *always* present towards the outer end of the passage. Alternatively, the position of these posts could indicate additional structural works within the passage, or a super-structure, such as a bridge, above the existing surviving architecture.

Ralston (2006, 68) highlights the fact that reconstruction drawings usually depict gates as opening outwards due to the sloping ground on the outside of the hillfort, which would be a practical solution. If this was a common feature, instead of opening inwards as is commonplace today, this would also ensure that these recesses would not be hidden once the gates had been opened. This would also add strength; if gates open outwards it is much harder to pull them open when attacking than it is to push them open.

Ralston also suggests that gates could have been a temporary addition and only hung when necessary (Ralston 2006, 72). For those without evidence of gateposts, especially of those unexcavated sites, we may also consider that these gateways may not have had gates upon them, at least possibly not permanently. Ralston refers to a quote from Caesar that trees had to be felled as an emergency measure to block an entrance to a hillfort in Kent as the Romans approached (Ralston 2006, 72).

The postholes at the initial phases at Bryn y Castell and Moel Hiraddug Main Inner do not appear to have any pattern, as all show a slightly different variation within the entrance passageway. Two of Moel Hiraddug's postholes are located opposite each other half way along the passage with the third located at the inner western corner. At Bryn y Castell phase 1, two opposite postholes are located at the two inner corners with the third at the outer eastern corner. In phase 2, the third posthole is located on the western outer corner, see Figure 3.12. The only similarity in layout is that two of the three postholes are *always* opposite each other at some position within the entrance passageway.

The evidence for four postholes within an entrance passageway comes mainly from simple gap entrances, see Figure 3.21. At Dinorben north east phase 1, see Figure 3.11, and south east phases 1 and 2, the four-postholes sit at each of the four corners of the entrance gap. In the second phase of Dinorben's north east entrance, after being narrowed, the outer corners of the gap have evidence for posts and another two opposite each other approximately half way along the passage/gap.

Four-postholes have also been located at Penycorddyn Mawr's north eastern guardchambered entrance, with two located opposite each other at the outer corners of its guardchamber doorways and another two, again opposite each other, a little further towards the outer end of the passage, see Figure 3.15.

Four 'posts' were discovered at Beeston Castle entranceway, within Period 3B. However, these results differ from the rest as the posts as two were found within the rampart itself and were the remains of charred posts of approximately 1.2m diameter (Ellis 1993, 28). The additional evidence for posts was found towards the interior of the hillfort to the west as two large flat based post pits. Due to later medieval disturbance, the archaeology is not clear here, but it is possible that these represent an entrance tower (Ellis 1993, 29-31). Alternatively, these could represent the equivalent of an inturned entrance made from a wooden structure rather than earth or stone. Additional posts were discovered just inside the hillfort at Bryn y Castell's relocated entrance. It is possible that these are associated with the feature, but the relationship between these features and the entrance was not determined. Evidence for all-timber guardchambers has been found at Midsummer Hill (Harding 2012, 83), so the potential of wooden inturns existing and hitherto escaping the archaeological record cannot be rejected.

In four instances, five or more postholes have been discovered within a hillfort's entranceway passage. Dinorben south east, see Figure 3.19, Eddisbury's east, see Figure 3.13 and Moel Hiraddug Main Inner are all the final phase of entranceway at the location and all have double guardchambers, suggesting that the more complex the entranceway, the more posts were used. All three have evidence for four postholes slightly offset from each other but generally in a square layout before the guardchamber gaps, towards the outer edge of the entrance passage. Moel Hiraddug's fifth posthole is located centrally within the guardchamber mouth, see

Figure 3.2. Dinorben's four further postholes are located at each corner of its guardchamber gaps.

At first glance, the set-up appears simple, albeit developed, at Eddisbury's east entrance, as reported by Varley (1950, 29). Eddisbury's east entrance's penultimate phase was reported by Varley to have seven pairs of postholes and one guardchamber before being developed to have a second guardchamber built and one of the postholes filled in. However, further excavation by Garner (2012b) revealed a small unexcavated area by Varley which highlighted a more irregular arrangement, see Figure 3.13. Originally, as not all of the guardchamber had been excavated, the entire passageway layout appeared more symmetrical. In fact, the southern guardchamber mouth extended further to the east, revealing that the outer side of the entrance passage had three postholes before reaching the four located at each corner of the guardchamber gaps with one additional posthole located within the centre of each guardchamber gap. Five further postholes were located towards the inner end of the passage. Despite an even number of postholes (14) being found at the location, all are slightly offset, and the entranceway was not a simple mirror image on each side of the passageway architecture, as reported by Varley. Garner concluded that due to this omission by Varley, the original south guardchamber would have been larger, as seen on the excavated footprint.

It is possible to speculate, due to facing stones being visible on Varley's plan of his excavations, that the south guardchamber he excavated was the second phase with stone facing, and that Garner located the original footprint of the original, rounded single guardchamber, later to be reduced in size and squared off. This is supported by the evidence that guardchambers are seen to reduce in size as development occurred, e.g. the evidence from the guardchambers excavated at Dinorben were made progressively smaller, see Figure 3.23, not originally stone lined and the evidence that sub-circular roundhouses were usually replaced by sub-rectangular ones (Bowden 2006, 426). Garner's excavations extracted material suitable for dating, and this sample may demonstrate the reason behind the redesign of the entrance due to fire damage (Garner 2012b, 30). Subsequently, this appears to provide a date for the remodelling of the eastern entrance from a single, sub-circular guardchamber to a double, stone-lined, rectangular guardchambered entrance at around 359-169 calBC (NZA-36592).

The north west entranceway at Eddisbury was reported to be single phase upon excavation, reported to have seven postholes along the passageway sides and one central post at the entrance mouth with no guardchambers. Varley also reported that the entrance "…*extended [inwards] for another ten yards beyond the point shown in our plan*" (Varley 1950, 20), but the discovery of any further postholes was not published. This entrance has not been re-excavated.

Within those entrances with guardchambers, in every instance apart from one, a pair of postholes is located at the outer corner of the guardchamber's gap and at least one additional posthole towards the outer side of the passageway. In two instances, at Eddisbury east phase 3, see Figure 3.13, and Dinorben south east phase 5 (both final phases of development), two further postholes are located at the inner corner of the guardchambers' gap. The anomaly is seen at Moel Hiraddug's final phase at its north west entrance where the "tacked on" guard hut did not reveal any evidence for postholes within or surrounding the stone-built structure.

Further postholes are found within the guardchambers themselves at Moel Hiraddug Main Inner phase 4, see Figure 3.2, Eddisbury east phase 3, see Figure 3.13, and at Penycorddyn Mawr north east, see Figure 3.15, alongside a groove within the masonry, possibly to accommodate room for a post to sit vertically.

Alongside the postholes already discussed above situated at corners and centrally within the mouth of the guardchambers, a posthole was discovered within the curve of the inside edge of one guardchamber of Moel Hiraddug, one within the wall of the northern guardchamber and also two within the southern guardchamber at the final phase of the east entrance at Eddisbury, see Figure 3.13. The postioning of these additional postholes could suggest where a partition once stood, but a door at these points would be redundant. Other suggestions include posts for roofs or additional structures sitting above the guardchamber (Varley 1950, 33). It would be expected that if this were the case, the layout of the posts would be almost identical between two guardchambers within the same entrance. The two examples where two guardchambers are present and have interior postholes show that the postholes are not similar in layout. This is seen, however, at the two sites which suggest evidence for a single guardchamber having a second added later; at Moel Hiraddug Main Inner and Eddisbury East. The third example listed above, Penycorddyn Mawr's

north east, has one posthole within the structure of only one of its two guardchambers and is proposed as single phase, see Figure 3.15. It is unclear what the purpose of this single post could have been.

3.2.2.4.4 Grooves

Many postholes have been reported to have been built recessed into the inturn walls or entrance passageway. Some reports show that long grooves ran down the walling on the sides of the passage below which postholes were found, such as at Dinorben south east phase 2, at Penycorddyn Mawr's three entrances and at Maiden Castle[22] (Varley 1935, 103-4). This suggests that the posts were either in place when the walling was built around them and/or that the walling was built as planned to incorporate room for these posts when erected. In these cases, the posts which are set within recesses/grooves within the walls are likely to be either earlier or contemporary with the wall.

If the walling is secondary, the theory for postholes running into the interior of the hillfort from the entranceway at Beeston and Bryn y Castell may be examples of this earlier phase which were never developed further, especially when considering the inconsistent arrangement of posts found across the sites' entrances.

At Eddisbury's eastern entrance, Varley's excavations recovered posts *in situ*. He concluded that the posts were original and the walling secondary, supporting the above theory, and the theory that Garner's discovery of additional floor area could be from an original pre-stone-lined guardchamber, see Figure 3.13.

However, at Eddisbury's east entrance, an additional 'groove' within the entrance passage has been reported on, not associated with a posthole. A recess was reported to be carved into the side of the hollow way between postholes (411) and (410) which "*has the appearance of being designed to accommodate a post of similar size to the others in the alignment*" (Garner 2012b, 29-30). Varley also reported on a "*square depression adjacent to posthole No.6*" which is unidentifiable on his published plan of the entrance, but he described as "*may have been intended*

[22] The round holes found on either side of the floor of the entrance had been infilled before a causeway of large flagstones within entrance passage was laid. Varley suggested that this could be evidence for an earlier wooden entranceway which was dismantled and reconstructed (1935, 104) but later assigns the road surface to be associated with later, more modern quarrying (1936a, 101)

to carry a strut supporting the gate" (Varley 1950, 29). He attributed this to the entrance phase before the reconstruction and adding of the second guardchamber (*ibid.*). Garner identifies a square depression immediately west of the 'recess' reported on. However, it is currently unclear where this 'square depression' is located. Plate 12 of Varley's report is clearly labelled as the 'south east' (read east) entrance but captioned as 'area 4' (which was in fact Merrick's Hill area south east of the hillfort)[23]. Within Varley's photograph, it is possible to identify an angled face in the dry-stone wall to the immediate left (west) of posthole 4/411. This may be a tantalising glimpse of the recess which otherwise does not appear to be depicted elsewhere. A square feature does appear to be visible within the ground below this angle, but it is unclear whether this is a depression, a stone or something else entirely.

This is close to the eastern wall of the northern guardchamber which has been described above as possibly being an earlier phase of entranceway before later modification. It is possible that these two elusive features are associated with this earlier modified entranceway. In addition, these features display an alternative element of the hillfort entrance. The groove within the wall not associated with a posthole is uncommon. If not, an earlier feature modified to give the impression of a post groove, could be an example of 'future proofing' architecture. The groove with room for a post to sit comfortably at the wall was incorporated within the entrance design when built, but a post deemed unnecessary, so the hole was never dug.

This could be an example of where the grooves within the walls were for a separate use altogether; possibly for use when formal doors were not erected within entrance passageways, or to make room for barricades to be erected and kept firm within the grooves when needs arose. This could also account for the need for doors to be easily removed, using posts which sat on top of the ground, not dissimilar to the archaeology found at Moel y Gaer Rhosesmor and the use of 'sleeper beams' for

[23] Earlier on this page, 29, Varley refers to the plan of the entrance as 'Figure 10', but Figure 10 is a plan of the hillfort, Figure 11 in fact depicting the plan of Area Three. Within the text Plates 12 and 13 are described within the Area Three ('south east' entrance) text, referencing the *in situ* post recovered in posthole 4. The accompanying posthole within the photograph must then be posthole 2 and to the left of posthole 4 (Garner's 411), out of shot, posthole 6 (Garner's 410).

buildings. This also provides an explanation for the square depression identified by Varley.

Alternatively, but less likely, due to the good preservation of other features within this location, it is possible that the trace of an earlier, filled posthole has not survived and therefore, not identified.

The groove running across the width of the floor within the entrance of the Breiddin may present further evidence for the use of temporary barricades; the groove providing a ‘slot’ for a barricade to sit within, before it was subsequently filled in.

3.2.2.4.5 Roads and approaches

Many reports described a surface of some description within the entrance passageway. These ranged from clay surfaces, to cobbles, to limestone pitching and ‘paving’. Only Dinorben’s south east entrance appears to show a change of roadway surface and, in addition, a change of positioning and direction as phases of the entrance develop, see Figures 3.23 & 3.19 respectively, for example. At Moel Hiraddug’s north west entrance the passageway floor appears to have been made level by paving on one side only and utilising the bedrock. Repair work was carried out at Bryn y Castell’s second phase entranceway following damage.

Five entrances were reported to be located within ‘hollow ways’ or be associated with a ‘hollow way approach’. It is possible that the hilltop was chosen for a hillfort site as an access route was already formed, possibly leading to an existing structure or a routeway. The hollow ways create an approach to the entrance, funnelling and controlling movement into, and out of, the hillfort. Inturned entrances have a similar effect, as does the joining of multivallation along the entranceway passage, blocking access to the rampart and ditch lengths, as seen at Penycorddyn Mawr for example. The five entrances, at the three hillforts of Eddisbury, Moel Hiraddug and Penycorddyn Mawr, which are associated with hollow way approaches are all inturned/incurved. This creates a longer passage and a continuation of the hollow way into the inturned entrance route. The association of the hollow ways, either by stratigraphy or dating – or geology if found to be natural features – would aid interpretation of the entrance location chosen to utilise the existing passage or made

additionally monumental by carving out an approach leading to an inturned passage before entering the enclosure itself.

Some evidence has been found for trackways and roads into the hillforts. Evidence of repair can be found at Bryn y Castell's relocated north entrance, where an erosion gully formed from water flow was lined with stones on the side, possibly to prevent undercutting of the rampart, the two postholes repaired, and the gully packed with stones to create part of a new entrance passage floor (Crew 1983, 17).

Surviving evidence for the passage of wheeled vehicles is reported, such as at Dinorben and wheel marks at Maiden Castle and Eddisbury (Gardner & Savory 1964, 25; Varley 1964, 92). Savory, (1980, 300) suggested that hillforts would be maintained by professional military engineers, under the command of powerful rulers, whose authority is reflected in the guardchambers and associated roads between them, each renewed from time to time, as seen at Dinorben (Gardner & Savory 1964, 24-25). The entranceway at Moel Fenlli was subject to excavation in 1846 by Wynne Ffoulkes (1850a). A "*road way not more than a yard in width... [with] an artificial surface, formed with stones of some size*", was described sited in between the two inturns at the entrance and that this led to the 'zig-zag road' which is presumably the route of today's path leading to the pass of Bwlch Pen Barras (Wynne-Ffoulkes 1850a, 83).

A "*heavily metalled roadway*" 2-3 metres wide was found during excavations at Moel Hiraddug running from the Main Inner gate, following the course of the rampart on the inner side and laid 5 metres from rear revetment (Davies 1970a, 9). Two inhumations "*at the latest of Iron Age date"* were discovered sealed by a metalled track immediately inside the Main Inner gate, see Figure 3.2 (Davies 1970a, 10). The Phase 1 entrance was not known before excavation and was discovered because the metalled track associated with the Phase 2 Main Inner entranceway appeared to join another 'road' which appeared to run beneath the rampart, indicating the original entrance gap (Davies, J. L. 2016. Meeting with Erin Lloyd Jones, 25 November)

Many of the entranceways at Moel Hiraddug are associated with a 'hollow way' leading to or from the entrance passage, but due to the amount of later quarrying damage on the site, it is difficult to know whether these are contemporary (Brassil et al 1982, 20-21). A "*terrace way to the Main Inner Gate"* is referred to as being

overlooked by an excavated rectangular hut where over 600 sling stones were found in the interior (Davies 1970b, 3).

During his early excavations of Moel y Gaer Llanbedr, Wynne-Ffoulkes noted the presence of what he originally thought to be a roadway at the eastern entrance (1850b, 174-5). However, after unsuccessfully attempting to 'follow' the route of this 'roadway' from the inner entrance gap towards the dog-leg at the outer rampart, he surmised that it must have been a later feature (*ibid.*). It is possible, however, that this metalled surface, if this is what it was, dated back to an earlier phase of the hillfort and an earlier, simpler entrance and the remaining undetected 'roadway' would lie hidden under the later, outer rampart instead of following the later, more complex, dog-leg route. However, this cannot be proved without further excavation and it is a great shame that the detail from Wynne-Ffoulkes' exploration will not carry us further with regards to this potential feature.

A track sitting on the exterior slope of Moel Arthur hillfort was discovered by the Clwydian Range Archaeology Group, which also revealed what have been described as 'cart ruts' running along the track (CRAG 2011). These lay under a layer of peat which would have been formed from AD600 onwards, so it is possible that this trackway is associated with the prehistoric use of the hillfort, although no firm dating evidence was found in association with the track (*ibid.*).

A metalled trackway was also found at Eddisbury's north western entrance in Cheshire (Varley 1964, 97) amongst others in the area. The entrances at Maiden Castle and Eddisbury in Cheshire were reported to only 'cater' for pedestrians at first but were subsequently developed to show evidence of wheeled vehicles (Varley 1964, 97). Some hillforts may have suggested pathways within their interior which have been found by archaeological survey, such as the geophysical interpretation of Moel y Gaer Llantysilio (Brooks & Laws 2009) but there is no stratigraphical evidence to suggest when it was in use and whether the results are correct in their identification and interpretation. Additional research into trackways, including width and therefore potential use, or constraints of use, could help to identify what could, or could not, gain access into the hillforts and therefore suggests functions and/or limitations of the use of the monuments.

The approach to the north eastern and southern entranceways of Penycorddyn Mawr are flanked on either side by artificial banks creating a hollow way, taking advantage of the natural craggy geology (Gardner 1926, 29-30). A feature which could be interpreted as having a similar function to these hollow ways, as controlling the route into the hillfort, is seen at Penycloddiau, where a singular hornwork is seen on the southern side of the eastern entranceway (Forde-Johnston 1976, 241; Jones 2006, 3) and at Moel y Gaer Bodfari where the inturned entranceway turns both inwards and outwards, forming a T-shaped feature (Forde-Johnston 1976, 230).

It is interesting that no routeway or metalled track was discovered during excavations at Moel y Gaer Rhosesmor; a hillfort which has been described as a site where "*the 'prehistoric town-planner' had a far greater opportunity to express his ideals*" (Guilbert 1976b, 304).

3.2.2.4.6 Additional features/miscellaneous

At Penycorddyn Mawr's north east entrance, evidence was uncovered for the use of a compound wall (Gardner 1910), see Figure 3.15. Gardner differentiates this feature at the entrance as being different from a previously located 'terrace' on the inside of the main rampart, due to the construction rising from a foundation on the rampart core rather than from the ground (Gardner 1910, 113) which may indicate the compound wall is a later addition to the rampart. It is unclear as to whether this was utilised to strengthen the wall in this area, or as an additional barrier to maintain the core within the structure itself, which it apparently sits upon or, despite Gardner's thoughts, a continuation of the 'terrace'. Gardner later concludes that the irregularity in which the ramparts of the hillfort were built, comparing sections surrounding the site, suggests that they were constructed "*somewhat hastily in short lengths by different gangs of labourers working by different methods and with different degrees of skills*" (1910, 139).

Although unexcavated, compound walls were also uncovered during 'clearings' of the walls of Caer Drewyn hillfort, Corwen, in the 19th Century "*immediately below the point where the flanking works of the gateway terminate*" (Pritchard 1887, 244). At this location, the ramparts are also made from stone walling and the use of 'two or more lines of masonry' is suggested as for either of the two theories stated above or

as an access point to the walls themselves, creating a wall walk, or terrace (Pritchard 1887, 245-247).

Buttressing has been discovered at the north west entranceway of Moel Hiraddug. After a phase one arrangement of an entrance gap, further features were added including additional walling, a guard hut and a buttress to the right (west) of the outer approach wall of the entranceway. The buttress appears to be an additional feature to the additional walling and increased the width of the rampart at the entrance and elongated the passageway.

Features projecting from entranceways, such as buttressing, take a number of forms. Another example of the use of 'joining up' multivallate ramparts at inturned entranceways can be seen at the Breiddin.

Penycorddyn Mawr's north east entrance highlights an impressive merge of natural topography, geology and artificial architecture to create a 43-metre-long passage leading to the entrance gap through 'hornworks'. Excavation here demonstrated that the eastern wall creating this feature abutted the main rampart (Gardner 1910 129-131), suggesting that this was a later feature to the original hillfort, despite the entrance itself being described as single phase.

A single hornwork is also reported at the unexcavated, eastern entranceway at Penycloddiau. The hillfort was subject to topographical survey in 2006 and this hornwork was described as flanking the southern side of the approach at the top of a 'steep-sided dry valley' (Jones 2006, 3). The hornwork in question sits at 90 degrees to the hillfort's enclosing ramparts, jutting out and running alongside the approach to the entrance, effectively restricting access to the south leading to the said dry valley. In addition, at this point an additional, third (or second, alongside the substantial 'counterscarp') rampart appears on the opposite, north side of the entrance.

In both cases, the hornworks at Penycorddyn Mawr and Penycloddiau flank the entranceways and provide a passage and direction for entering the hillforts, certainly adding a sense of arrival at the site. However, the use of the hornwork at Penycloddiau at this particular location suggests a second or alternative function for the feature, to block access to a potentially dangerous geological feature further south along the ramparts. At this point, the geological feature - a steep valley -

appears to have been utilised as a natural defence with the rampart appearing slighter along this section (Jones 2006, 4).

A unique feature reported within the excavated examples is the so-called ‘squint’ at Dinorben during Savory’s excavations (Gardner & Savory 1964). During later phases, the guardchambers within the inturned south east entrance became smaller and smaller as the outer wall of the guardchamber moved back further into the interior of the chamber and hillfort, see Figure 3.23. Within its final phase, the south west chamber was roughly half of its original depth. The outer wall of this chamber, unlike its north eastern counterpart, was not straight but curved outwards to create a small triangle of additional space within the interior at the eastern corner, see Figure 3.19. Savory admits this to be a feature hard to interpret but suggests that a “*man could be posted to command the entrance through a slit in the upper courses of the south west wall of the entrance passage*” (Gardner & Savory 1964, 21). This presents a tantalising suggestion of the presence of windows and slits within the masonry of hillforts, which has not seen to be discussed or suggested elsewhere.

3.2.3 Discussion

Despite Cunliffe’s statement that hillforts generally have one, and ‘less usually’ two, entrances (Cunliffe 2005, 365), many hillforts within the wider study area have evidence for two or more entrances. Davies & Lynch’s statement that walled forts tend to have multiple ‘posterns’ in addition to a ‘main gate’ has not been positively confirmed. Perhaps due to the high number of hillforts which utilised stone within their ramparts (facing or walls), stone hillforts do, however, appear to prefer more than one entrance.

It is not yet clear why some hillforts have more than one entrance and others do not. The number of entrances does not have a positive correlation with regards to the amount of area enclosed by the ramparts. In the example of Moel Hiraddug, it is clear that multiple entrances are required to get from one enclosure to the next as the ramparts are so widely spaced, creating their own individual enclosures. Nevertheless, individual ramparts within the same circuit demonstrate more than one entrance, for example the north western, southern and the main inner entrances all lie on the inner rampart (western enclosure). What this suggests, however, is that there were multiple aspects of approach to the hillfort.

A clear preference for easterly located entrance passageways is seen at the Clwydian Range hillforts and substantiated by hillforts with excavated entranceways within the 30-mile radius, see Figure 3.8 and Table A3.4. Almost all hillforts have an entranceway with an easterly (north east, east or south east) entrance, despite some having additional entrances elsewhere on the rampart circuit. A hillfort without an eastern entrance is uncommon within the excavated examples.

These results are also valid for the entrances' aspect, see Figure 3.9 and Table A3.4. However, the aspect of an entrance does not always follow the same line of where the entrance is located within the hillfort, due to the use of skewed gaps, dog-legs and other features within the gap or corridor. Care must be taken to differentiate between reports regarding the location of an entrance within a hillfort and its aspect as these do differ. A stronger inclination for specifically east and south east aspects is detected. Of the 75 hillfort entrances investigated by Hill, east and west entrances predominate and a majority of 'simple entrances' have a western orientation, but the majority of 'complex' entrances having an easterly orientation (Hill 1995b, 66). He suggests that their orientation is a clear demonstration that 'more than functional factors', i.e. cosmology, were considered when planning a hillfort entrance (Hill 1995, 53). The easterly preference for hillfort entrances in the wider study area could be linked to celestial events, such as sunrise. Topography, access, view and sunlight, e.g. functionality are equally valid theories for their aspect and location.

The access to some hillforts is defined by a hollow way passage leading to an entrance/s. It is unclear whether these hollow ways have been manipulated to aid ascent to the hilltop and existed before the monument was erected; the entrance location predefined by the existing route way, or whether they have been enhanced alongside the entranceway and hillfort as it was built and in use.

In north Ceredigion and mid-Wales, Driver found that complex architecture, siting and approach had often been implemented at hillfort entrances, where natural approaches had been blocked or avoided, thus requiring more work despite 'easier' options being available (Driver 2013, 132). Further research into hillfort approaches in north Wales and the borders would help determine the significance between hollow ways and hillforts and the importance of the approach to a site.

The route within entrance passageways has often been engineered in some fashion, including metalled surfaces creating an, often crude, roadway. Repair to these features is also evident. With the presence of at least three phases of roadway at Dinorben and the discovery of two inhumations beneath a roadway running from the entrance to the interior of the hillfort at Moel Hiraddug, published only within one sentence in a short annual update within Archaeology in Wales, the exploration of roadways, however basic, warrants more attention within the investigation of hillfort entrances.

Overall, developments show a trend for narrowing the width of the entrance gap. This may suggest a change of use or function. Harding suggests that the width and length of an entrance can reflect the functions of their purpose; a narrower gap being less vulnerable and a wider gap allowing access to wheeled vehicles whereas a longer gap with inner gates would add to the defence of the site (Harding 2012, 78). Within the wider study area, the approximate (known) entrance widths of those excavated range from 1-4m. As entrances were made smaller, the use of hillforts may have changed from a pastoral use, with groups of animals or wheeled vehicles, to a more military function. However, at Eddisbury and Maiden Castle Varley reported that the entrances initially ‘catered’ for pedestrians and in a later phase showed evidence for wheeled vehicles (Varley 1964, 97) although the details are unclear.

There are a number of different features seen within the entranceway architecture, creating gaps, inturns and guardchambers as the three main characteristics.

For those entrances which have been excavated, it can be seen that most are of multi-phase and are developed over time. All entrances which began as simple gaps have been amended to some degree. Hill suggests that emphasising the passage and threshold to hillforts was important and the development of this feature of the site, such as ritual deposits, elaborate gateways and façades, would have been symbolic (Hill 1995b, 51).

When excavating hillfort entrances, it is recommended that a larger area is considered to ensure any previous, relocated hillfort entrances are identified, as well as stratification between other features and structures can be associated even if not ‘attached’ to the entrance architecture.

Blocked entrances have been described as a ‘well-known feature’ of some Wessex hillforts (Corney & Payne 2006, 138). It has been reported in univallate hillforts where two entrances, originally opposing east and west, have one subsequently blocked at Chiselbury, Liddington, Uffington, Danebury, Beacon Hill and Conderton Camp (Corney & Payne 2006, 136). However, multivallate sites in the area appear to retain their opposite entrances at sites such as Barbury and Oldbury, Maiden Castle Dorset and Castle Ditches Tisbury (*ibid.*). These appear to be undergoing a different phenomenon from that which may be happening in north Wales and the borders.

In north Wales and the Marches, those entrances which are blocked are generally relocated and developed rather than one entrance being favoured overall, as in Wessex. Those hillforts which do appear to have opposing entrances, such as Moel y Gaer Llanbedr, are not blocked. However, if Liverpool University researchers are correct in their identification of a possible blocked entrance on Penycloddiau hillfort following a drone survey, this would have been placed in the west and roughly opposite the eastern entrance. At Maiden Castle Cheshire, unpublished excavations report that a blocked entrance was located to the south west of the promontory fort, on the opposite side of the fort to the north eastern entrance (Taylor 1980/81; Jope 1986; Taylor 1993; Miln 1994; Pearson undated). These two examples have much more in common with the Wessex trend and therefore additional research could highlight two motives for blocking in the area; for relocation/development and for termination/close-down in preference for (an)other existing entrance/s.

Inturned entrances are common within the area, and can appear following an initial, simpler entrance gap. Where excavations have discovered only a single inturn, this is placed on the right-hand side of the entrance, looking in from the outside.

Additional features within two particular ‘gap’ entrances at Bryn y Castell and Beeston Castle could allude to more complex structural architecture within their entrances, leaving less evidence within the archaeological record. Postholes found within and inside of the eastern entrance at Bryn y Castell have also been suggested to show multiphase features and a narrowing of the passage, due to two unlined postholes sitting next to two stone-lined postholes; possibly later replacements. The positioning of the postholes at both Bryn y Castell and Beeston Castle suggest the presence of structures, if connected to the entranceway, leading from the entrance

gap itself towards the inside the hillfort. The remnants within the archaeology suggest that these were wooden features. Wooden features within entranceways could be interpreted to represent towers or walkways. It is possible to imagine that these features, turning into the enclosure from the entrance gap, represent timber additions or extensions to the entrance passage, perhaps the equivalent of rampart inturns, made from wood.

For a larger cross-section of hillforts, distinction should be made between inturned entrances and incurved entrances. Some of the hillforts within the wider study area have a sharp 90-degree angle from the enclosing rampart to where it forms the entrance passage. Others have a smoother curve inwards and appear to deliberately have a different style of entrance. It may be found that some inturned 'incurved' entrances discussed above are more similar to a simple gap entrance in some instances. With the small sample of excavated hillforts within the subject area, this would need to be explored as part of a larger study.

The possibility of guard huts existing outside the entranceway architecture has been alluded to, but, again, due to the extent of prior excavation, none have been stratigraphically associated with entrances. If these possible features were to be investigated in the future, the orientation of their entrances would be of interest, considering the potential guard hut found at Moel y Gaer Rhosesmor, with its entranceway orientated towards the entrance of the enclosure, rather than to the south east - as all other (excavated) huts appear to be, see Figure 3.7.

Forde-Johnston noted that the use of guardchambers flourished in this area (1964a, 5) and in his paper on 'The Hillforts of the Clwyds' he stated that guardchambers are a 'feature' of north Wales and the Welsh Marches (Forde-Johnston 1965, 152). This is reiterated by Brassil et al (1982, 85 fn.149), noting that many of the numerous guardchambers in southern Britain, i.e. south of Hadrian's Wall, are located in the hillforts of north east Wales, also by Harding who regards them as a '*distinctive feature of hillfort entrances, from north Wales through the Marches to Somerset and Northamptonshire*' (Harding 2012, 83) and by Davies & Lynch, who suggest that they may be a type fashionable in north Wales and the Marches and that '*there is no evidence that this type of gate exists elsewhere in Wales"* (Davies & Lynch 2000,

154). Rather refreshingly, this consensus suggests that these features are *not* 'Wessex-centred'.

Bowden has proposed that these recesses in hillfort entrances tend to date to around the Sixth to Fourth Centuries BC and that they are typically built after an initial phase, but abandoned before a final phase (Bowden 2006, 426). As discussed above, he also suggests patterns such as rectangular recesses replacing sub-circular recesses, but never the other way around, and also evidence for recesses being made smaller, but never larger; the recess 'doorway' being made progressively smaller and this occurring simultaneously with a lengthening of the entrance passage (*ibid.,* 428). The overall trend in this wider study area shows that guardchambers were progressively made smaller and generally the new sub-rectangular shape follows the sub-circular. These two aspects may be closely related; the truncation of a sub-circular shape instantly giving the impression of a sub-rectangular shape. The progression of a sub-rectangular singular guardchamber at Moel Hiraddug's Main Inner entrance to, in its final form, two sub-circular guardchambers appears to be 'bucking the trend'. This may be explained by the fact that the entrance here is undergoing a slightly different evolution, beginning (after relocation) with a singular guardchamber, then undergoing development and then, ultimately, being redeveloped again to incorporate two sub-circular guardchambers.

Inturned entrances do not always have guardchambers within them, but if guardchambers are present it is likely that these were built at the same time as the inturns were added to the ramparts. Bowden's investigation into guardchambers notes that they are typically built after an initial entranceway phase which is seen in this area, but he also notes that they are generally abandoned before a final phase (Bowden 2006, 426), which has not been observed in this wider study area. On occasion, the 'developed' entranceway of inturns and guardchambers within excavated hillforts in the wider study area has been reported as a single-phase building event, at Penycorddyn Mawr for example, see Figure 3.15. If these highly developed structures are indeed single event cases, the evidence suggests that these hillforts in their totality are an example of a later construction than those with earlier gap entrances, due to the similarities between their developed entrances. However, as it is unclear whether the excavations for these explored a wide area

encompassing lengths of the rampart to the left and right of the entranceway, the possibility of other earlier blocked gaps, still unidentified, cannot be ruled out.

Without excavation of the Clwydian Range hillforts, topographical survey makes it impossible to determine whether these possible guardchambers, if 'chambers' at all, are rectilinear or curvilinear, but even with this information, without accurate dating it would be unwise to suggest a chronology or typology using the shape of a guardchamber, when the reason for its shape may simply be down to what topology allows. Bowden makes reference to the fact that the features themselves are difficult to recognise in terms of surface morphology, let alone size and shape, and questions whether they could have been deliberately backfilled and further suggests that this may be evidence of deliberate destruction or slighting of a site, as at the earlier phases of Dinorben (Gardner & Savory 1964, 40) or the final phase at Moel y Gaer Rhosesmor (Guilbert 1976b, 315). In 2011, Guilbert described possible 'hollows' at the inturned entranceway, previously interpreted as evidence of guardchambers from the surface evidence by Forde-Johnston (1976, 229), as features left behind from the digging out of the gateposts as the hillfort was abandoned (Guilbert, G. 2012. Site visit with Erin Lloyd Jones, 19 June).

Guilbert compared the guardchambers at Dinorben and Moel Hiraddug, the hillforts sitting 10km apart, and considered that their similarities are the principle structural link between the two (Guilbert 1979c, 516). He suggested the possibility of these being built simultaneously, perhaps even through "*the passage of a professional hillfort architect*" (Guilbert,1979c, 519). Both hillforts have similarities at their south east and Main Inner gateways, respectively, having an early, simple, blocked portal with a later inturned, dry-stone lined guardchambered gateway having been built to the left of the earlier passage (Guilbert 1979c, 516). The north west gateway at Moel Hiraddug also suggests a similar phasing, where a simple portal is modified to include a single curvilinear chamber added on to the end (Houlder 1961, 12-16). This curvilinear chamber is a reminder of the main difference between the said gateways at Dinorben and Moel Hiraddug in the secondary phase, the shapes being rectilinear and curvilinear respectively. Guilbert assigns this to perfect replicas being improbable when it comes to human behaviour (Guilbert 1979c, 518).

Cunliffe recognises that in the hillforts of Wales and the west, guardchambers can be seen either located immediately behind the rampart or located at the end of a long corridor (Cunliffe 2005, 247). Those with guardchambers located behind the rampart, he lists the local hillforts of Castle Ditches Eddisbury (Cheshire) and Dinorben (Conwy), those with long corridors are listed as the Wrekin (Shropshire), Caer Drewyn (southern Denbighshire) and Penycorddyn Mawr (Conwy) (*ibid*., 372-373). This comparison was originally considered by Gardner and Savory following the excavations of Dinorben (1964, 87-90). An initial comparison was made between the Period II Dinorben and north west entrance of Moel Hiraddug, both using a single 'rudimentary' guardchamber on one side of the entrance (*ibid*., 81). The Period III guardchamber at Dinorben was compared directly with those at Penycorddyn Mawr's north east entrance and apart from a pair of outer postholes at Penycorddyn interpreted as possible supports for a bridge across the entrance, the parallels were so close that *"one might think of construction by one and the same military engineer"* (*ibid*., 87).

The guardchamber is described as "*a new structural feature… hardly known outside a limited area in the northern Marches*" (*ibid.*) which corresponds with Forde-Johnston's earlier observation (1965) that this was a trend within a certain area limited to north east Wales and its borderlands, albeit regarded as an extended area from north Wales to Somerset by Harding (2012, 83) and Bowden (2006). The single, or possibly double, guardchamber at Caer Drewyn's deeply inturned eastern entrance in Corwen is also directly compared alongside Castle Ditches Eddisbury (Gardner & Savory 1964, 87). Varley found two phases at the eastern entranceway at Eddisbury; the first, a timber construction with a single rectangular guardchamber and the second, a dry-stone construction of two rectangular guardchambers (Varley 1964, 92; 97), see Figure 3.13. Garner's discovery of the additional floor area of the south guardchamber creating a curvilinear floor plan included materials recovered to allow radiocarbon, OSL and archaeo-magnetic dating (Garner, forthcoming). The additional floor plan recovered in these excavations has been discussed above and it was suggested that this original area depicts the original single (curvilinear) guardchamber and Varley uncovered the later (rectilinear) stone-lined structure. This theory fits with Bowden's results as well as most of the others within this study.

Of the unexcavated sites, Gardner and Savory report that fieldwork has suggested guardchambers at Moel Arthur, a single rectangular chamber in the southern entrance of Penycloddiau and at Castell Cawr in Abergele (Gardner & Savory 1964, 88), with foundations for the guardchamber at Castell Cawr being apparently partially exposed at the time, 'looking similar' to Period III Dinorben (Gardner & Savory 1964, 111: 92).

Guilbert warns of the problem of dating guardchambers in this area. At the time of his writing, only the two hillforts of Moel y Gaer Rhosesmor and Dinorben in the then county of Clwyd had been accurately dated and these samples had not been taken from entranceways (Guilbert 1979c, 519). As the earliest rampart on Moel y Gaer Rhosesmor was dated to 260+/-70bc, this provides the earliest possible date for a guardchambered gateway within the entranceway feature itself[24], so the most accurate date for 'guardchambers', if they are so, at the site would not provide a definite date of construction (Guilbert 1979c, 519). Additionally, he has later speculated that the hollows seen within the entrance topology may be evidence for removed posts, rather than guardchambers (Guilbert, G. 2012. Site visit with Erin Lloyd Jones, 19 June).

The dates that were obtained for Dinorben cannot be accurately related to the entranceway context and so cannot be used with its interpretation either (Alcock 1972, 330). Samples for radiocarbon dating were taken from a rubbish deposit in the Main Inner entranceway at Moel Hiraddug which preceded the construction of guardchambers and this phase originally calibrated to Sixth to Fifth Centuries BC (Brassil et al 1982, 84)[25] although the stratigraphical context has not been fully published.

Moel Hiraddug's north western entrance shows evidence for an entranceway with a single guardchamber, or guard hut, see Figure 3.3, rather than double guardchambers at Moel Arthur, Penycorddyn Mawr, Dinorben, see Figure 3.19, and Castle Ditches Eddisbury (Forde-Johnston 1964a, 5). The neighbouring sites of Castell Cawr, Abergele and possibly Caer Drewyn, Corwen also have the characteristic of a single chamber (*ibid.*). Forde-Johnston believes that the disparity

[24] Not including a possible free-standing guard hut at Moel y Gaer Rhosesmor, see Figure 3.7 (Guilbert, 1977a, 47-8)
[25] Recalibrated and discussed in chapter 4

in length of the two inturns at the entrance at Castell Cawr is due to it only having a single guardchamber, the gate itself being located at the end of the opposite, shorter inturn, leaving the chamber inside of the entrance on the opposite side (*ibid*., 14). If other hillfort entrances display differences in the lengths of their inturns, or the presence of a single inturn, this may suggest a single guardchamber masked by collapse. Hillfort entrances within single inturns or incurves include Penycorddyn Mawr north west, where no evidence for 'masked' guardchambers was recorded, and Moel Hiraddug north west, where a potential platform for a guard hut, opposite the inturn and 'tacked on' guard hut, was found to be natural (Houlder 1961, 16). At the Breiddin, O'Neil reported 'rough stone footings' of a 'small egg-shaped hut' where burnt wattle-and-daub remains identified the location of a superstructure (O'Neil 1937). However, later some of the daub was re-identified as VCP and as O'Neil's excavation took place over three separate trenches (Musson et al 1991, 9), the identification cannot be confidently confirmed.

Excavated examples of single guardchambers include early phases of Eddisbury's eastern entrance and Moel Hiraddug's Main Inner entrance. Unfortunately, lack of evidence and information will not allow us to compare the excavated examples with those speculated. However, with evidence at Eddisbury and Moel Hiraddug that these were an earlier phase of an entrance with double guardchambers, it cannot be ruled out that additional phases of single guardchambers are present elsewhere, undiscovered beneath later developments.

The purpose of guardchambers, including the term itself, has been debated in particular by Bowden, who investigated alternative suggestions, including the significance of entrances and similar features within ethnographical examples (Bowden 2006). Harding, however, suggests that to question their military function is to misunderstand their purpose and suggests that 'guards' would have controlled the traffic at the entrance, a fire, where present, providing warmth and light for off-duty guards and that they would have accessed the hillfort walls via stairs or ladder from inside the chamber (Harding 2012, 83). The existence of as yet unexplained grooves and postholes within guardchambers may lend themselves to this theory.

This does, however, return us to the assumption of military function of hillforts. Bowden & McOmish (1987) suggest that there is little evidence for hillforts being

under attack, but at the entrance to Eddisbury hillfort's eastern entrance's southern guardchamber, near Beeston Castle's entrance and not far from Moel Hiraddug's north western entrance just inside the north ramparts, hordes of sling stones were discovered upon excavation (Varley 1950, 33; Ellis 1993, 87-89; Stead 1982) suggesting the need for defence. The discovery of two human skeletons at Moel Hiraddug, buried underneath the second phase development of the Main Inner entrance, see Figure 3.2, (Davies 1970a, 9-10), part of a human skull at 'one of the guardchambers' at Dinorben's main entrance, a fragment of human lower jaw bone on the rock surface in the south east entrance, a fragmentary human skull from the 'upper road surface' in the main south east entrance (Gardner & Savory 1964, 221-222) and a Late Bronze Age socketed axe at the entrance at the Breiddin, for example, suggest that further meaning must be attached to hillfort entrances, as Hill has proposed for those in southern Britain (Hill 1995b, 51).

Many hillforts have evidence for single or an odd number of postholes within their entrance, if it is assumed that preservation has allowed the archaeological record to locate all that once were at the sites excavated. Postholes within entrance passages, even when positioned in an even number, are not always aligned and so it appears that symmetry may not have been of vast importance. However, the use of posts within the entrance passages may not have been wholly functional. Some may have been used to hang gates or for towers and some may have been utilised to secure the structure of the passageway. It is also possible that some were used to hold barriers across sections of the passage to create a more complex route into the enclosure. Nevertheless, the more complex entranceway passages seen at examples such as Dinorben's south east, see Figure 3.19, and Eddisbury's two entrances at their final phases have evidence for eight or more postholes lining the passage, which insinuates that this was an act of ostentation, see Figure 3.13. Varley observed wooden gateposts preserved *in situ*, with iron ferrules also still surviving at both entrances at Eddisbury, with unscaled photos included within his report (Varley 1950, 33-34, 36), the postholes in the east entrance reported as being around 800mm diameter (Varley 1950, 29). With the lack of evidence for gates in British hillforts (Harding 2012, 77), the survival of these elements of the gateway architecture will aid interpretation of the wider monument group despite having limited analysis within the report.

Postholes are not always in the same positions, nor are they symmetrical within entranceways. The consideration of postholes within entrance passageways which have previously been compared suggests that they may not be similar enough to suggest the same architect but certainly an element of trend and/or technique. If the positioning of the postholes suggests that the posts were for different uses, such as the difference between holding up a tower, walkway, roof or, more simply, holding back a wall, the similarities between the 'comparable' entrances of hillforts in this area become much further removed.

Where guardchambers are present, postholes are always found on the outer corners of the guardchamber 'entrance'/gap. If these postholes were utilised for a gate to the hillfort, it shows that the chambers sat 'inside' the hillfort, after entry through the main gate had been permitted. It is possible that the chambers were present to be utilised before entry was permitted any further. Alternatively, the postholes found on the outer corners of the chambers may have been utilised for the chambers themselves and suggest that these features had doors and could be closed off from the entrance passage.

Postholes found within guardchambers, often lining the guardchamber mouth suggesting a door, are subjects for further examination. Those found within the structure of the guardchamber, as seen at Penycorddyn Mawr's north east, see Figure 3.15, Moel Hiraddug's Main Inner, see Figure 3.2, and Eddisbury's east entrance, see Figure 3.13 for example, are all located at different places within the chamber sides and if present to support a roof or a structure above, are located within peculiar, off-set positions. Further investigation into the location of these posts could help aid interpretation of their function.

At Dinorben, the unusually shaped guardchamber in its final phase has been interpreted as a possible 'squint' to users of the recess, see Figure 3.19 (Gardner & Savory 1964, 21). The small triangular shaped corner could also justifiably be a by-product of multiple reconstruction in this area and existing stones or architecture may have warranted this line of stonework, instead of it having a function. However, this presents a need for further work into the use of 'guardchambers' and whether there was a need for sight into the passageway approach from inside the chambers. In addition, it presents a possible piece of architecture unseen elsewhere, possibly due

to preservation issues rather than its absence; namely the window. Due to most hillfort entrances only having their ground plan still in existence the preservation of any features above 'foot level' is often subject to imagination. Postholes within the masonry may also be a tool which can aid this interpretation. Other sites with more substantial masonry can also offer tantalising glimpses into this unknown feature. For example, at Tre'r Ceiri, the remains of a horizontal hole within the 'main gateway of the outer wall' has been discovered and could be the remains of a draw-bar hole, sitting opposite a jamb "*2ft wide and 4ft thick for a door opening inwards*" (Hogg 1960, 13).

In conclusion, the phasing of the hillfort entrances suggests that the more complex the entranceway, the later the phase of entranceway. The 'simple gap' entrance appears to be 'phased out' in favour of more developed entrances with inturns and sometimes guardchambers. This suggests that the 'simple gap' is no longer appropriate or functional and may indicate a change of function or priority of the site overall. Where the entrance is single phase, yet complex, the entire monument may be a later phase within the group. Additional, complex features include dog-leg passageways, such as Moel y Gaer Llanbedr and, despite not being excavated, a fine example of Chevaux-de-frise at Pen y Gaer, Llanbedr y Cennin. No other examples of this particular feature are known in this area[26].

By comparing the excavated entranceways in the area, guardchambers appear to be present in north east Wales and the borderlands, but out of the *excavated* examples, only a small sample have this evidence. All other examples have been 'identified' by topographical survey or by eye. To examine fully whether guardchambers are indeed a 'feature' of this area, more would need to be examined in much more detail than those currently reported to have guardchambers 'identified' (read 'interpreted') solely through topography. The comparison of archaeological surveying results of guardchambers prior to and with excavation results in the future may provide more substantial information on how to identify the presence of the features without substantial ground penetration. Until that time, the 'evidence' for guardchambers is, in essence, speculation and those identified, unless excavated, cannot be assumed.

[26] This is despite Brown (2004, 72) reporting that Gardner identified these at Moel y Gaer Llanbedr on the Clwydian Range in his 1926 publication, but in fact Gardner references 'Y Gaer, Llanbedr' referring to Pen y Gaer Llanbedr y Cennin (Gardner 1926, 258).

Unexplained features within entrances highlight the amount of ‘missing data’ and possibly even ‘missing features’ which make up the architecture of the passage into the hillfort. Unexplained postholes, grooves and other characteristics could be long-lost elements of now missing wooden inturns, barricades and staircases, or other hypothetical attributes yet to be considered. Earlier phases may still lie undiscovered outside of the limits of excavation.

With all features, a generic theme of ‘control’ can be observed, whether this is through inhibiting or facilitating view, controlling movement, or the positioning of architectural features. A similar trait has been found in mid-Wales, where defences have been deliberately heightened, and work concentrated in certain areas to be seen from particular approaches and in the most visible parts of the hillfort, for maximum effect, possibly facing key lands and paths of approach/movement (Driver 2013, 135; 139). Whether this control of direction at the entranceway was for people approaching the hillfort and hoping for entry or for those already within and considering their exit is still to be determined. What can be concluded is that the point of entry, or exit, to the hillfort was considered important. Items and human remains were deposited within the junction, probably ritually. Resource such as time, effort and human hours was time and time again invested into the passage, developing and elaborating. The act of approaching and entering a hillfort would have been filled with intimidation, trepidation, suspense and excitement. Once inside, chambers on either side would have had a purpose, such as housing a welcome, acknowledgement, reception or despatch, a place for safe storage of personal or forbidden items, or where the visitor had to justify their presence and purpose, perhaps through imparting goods or something of worth.

The amount of effort which had gone into initially building the hillfort entrance and of those who approached and eventually gained or were granted access into the main enclosure suggests that hillforts were an exclusive place. To be allowed passage from the outside to within would not have been assumed for all. For those who were allowed to flow freely to and from the enclosure still encountered the impressive structures and ostensive, protective architecture on their journey. This passage from outside to in must have been considered special. Hillforts must have been, to some extent, considered a restricted, controlled place, and to gain entry and permission to

make the journey from the outside to within the encompassing walls would have been seen as gaining acceptance by those ‘inside’.

3.3 Conclusions

This chapter has provided an overview of information collected through a study of excavated ramparts and entrances in the wider study area. The overarching theme is of highly complex developments, demonstrating longevity, renewal and maintenance. Multiple phases show ongoing development and evolution, including, on occasion, non-utilitarian building activity.

Stone was often used across the region, even in areas where it was not ‘functional’ to use. Stone facing was utilised on earthen banks to create a façade, adding to a site’s prominence. Entrances were developed, blocked, narrowed and made more complex as the use of a ‘simple gap’ was phased out.

In some cases, such as the stone walled hillforts of the west, the stone-faced hillforts of the east and some which demonstrate use of both, the question still remains ‘which came first?’. Was one group simulating the other, and/or simply utilising available materials in their location?

Developments and sequences, where available, are out of context in the timeline of the hillforts’ existence. As sites, ramparts and entrances developed, is it a case of complexity = later in date? The use of material culture and scientific dating will help to contextualise some of the architectural features and developments seen in the archaeological record. Despite ground conditions, some artefacts have been discovered and may aid in the dating of a feature. Charcoal too has been subject to scientific dating in the area since the advent of radiocarbon dating and can provide useful data for placing hillforts’ features into a chronological sequence over time.

Chapter four will provide an overview of ‘dated hillforts’ in the wider study area and, through a comparative study, will attempt to place hillforts, their features and their complex developments into a chronological context.

CHAPTER 4

DATING

Having discussed the results of excavated architectural features within the hillforts, the dating of these will provide additional and important information in order to interpret the monuments and their use over time. This chapter discusses both relative and scientifically dated hillforts from the wider study area.

It will begin by providing a brief introduction and will highlight issues surrounding dating the hillforts. An overview of dated hillforts will then be discussed by site. Following this and following a recalibration of radiocarbon dates available for the wider study area, the results of which can be found in Table A3.7, a comparison of dated features will be reported on by feature, including the enclosure, entrances, and structures. The recalibrated results and their meanings will be discussed. All radiocarbon dates listed below are reported as the recalibrated dates for this study. These results and their original dates from their original reports can be found in Table A3.7.

Despite ground conditions impeding artefact preservation at hillforts on the Clwydian Range and in the surrounding areas, a number of items have been found, some of which can be typologically dated to more precise periods than others. Where this is possible, the artefacts and their relative contexts and stratigraphy will be discussed, in an attempt to consider their impact on dating the site where they have been found and any phases of activity. These results can subsequently be compared with and related to radiocarbon dating evidence.

With the lack of artefactual information on many of the hillforts, radiocarbon dating is a key process to aid in the interpretation of the sites. Although only limited excavation has taken place in north Wales and the Marches, since the advent of scientific dating techniques 60 years ago, a number of radiocarbon samples have been submitted for analysis (Guilbert 1974a; 1975a; 1976a; 1977b; 1979e; 1980; White 1977; Brassil et al 1982; Musson & Northover 1989; Musson et al 1991; Ellis 1993; Karl & Butler 2009; Garner 2012b; 2012c; Grant & Jones 2013). Since the earliest of these submissions, for example Dinorben hillfort (Savory 1971a), techniques have continued to develop to allow more accuracy, including the

innovation of calibration (Bayliss 2009, 123). This includes further research into the calibration curve itself and increased caution when interpreting dates which fall between 800 and 400BC due to the calibration curve plateau affecting the range of potential dates (Bayliss 2009; Cunliffe 2005, 652-654).

These developments can be seen by examining the radiocarbon samples and dates reported on for the hillforts of north Wales and the Marches over the last half a century, which have been subject to different recording techniques. This includes the publishing of the information in a number of different ways, as the process has developed over the years. In some cases where material for radiocarbon dating has been found and sampled, features and other related elements associated through stratigraphy have been dated and a chronology attempted for the site (e.g. Savory 1971b; Musson et al 1991; Garner 2012b).

Where different hillforts contain similar features and structures, it is possible to compare the dating evidence for said features to investigate whether they could be attributed to the same period across a wider area. However, due to the nature of how the dates have been calibrated, the method of acquiring the dates are not consistent with one another and therefore cannot be compared with accuracy. Where raw, uncalibrated results from radiocarbon samples can be gained and recalibrated in the same way to ensure consistency, it is possible to compare dates and their associated features from hillfort to hillfort. In turn, if relationships were found, this could suggest a dating range for other features of the same type that have not produced dating material and/or have not been excavated.

A general chronology for hillforts in Wales has been attempted, albeit with limited scientific data (Davies & Lynch 2000). Davies & Lynch group hillforts into the following categories:

- Late Bronze Age/Early Iron Age Transition: the earliest hillforts, c.800-550 cal BC

They state that the northern and central Marches have the clearest evidence for hillforts in this period, that the early hillforts have slighter defences than those later and that the palisade fence was a common enclosing ‘defence’ (Davies & Lynch 2000, 150).

- Early Iron Age, c.550-400 cal BC

Davies & Lynch suggest that this period saw a ‘remarkable burst’ of renewed interest in hillfort building and that sites chosen tended to be strongly naturally defended promontories or spurs and on previously established sites, univallate, timber-framed (although they make note of the stone-walled forts of Gwynedd) and not very large, i.e. under 3 hectares (Davies & Lynch 2000, 152).

- Middle Iron Age, 400-150 cal BC

Within this period, Davies & Lynch report an evolution in Wales similar to that reported in Wessex, namely enlargement and the adding of ramparts and inturned entrances (Davies & Lynch 2000, 154-6).

- Late Iron Age, 150 cal BC to ‘the Roman Conquest’ (First Century AD)

Within this period, there is little evidence for hillfort activity available, but there is some evidence that in north east Wales and the Marches, they continued to be used and occupied (Davies & Lynch 2000, 156-7).

A wider chronology for hillforts of ‘southern Britain’ was attempted by Avery. He suggests that ‘stockaded enclosures’ were developing between the 11th and Ninth Centuries BC (Avery 1993, 120), few hillforts were built before 800BC, ‘wall-and-fill’ ramparts are earlier than dump ramparts and that there is a significant gap between these two architectural features (Avery 1993, 109-112). He dates ‘wall-and fill’ ramparts to between c.800-500BC and most frequent after 600BC (Avery 1993, 122-127). He suggests that dump ramparts have their origins in Wessex and the Welsh Marches around 300BC and evolved as their geographical area expanded, up to the Roman Conquest and in some cases beyond (Avery 1993, 126-139).

The following results attempt to correlate relative and radiocarbon dating information from the hillforts which have produced scientific dates from the wider study area within north Wales and the borders, an approximately 30-mile radius from the Clwydian Range in north east Wales. Features such as ramparts, ditches, roundhouses and other structures, where dates are available, have been compiled.

The list below should not be taken as a complete record of finds on hillforts in the area, especially when comparing sites for collections of certain items to decipher specific large-scale activity at a site, as items may not have been noted below if dates and/or context are not available. Alongside dating evidence, artefacts may present some clues as to what activity occurred on the hillforts, or at least the hills the hillforts sit upon, in prehistory even without firm context information. For example, the lack of animal bones may be testament to the soil properties, but items such as loom weights and spindle whorls suggest the significance of sheep where their physical remains have disappeared from the archaeological record (Davies & Lynch 2000, 176). The presence of VCP secures a trade link with Cheshire and Droitwich at hillforts such as Moel Hiraddug, Old Oswestry and Dinorben, for example (Davies & Lynch 2000, 206). Small-scale secondary metalworking can be seen at a number of sites such as Dinorben, Old Oswestry, Breiddin and Llwyn Bryn Dinas (Davies & Lynch 2000, 211). A large number of artefacts may present a wide typological date range, such as flints, spindle whorls etc., and those found unstratified may include impressive finds or of particular note for other discussions where relative dating measures is not the aim of the study.

A list of hillforts which have produced radiocarbon dates was assembled through gathering data from the Historic Environment Records, publications such as excavation reports and Radiocarbon journal, and grey literature, in particular the radiocarbon database assembled by English Heritage and published on Archaeological Data Services online grey literature archive. Artefactual evidence gathered in a similar fashion also includes the National Museum Wales' 'Celtic Art in Britain' archive.

In most cases, it was essential to source the original laboratory reports to access the uncalibrated results. This was due to the lack of standardisation of the presentation of published radiocarbon dates, resulting in a range of arrangements including 'bc', 'BC', 'calBC', 'bp' and 'BP', 'BCC' without clarity of what these referred to and a lack of confidence as to whether they followed the standardised forms now generally adopted. Although more recent dates sourced may have been subject to vigorous analysis, all dates underwent the same calibration technique to ensure consistency within this exercise.

In most, but not all, cases lab-codes were published alongside radiocarbon dates, which allowed research into the original source of the data and the lab reports. However, in a large number of cases the laboratories in question had ceased to exist, which made accessibility to the information problematic.

Once the raw data from the radiocarbon samples had been gathered, the dates were inputted into the radiocarbon programme OxCal, version 4.2 and later re-examined to verify consistency in version 4.3.2, developed by Oxford University's Radiocarbon Accelerator Unit. This was done in order to standardise the calibration across all dates from all hillforts in the area by calculating the probable date ranges for their scientifically dated samples.

A summary of dating evidence will be reported on for each hillfort. This will be followed by chronological discussions listed by feature, merging the results of all sites.

4.1 Dating evidence for individual sites

4.1.1 Dating evidence for the Clwydian Range hillforts

All radiocarbon dates listed below are the recalibrated dates for this study. These dates and their original forms as per their original reports can be found in Table A3.7. All radiocarbon dates stated below are calibrated calendar dates at 95.4% confidence levels. The 'new' recalibrated radiocarbon dates are presented as 'BC'.

4.1.1.1 Moel Fenlli, Denbighshire

Although the material evidence has since been lost, Gardner describes the objects studied following the excavation of Moel Fenlli by Wynne-Foulkes. Alongside two hoards of 43 and 150 Roman coins found on the site following a heather burn in 1816 and 1845 respectively (Gardner 1921, 247), the remains inspected by Gardner are attributed to the Roman era, including part of a Samian bowl "…*showing semi-circular panels, in one of which is a running dog*" and dated to AD90-110 by Professor Bosanquet (Gardner 1921, 246).

There are scant records of a subsequent excavation within the hillfort in 1959. Permission was granted in early June to Peter Hayes of Flintshire Record Office by C. J. Harries of the Ministry of Works to excavate two hut platforms out of a group

identified near the spring; one near the spring and the other to the south, on the condition that "*a report of your findings is published in the journal of the Flintshire Historical Society*" (Harries 1959). No record of the excavations was published with the exception of one sentence within the annual report for 1959, hidden within a larger paragraph reporting the year's activity; "*Mr Peter Hayes carried out a most interesting excavation on Moel Fenlli of two huts occupied in Romano-British times."* (Anon 1961, ix).

From other correspondence, it can be determined that they aimed to do the work during weekends, planning to initially survey the site on 21st June before excavating from the following weekend onwards (Hayes 1959b; 1959c). A subsequent letter dated 22nd June 1959, states that "*last Sunday we began with a very small excavation on Moel Fenlli"* (Hayes 1959d) and on Thursday 25th June Hayes wrote to H. N. Savory stating "*we have started on a circular hut site near the spring... as far as taking the turf off one half of the hut. We will continue this coming Sunday...*" (Hayes 1959e).

The next reference to the work at Moel Fenlli can be found in a letter on 2nd September from Bevan-Evans to members of the Flintshire Historical Society regarding a trip to Moel Fenlli but stating that "*there will be no digging at Moel Fenlli on either of these days but there will be on the Sundays 5th and 13th September"* (Bevan-Evans 1959).

It is unclear exactly where was excavated and when, but the allusion to Romano-British material being discovered during this 'most interesting excavation' which must have been carried out over a number of months, possibly sporadically, appears to complement the only other artefacts found on site to date; namely Romano-British.

4.1.1.2 Moel y Gaer Llanbedr, Denbighshire

The excavations by Bangor University at Moel y Gaer Llanbedr (Karl & Butler 2009) produced five radiocarbon dates (Karl et al 2015). Two of which were described as being found "below the body wall" and both produced a date and, by association, a Terminus Post Quem (TPQ) for the single-phase rampart of 794-524 (SUERC-30901, SUERC-30902). The body of wall itself, context 11, produced two dates of 788-486BC (SUERC-30897) and 507-235BC (SUERC-30895) which could be

therefore interpreted as lying between 507-486BC. The dry-stone wall which made up the facing wall of the rampart gave a date of 782-433BC (SUERC-30896) but if this was contemporary with the rampart body, this may also be suggested at a less wide date range of 507-433BC.

4.1.1.3 Moel Arthur, Denbighshire

Three Bronze Age flat axes were discovered at Moel Arthur hillfort following a storm which is reported to have loosened them from the soil (Forde-Johnston 1964b). They were reported to have been found "*within the ramparts of the hillfort, 6-9" down exposed after a minor landslip"* (Burgess 1962, 3). Two were of 'thick-butt type' and the third of broad 'Icklingham type' (*ibid.*). It is unclear whether 'within the ramparts' refers to within the *enclosure* or within the actual rampart feature and out of context these artefacts cannot confirm any evidence for dating the hillfort, only that there was activity on the hill during the Early Bronze Age.

4.1.1.4 Moel Hiraddug, Denbighshire

The first recorded artefacts discovered at Moel Hiraddug were found during the initial laying of a simple road to the quarry in 1872, the feature which would lead to around a third of the hillfort being destroyed in its entirety (Hemp 1928, 253-284; Houlder 1961, 18). A number of iron and bronze objects were found including a shield boss and other plates and parts of iron blade (Houlder 1961, 18), now on display in the National Museum of Wales. The conditions in which these items were found means that using them to stratigraphically date the rampart is impossible (Houlder 1961, 19) and simply suggest activity occurring on the hill during the period they typologically date from. The Moel Hiraddug 'plaque' is thought to date to c50BC-AD50 (Fox 1958) and is made from copper from Llanymynech Hill (Davies & Lynch 2000, 208). It has been suggested that through the limited knowledge of the context of these finds, within 'red silt' and "*most likely to have been sealed by material from the middle rampart*", that these items pre-date the collapse of the middle rampart (Houlder 1961, 8).

No dateable finds were reported to have been discovered during excavations by Houlder in the mid-1950s, which included the possible site of the 1872 metalwork finds, close to ramparts and the north west entrance (Houlder 1961).

During the 1960s, excavations at Moel Hiraddug were led by Livens of Bangor University, W. H. Stead and Bevan-Evans of Flintshire Record Office and ultimately by J. L. Davies of Aberystwyth University from 1969-72 (Brassil et al 1982, 24). Although these excavations were not fully published by the excavators, notes on the years between 1960-7 were provided to Brassil for the publication on the excavations of Moel Hiraddug, published in the Flintshire Historical Society Transactions (*ibid*., 24-36) and annual updates from Davies were published in summary within Archaeology in Wales (Davies & Bevan-Evans 1969; Davies 1970a; 1971; 1972).

A collection of items found during the excavation of the site in the 1960s were discovered over a decade later after the excavation records were deposited at 'Clwyd Record Office' following the death of the excavator, Bevan-Evans (Guilbert 1982, 12-14; Brassil et al 1982, 36). Unfortunately, only the excavation areas were able to be surmised and the context of the items was unable to be confirmed (*ibid.).* The finds included collections of iron, bronze, lead, flint, stone, chert, antler and bone, the latter two collections stated to be of particular interest and, at the time of writing, rivalled only by the nearby hillfort of Dinorben which had been extensively excavated (Brassil et al 1982, 37; 38).

The worked bone and antler at Moel Hiraddug and Dinorben only match in a few cases out of the collection of items, which could suggest different activity at each site and possibly at a different time. In addition, no 'off-cuts' or waste were reported to have been found at Moel Hiraddug but detected collectively at Dinorben, suggesting on-site manufacture at the latter but possibly not at the former (Brassil et al 1982, 38). However, in contrast, evidence of bronze working was evident at Moel Hiraddug (*ibid.*).

A number of metal items found at Moel Hiraddug have been dated typologically, including a decorated, bronze, La Tène I brooch, which was said to be found "*under tumble from the inner rampart*" (Guilbert 1982, 12-14; Brassil et al 1982, 39, fn 68), dated to around 400BC (Brassil et al 1982, 39-41). A curved neck, iron cup-headed pin was found, the cup of which still containing 'tufa' upon discovery in 1960. Comparisons were attempted with similar brooches in the 1982 publication, but few parallels were found, especially with associated firm dates so dating remains an

issue (Brassil et al 1982, 42-45). A fragment of a thin, iron, openwork disc was found in 1962, typologically attributed to La Tène Early style and dated to around 400BC (Brassil et al 1982, 45-47). Many items cannot be typologically dated, but certainly add to the narrative of the use of the enclosure, including items interpreted as 'gaming pieces' or counters and a gaming board (Brassil et al 1982, 47-55), highlighting less 'official', entertaining, leisure activities which may have taken place at the hillfort which may sometimes be forgotten when discussing activity at sites such as this. Similar items described as 'gaming pieces' have been reported at Craig Rhiwarth, Bryn y Castell and Dinorben (Crew et al 2012, 325-326; Crew 1981a; Gardner & Savory 1964, 170).

The 1969-72 excavations are reported as 'unpublished' in the Moel Hiraddug excavations report, published in 1982 (Brassil et al). However, a number of updates were recorded and published in Archaeology in Wales. During the early 1970s, a short piece in Archaeology in Wales reported the discovery of two human inhumations, contemporary with one another and 'at latest of Iron Age date' were found "*immediately inside the (Main Inner) gate and on the axis of the gate passage*", sealed by the track running from the gate along the line of the rampart on the inner side (Davies 1970a, 9-10). It was stated that work would continue at the location in the following year, but the inhumations are not referred to again in the public record (Davies 1971, 8-9; 1972, 12-13)[27].

In a report within the archives at the National Monuments Record (NMR), Davies provides further detail:

[27] The Bevan-Evans archive at Flintshire Record Office also reveals a fascinating story regarding the skeletons. In Bevan-Evans' 1970 diary, a reference is made to 'the skeleton' (singular) on 6th July and on 24th Bevan-Evans mentions "*Jeff Davies taking up the skeleton*…" (Bevan-Evans, 1970a). In a notebook of the same year, a sketch reveals the general location of the skeletons in relation to the double guardchamber entrance and other excavated sections in the vicinity (Bevan-Evans 1970b), see above, Figure 3.2. Letters which pre-date the survey and excavation of the two inhumations reveal that some of the leg bones were 'stolen' in what seems to be the period in between the 1969 season (which had run from August 18th for 6 weeks), when the bones must have first been identified, and before the site was returned to in 1970. In a letter from W. H. Stead, "Bill", to Bevan-Evans he reports that two local boys reported and subsequently brought to him human bones from the site (Stead 1970a) which consisted of a right and left tibia, a left femur and a right and left fibula (Stead 1970b). Stead accompanied the 'boys' to the site to be shown the exact location of the extraction and his description of the site matches Davies' description (Davies 1970b) and Bevan-Evans' sketch (Bevan-Evans 1970b). Davies was able to subsequently retrieve these remains and the fully excavated remains of the skeletons, with plans and further notes, are currently held at the University of Aberystwyth (Davies, J. L. 2016. Meeting with Erin Lloyd Jones, 25 November)

"*A feature of considerable interest was a heavily-metalled trackway which ran from the gateway proper and followed the course of the rampart. This trackway was 2-3 metres in width, and it sealed two human skeletons which had been buried some 3 metres to the rear of the gate, and on the axis of the gate passage itself. The burials were laid out side by side and appear to be contemporary. There was no trace of a grave-pit, and the bodies appear to have been laid out with their heads immediately below a step in the natural limestone. The burials were very shallow, 60-70cms. below the present-day ground surface, and only some 30-40 cms. beneath the surface of the Iron Age trackway. They lay W-E with the lower portions of their legs flexed. Apart from two small fragments of pottery and a few chert flakes… there were no associated grave goods."* (Davies 1970b)

Davies has commented that the skeletons were found underneath the Phase 2 entranceway road surface, but within the enclosure not underneath the Phase 1 rampart and therefore could be contemporary with Phase 1 or could be earlier still (Davies, J. L. 2016. Meeting with Erin Lloyd Jones, 25 November). As these skeletons, along with their associated plans and field notes, are still in the possession of the University of Aberystwyth (*ibid*.), they present a rare opportunity to examine two full prehistoric skeletons from a Welsh hillfort and also to provide dating evidence and context.

Davies' publications in Archaeology in Wales reported on the phasing of the entrance passage and also provided samples for radiocarbon dating. Initially, it was stated that work continued on the eastern guardchamber and this is when the 'heavily metalled roadway' was found, which sealed the inhumations (Davies 1970a, 9-10).

The Phase 1 entranceway was excavated the following year (Davies 1971, 8-9). A second swan's neck pin was found stratified under the eastern guardchamber's multi-phase hearth, which lay on top of the rubble of demolished Phase 1 gateway (Davies 1971, 9; Davies, J. L. 2016. Meeting with Erin Lloyd Jones, 25 November).

The succeeding year it was discovered that the guardchamber entranceway was also multiperiod, suggesting that the swan's neck pin was found under the hearth of the later location of the entranceway. Its final form had two semi-circular guardchambers, termed 2c. These had replaced an earlier entranceway, in the same

position, with a singular sub-rectangular guardchamber, 2a (later also reduced in size in a subsequent phase, 2b) and the pin may date from this period of use. All of these phases sat upon the demolished rubble of the first phase, simple entranceway, situated slightly to the right (Davies 1972, 12-13). It is possible to suggest that the swan's neck pin is certainly later than the first period of the entranceway and earlier than the final phase and therefore may date period 2a or 2b to the Sixth Century BC, stylistically (Davies 1971, 9). A 'fine iron chisel' and fragments of an iron sword were also reported to have been found "*in rubble at the rear of the gate in 1969" (*Davies 1970b; Stead 1970a), the sword having been bent (Davies, J. L. 2016. Meeting with Erin Lloyd Jones, 25 November).

Material for radiocarbon dating was found within the fill of the blocked early entranceway (Davies 1972, 13; Davies, J. L. 2016. Meeting with Erin Lloyd Jones, 25 November) and provided dates of 728-193BC (CAR-372), 756-233BC (CAR-373), 756-368BC (CAR-374) and provide a date for the blocking of the phase one entranceway to between the mid Eighth and Fourth Centuries.

Also excavated during 1969-72 was a circular hut at the summit of the hillfort, above the Main Inner gate which overlay a four-poster, which were abundant on the summit, and contained no hearth and around six spindle whorls (Davies, J. L. 2016. Meeting with Erin Lloyd Jones, 25 November). Other finds included a possible ring-headed pin, Cheshire VCP, and a rectangular building "*overlooking the terraceway to the Main Inner Gate"* which contained a hoard of over 600 slingstones (Davies & Bevan-Evans 1969, 10; Davies 1970b, 3). References to slingstones occur elsewhere; around 200 in 1960-61 excavations by Stead along the rear face of the north rampart (Brassil et al 1982, 28; Stead & Bevan-Evans 1961, 3) and during excavations of the north and east grids by Bevan-Evans (Brassil et al 1982, 32).

Other items found during Davies' excavations include a fragmentary bronze penannular brooch within a circular 'stone' house on the summit (Davies 1972, 13) and a blue glass bead found to the rear of inner rampart, near the quarry edge in 1970 (Davies 1970b, 2). Another blue glass bead was reported to have been found in the East Grid during the 1962 excavations (Anon. 1964, ix; Brassil et al 1982, 38 fn.64). Pottery found at the rear of the inner rampart was said to be similar in form to

some found at the Breiddin hillfort from a late- or post-Roman deposit (Davies 1971, 8).

Other artefacts were found during the final[28] 1979-80 excavations, on the middle and outer ramparts and ditches and counterscarp bank, including bronze, flint and stone, but cannot be dated. In addition, three human teeth were found (Brassil et al 1982, 76-79).

4.1.2 Dating evidence for hillforts in the wider study area

4.1.2.1 Beeston Castle, Cheshire

The Outer Gateway and Outer Ward at Beeston Castle were excavated in 1968-85 by Keen and Hough and published in 1993 by Peter Ellis. Features found and dated in the Outer Ward were problematic to associate with features within the Outer Gateway and will not be discussed in detail.

Two very early dates were found at Beeston Castle's Outer Gateway. A date of 4441-3948BC (HAR-6461) was found in an occupation layer (Ellis 1993, 85) and a date of 4228-3711BC (HAR-6462) was found nearby from what was described as the 'Period 3A ditch', the same layer containing Iron Age pottery. It was suggested that this material had eroded into the ditch and had come from the same occupation layer as the former date (Ellis 1993, 86).

The initial structure (termed Period 2A) thought to be present at the site was a possible palisade, through evidence for postholes and slots at the Outer Gateway and Outer Ward (Ellis 1993, 87). No dating evidence was found with these features, but parallels were made between these and nearby hillforts at Eddisbury, Breiddin and Old Oswestry (*ibid.*).

Pottery of 'Late Bronze Age date' was reported to be found within the rampart (labelled Period 2B) and Ewart Park metalwork, including two Ewart Park axes found attributed to the same phase layers (Ellis 1993, 22-25; 41-50). This second phase was a slight bank on the scarp edge, made with 'crossways timbers'; these 'outlines of carbonised wood' being evidence for possible timber lacing within the rampart or

[28] Subsequent excavations, such as watching briefs, have been carried out at the site, e.g. Thomas 1992.

the remains of a timber structure and parallels made with the Breiddin (Ellis 1993, 87). A date of 1260-837BC (HAR-4405) was from a sample lying on the surface of this rampart and provides a Terminus Ante Quem (TAQ), although it was also stated that this could have been taken from mature wood from earlier than the rampart construction (Ellis 1993, 85). The layer also revealed two Ewart Park bronzes and Late Bronze Age pottery (Ellis 1993, 22; 87). The rampart features were considered to date to the same period as a simple entranceway with no inturn and no accompanying ditch (Ellis 1993, 87).

Late Bronze Age pottery and Iron Age stony VCP were recorded within the next phase of rampart construction, Period 3A, alongside metalworking debris such as crucible and furnace lining fragments and in the upper layers, ironwork including a possible La Tène dagger (Ellis 1993, 26) and a swan-necked pin (*ibid.,* 53-54). This subsequent phase (Period 3A) was seen as a 'slight overlying bank' which contained VCP and ironwork, suggesting an Iron Age date. Samples for radiocarbon dating were not found, but the phase was thought to date to the same period as the steep sided ditch, a narrow entrance passage and a platform at said entrance, containing a cache of slingstones, which had later been altered with a possible hearth added, suggesting a 'guardchamber' (Ellis 1993, 87-89). The primary fill of the ditch revealed a radiocarbon date of 782-414BC (HAR-8102), taken from below Tower 7, which provides a latest date for the establishment of the ditch and by association the secondary bank and 'Period 3A', although no indication of the nature of the bank was found (Ellis 1993, 84-85, 87-89).

Later, a new rampart construction was found, using stone rubble, rather than the previously used sand, as the core of the timber framework in a cellular construction, possibly using a timber box frame, with an initial trenched front and a rear boulder revetment which may be evidence for a taller dry-stone wall originally having been in existence (Ellis 1993, 89). Postholes on top of this bank, a suggested timber palisade on top of the stone rampart although possibly secondary (Ellis 1993, 89), revealed radiocarbon dates of 750-166BC (HAR-6464), 728-171BC (HAR-6468), 770-231BC (HAR-6469), 755-210BC (HAR-6503) from one timber and 766-401BC (HAR-6465) from another. An associated displaced fragment also gave a radiocarbon date of 766-385BC (HAR-5609). These results date the timber palisade on top of the stone rampart between 728 and 401BC if agreed that they are

contemporary. Alongside an archaeomagnetic date of 400-200BC at 2 sigma (AML ref 873704-5) taken from two blocks of burnt sandstone within the rampart accepted as being *in situ* and the presence of VCP within the rampart (Ellis 1993, 85), the evidence correlates to dating the stone rampart and palisade to the Iron Age.

This third phase of rampart building and associated layers and features, Period 3B, revealed an Iron Age vessel which has been interpreted to be leather with copper alloy mounts (*ibid.* 31). A deposit representing a surface overlying the 'Iron Age' entrance track, containing Romano-British pottery, revealed a date of 745-183BC (HAR-6504) and although a date of 405-270calBC was calibrated from the sample in 1993 it may be assumed that due to hillwash this may still represent "*timber fragments from the Period 3B rampart upslope*" as suggested at the time of publication (Ellis 1993, 86).

In the ditch, also associated with this period, a sherd of Iron Age pottery was located in the deepest fill of the ditch terminal without any other pottery being present and therefore suggests an Iron Age period should be assignable except for the fact that a radiocarbon date from the same layer was dated to the Neolithic period (HAR-6462) and therefore must be disturbed (*ibid.* 32).

Two postholes in the outer ward revealed dates of 996-434BC (HAR-4401) and 734-111BC (HAR-4406), which demonstrate activity in this period but without association to other features their relevance is weakened.

4.1.2.2 Braich y Ddinas[29], Penmaenmawr, Conwy

A number of finds were recorded by the Cambrian Archaeological Association when it became clear that quarrying on the site would lead to destruction of the monument (Hughes 1912, 169). During the 1912 excavations, it was reported that an iron ring and a bronze pin and spring of a late La Tène brooch were discovered within two of the five 'huts', of varying design, excavated alongside other objects of indeterminate date and charcoal (Hughes 1912, 174-5). In a third hut ('Hut D'), a collection of pottery was discovered (Hughes 1912, 177-181) and CH Read from the British Museum identified all as being of being First Century AD Roman apart from one

[29] Often incorrectly spelled Braich y Dinas, without the correct Welsh mutation following 'y'

‘dark, rubbed surface’ sherd as being “*more or less contemporary with the brooch*” (Hughes 1912, 180).

Subsequent excavations of other ‘huts’ revealed a second iron ring and an iron nail (Hughes 1915, 25), a piece of Roman glass, a piece of jet (*ibid.*, 30), a “*long iron object…in numerous fragments*”, combined to a length of 14.5 inches (*ibid.*, 31), and a collection of bronze objects including part of a possible torc and the ring of a penannular brooch (*ibid.*, 34).

Following World War I, excavations continued and in 1921 a Romano-British silver bracelet was recovered during excavation of one of the ‘huts’, described as in the shape of a ‘convoluted snake’ upon examination by Mortimer Wheeler (Hughes 1922, 347). More corroded and unidentifiable iron objects were discovered (*ibid.*, 348-357), alongside two separate segments, from different ‘huts’ which have been interpreted as ‘armlets’ made of ‘rock’ (*ibid.*, 352).

In 1922, 35 ‘huts’ were excavated, and items recovered included half a small blue glass bead, a green bead and a fragment of red and yellow bead, a number of Denarii, fragments of pottery including Samian ware and 135 pieces of amphorae from more than one vessel together with a small fragment of patterned bronze plate with holes for attachment elsewhere (Hughes 1923a, 248-263).

There were also a number of spindle whorls and other domestic items found throughout the site (Hughes 1912; 1915; 1922; 1923a; 1923b).

In these early excavations, stratigraphy and context cannot be deciphered. The information and detail on the finds and features of the site are, however, incredibly important especially due to the site no longer being in existence. Without these excavations this information would have been lost forever.

Charcoal was collected during the excavations, but without information on provenance, the information gained from sampling would be extremely limited. From Hughes’ excavations there is certainly evidence of activity in the Roman period but whether the hillfort was in existence and/or use before then will remain a mystery.

4.1.2.3 The Breiddin, Powys

Both prehistoric and Romano-British artefacts were found during excavations of the Breiddin, ranging from stone hand axes to coarse pottery to fine metal work and a large number of samples eligible for radiocarbon dating (Musson et al 1991).

A collection of Bronze Age pottery and metalwork was found within a pre-rampart occupation layer at the 'Iron Age' entrance to the hillfort during O'Neil's 1930s excavations (Musson et al 1991, 9-10; 177). This included a socketed axe fragment and a fragment of a penannular bracelet with expanded terminal, typologically dateable to the later phases of the Late Bronze Age, predating the addition of the entrance inturn (*ibid*., 9; 137-138).

Much of the Bronze Age metalwork could be assigned to the 'Bronze Age' hillfort on stratigraphical grounds and said to date to between the Eighth and Seventh Centuries BC on typological grounds (Musson et al 1991, 178). Metallurgical analysis has suggested that most of the Late Bronze Age items were cast from scrap metal, originally derived from Ireland or France, and furnaces and moulds found on site would have been for this purpose and not for large-scale primary smelting, which was also suggested by the lack of large amounts of slag found on site (*ibid.*).

Around 2,000 sherds of probable Bronze Age pottery were found during the excavations and were found throughout the contexts including within pre-rampart deposits and within and beneath the rampart core (Musson et al 1991, 177).

The finds dating from the Iron Age, taken alongside radiocarbon dates, allowed Musson to suggest that for the time between the Late Bronze Age hillfort falling into disuse and the Iron Age occupation and, at some point, construction of a second phase of rampart, the hilltop was simply used for grazing (Musson et al 1991, 180). However, there are a number of instances where Late Bronze Age artefacts appear in what are classed as Iron Age contexts. With a number of occurrences of Late Bronze Age residual objects in later contexts, the question arises as to whether a gap could have occurred between the two phases and early artefacts still remain on site to be later used and/or brought back to the site. Late Bronze Age pottery was found within a posthole of 'six-post structure' S1, but charcoal also taken from its postpipes was dated to 330+/-70bc, now recalibrated to 748-198BC (HAR-1287); the

pottery being deemed residual (Musson et al 1991, 182). In addition, a Bronze Age blade and tip of a leaf-shaped sword were found in the packing of the 'Iron Age' four-poster F16 in the interior, the sword thought to be Ewart Park and the posthole generating a radiocarbon date of 294+/-40bc, now recalibrated to 395-204BC (BM-964). This posthole was later cut by another 'Iron Age' posthole containing a socketed spearhead, typologically dated to the Late Bronze Age (Musson et al 1991, 134). Rather than residual remains, it could be suggested that this was deliberate interment of the items, brought to the site when it was returned to, or that the site was never fully abandoned.

Remarkably, the collection of artefacts recovered from the hillfort includes a collection of wooden items found within Buckbean Pond on the interior (Musson et al 1991, 89-93; 163-172). Remains from the cistern cut within Buckbean Pond have been dated to the same period as the construction of the Iron Age rampart and also released evidence of the existence of beetles, indicative of human habitation and indoor conditions alongside arable cultivation at this time (*ibid*., 179).

Two other finds of note are a large piece of daub from the hillfort entrance which has cast the main wall-post or door-post and wattle, providing evidence for structural architecture of the hillfort (Musson et al 1991, 132) and a decayed fragment of human facial bone found incorporated within the initial rampart core (*ibid*., 23).

Five or possibly six Iron Age iron brooches were found, the most complete of which attributed to La Tène and all of which found within Iron Age contexts behind the Iron Age rampart (Musson et al 191, 141-144). Brooch 186 was found in four-poster F9, which cut through the deposit which produced brooches 184 and 185 (*ibid.*). Other pieces of iron work include a small length of rod found in a posthole of four-poster F11, cutting through the Iron Age deposits behind the rampart and the probable tang of a large knife from the edge of a posthole of four-poster F27 in the interior (*ibid.*).

Later Iron Age and early Romano-British dated objects and samples have not been identified. The latest Iron Age find is in the form of a La Tène decorated bronze ring and a blue glass bead, both of which could typologically date from around the First Century BC. However, the bead could have been dropped at a later stage, concurrent with the context in which it was found; above Romano-British occupation (Musson et al 1991, 180).

Two radiocarbon dates were acquired from underneath the rampart (Musson et al 1991, 195), which provide an earliest possible date for the building of the rampart. A series of bowl hearths underneath the rampart provided a radiocarbon date of 2134-1562BC (HAR-470) and a layer of soil taken from beneath the ramparts provided a date of 1427-1059BC (BM-885).

Upon excavation, the rampart itself was seen to have been built in two separate phases; the later rampart, having no trace of timberwork sat upon an earlier timber-laced rampart (Musson et al 1991, 17-54).

The initial, earlier rampart had a foundation gully placed at the front of the structure (Musson et al 1991, 26-28), post-sockets of which provided dates of 1113-807BC (BM-879) and 1107-802BC (HAR-1615) which suggests that the rampart was under construction between the 11th and Ninth Centuries BC.

Within the rampart core, which had evidence of a number of paired postholes running throughout (Musson et al 1991, 25), provided dates of 1035-571BC (HAR-1761), 1018-766BC (HAR-1615) and 996-816BC (BM-878). This earlier, initial rampart is thought to have been all of one phase following excavation (Musson et al 1991, 26-28) and therefore it can be suggested, using the three dates to provide one range, that the rampart was built between the 10th and Ninth Centuries, supporting the dating evidence taken from the foundation gully.

The later rampart, built on top of the original structure, revealed a band of stones within charcoal soil within its core at the rear (Musson et al 1991, 35-36) and provides a date for the rampart of 411BC-AD2 (QL-1080).

A number of roundhouses were excavated, but due to the multi-phase activity on site in the area of excavation, samples may have become contaminated with earlier and/or later activity (Musson et al 1991, 36-48).

The roundhouse labelled as R1, which sat behind the Iron Age rampart, was found to be multi-phase, timber built, with at least six phases of construction or repair. It measured up to 5m in diameter and comprised of wall gullies and stake holes. The material for radiocarbon dating was taken as a bulk sample from locations throughout the roundhouse and therefore may not be reliable. In addition, the date

for the wall-line and floor of R1 was calculated as 757-403BC (BM-881) and may also have been affected by the calibration curve.

Roundhouse R2 also provided a wide range of dates within the 95.4% confidence levels of 728-101BC (HAR-842) for its floor, hearth and wall gully. This structure was seen to have been built at least four times, ranging in size from 5m to 7m across comprising of timber walls and stake holes (Musson et al 1991, 38-39).

Roundhouse R3 similarly had at least three phases, ranging from 5-5.7m with multiple wall gullies, a clay floor and a central hearth with entrance on the eastern side (Musson et al 1991, 41). These features produced a radiocarbon date of 204-45BC (BM-1160). The ground it sat upon was levelled and placed against the rampart, so it could be said to be stratigraphically later than the Iron Age rampart and therefore providing a date by which the rampart must have been built. An undated four-post structure was found underneath R3 (*ibid.)*.

An occupation deposit stratigraphically later than R3 produced a date of 357-61BC and this itself was seen to be earlier than the four-post structures F4-F7, although none of these produced material for sampling (Musson et al 1991, 39-44).

Between the roundhouse and the rampart, an area of refuse had built up and this provided a date of 353-59BC (BM-1161). It contained artefacts including an iron ring and a bronze ring (Musson et al 1991, 39-44). These dates correlate with the dating evidence for the later, Iron Age rampart of Fifth - First Century BC, 411BC-AD2 (QL-1080) referred to above.

A bulked sample for dating was taken from roundhouse R8's porch postholes on its east-facing entrance and dated to 797-235BC (HAR-467) (Musson et al 1991, 62). A pit reported to be 'within' roundhouse R9, provides a date of 743-202BC (BM-963). These long date ranges, together with a lack of stratigraphical relationship between the pit and roundhouse R9 cannot add a great deal to the features' and site's interpretation.

A large number of four- and six-post structures were found on the Breiddin and these dated to different periods through both stratigraphy and radiocarbon dating. A phasing plan of these buildings has been suggested by Musson using this

information and a simple, conjectured typology of the structures through posthole size (Musson et al 1991, 74, 78 & figs 39 & 41).

With regard to the four- and six-post structures, some dates were taken from throughout the postholes and some were taken from what have been interpreted as ‘digging out pits’ at the time of removal and destruction of the structure (Musson et al 1991, 76-79).

The six-poster S1, overlaid by a later, undated, four-poster, was dated to 748-198BC (HAR-1287), the accuracy probably affected by the calibration curve. The sample was taken from the posthole but made up of hawthorn, ash and hazel, i.e. not structural timbers. The date of 748BC does, however, coincide with a piece of Bronze Age pottery found in similar nearby six-poster S2, which was seen to be petrologically similar to Late Bronze Age pottery found in the rampart (Musson et al 1991, 77).

A similarly wide-ranging date was found for the four-poster F41 with a date of 751-196BC (HAR-1286). Within this, it was suspected that the postholes had more than one period of use. The sample was taken from a ‘digging out pit’ and it was reported that this could not have been a date far removed from the extraction of the posts (Musson et al 1991, 79). This particular four-post structure was found to be larger than the other structures in area, measuring 3.9x3m across (*ibid.*).

A combined sample from four-posters in excavation area 3-4-5 gave a date of 397-51BC (HAR-468) and a posthole from which also revealed Bronze Age and sherds of Iron Age pottery (Musson et al 1991, 62-64). A similar date was found for four-poster F39 digging out pit (*ibid*., 77-79), producing a date of 396-46BC (HAR-1413).

A short date range of 395-204BC (BM-964) was sampled from a postpipe from four-poster F16 which overlapped the earlier, undated four-post structure of F17. The post-pipe of F16 was the only example where the post appeared to have been squared (Musson et al 1991, 63).

Four-post structure F33, producing a date of 393-57BC (BM-804), but from a sample not definitely *in situ*, was seen to be later than the undated roundhouse of R13, overlying its wall gully, but in this area of the site, in particular, there was little evidence the phasing of the distributions of the two structures. The only certain

conclusions were that one or more of the roundhouses in the area must have been out of use at one time and that only two of them, R9 and R14, both undated, showing any evidence of continuous existence (Musson et al 1991, 64). A similar situation is seen with the possible incomplete four-poster F29 and roundhouse R11, where the layout of the structures shows that the two cannot have been contemporary. A date of 170 ± 70 bc, recalibrated to 363BC-AD5 (HAR-469) came from the post-pipes of F29 but R11 was undated (*ibid*., 62-63).

Some of the postholes for a series of four-post structures located near to the rampart, including those of F13, were found at the very top of Iron Age deposits and so they have been assigned as a group to a later period of the underlying, undated roundhouse of R5. Three of the post-pipes of F13 produced a combined date of 356-39BC, but, once again, they were not definitely in-situ timbers (Musson et al 1991, 44-47). Others were found within and below Bronze Age occupation layers, but were undated (*ibid*., 30-32).

The four-post structure F49 was seen to post-date four-poster F48 and pre-date F50 (Musson et al 1991, 77). The initial structure had what was described as ‘unusually small’ postholes, similar in size to the six-post structures (Musson et al 1991, 79), assigned in the conjectural phasing plan as the earliest structures, found with Bronze Age pottery. F49 itself produced pieces of Iron Age vesicular pottery in its digging out pit (Musson et al 1991, 79) as well as the radiocarbon date of 355BC-AD125 (HAR-1617), corresponding with the artefactual and stratigraphical evidence and the posthole typology tentatively suggested by Musson in the excavation report (Musson et al 1991, 78, fig 41).

4.1.2.4 Bryn y Castell, Gwynedd

Bryn y Castell has gained recognition for its metalworking activity evidence. Slag deposits within ‘Structure 1’, a stone-built roundhouse, referred to as ‘the snail’ due to its spiral shape, were dated to 194BC-AD208 (HAR-4855) and 363BC-AD5 (HAR-4856). The structure abuts and, therefore, is assumed to post-date the rampart, see Figure 3.12.

Stake holes and a hearth from a round structure ‘Structure 0’, pre-dating Structure 1, were dated to 411BC-AD51 (HAR-6234). Structure 0 also appears to respect the line of the rampart, so it may be contemporary or later.

Although ‘finds’ were not plentiful during excavations, a major discovery at the site was the presence of two stake wall roundhouses. These were the first of their kind to be discovered in north west Wales; the nearest other examples being located much further east at Moel y Gaer Rhosesmor, Flintshire and the Breiddin, Powys (Crew 1985, 22-23).

4.1.2.5 Castell Caer Seion, Conwy

The hillfort of Castell Caer Seion on Conwy Mountain was excavated in 1951-2 and the results of this were re-examined and parts of the trenches re-excavated in 2012 (Smith 2012). No pottery or other dateable items were found in the 1950s excavation, but the absence of any Romano British material found was interpreted that the hillfort was occupied earlier and abandoned by the time of the Roman occupation of north Wales (Smith 2012, 8).

Although no dateable artefacts were found in the 2012 excavation either, material for radiocarbon dating was recovered (Smith et al 2012, 9-10).

Three samples have been published with associated context. Firstly, a sample found underneath the interior ‘floating’ earthen rampart sitting to the right, east, of the smaller stone enclosure, within the larger enclosure was dated to 751-401BC (Beta-250542). Secondly, a sample taken from a posthole, possibly from a roundhouse, which lay under the bank was dated to 511-214BC (Beta-250543).

The third sample which has been dated, came from a sample under the wall of and predating Hut 4, but later than the wall of the smaller stone enclosure’s inner rampart (Smith et al 2012, 9). This was dated to 393-204BC (Beta-254607) and indicates that the wall was in place when the roundhouse was built and provides a date for when the small fort was in use.

4.1.2.6 Dinorben, Conwy

Prior to its destruction by quarrying, Dinorben hillfort was excavated by Gardner in the early 20th Century, along with Savory in the 1950s and 60s (Gardner & Savory

1964; Savory 1971a; 1971b) and by CPAT between 1977 and 1978 (Guilbert 1977b; 1978c; 1979c; 1979d; 1979e; 1979f; 1980) and radiocarbon dates were retrieved for all but Gardner's excavations. However, Savory's inconsistent interpretation of the site and context of the radiocarbon samples cast doubt on his conclusions (Alcock 1972) and therefore the context of some of the samples and suggested phasing have been treated with caution. For where descriptions are preceded with words such as 'possibly' with no further explanation as to context, such as V-122 and V-125, the relevance of the dates has been lost. It was stated that the chief challenge of the CPAT excavations was to resolve the issues posed by Alcock in his review of Savory's interpretation (Guilbert 1980, 336).

A number of artefacts from prehistory, Roman and medieval periods were discovered at Dinorben hillfort. Perhaps the most celebrated are, in fact, from the slope beneath the enclosure, which make up a collection of bronze horse bridal ornaments such as jangles and harnesses dating from the Bronze Age. However, due to the location of their discovery, the activity which led to the discarding of the bronze ornamentation cannot be linked with the hillfort directly. These items present early evidence for the importance and significance of the horse as a status symbol in prehistory, these particular items dating to the Ninth Century BC, of French Urnfield origin (Davies & Lynch 2000, 178). In addition, at the hillfort itself, an unstratified fragment of an enamelled harness or fitting was discovered during excavations and although recorded without context, the decoration can be dated to around the time of the Roman conquest (Savory 1971b, 42).

Many other artefacts were discovered during the excavation of the hillfort which can lead to interpretation at the site. 251 Roman coins were excavated by Gardner and Savory and all of these were reported to "*cover the century centring on 300*" (Savory 1971b, 33). A lack of coins found from the early Third Century or earlier led them to suggest that a coin-using occupation did not exist until the later periods (Gardner & Savory 1964, 114; Savory 1971b, 33). Late Third and Fourth Century AD bracelets were also found at the site along with a number of metal items which cannot be typologically dated to a specific period (Gardner & Savory 1964; Savory 1971b). Activity at the site during the first two centuries AD are represented by the discovery of bow brooches, one of which was a trumpet brooch found "*above the floor of Hut 4*" (Gardner & Savory 1964, 134-5).

Three ring-headed pins, two iron and one bronze, were found during excavations at Dinorben by 1964 (Gardner & Savory 1964, 131-132) and the head of a fourth, iron, ring-headed pin discovered later although deriving from a box of finds from an earlier excavation at Dinorben in the 19th Century (Savory 1971b, 51). This discovery was dated to the 'Early Iron Age', but without clear locational information (*ibid.*). The three other pins were all found within huts and appear to have been located in undisturbed stratigraphy (Gardner & Savory 1964, 132) and dating to 'Iron Age A' by Savory (*ibid*., 131-132).

Evidence for three bronze cup-headed pins were reported to be found by 1971, with the terminal containing red enamel or green glass, compared in type to the iron cup-headed pin found on Moel Hiraddug, although the latter's compartment was divided into two halves (Savory 1971b, 43). The smallest of the three was found on surface rubble, one from the primary deposit of 'Hut 19', later described as a 'hut hollow', which has subsequently been interpreted as a working area (Guilbert 1979f), and the other picked up by a quarry worker from the spoil from the same deposit (*ibid.*). It was suggested that these two pins dated from no later than 200BC (*ibid.* 43-44).

An antler item thought to have been a component of a stringed instrument, possibly a lyre, was found in the lower-hearth of Hut 3, stratigraphically indicating an Iron Age 'A' date for its provenance, according to Savory (Gardner & Savory 1964, 169-70). As at Moel Hiraddug, although plain, an antler piece thought to be a gaming piece was discovered in a layer also containing Romano-British material (Gardner & Savory 1964, 170).

Although undated, a number of fragmentary human remains were discovered at Dinorben. These included two 'dismembered' male skeletons "*found together at the bottom of the ditch at the northern end"*, a fragmentary male skeleton "*assigned to the north ditch"* (Gardner & Savory 1964, 211), a female skeleton and an infant "*found together on the steep northern slope of the [outer] rampart to the north of the ditch"* (*ibid*., 45). A fragment of lower jaw was found on the road surface of the south east entrance, fragments of cranium in a number of hut floors and a fragment of skull within one of the guardchambers in the main entrance (*ibid*., 221).

Two penannular brooches were found, one of iron found within an occupation layer of Hut 16 and dated to the Early Iron Age and the other made of bronze, dated to the

Late Iron Age and found "*in the occupation layer behind the main rampart…*" (Gardner & Savory 1964, 132-34).

An iron-tanged arrowhead was found on the top of the foundation of Savory's 'Period III-IV' rampart (Savory 1971b, 49-50), following a similar one found earlier but unconnected with a feature and thought to be Roman (Gardner & Savory 1964, 157). Elsewhere, in the body of the north east rampart, three small square bronze plaques were discovered and have been dated to Early Iron Age (*ibid*., 149).

Described as "*the most interesting and significant objects found at Dinorben*", two ox-head escutcheons, interpreted to have come from the handles of ceremonial stave-built pails, were found in 1912 and 1956 and although difficult to date, are thought to resemble others from the Roman period (Gardner & Savory 1964, 144).

A number of artefacts described as 'military equipment' or weapons were found during excavations of Dinorben, and all identified as Roman, connected with the later phase of occupation at the site and many of which found along the line of the north west rampart (Gardner & Savory 1964, 155). This leads to a tempting suggestion that the items could have been lost in connections with an attack upon the hillfort, but an alternative suggestion is that they were scrap metal which had worked its way down the site and collected at the bottom of the slope of the rampart (*ibid*., 157).

The items found at Dinorben shed light on life at the site throughout a range of periods, but it must be noted that their re-interpretation is needed with dedicated study of the excavation reports, notes and plans and re-examination of the finds. This will aid analysis of whether provenance is possible and if contexts can be relatively dated following fifty years of archaeological advancement with regards to identification and scientific dating techniques. This is especially evident with regards to the possible early pottery found on site (Gardner & Savory 1964, 192-196; Savory 1971b, 58-60) which, with further identification and reference to contexts, could shed light on the date of features.

This appears to have been the case during the excavations of the site during the 1970s where worked flint, 30 small sherds of prehistoric pottery, slag and charcoal were found within a soil layer which underlay Bank 1, the innermost earthwork, but spread downslope and continued above Ditch 1, possibly post-dating the slots

interpreted as possible, multiple, palisade trenches (Guilbert 1979f, 186). The pottery found was reported to have been sent for petrographical analysis (*ibid.) but* described as "*coarse prehistoric pottery*" (Guilbert 1977b, 19).

Later, overlying Bank 1 and its later addition of width between dry-stone walls, a thin deposit of rubble was added to the feature containing Second to Fourth Century AD Romano-British potsherds (Guilbert 1977b, 19; Guilbert 1979f, 186). In addition, in 1980 trial excavations outside of the by-then-destroyed hillfort were undertaken and it was found that a 'meandering' boundary bank which followed the ridge to the south of the hillfort may date into antiquity when a number of Romano-British pottery sherds were found, ranging from Second to Fourth Century AD in date (Guilbert 1981d, 39). Within the interior, an assemblage of Fourth Century AD potsherds was discovered high in the fill of a posthole of one of four four-post structures, providing a TPQ for the structures, all apparently aligned and assumed contemporary (Guilbert 1979f, 187).

Charcoal was dated to 1381-843BC (V-123) underlying 'rampart of Period I'- the inner timber-laced stone-revetted rampart (Savory 1971a, 252). CPAT produced a date of 772-413BC (CAR-167) from the pre-rampart horizon, also taken from the inner defences area (Guilbert 1980, 336), demonstrating that the initial rampart was built after 772BC.

At least three palisade structures, seen from 'slots' and Ditch 1 pre-date the initial rampart found on site (Guilbert 1977b, 19; 1979f, 186). The square-sided ditch's fill, found by CPAT, was dated to 795-428BC (CAR-128). A radiocarbon date was recalibrated to 1006-537BC (V-204), found by Savory in the upper fill of 'ditch D', (Savory 1971b, 76).

Following this, a scoop was dug, thought to be for the initial rampart's material, of which the timber material was dated to between 750 and 409BC (CAR-122, CAR-121, CAR-120, CAR-119). This suggests a construction date for the initial rampart (Bank 1) if assumed contemporary. Bank 1 was shown to be multi-phase, initially at least a 2-metre-wide timber-framed bank with timber-laced clay and rubble core revetted front and back in stone.

Savory also retrieved dates for the rampart, although thought it to be from the rampart's second phase when it was enlarged. Savory describes (V-175) as being from a piece of charred timber embedded in the inner foot of the lime-heap "*derived from Period II dry-stone revetted rampart*", described as being built after the destruction of the initial Period I rampart (Savory 1971a, 254), and dates to 361BC – AD53. V-124 and V-176 are also described to have come from the timber-lacing of Period II dating to 792-411BC and 765-236BC respectively.

Following the initial radiocarbon dating calibration of these samples by Savory, the three dates were seen to be not statistically distinguishable from each other. Savory suggested that this may be due to later disturbance of the lime-heap for the first sample of V-175 (Savory 1971a, 256). The recalibration of these dates still demonstrates this difference and Savory's interpretation holds. However, upon excavation by CPAT, the *initial* rampart was found to be dry-stone revetted. This could suggest that the evidence for the wooden structure Savory had thought to be revetment for the initial rampart could even have been one of the since-discovered early palisade slots. This would therefore mean that V-124 and V-176 are, in fact, for Period I, accompanying and complimenting the dates subsequently recorded by CPAT in sample CAR-128.

After the initial rampart was erected, Platform 38 was built, which showed no signs of a structure but cut into the scoop which had provided material for the rampart. Subsequently, material on the platform was burnt providing a radiocarbon date of between 753 and 402BC (CAR-123 and CAR-124). The rampart was enlarged to measure 7m between dry-stone revetments and incorporated back terracing but yielded no material for sampling (Guilbert 1977b, 19).

CPAT reported that the outer rampart 'Bank 2' and Ditches 2 and 3 were divorced stratigraphically from the inner defences but it was indicated that Bank 2 had been built in dump style from the spoils from digging out Ditch 3 (Guilbert 1977b, 19). Savory reported that through stratigraphy, it could be seen that the outer rampart was built after the inner rampart within his section (Savory 1971a, 255 fig 1).

A quarried area lay beneath Bank 2 (Guilbert 1977b, 19) and produced two complimentary dates of 378-56BC (CAR-131) and 341BC-AD74 (CAR-132). Bank 2 overlay the silt fill of this quarried area (Guilbert 1977b, 19) and the radiocarbon date

therefore determines that Bank 2 could not have been erected before 341BC. The fill of Ditch 2 was radiocarbon dated to AD84-335 (CAR-133) and three sequential fills of Ditch 3 were dated to 44BC-234AD (CAR-129), AD428-655 and AD259-606 (CAR-130 and CAR-203) and AD405-605 (CAR-204).

A hearth on platform number 39 which had housed a small stake-built structure (Guilbert 1979, 188), dated to 538-198BC (CAR-125) and a pit in the interior dated to between 728-201BC (CAR-126).

In addition, a series of possible four-post structures were found and interpreted to have a TPQ of the Fourth Century AD at the earliest through potsherds dating to the late Roman period found high in the fill of one of the postholes (Guilbert 1979f, 187-88).

4.1.2.7 Eddisbury, Cheshire

In recent years, a number of excavations have taken place at Eddisbury hillfort, by Cheshire County Council and Liverpool University. Upon their reports' completion and publication, additional information can be added to that below.

The hillfort was excavated by Varley in the 1930s and a cobbled surface, overlain by "Iron Age A2 material", roughly the La Tène II period, ash, bone and a broken bronze pin was found within the hillfort, which appeared to be contemporary with the initial rampart at the site (OAN 2008, 29). This information suggests a TPQ of around 200-100BC for the initial rampart structure (*ibid.*, 30). However, contradictions within Varley's reports on the hillfort, including within text and drawings, lead to confusion as to which rampart he was referring to. Varley reported Eddisbury to be originally a univallate hillfort consisting of the inner rampart and a ditch (Varley 1950, 28; 53), but he also refers to "an initial outer rampart" (*ibid*., 24). It is possible that Varley was suggesting that the inner rampart had been accompanied by a counterscarp bank, as Garner now suggests (Garner 2012b, 37), but due to the nature of Varley's phasing being unclear, and therefore the location of his finds being untraceable, the original artefactual dating evidence cannot be used with accuracy.

Varley also uncovered Romano-British ware within infilled ditches and the guardchambers and this led him to believe that the second phase of the hillfort was constructed during the First Century AD (Garner 2012b, 32). The presence of the

pottery may signify the time that the hillfort was destroyed or fell out of use. This may also be evident in the southern guardroom in the eastern entrance, which was subject to burning and which may indicate the destruction of the guardchamber (*ibid*., 30).

This southern guardroom in the eastern entrance located within the inner rampart was subject to burning between 359-169BC (NZA-36592). A pre-feature layer has been dated to 771-515BC (NZA-36648) and so it can be assumed that the guardchamber was built at some point between 771-169BC. The entrance underwent at least one period of modification (Varley 1950, 29; Garner 2012b, 30) and I have suggested above (see chapter 3) that the fire damage may have been the reason behind, or a by-product of, the remodelling of the guardchamber. The layer of burnt material was found within an unexcavated section of the guardchamber which I suggest is part of the earlier sub-circular structure predating its conversion into a sub-rectangular feature. Therefore, it can be suggested that a guardchamber was in existence 771-169BC, but at some point, between 359 and 169BC, it was burned and remodelled.

From draft publications of the more recent excavation reports, a pre-rampart occupation layer in Trench 7 has been dated to 771-431BC (NZA-36648) by association, providing a TPQ of 771BC for the inner rampart at Eddisbury. Through OSL, an early hilltop enclosure by timber palisade and counterscarp bank has been dated to 2560+/-25BP (Garner 2012b, 20) which corresponds to 635-585BC. Following the construction of the inner rampart, secondary deposits were added to the feature and when sampled dated to 396-210BC (NZA-36593). The inner ditch, initially cut in segments and probably quarrying material for the bank, was re-cut, likely to affect the outer rampart, at some time before 209BC with a period of prolonged silting occurring between 397-209BC (*ibid*., 37).

A pre-rampart occupation layer in Trench 14 provides a date range for the building of the outer rampart of 739-515BC (Beta-317521), offering a TPQ of 739BC for the outer rampart and by association the outer ditch. The ditch had begun to fill in by sometime between 392-209BC (NZA-36654) and this provides a TAQ for the ditch itself and, by association, the outer rampart of 209BC. The outer ditch was re-cut and had begun to fill by AD4-131 (Beta-319724).

The date of the outer rampart and ditch having been built some time before 392-209BC, could suggest that it is contemporary with the enlargement of the inner rampart dated to 396-210BC and it has been suggested that the initial outer rampart could have acted as a counterscarp bank before being increased in size and the outer ditch cut (Garner 2012b, 37).

4.1.2.8 Helsby, Cheshire

A deposit sealed beneath the rampart core material provided a very early date for Helsby hillfort at 3945-3788BC (NZA-35504), demonstrating early pre-rampart activity on the hill.

After the rampart had been built, a number of colluvial deposits built up against the side of the structure, which have been suggested as providing dates and ultimately a date for the hillfort's rampart (Garner, D. 2011. Paper to Bronze Age Forum, 25 November). An early date of 1207-1055BC (NZA-35493) was produced for a deposit against the primary stone rampart (Garner 2011, 34), but it is possible that these colluvial deposits include hillwash from elsewhere on the hilltop containing earlier deposits than the rampart's origins (Waddington, K. 2011. Conversation with Erin Lloyd Jones, 25 November).

Following the formation of the silts, evidence was seen for partial rebuilding of the rampart with a stone retaining wall and the erection of a wooden post (Garner 2011, 34). The secondary fill of this posthole provided two dates of 203-94BC (NZA-35496) and 196-53BC (NZA-35632), highlighting that the rebuild had occurred and the posthole would have been filled by 94BC at the latest. The foundation cut for the retaining wall was reported to cut upper colluvial deposits (Garner 2011, 38), dated to AD392-533 (NZA-35494) highlighting much later activity at the site in addition to its early beginnings. A secondary fill of a rock-cut slot provided a date of 405-264BC (NZA-35495). At present these results and the phasing appears confused and unclear. Additional information and interpretation will be achievable following the full publication of Garner's excavation results (Garner, forthcoming).

4.1.2.9 Kelsborrow, Cheshire

Similarly, a bronze palstave axe was found on Kelsborrow hillfort in Cheshire, and although it was found in 1810, it has no accurate provenance (Garner 2012a, 27).

During excavations at the site by Cheshire West and Chester Council's Habitats and Hillforts, samples were taken for radiocarbon dating (Garner, forthcoming). Once published, these dates will provide further details for activity at the site.

4.1.2.10 Llanymynech, Powys and Shropshire

At Llanymynech hillfort although four radiocarbon dates were processed, only two of them appear to be accompanied by useful descriptions of their context in the available literature.

A bowl-hearth behind the inner rampart was dated to between 204BC and AD130 (CAR-534) and a pit behind the inner rampart was dated to 384-52BC (CAR-535), both of which were shown to post-date the inner rampart by stratigraphy (Musson & Northover 1989, 18, fig 2) and therefore giving a TAQ for the hillfort's innermost rampart on the eastern side.

Two dates published in Archaeology in Wales following an excavation by CPAT assisted by Lampeter University, produced dates of 10566-9670BC (CAR-1354) and 733-176BC (CAR-1353) and were described to have been taken from "*peat deposits revealed from within the defences of the hillfort… obtained from samples taken from two points within the sequence*" (Martin 2012) indicating, if nothing else, a long period of peat formation on the hill.

During a watching brief at the time of the construction of a machinery store and a greenkeeper's office on the golf course, which lies within the hillfort, human bone fragments of a child of around seven years old were found including cranial fragments, two rib fragments and one pelvic fragment, radiocarbon dated to 2375 +/- 75 BP (OXA-6824) subsequently calibrated to 770-370BC at 95% confidence (Owen 1997, 61-62). This provides a date for human burial within the hillfort, but with very limited information regarding context.

4.1.2.11 Llwyn Bryn Dinas, Powys

The hillfort of Llwyn Bryn Dinas was excavated in the 1950s and 1983 (Musson et al 1992, 265). An area across the ramparts, where a modern track ran through the feature, was opened in reaction to planning consent for the construction of an official farm track through the hillfort (*ibid.* 264-267). Alongside charcoal representing timbers deposited around the time of rampart construction, which were radiocarbon

dated, a piece of possible Late Bronze Age pottery was found sitting on the surface of the pre-rampart soil and a second piece of coarse pottery was found within a thin turf line which sat above the surface of the pre-rampart layer. Both of these have been interpreted to resemble the Late Bronze Age pottery found at the Breiddin hillfort (*ibid*., 267). Samples from pre-rampart deposits were dated to 1075-798BC (CAR-803) and 996-797BC (CAR- 802).

No dating evidence was found for the first phase of the rampart (termed 'Rampart X') (Musson et al 1992, 267-9). However, an area of metalworking activity was found behind and cut through the tail of this initial rampart. Charcoal samples for radiocarbon dating were dated to 382-41BC (CAR-708). Two sherds of Iron Age vesicular pottery, compared in type to material found at the Breiddin dated from the Third Century BC, were also found amongst other metallurgical finds such as four items of iron including a pin, a copper alloy ring-headed pin, and numerous crucible fragments (Musson et al 1992, 268). Possible anvil and forge sites were discovered, and, in addition, a series of bowl hearths revealed items including three iron objects of a pin originally decorated with a tin disc, a possible awl and a thin bar (*ibid.*, 269). These deposits were covered during a second phase of rampart building (*ibid.*).

The secondary phase of rampart ('Rampart Y') contained coarse pottery, briquetage or stony VCP, charcoal, metal working debris, suggesting that material had been quarried from metalworking deposits beyond the confines of the trench (Musson et al 1992, 269). Charcoal from the body of this secondary rampart phase dated to 401-63BC (CAR-800). The rampart also overlaid the metalworking section cut into Rampart X, providing a date. Accumulations behind the rampart contained Iron Age briquetage and occupation debris, suggesting that the hillfort remained in occupation during this time (*ibid.*, 270).

The rampart was added to for a third phase ('Rampart Z') by deposits to the rear of the structure which included, again, briquetage and charcoal which dated this final phase to the pre-Roman Iron age (Musson et al 1992, 270). Occupation soil partially sealing the dumped material of this rampart was dated to 357BC-AD25 (CAR-798).

In total, 71 crucible fragments were found, representing a minimum of five vessels (Musson et al 1992, 272) and their form was compared to a similar, but smaller, crucible found at Old Oswestry which pre-dated the bivallation of the hillfort and was,

therefore, possibly quite early in date (Musson et al 1992, 274; Hughes 1994); later Iron Age crucibles found elsewhere are of different form and have evidence of slightly different use when heating (Musson et al 1992, 279). Copper analysis suggested that copper was smelted on site but not produced (*ibid*., 275). A single piece of pure copper found on one of the crucibles was described as 'remarkable' due to it being "*the first from a British prehistoric context, and of likely British origin, to show inclusions of iron in the microstructure*" (*ibid*.). Crucibles have been found at Old Oswestry (Hughes 1994, 75-79) and Llwyn Bryn Dinas and a distinctive zinc-impurity within north Powys has been identified (Musson et al 1992, 179). This suggests a specific community of metalworking and trade within this small area and a call for further investigation into metalworking during the later prehistoric period in this area.

4.1.2.12 Maiden Castle, Bickerton Hill, Cheshire

During Varley's excavations of the main entranceway at the northern end of Maiden Castle on Bickerton Hill in Cheshire, 'relics' were found on an occupation layer within the possible southern 'guard hut', beneath an area of collapse. A prehistoric potsherd and associated iron objects were included in these finds (Varley 1936a, 105). This layer has been interpreted to be Late Iron Age (OAN 2008, 71). Varley concluded that the absence of Roman finds during the excavations suggested that the development of the hillfort took place before the Roman occupation (*ibid.*, 106).

Apart from samples for radiocarbon dating, it is not clear whether any artefactual evidence was uncovered in later excavations by Taylor in the 1980s (Taylor 1980/81). A number of samples from Maiden Castle were radiocarbon dated but sourcing the nature of their contexts is an issue, due to only letters and lab reports being available within the Cheshire HER (Taylor 1980/81; 1993; Miln 1994; Pearson undated), the context of the samples either not being available or, potentially, not in existence. From the letters, lab reports and reference within one publication (Jope 1986), the following information can be deduced:

The south entrance in the outer rampart was excavated by J.J. Taylor and produced dates of 767-402BC (UB-2615) and 366BC-AD2 (UB-2614), context unknown (Pearson undated). The northern inner rampart was excavated by J.J. Taylor (Pearson undated) and produced three dates; 998-431BC (UB-2619), 774-205BC

(UB-2618) and 755-210BC (UB-2617). Unfortunately, without context, this provides only limited information about the site's phasing and history.

However, other excavations and samples sent for radiocarbon dating by J.J. Taylor have left a more substantial paper trail and can be traced to "*burnt wood from the outer rampart on south western end of the ramparts, immediately south and downslope from the summit of the rampart*" and appear to show the discovery of an earlier entranceway (Taylor 1980/81; Taylor 1993). The four dates from these samples, two of which being re-run samples, date the outer rampart from the Sixth to the Fourth Century BC with dates of 400-260BC (UB-2725 No2), 405-383BC (UB-2725 sample 2 re-run), 537-407BC (UB-2725 sample 3b re-run) and 538-406BC (UB-2727 No3). Once again, further context would have aided interpretation of these dates and whether or not this indicates a multi-phase rampart.

Other chance finds include two barbed and tanged flint arrowheads found to the north east of the fort and a possible borer found close to the entranceway, suggesting activity at the site during the Bronze Age (OAN 2008, 67).

4.1.2.13 Moel y Gaer Llantysilio, Denbighshire

Three dates were produced from the small excavation of two roundhouses at Moel y Gaer Llantysilio (Grant & Jones 2013).

An occupation deposit pre-dating 'Roundhouse 1' (Grant & Jones 2013, 49) dated to 345-51BC (SUERC-43982) and the fill of Roundhouse 1's drip gully (Grant & Jones 2013, 50) was dated to 360-171BC (SUERC-43981).

'Roundhouse 2' was sealed by an occupation deposit dating to 386-205BC (SUERC-43983) and is stratigraphically later than Roundhouse 1 as the northern arc of the gully surrounding Roundhouse 1 sits beneath the raised platform of Roundhouse 2 (Grant & Jones 2013, 52).

These dates provide a TPQ for both roundhouses of 345BC and a TAQ of 205BC and so therefore they can be seen to both date to the mid-Fourth to Third Centuries BC.

4.1.2.14 Moel y Gaer Rhosesmor, Flintshire

Although there are only a few references to artefactual finds in the published data on the Moel y Gaer Rhosesmor excavations, Guilbert notes that "*finger impressed early Iron Age pottery"* was seen to be in use during the first and the last phases of occupation at the site (Guilbert 1973a, 24). Potsherds are reported to be found in the 'yards' during the final occupation layers (Guilbert 1976b, 304) and later the pottery finds at Moel y Gaer Rhosesmor are described to have 'little variation' throughout the occupation of the site (*ibid.*, 305; 316).

The acidity of the soil at Moel y Gaer Rhosesmor lends itself to the explanation for the lack of metalwork found on the hilltop (Guilbert 1976b, 316), but a small bronze stud, assigned to the Late Bronze Age, was found lodged between stones of 'Rampart B' and therefore out of contact with the acidic soil (Guilbert 1975b, 115).

In addition, a dozen flint arrowheads, suggested as being Early Bronze Age and associated with the pre-rampart layer, were reported but without context (Guilbert 1974a, 14).

The pre-rampart settlement at Moel y Gaer Rhosesmor can be dated by post-ring roundhouses being present between 892-388BC (HAR-1197, HAR-606, HAR-1126, HAR 1196) and at least one of these structures having a TPQ of 780-388 (HAR-1196). During this 'phase' the post-ring roundhouses ground plans overlap in some areas and not in others therefore causing Guilbert to suggest that this shows the gradual growth of the settlement (Guilbert 1975c, 203), sometime between 892 and 388BC.

By association, the post-ring roundhouse sealed by Rampart A provides a date of 891-431 (HAR-606) and an earliest possible date for the building of the rampart, assigned to Phase 2 of the site. The date of 820-408 (HAR-604) provides the date of the rampart being built; the sample having been taken from the foundation trench. As Phase 1 pre-dates the building of the rampart, if it is assumed that all of the post-ring roundhouses are of the same (general) phase/era, the range of dates could be reduced further to 780-408BC for this 'gradual growth' of an initial palisaded enclosure post-ring roundhouse settlement on the hilltop, see Figure 3.7.

Following a foundation trench being dug by around 408BC (HAR-604), a date of 401-63BC was attained from the core of Rampart A (HAR-1122). Rampart A has been associated with Phase 2 of the site which features stake wall roundhouses and four-post structures (Guilbert 1975c, 205). One four-post structure has been dated to 536-209BC (SRR-494) and a stake wall roundhouse dated to 840-197BC (HAR-1125).

The removal of a post of a four-post structure has been dated to 769-263 (HAR-1294) and a four-poster sealed by Rampart B of Phase 3 dating to 397-51BC (HAR-603). These dates allow a date range of 401-263BC to be initially suggested for Phase 2 settlement if the assumption is made that the four-post structures were not regularly replaced. Assuming that the stake wall roundhouses and four-post structures were established at a similar time to Rampart A, a date of 401-51BC for activity during Phase 2, before being sealed by Rampart B in Phase 3, can be proposed.

This could be assumed due to the layout of the site suggested as having a 'planned interior' (Guilbert 1975c). Taking into account the gap of 7 years between the latest date of the foundation trench of Rampart A and the earliest date of the core of Rampart A, it may be assumed that a) the radiocarbon dating methods are subject to only 95% accuracy and therefore dates cannot be assumed to be 100% accurate and/or b) Rampart A itself was built over a number of years, suggested by Guilbert in his interim report, albeit with no time-frame insinuated; "*the coursed masonry was built up progressively as the rampart was heightened and headers were frequently employed in order to key the facing into the rampart core*" (Guilbert 1975b, 110). If one can assume that the foundation trench for the rampart was in existence before the commencement of the building of the rampart proper, the layout of the site and its buildings could easily have been established prior to the building of the rampart yet in-keeping with the plan, due to the knowledge of where the boundaries would lie set by the foundation trench.

4.1.2.15 Old Oswestry, Shropshire

Similarly, for the excavations at Old Oswestry hillfort by Varley between 1939 and 1940, the report on the excavations were never published until re-examined later,

after Varley's death (Hughes 1994). The context record for the majority of the finds did not survive and therefore the provenance has been lost (*ibid*., 64).

Dateable artefacts found included a collection of Early Iron Age pottery and four fine ware bowls, stone implements and stony VCP (Hughes 1994, 69-70) but no radiocarbon dating evidence.

A small pottery crucible was found, attributed to 'Period 1' and through investigation of the type and its contents has been attributed to early La Tène, around the Fifth to Third Centuries BC and possibly earlier (Hughes 1994, 75-79). Period 1 activity at Old Oswestry was seen to have evidence for a feature interpreted as a possible palisade trench, as seen at other sites in the surrounding area such as Moel y Gaer Rhosesmor and Dinorben (*ibid*., 81).

Period 2 at the site, attributed to the Early Iron Age, is represented by an inner stone-revetted rampart with no evidence for timber revetment, compared with the Breiddin's Iron Age rampart and Moel Hiraddug by Hughes (1994, 84). In addition, the site's 'Period 2' saw what were described as 'stone kerbed roundhouses', set in gullies, features of which were again compared to similar features at the Breiddin and Moel y Gaer Rhosesmor (*ibid.*). Early Iron Age pottery and four fine ware bowls were noted as "*the most significant pottery found at this site*", showing classic examples of variation of the type which became popular in around the Seventh Century BC and unusual to be found so far from Wiltshire, which may suggest long-distance trade (*ibid*., 69-70).

Following the abandonment of the 'stone-kerbed roundhouses', Period 3 sees the entranceway being altered to include an inturned entranceway and additions to the ramparts (Hughes 1994, 85).

Stony VCP, or Cheshire salt containers, found at the site were determined to have been from Varley's' "Period 4", stated as of "*at latest pre-Roman Iron Age date*" (Hughes 1994, 72). Hughes states that this is significant, as this evidence concurs with previous findings from similar sites which show that the use of containers such as these to transport Cheshire salt did not continue beyond the First Century AD, even though Roman production of salt at the origin sites continued (*ibid*., 73). Period 4/5 saw the final phase of rampart construction in a glacis-style, this style also being

adopted at the Wrekin and Dinorben, and the construction of stone-founded circular huts, the footings of which was where the Stony VCP was found. However, the artefacts dating to this period were stated to come from a 'considerably' disturbed context so must be treated with caution (*ibid*., 64; 86).

4.1.2.16 Pendinas Llandygai, Gwynedd

Two dates were obtained for the rampart at Pendinas in Llandygai. The date of 1222-827BC (HAR-1671) was produced from a sample taken from the 'variegated series of tips forming the foundation of the rampart' (White 1977, 14) and a date of 353BC-AD79 (HAR-1672) from the 'vitrified core' of a full section of the rampart (White 1977, 14). The rampart was built in one phase, apart from a later undated dump of vitrified material on top. The earlier dated material formed a foundation or levelling for the rampart and was made up of material previously burnt in the Bronze Age.

4.1.2.17 Pen y Ddinas[30], Great Orme, Conwy

A roundhouse on the hillfort of Pen y Ddinas on the Great Orme was excavated in 1960 and published as a report with re-examination in 2009 (Smith 2009). Upon re-examination, the site records and archive from the excavation were found to be lost without record, apart from a collection of objects held at Llandudno Museum (Smith 2009, 1-3). Three-dimensional locations were given for all objects, but as these could not be attributed to the site plan, no stratigraphical information can be gleaned from the information (*ibid.*, 3).

However, the collection of objects found were indicative of dietary and economic evidence, such as bone and marine shells, at the time the roundhouse was in use, which is a rare occurrence and therefore noted (Smith 2009, 1). In addition, the range of dietary evidence suggests a permanent, year-round settlement as the remains of domestic animals, many of them young, suggest an agricultural settlement and shellfish to be a seasonal supplement (*ibid.*, 7; Smith 2012, 5-6).

[30] Often incorrectly spelled Pen y Dinas, without the correct Welsh mutation following 'y'

A single piece of Samian ware found during excavations at one of the roundhouses at the site indicates Romano-British activity at the settlement, although the notes from the 1960s excavation suggested that the roundhouses excavated may be Bronze Age due to a lack of ceramic and iron finds (*ibid.*), which, in fact, is indicative of an Iron Age site in north Wales. A piece of animal bone found 9 inches in depth from the roundhouse deposits was dated to 403-206BC (Beta-254961). Earlier deposits were reported to be as deep as 39 inches. It is not clear whether the bone was found in an undisturbed context (Smith 2009, 7). Unfortunately, other surviving finds are not dateable to a specific period (Smith 2009, 6).

This section has provided an overview of our knowledge of dated features of hillforts to date. The following section will provide the results of a comparative study of dated hillforts following a recalibration of radiocarbon dates. This comparison will look at the hillforts as a group, discussing dated features and any consistencies or changes over time.

4.2 Dating Results

Following recalibration using radiocarbon programme OxCal, version 4.2 and later re-examined to verify consistency in version 4.3.2, developed by Oxford University's Radiocarbon Accelerator Unit, the recalibrated radiocarbon dates for hillfort features is shown in Table A3.7. All radiocarbon dates stated below are calibrated calendar dates at around 95% confidence levels.

4.2.1 Enclosure

Pre-rampart activity is presented by a number of dates. For example, pre-rampart occupation at Llwyn Bryn Dinas can be attributed to the Late Bronze Age. At Old Oswestry, the initial phase at the site was dated to around 500BC and suggested as possibly being earlier.

With regards to dates specifically in relation to the existence of enclosure, such as palisades and ramparts, disregarding any dates which may have been contaminated or previous assumptions (e.g. HAR-4405, Beeston Castle initial rampart dated by

unprovenanced wood ‘on top’ of rampart), the results can be presented by feature, as follows:

4.2.1.1 Pre-rampart settlement and palisaded enclosures

4.2.1.1.1 OSL date

- Eddisbury, palisade with counterscarp ditch
    - OSL dated to 635-585BC (Garner 2012b, 20)

4.2.1.1.2 Radiocarbon dates

- Dinorben, ditch possibly associated with three palisades
    - Built by 795-428BC (CAR-128)
- Moel y Gaer Rhosesmor, pre-rampart settlement, possibly associated with the palisaded enclosure, see Figure 3.7
    - Settlement evidence 891-431 (HAR-606)

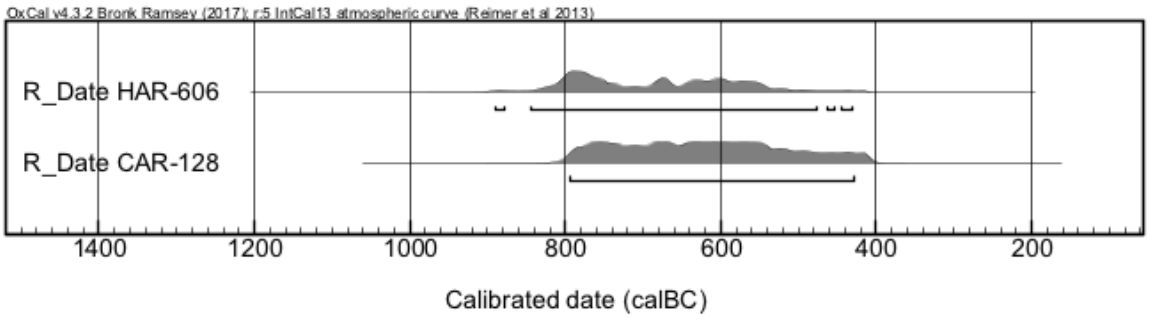

Figure 4.1. Recalibrated radiocarbon dates for pre-rampart enclosures at Moel y Gaer Rhosesmor (HAR-606) and Dinorben (CAR-128)

4.2.1.2 Initial ramparts

4.2.1.2.1 Artefactual dates

- Beeston Castle initial rampart
    - Built around/after c800-700BC, artefactual
- Old Oswestry, initial inner rampart

    - After c700BC, artefactual

4.2.1.2.2 Radiocarbon dates

- Breiddin, initial inner rampart
    - Built after 1427-1059BC (BM-885)
    - Rampart gully 1113-807BC (BM-879), 1107-802BC (HAR-1616)
    - Core (one phase) 1035-571BC (HAR-1761), 1018-766BC (HAR-1615), 996-816BC (BM-878)
    - Built before 411BC-AD2 (QL-1080)
- Castell Caer Seion, western enclosure, inner rampart (NB: may not be initial rampart on site)
    - Built before 393-204BC (Beta-254607)
- Dinorben, inner rampart, first phase
    - Built after 772-413BC (CAR-167)
    - Built before 753-402BC (CAR-123, CAR-124)
- Eddisbury, initial inner rampart
    - After 771-431BC (NZA-36648)
    - Built before 396-210BC (NZA-36593)
- Llanymynech, inner rampart
    - Built by 204BC-AD130 (CAR-534), 384-52BC (CAR-535)
- Llwyn Bryn Dinas initial rampart, Rampart X
    - Built after 996-797BC (CAR-802)
    - Built before 382-41BC (CAR-708)

- Moel y Gaer Llanbedr, single phase inner rampart
    - Built after 794-524BC (SUERC-30901, SUERC-30902)
    - Core 788-486BC (SUERC-30897), 507-235BC (SUERC-30895)
    - Wall face 782-433BC (SUERC-30896)
- Moel y Gaer Rhosesmor, initial inner rampart
    - Built after 891-431BC (HAR-606)
    - Foundation trench 820-408BC (HAR-604)
    - Core 401-63BC (HAR-1122)
- Pendinas Llandygai, initial rampart
    - Built after 1222-827BC (HAR-1671)
    - Core 353BC-AD79 (HAR-1672)

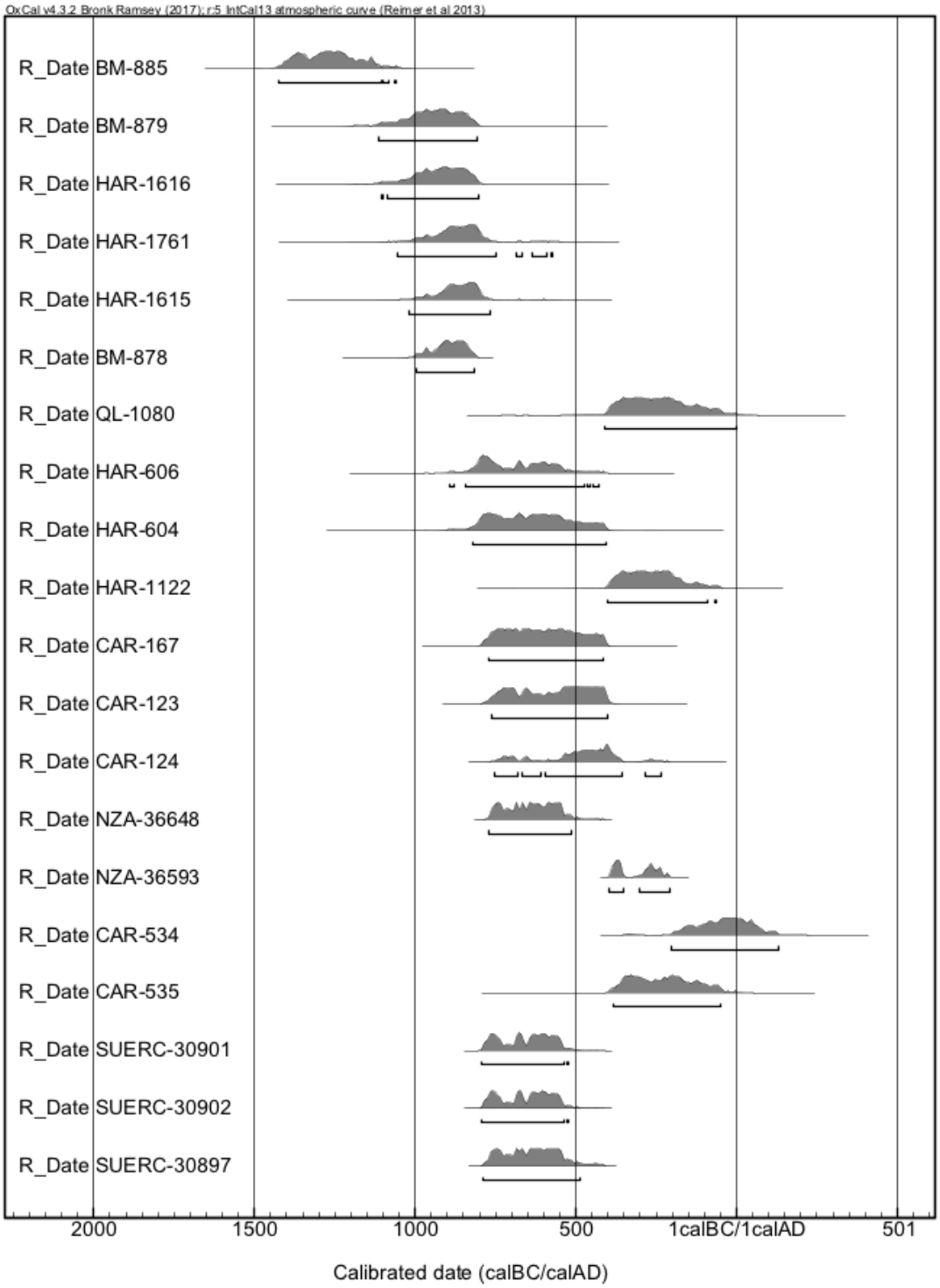

Figure 4.2. Selected recalibrated radiocarbon dates for initial ramparts at Breiddin (BM-885, BM-879, HAR-1616, HAR-1761, HAR-1615, BM-878, QL-1080), Moel y Gaer Rhosesmor (HAR-606, HAR-604, HAR-1122), Dinorben (CAR-167, CAR-123, CAR-124), Eddisbury (NZA-36648, NZA-36593), Llanymynech (CAR-534, CAR-535) and Moel y Gaer Llanbedr (SUERC-30901, SUERC-30902, SUERC-30897)

4.2.1.3 Modification to ramparts

4.2.1.3.1 Artefactual date

- Beeston Castle, rampart phase 2
    - Built after c500BC-AD47, artefactual

4.2.1.3.2 Archaeomagnetic dates

- Beeston Castle, rampart phase 3
    - Core 400-200BC (AML ref 873704-5)
- Beeston rampart phase 4 (final)
    - Built after 400-200BC (AML ref 873704-5)

4.2.1.3.3 Radiocarbon dates

- Beeston Castle, rampart phase 3
    - Built by 728-231BC (HAR-6464, HAR-6468, HAR-6469)
- Breiddin, inner rampart phase 2
    - Core 411BC-AD2 (QL-1080)
- Dinorben, outer rampart
    - Built after 378-56BC (CAR-131), 341BC-AD74 (CAR-132)
- Eddisbury, outer rampart
    - Built after 739-515BC (Beta-317521)
    - Built before 392-209BC (NZA-36654)
- Eddisbury, inner rampart phase 2
    - Core 396-210BC (NZA-36593)
- Llwyn Bryn Dinas, rampart phase 2 (Rampart Y)

    - Built after 382-41BC (CAR-708)
    - Core 401-63BC (CAR-800)
- Llwyn Bryn Dinas, rampart phase 3 (Rampart Z)
    - Built before 357BC-AD25 (CAR-798)
- Moel y Gaer Rhosesmor, inner rampart phase 2
    - Built after 397-51BC (HAR-603)
- Pendinas Llandygai rampart phase 2
    - Built (dump) after 373BC-AD79 (HAR-1672)

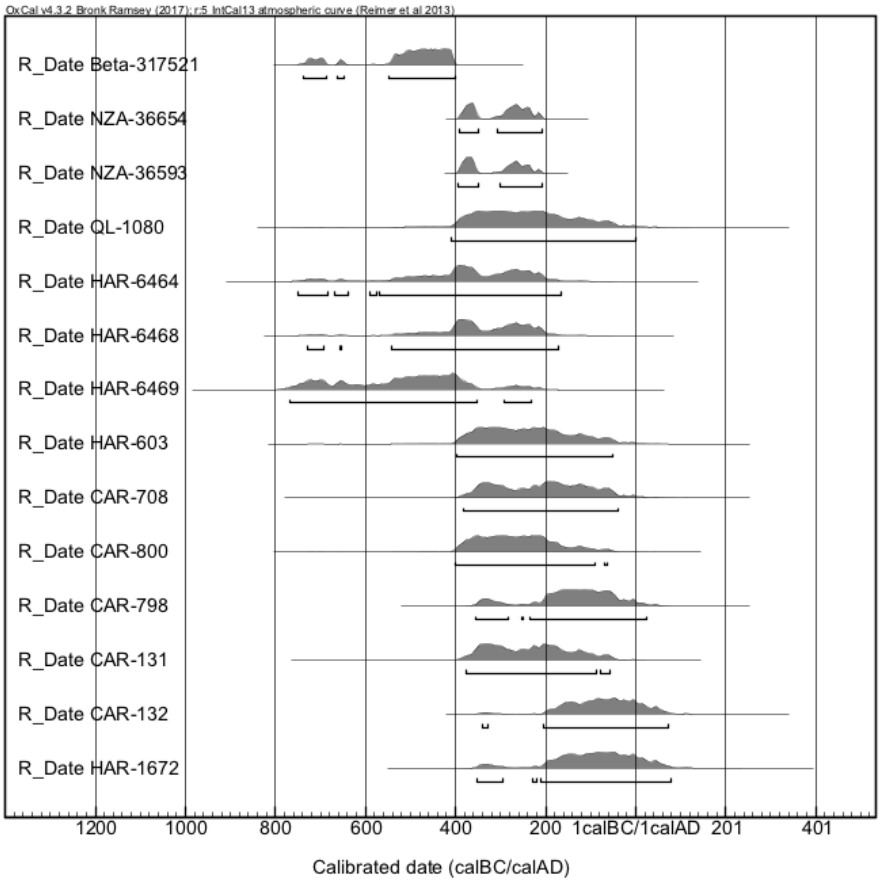

Figure 4.3. Recalibrated radiocarbon dates for modified ramparts at Eddisbury (Beta-317521, NZA-36654, NZA-36593), Beeston (QL-1080, HAR-6464, HAR-6468, HAR-6469), Moel y Gaer Rhosesmor (HAR-603), Llwyn Bryn Dinas (CAR-708, CAR-800, CAR-798), Dinorben (CAR-131, CAR-132) and Pendinas Llandygai (HAR-1672)

4.2.2 Entrances

4.2.2.1 Radiocarbon dates

- Eddisbury, sub-circular, southern guardchamber
    - 359-169BC (NZA-36592)
- Moel Hiraddug, phase 1 entrance blocking for relocation
    - Core 728-193BC (CAR-372), 756-233BC (CAR-373), 756-368 (CAR-374)

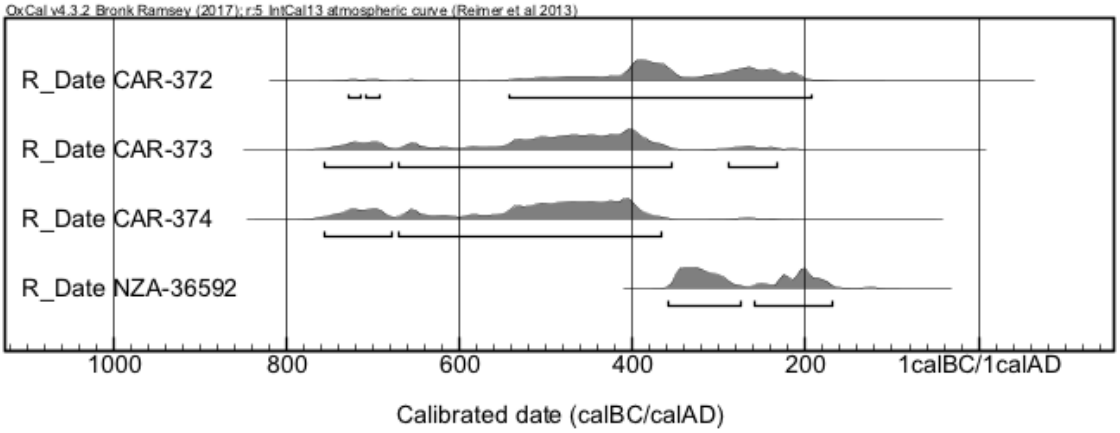

Figure 4.4. Recalibrated radiocarbon dates for hillfort entrances at Moel Hiraddug (CAR-372, CAR-373, CAR-374) and Eddisbury (NZA-36592)

4.2.3 Roundhouses

4.2.3.1 Radiocarbon dates

- The Breiddin
    - 204-45BC (BM-1160), 353-59BC (BM-1161), 757-403BC (BM-881), 797-235BC (HAR-467), 728-101BC (HAR-842)
- Bryn y Castell
    - 411BC-AD51 (HAR-6234)
- Castell Caer Seion

    - 393-204BC (Beta-254607)

- Moel y Gaer Llantysilio
    - 360-171BC (SUERC-43981), 345-51BC (SUERC-43982), 386-205BC (SUERC-43983)

- Moel y Gaer Rhosesmor
    - 840-197BC (HAR-1125), 821-401BC (HAR-1126), 780-388 (HAR-1196), 892-410 (HAR-1197), 782-259 (HAR-1353)

- Pen y Ddinas (Great Orme)
    - 403-206BC (Beta-254961)

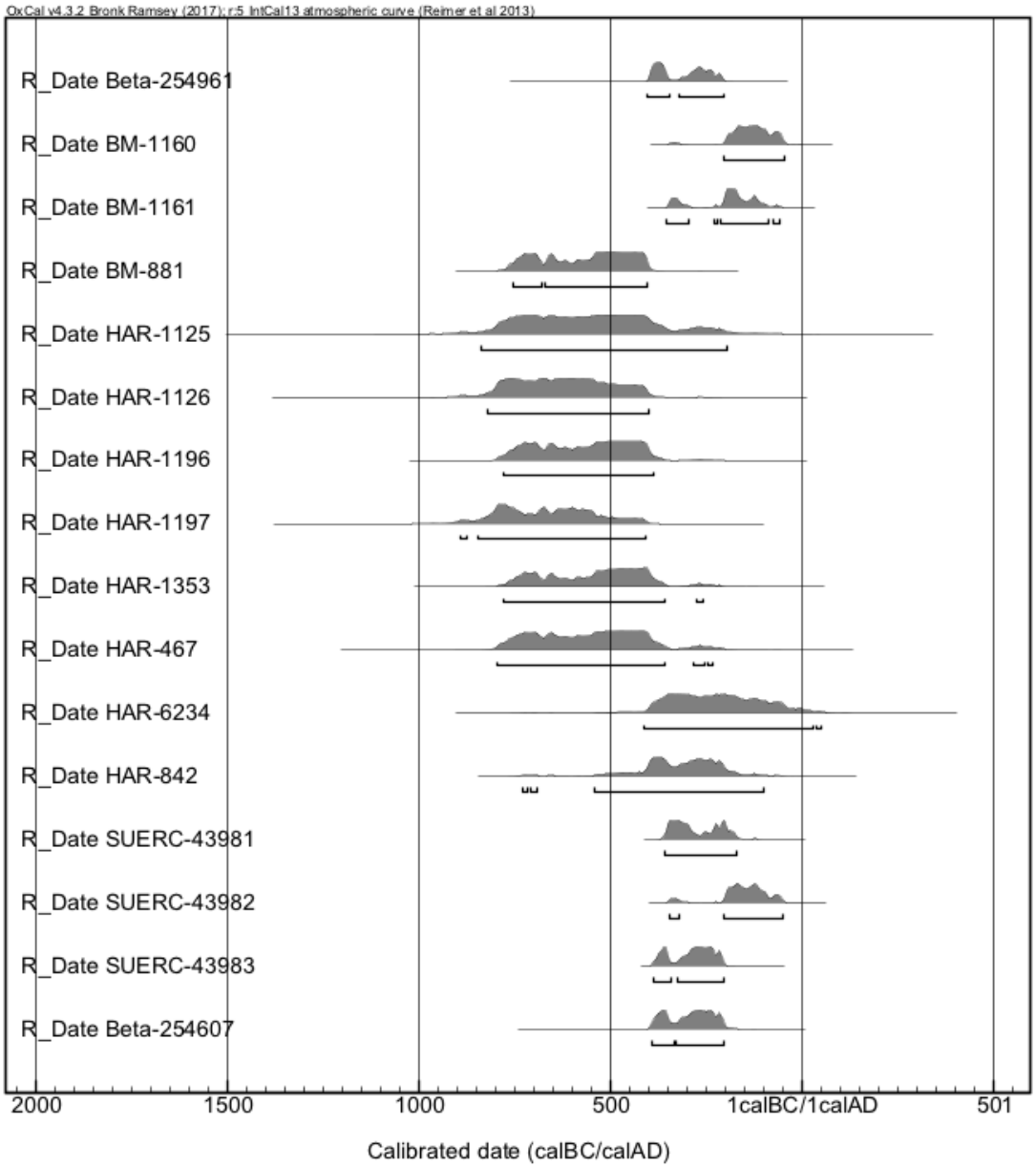

Figure 4.5. Recalibrated radiocarbon dates for roundhouses at Moel y Gaer Rhosesmor (HAR-1125, HAR-1126, HAR-1196, HAR-1197, HAR-1353), the Breiddin (BM-1160, BM-1161, BM-881, HAR-467, HAR-842), Pen y Ddinas (Great Orme) (Beta-254961), Castell Caer Seion (Beta-254607), Bryn y Castell (HAR-6234) and Moel y Gaer Llantysilio (SUERC-43981, SUERC-43982, SUERC-43983)

Table 4.1 lists the roundhouses in hillforts in the surrounding area of the Clwydian Range which have been excavated and for which dates were retrieved, along with their understood building structure.

The remains of the roundhouses at Moel y Gaer Llantysilio revealed few surviving features but did show evidence for surrounding gullies and that Roundhouse 1, with

an internal diameter of 7m and a possible internal division and a sole possible post-pad, pre-dated Roundhouse 2, also around 7m in diameter but with no evidence for postholes nor an entrance and built on a platform which sealed the gully of Roundhouse 1 (Grant & Jones 2013, 49-52). Samples provide a date for both roundhouses of 345BC at the earliest and at latest 205BC and so, therefore, they can be seen to both date to the mid-Fourth to Third Century BC.

Remains of ‘stake hole’ roundhouses were excavated at the Breiddin and gave dates of between 757-403BC and 728-101BC. In addition, roundhouses R3 and R8 were both surrounded by wall gullies, R8 with evidence for a projecting porch (Musson et al 1991, 39-43; 62), and dated to 204-61BC and 797-235BC respectively.

Remains of both post-ring roundhouses and ‘stake wall’ roundhouses were reported at Moel y Gaer Rhosesmor and stratigraphically it was seen that the former pre-dated the latter. The phase of the site which consisted of post-ring roundhouses was dated to between 780-431BC. Phase 2 of the site, with stake wall roundhouses, was dated to between c.401-51BC.

At Pen y Ddinas, Great Orme, a piece of animal bone found within a stone-walled roundhouse deposit was dated to 403-206BC (Beta-254961). Stake holes of the hearth associated with Bryn y Castell’s ‘Structure 0’, sealed by the stone-walled ‘Structure 1’, was dated to 411BC-AD51 (HAR-6234). At Castell Caer Seion, a deposit beneath stone-walled Hut 4 dated to 393-204BC (Beta-254607).

Hillfort	Roundhouse Features	Date
The Breiddin	Stake hole	757-403BC 728-101BC
Bryn y Castell	Stone walled?	411BC-AD51
Bryn y Castell	Stone walled	Built after 411BC-AD51
Castell Caer Seion	Stone walled	Built after 393-204BC
Moel y Gaer Llantysilio	Gully. Possible post-pad	345-205BC
Moel y Gaer Rhosesmor	Post-ring	780-431BC
Moel y Gaer Rhosesmor	Stake wall	401-51BC
Pen y Ddinas Great Orme	Stone walled	403-206BC

Table 4.1. Dated roundhouses, stating the recorded building structure or evidence and associated recalibrated radiocarbon dates

4.2.4 Four-post structures

4.2.4.1 Radiocarbon dates

- The Breiddin
    - 396-46BC (HAR-1413), 397-51BC (HAR-468), 751-196BC (HAR-1286), 748-198BC (HAR-1287), 355BC-AD125 (HAR-1617)
- Moel y Gaer Rhosesmor
    - 397-51BC (HAR-603), 769-263BC (HAR-1294)

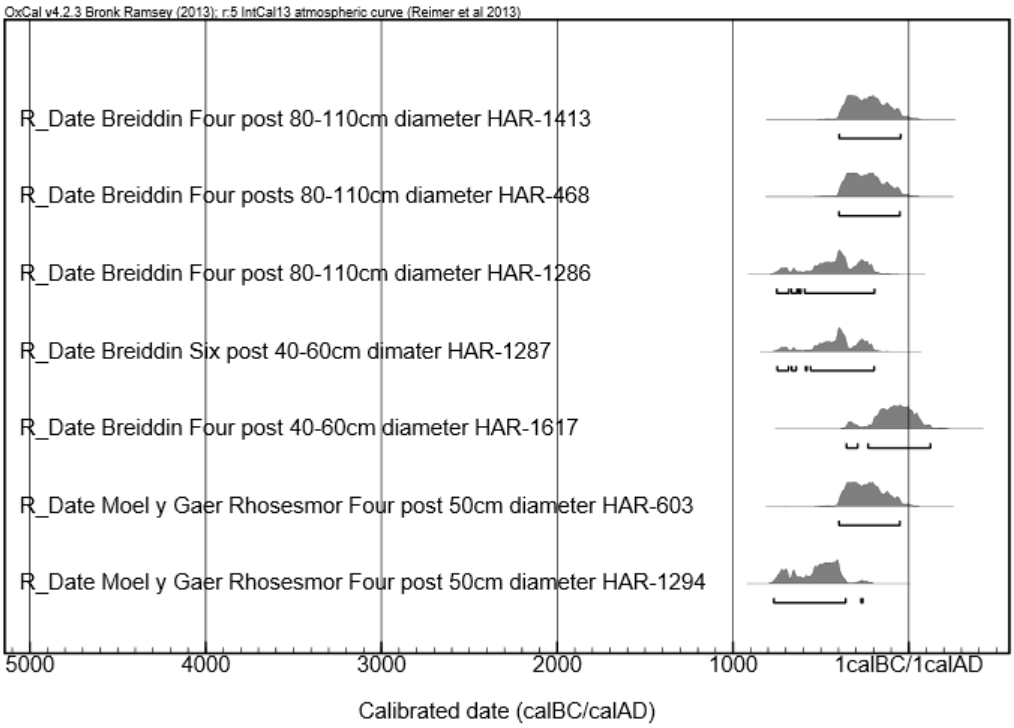

Figure 4.6. Recalibrated radiocarbon dated samples from four/six-post structures at Breiddin (HAR-1413, HAR-468, HAR-1286, HAR-1287, HAR-1617) and Moel y Gaer Rhosesmor (HAR-603, HAR-1294)

Moel y Gaer Rhosesmor, Dinorben and the Breiddin provided dated remains of four-post structures (Guilbert 1975c; Guilbert 1977b; Musson et al 1991).

At Moel y Gaer Rhosesmor, posts of 50cm in diameter sunk over 60cm below the ground in the south and west areas were reported for larger structures ranging from 3.4mx2.4m to 4mx4m (Guilbert 1976b, 310). Three structures to the north were found to have smaller timbers of up to 20cm in diameter in post-pits averaging 30cm in depth but with 'widely differing floor areas', two of 2.7m^2 and 6m^2 respectively and a third, consisting of five postholes 'identical' in nature with the four postholes surrounding a square of 3.2x3.2m, with its fifth posthole placed asymmetrically to the square (Guilbert 1976b, 311).

The four-posters at the south and west of the excavations were thought to be of one phase, due to the gridded layout of the structures and as one of these post-dated a post-ring roundhouse, this entire group was assigned to a later period than the post-ring roundhouse phase (Guilbert 1976b, 313).

The larger structures in the northern half of the excavation did not appear to conform to the grid nor clash with the post-ring roundhouses, so it is possible that they date to the earlier phase, even though it was concluded that their similarity suggested that all of the four-post structures dated to the same phase plan (*ibid.*). If so, this provides dates for their existence between 769-51BC or, if proposing that they were all in existence at relatively the same time, a date of 401-263BC can be put forward.

Four-post structures were also discovered at Dinorben. Artefactual dating evidence was only found in the upper fill of a posthole and therefore provides a date for the end of the lifetime of the four-posters during the Romano-British period. However, it is not clear whether their construction and use would have pre-dated this by any amount of years (Guilbert 1977b). The structures found ranged from 2x2m to 3x2.3m but the size of their postholes specifically was not reported (Guilbert 1979f, 187-188)

The structures at the Breiddin, including a number of six-post structures, were shown to have a wide range of dates from 748BC-AD5. Musson suggested that through radiocarbon dating, artefactual evidence and information such as width of posthole, but not necessarily the size of the overall structure, a sequence of 'typology' could be suggested (Musson et al 1991, 74, 78 & figs 39 & 41). This comprised of the six-post structures and the four-post structures which had postholes of similar dimensions to be of one general phase.

Six-post structures S1 and S2 had postholes measuring 40-60cm across and about 30cm deep (Musson et al 1991, 76) and F47 and F48 also had postholes measuring 40-60cm across (Musson et al 1991, 77). S1 provided a TPQ of 748-198BC and S2 provided a Late Bronze Age date through artefactual evidence. The four-posters F47 and F48 attributed to the same phase were not dated specifically themselves, but an overlying four-poster provides the earlier structure of F48 with a latest possible date of 355BC-AD125.

In addition, four-post structures were found by the Bronze Age rampart and deposits, dated by association to the Bronze Age at the latest and these also comprised of smaller postholes (Musson et al 1991, 30-32). The four-post structures with larger postholes, generally between 80cm and 1.1m across, were thought to be of a later date, lying between 751BC and AD125, most dates giving a Fourth to First Century

BC date, and additional phases seen due to re-use and replacement (Musson et al 1991, 74, 78).

Hillfort	Structure	Post Diameter	Structure Dimensions	Date
Breiddin	Four-post	40-60cm	-	TAQ 355BC-AD125
Breiddin	Six-post 30cm depth	40-60cm	-	TPQ 748-198BC *+ Late Bronze Age pottery*
Breiddin	Four-post	80-110cm	-	751BC-AD125 *Majority Fourth – First Century BC*
Dinorben	Four-post	-	2x2m^2 3x3.2m	*No dates but artefactual evidence: Romano British period fill (post First Century AD)*
Moel y Gaer Rhosesmor	Four-post			769-51BC
		50cm	3.4mx2.4m	
	Gridded layout		4x4m^2	
	60cm in depth			
Moel y Gaer Rhosesmor	Four-post (possible five-post)	20cm	2.7m^2	*No dates but due to no overlap could be as early as initial phase of site: TPQ: 892-259BC*
	No conformity to grid layout		6m^2	
	30cm depth		3.2m^2 (five post)	

Table 4.2. Selected, dated four- and six-post structures within hillfort interiors in the surrounding area. Where available, the number of associated posts with the structure is noted, alongside the depth of the postholes. The excavated post diameter and dimensions of the entire structure is listed, and associated recalibrated radiocarbon dates and/or artefactual evidence

It was noted that larger postholes for four-posters at both the Breiddin and Rhosesmor were thought to be later structures, dating to around 400-1BC, and

structures with smaller posts could possibly have been in existence during an earlier phase.

These results have been brought together to examine groups of features within hillforts and dating material found associated with them. These features, such as palisades and ramparts, entrances, roundhouses and four-posters, have wide-ranging dates but have begun to reveal groupings of activity. These will be discussed and scrutinised further in the discussion.

4.3 Discussion

A number of research projects had provided dates from samples or artefacts from hillforts from the wider study area to date. This study has recalibrated the numerous results in order to compare them as a group to date activity within hillforts over time. This discussion will attempt to interpret these results and their significance.

Some hillforts have evidence for a number of phases of modification to their ramparts. Through further inspection of their individual dates, a stricter chronology can be put forward for the hillforts' architecture:

- Beeston Castle: The original site may have been enclosed by a palisade. Through artefactual remains, it is likely that the initial rampart at Beeston Castle was built c800-700BC. This infers that Beeston Castle presents an example of early origins for a rampart and also an even earlier date for a palisaded enclosure. The rampart was modified a number of times; firstly, (the second phase of rampart) after c500BC, secondly, around 400-200BC (AML ref 873704-5) and then thirdly, a final phase of building.

- The Breiddin: Breiddin's initial rampart has provided dates for a rampart gully, between 1107-807BC (BM-879, HAR-1615), as well as from the core 996-816BC (BM-878). The rampart's second phase's core was dated to 411BC-AD2 (QL-1080). These results suggest that the Breiddin was built with ramparts very early, comparatively, but was not modified for at least 400 years until secondary building works occurred.

- Dinorben: A ditch and possibly three palisade fences were present at Dinorben by 795-428BC (CAR-128). Its initial inner rampart was built after 772-413BC (CAR-167), but before 753-402BC (CAR-123, CAR-124), providing us with a date range of 772-402BC. Its outer rampart was added after 378BC (CAR-131).

- Eddisbury: As the palisade with ditch has been dated to 635-585BC, it is unlikely that the initial rampart could be any earlier than this, confining its construction to after c635BC. The results have shown that it must have been in place by the time it was modified from c396-210BC (NZA-36593), giving Eddisbury's initial inner rampart a date range of between 635BC and 210BC, with modification to the structure at 396-210BC. Its outer rampart was built after 730-515BC (Beta-317521) and before its associated ditch had begun to silt 392-209BC (NZA-36654), therefore, sometime between 730BC and 209BC. The silting of the outer ditch occurs within a similar time range of 180 years as the modification to the inner rampart, so it is possible that the two construction activities are related.

- Llwyn Bryn Dinas: The initial rampart was built after 996BC but before 41BC (CAR-802, CAR-708). As its second phase post-dated 382-41BC (CAR-708) and its core dated to 401-63BC, it can be surmised that the initial rampart was built at some time between 996BC and 382BC and the secondary phase between this time and 63BC. A third phase was in place before 357BC-AD25.

- Moel y Gaer Rhosesmor: Pre-rampart settlement at this hillfort has been dated to 891-431BC (HAR-606). An initial rampart at the site was built after this, as it overlaid the roundhouse dated to this time. A foundation trench for the rampart was constructed between 820-408BC (HAR-604) and the core of the rampart was dated to 401-63BC (HAR-1122). I propose that this gap in time between the foundation trench being constructed and the date of the rampart core can be explained by the course of the rampart being laid out as a foundation in advance of commencing the rampart proper. Excavation demonstrated that this rampart was "*built up progressively as the rampart was heightened*" (Guilbert 1975b, 110). Therefore, it can be put forward that the

initial rampart at Moel y Gaer Rhosesmor dates to around the Fifth Century BC and may have taken some years to build following an initial layout determined by a foundation trench. The rampart was then modified, and this activity occurred after 397-51BC (HAR-603).

The Breiddin's first phase of rampart, timber-laced with paired postholes and a core of stones and soil, appears to have been built between c 996-816BC, the earliest date recorded for the core of a rampart within the wider study area. A piece of wood sitting *on top* of Beeston Castle's first rampart phase, layers of sand with loose stones and possible timber lacing and, associated with Late Bronze Age artefacts (Ellis 1993, 22; 87), produced a date of 1260-837BC. At the time of reporting, Ellis noted that this wood may have been mature wood predating the construction (Ellis 1993, 85). It is possible that, in some cases, the wood sampled for radiocarbon dating was mature wood and/or reused in the building of the rampart. Nevertheless, these two timber-framed ramparts, also constructed with a stone/rubble core, present evidence for Late Bronze Age ramparts.

Another feature present around this time is the use of a palisade to enclose the site, see Table 4.1. However, when scrutinising the firm results for palisaded enclosures in this area, the dates may not be as early as the ramparts at Beeston and the Breiddin. For example, a palisade and ditch enclosure at Eddisbury was OSL dated to 635-585BC (Garner 2012b, 20), settlement activity thought to be associated with the palisade at Moel y Gaer Rhosesmor appears to range from c891-431BC (HAR-606) and an initial ditch at Dinorben possibly associated with one/two/three palisade/s was in existence by 795-428BC (CAR-128). It is tempting to speculate that these palisades date from an earlier period, especially considering they were followed by subsequent phases of building activity at the site. However, Eddisbury's initial rampart dates to sometime in between 771-431BC (NZA-36648, NZA-36593), Moel y Gaer Rhosesmor's initial rampart to c820-63BC (HAR-604, HAR-1122) and Dinorben's stratigraphy between features is unclear. It is entirely possible that these palisaded enclosures date to later into the Early Iron Age than their dated evidence's extremes could tantalisingly suggest.

With regards to rampart building activity, two main clusters have begun to emerge from the results.

All of the initial ramparts built in this area date from after 900BC (with the exception of the Breiddin which *could* have been earlier), see Figure 4.2, and most of these also appear to date to after 800BC; Beeston Castle, Old Oswestry, Eddisbury, Moel y Gaer Rhosesmor, Dinorben, Moel y Gaer Llanbedr, Pendinas Llandygai and Llwyn Bryn Dinas. Many of these appear to be in position by or before c400-200BC and presents a cluster of hillforts which are having initial ramparts built between c800-400BC.

Later modification to ramparts at all sites with dating evidence cluster between c400-200BC or perhaps towards the turn of the millennium, see Figure 4.3, (apart from Pendinas, whose *initial* rampart falls within this date range), evident at Eddisbury, Moel y Gaer Rhosesmor, the Breiddin, Dinorben, Beeston and Llwyn Bryn Dinas.

The Breiddin is the only hillfort in the area where there is a clear gap for building activity on the ramparts. All other dates overlap in relation to rampart building activity. The Breiddin may be exceptional; its initial early dates are testament to that. In addition, a gap in time between rampart building episodes may not represent a gap in activity within the enclosure. However, the remainder of the results for the other hillforts present a pattern that an initial episode of rampart building occurred in the Early Iron Age, between c.800-400BC. After an unknown, but not indefinite, amount of time, a second building period developed in this area from 400BC to the turn of the millennium, some taking place by c.200BC, and many having evidence for multiple phases of building activity on their ramparts.

At Moel Hiraddug's Main Inner entranceway, the first phase, simple gap entrance was blocked around 728-368BC from radiocarbon dating evidence (CAR-372, CAR-373, CAR-374) and replaced by an entrance to the left with one sub-rectangular guardchamber, subsequently modified and then altered a third time to consist of two semi-circular guardchambers, dating to no earlier than the Sixth Century BC, from artefactual evidence. This evidence presents a date range for an episode where a simple entrance gap was no longer considered suitable and a more elaborate entranceway complex building project begun. The radiocarbon date dates not only the blocking, but possibly the introduction and establishment of an initial, singular sub-rectangular guardchamber at the site.

I have put forward that the burning episode at Eddisbury's east entrance's southern guardchamber may be related to the modification from a sub-circular singular feature into a double sub-rectangular stone lined feature. In which case, the burning episode, dating to 359-169BC (NZA-36592) represents the date range in which a singular guardchamber was modified and re-shaped, and possibly the introduction of a second guardchamber to the entranceway. Notwithstanding this, the date is representative of the existence of a guardchamber within the wider study area.

These two findings concur with Bowden's study into guardchambers, despite meagre wider evidence. Bowden reports three radiocarbon dates, around the late Fifth and earlier Fourth Centuries, for guardchambers in Britain and that "*most seem to fall within the 6th – 4th centuries BC, though there are exceptions"* (Bowden 2006, 426). From the evidence available, Moel Hiraddug and Eddisbury do not appear to be exceptions with regard to date, see Figure 4.4. However, their development and modification suggest multiple phases of redesign and refashion which must have entailed a number of years' work during each conversion. This fact may still not make these two hillforts exceptional but highlight the complexity and importance of hillfort entranceway architecture in general.

When investigating the excavation reports to source the contexts for the radiocarbon dates, other parallels became apparent, such as the existence of a number of initial pre-rampart palisades, for instance at Dinorben and Moel y Gaer Rhosesmor, see Figure 4.1, with only the latter providing a date for when this may have been in existence.

Further research into other roundhouses without dating evidence but additional feature description, relative dating and other associated information could help to define periods in which certain building styles were used. In addition, research into a wider context may aid interpretation (Ghey et al 2007).

Elsewhere in the surrounding area where there is evidence for four-/six-posters, such as Dinorben and Moel Hiraddug, it would be useful to gain dimensions of the postholes alongside radiocarbon dates and the use of relative dating techniques to make further comparisons and subsequently relate these results to a wider context such as four-post structures found at Croft Ambrey, Danebury and Collfryn (Gent 1983; Britnell 1989). From the initial evidence, see Table 4.2, it can be concluded

that, for this particular area, four- and six-post structures of undetermined function were in use from the Late Bronze Age and fell out of use by the Romano-British period, see Table 4.2 & Figure 4.6. Further research may allow a more valuable interpretation, but the wide date range and longevity of these structures suggests that they were well established; an important part and a significant feature of Iron Age life on a hillfort.

Certain items found within hillfort excavations have also begun to suggest certain patterns and areas of further research. Despite the general acidity of upland soils in north Wales, items of metal work and bone have been discovered.

In 1992, 21 Iron Age burial sites in Wales were said to be known and 11 Welsh hillforts were noted to have produced evidence of Iron Age burial (Murphy 1992, 28-29). This figure included the Moel Hiraddug inhumations, but the Llanymynech discovery had not yet been found and the human remains from Dinorben are not noted.

Albeit without context, the Llanymynech hillfort ‘child burial’ does provide an Iron Age date for the remains, 770-370BC (OxA-6824), earlier than the bowl hearths previously dated at the site, 204BC-AD130 (CAR-534) and 384-52BC (CAR-535). The discovery of part of a human facial bone at the Breiddin, some of the fragmentary remains at Dinorben and the two inhumations beneath the road of the developed Main Inner entranceway at Moel Hiraddug, see Figure 3.2, have suggestive elements of deliberate, ritual deposition. The depth of the soils on Moel Hiraddug make it almost impossible to consider that the builders of the new entranceway and road were not aware of, or were involved in the deposition of, the two skeletons inches beneath their feet. Other fragmentary pieces of human bones could point towards excarnation.

Perhaps, in contrast to those which may appear more ‘deliberate’ deposits, some of the remains found at Dinorben paint a much less considered committal and conflict. Murphy states that there are two distinct locations for Iron Age burial in Wales; those at Bronze Age ritual/funerary sites and those in or around hillforts, those at hillforts being in or immediately outside defensive ditches (Murphy 1992, 28-29). The discovery of two dismembered male skeletons, one with a skull “*cleft in two*”, at the bottom of a ditch to the north of the site, a fragmentary skeleton in the north ditch

(Gardner & Savory 1964, 45; 221) and a female and infant found on a steep slope of the outer rampart, to the north of the ditch (Gardner & Savory 1964, 45), do not inspire imaginings of a 'peaceful' demise.

The discovery of hoards of slingstones at hillforts also inspires notions of defence and conflict. Over 600 were found in a hut overlooking the routeway into the Main Inner entrance at Moel Hiraddug (Davies & Bevan-Evans 1969, 10; Davies 1970b, 3), another 200 behind the northern rampart (Brassil et al 1982, 28). Another hoard was found near the entrance at Beeston Castle (Ellis 1993, 87-89), around 400 in a hut 'next to the entrance' at Castell Caer Seion (Smith 2012, 7), as well as others elsewhere at the site (Smith 2012; 6; 10; 24) and a 'heap' of slingstones at the east entrance at Eddisbury (Varley 1950, 33).

In contrast, the discovery of slingstones may present evidence for defence against things other than people; namely wildlife. If the hillforts were used by a farming community, with stock a valuable resource, these would need protecting from predators. Additional evidence for 'the every-day' and domesticism appears in the form of spindle whorls, quern stones etc. Trade is represented by the appearance of VCP at a number of sites. What may be more significant for connecting the sites in this area is the presence of metalwork and metalworking. Crucible fragments have been found at Old Oswestry, Llwyn Bryn Dinas and Beeston Castle (Hughes 1994, 75-79; Musson et al 1992, 268; Ellis 1993, 26), metalworking areas and/or fragments have been found at Bryn y Castell, Llwyn Bryn Dinas, Beeston Castle and the Breiddin, and Guilbert has proposed that platforms at Dinorben are the remains of working areas (Guilbert 1979f). North Powys is reported to have a 'distinctive' zinc impurity (Musson et al 1992, 179) and the 'plaque' found at Moel Hiraddug was made from Llanymynech copper (Davies & Lynch 2000, 208).

The presence of glass beads reported at some sites may indicate the use of glass more widely in Britain before the Romano-British occupation, or that the hillforts continued in use further into the new millennium.

A number of hillforts have revealed Romano-British items, in particular Dinorben, where artefacts dating from the First to Fourth Centuries AD were present (Gardner & Savory 1964). The only dated artefacts known to have been discovered at Moel Fenlli derive from the Roman period and this appears to include the unpublished

1956 excavations. At Braich y Ddinas, Penmaenmawr, fragments of a late La Tène brooch were found with other contemporary items, but also a number of Romano-British items including a silver ‘convoluted snake’ bracelet (Hughes 1922, 349-357). At present, many of the radiocarbon dates represent the Iron Age, with some hint at continuation into the early new millennium. The (continuous?) use of these hillforts into the First Century AD onwards, with specific reference to Eddisbury which was used as an Anglo-Saxon burh in the early 10th Century (Shaw & Clark 2003), demonstrates that the radiocarbon dates cannot be used in isolation. In particular this demonstrates that whilst the use of dates for understanding the architecture and phasing of rampart building can be useful in the development of a site, much more was occurring within the confines of the site itself when ‘work’ on the ramparts had been completed.

The calibration technique used within this exercise established a consistent approach for calibrating radiocarbon dates for hillforts in the area. However, with many of the dates returning as between 800-400BC, the plateau in the calibration curve will continue to pose problems for accurate dating for many of the features.

In some cases, the recalibration of original dates has suggested solutions for original queries. For example, at Beeston two fragments sampled within the same context originally gave dates which did not overlap; rationalised by the problems arising from the calibration curve plateau (Ellis 1993, 89). The recalibrated dates within this exercise have revealed dates that coincide with each other. Additionally, a displaced fragment of wood was originally dated to the Romano-British period 30calBC-AD250. It was thought to have come from an earlier sample (Ellis 1993, 85-86) and the recalibration of the sample to 173BC-AD396 presents this earlier potential.

The results have also highlighted a number of issues with the available evidence. The use of phrases across the literature may be further standardised, if parallels exist. For example, in a number of cases, timber-lacing and stone facing/revetment is apparent but, as cases are reported on differing phrases, are used for what may be a similar interpretation. This issue is most probably due to excavations conducted at different times by different archaeologists, ranging over half a century and the fashion of literature usage developing and changing over this period of time. If accurate comparisons are to be made and parallels are to be found, in-depth

analysis of the context and features must be made. For example, the stake wall roundhouses at Moel y Gaer Rhosesmor and the stake hole roundhouses at the Breiddin may be compared further to investigate whether they use a similar construction technique or whether these two phrases do, in fact, describe differing structures, see Figure 4.5 and Table 4.1. The dates for the two hillforts' structures have produced dates which do not fully correlate so the result of the comparison would be of interest. A compendium or glossary of standardised terms for features such as these and for hillforts overall would be beneficial for the studies of the archaeology in general, something it is hoped the forthcoming 'Hillfort Atlas' will begin to attempt and introduce.

4.4 Conclusions

This chapter has highlighted a number of different themes of activity at hillfort sites, including early enclosure by palisade or, in some examples, by early ramparts, and later modification. Roundhouses and four-/ six-poster were used throughout the period/s when the hillforts were in use. Additional dates and context reported in the future, including dimensions and descriptions for both roundhouses and for hillfort entrances, will increase potential to interpret building activity of these features within a particular period.

Within this chapter, dated features have been discussed for the wider study area. The study so far has examined the hillforts' individual features and compared them to others in the wider study area. It is now time to expand the study into the wider context of setting. Chapter five will look at the hillforts in the landscape, reporting on their geological, environmental and archaeological settings, the geographical characteristics and their visibility of their surroundings, in order to attempt to understand the hillforts, their setting and their site location.

CHAPTER 5

SETTING

So far, this study has looked at the excavated results from hillfort research and compared them as a group. In order to attempt to understand the hillforts of the Clwydian Range and their site location, it is important to look at the monuments within their landscape setting as well as as a group. This chapter will look at the context and geographical setting of the monuments through environmental data and other features in the landscape. This will include an overview of the underlying geology, the climate, surrounding resources, height, access and other archaeological features.

Following this, the results of a visibility study will be reported on. The study looks at the view from the Clwydian Range hillforts, the hillforts from the wider study area and the view from hills without hillforts on the Clwydian Range. Thereafter, analysis concerning the intervisibility of hillforts will be explored for the wider study area.

Finally, these results regarding the setting of the monuments will be discussed and interpreted.

5.1 Context

5.1.1 Geology

The Clwydian Range is a prominent range of hills which sits in the heart of north east Wales. The Irish Sea lies to the north and the Vale of Clwyd and Denbigh/Hiraethog Moors lie to the west. The Vale of Clwyd, which the six hillforts of the Clwydian Range overlook to the west, is a fertile plain made up of red desert sandstones overlain by glacial sands, gravels and clays (Malpas 2007, 11). To the east, lies firstly the carboniferous limestone of Halkyn Mountain which then leads on to the fertile plane and sandstone hills of Cheshire in the distance. To the south, lie the oldest rocks in north east Wales, being 490 million years old, found in the Dee Valley, made up of deep-sea muds with layers of volcanic ash (*ibid.*).

The main ridge of the Clwydian Range is made up of Silurian mudstone[31] and it is here where five of the six hillforts are situated. In addition, elements and bands of siltstone and sandstone can be found, all of which were deposited in the 'Welsh Basin' 420 million years ago (Heather and Hillforts Landscape Partnership Board 2011, 5). Earth movements squeezed these together to make a slate/shale material which is not well suited for building (Jenkins 1991, 15; Malpas 2007, 12). The five southerly hillforts on the Clwydian Range appear on the surface to be made up of earthen banks and ditches. Some appear to show stone facing on the banks.

Around 350 million years ago, the Lower Carboniferous period, the area was covered in a tropical sea resulting in accumulations of organisms and lime-rich mud leading to deposits of thick limestone, now seen in a number of limestone quarries in the area (Heather and Hillforts Landscape Partnership Board 2011, 7). The northern hills of the Clwydian Range are comprised of this Carboniferous Limestone (Malpas 2007, 64). This is where the northernmost hillfort, Moel Hiraddug, is located. Moel Hiraddug is the only hillfort in the Clwydian Range to be visibly constructed of stone walls, although earthen ramparts are also present. This may be due to the accessibility of the limestone to quarry; the most economical building material to use; still being a valuable resource and extensively quarried to this day (*ibid.*, 65).

The Clwydian Range is bounded by two geological faults; the Vale of Clwyd Fault to the west and the Alyn Valley Fault to the east, forming major valleys (Heather and Hillforts Landscape Partnership Board 2011, 8). Earth movement related to these faults and glaciation during the last Ice Age, 115,000-10,000 years ago, has shaped and influenced the topography we see today, including the deposition of erratics (*ibid.,* 8-9). The movement of ice across the Clwydian Range has resulted in passes such as Bwlch Pen Barras, directly to the north of Moel Fenlli, and Bwlch y Ffrainc, immediately south of Moel Arthur hillfort (Brown 2004, 10).

5.1.2 Environment and climate

At the close of the Second and beginning of the First Millennium BC, Wales experienced the onset of the Sub-Atlantic phase, with higher rainfall and much lower

[31] The 'Silurian Period' was first named by geologist Roderick Impey Murchison in 1839, naming the rocks after the British tribe the Silures, who were said to have inhabited the southern Welsh borders (Malpas 2007, 63)

summer temperatures (Lynch et al 2000, 140). Generally, this wetter and cooler climate occurred from around 2500BC-AD750 with a period of warmer climate at the beginning of the First Millenium AD (Bigg 2003, 207; Huntley 2007, 140). It is argued that climatic changes are the most crucial factor in bringing about major changes in landscape and settlement pattern and these changes could have included a fall in population in the later Bronze Age, with subsequent recovery during the Iron Age (Davies & Lynch 2000, 140-141).

The Late Bronze Age across Britain is historically thought to have seen an 'abandonment' of the uplands (Lynch et al 2000, 141); a theory which has been disputed in more recent years following studies across Britain. It has been thought that the shift in climate would have made the upland and lowland divide most apparent; the upland zone becoming more hazardous for cultivation and communication (Megaw & Simpson 1992, 22). Whittle suggests that climate changes at this time could have produced serious constraints on upland exploitation, leading to a severe curtailment or abandonment of upland activity, with adjustment to varying degrees including greater management of grazing or transhumance (Whittle 1982, 198-200); a management technique still in existence today of winter retreat and lowland use with more intensive use of the uplands in the summer. Alcock suggested that the hillforts in Wales and the Marches are sited just as conveniently for access to the upland pastures as to fertile valleys and that hillforts could have played a part in these seasonal movements of livestock as well as exploitation of arable land (Alcock 1965, 188-189). The 'four-posters' found at a number of hillforts, including Moel y Gaer Rhosesmor, the Breiddin and Moel Hiraddug have been suggested to be storage units for winter fodder by Savory. The amount of sheep bones found at the marcher hillfort of Croft Ambrey and Dinorben along with spindle whorls could suggest that sheep were being kept for wool rather than meat (Savory 1980, 299). Whittle suggests that cereal cultivation would have faced difficulties with these harsher conditions; land usage would have had to have moved to lower altitudinal limits with the threshold reduced by about 300m and growing season at higher altitudes reduced by about 40 days. This would have produced "*harsher conditions for animal husbandry in the winter… [and] serious constraints on upland exploitation*", although he notes that this change would have varied between seasons and throughout regions (Whittle 1982, 198).

Studies in north east Scotland have identified relocation and restructuring of agricultural activity from upland to lowland in later prehistory, but which do not indicate settlement abandonment due to climatic stress (Tipping et al 2008). In northern England, Van der Veen found that sites growing hardier crops well-suited to upland locations and those growing crops better suited to warmer climates differed in settlement type and location rather than being determined by changing climates or a soil-type. This, therefore, may reflect social and cultural differences. She reported that sites which grew predominately emmer suited to warm, dry climates represented small-scale, intensive, traditional subsistence farming and had not developed further due to social and political tensions. Those sites growing predominately spelt, a hardier cereal which will grow at all elevations, worked with larger-scale production and saw arable expansion which may represent a less pressured society, also demonstrated by the lack of fortified settlements in the area they were located (Van der Veen 1992). Young also highlights that the same soils and environment can generate different potential according to the individuals/society and their capacity, resources and/or needs (Young 2000, 73-74). Societies would have reorganised their management and production techniques in order to deal with changes, rather than abandoning their well-established 'place' (*ibid.,* 77; Young & Simmonds 1995, 15).

Widespread evidence of bog regrowth is seen across Europe during the Iron Age (Robinson & Henderson-Sellers 1999, 234) and that growing bog complexes were at their most vast at the turn of the millennium (Barber 1993, 476). It is possible that field systems became unusable due to bog growth, owing to the increase in rainfall or possibly due to shorter, colder and wetter summers, providing insufficient time for any crops to ripen (Megaw & Simpson 1992, 21). However, the prevention of blanket peat spread through cultivation has been seen in Lairg, Scotland in the Iron Age; the spread of blanket peat was a result of land abandonment, not vice versa (Tipping & McCullagh 1998, 210). Evidence found in Northumberland indicates crop rotation and/or moving of cultivation around the landscape to optimise soil fertility, on a local scale (Huntley 2007, 140). Flexibility and active responses to change was reported by Davies, observing that land-use was structured to take advantage of small, dispersed areas of better ground as peat began to dominate in north west Scotland. This appears to demonstrate resourcefulness and careful management allowing for

continued exploitation and resilience (Davies 2007). Further flexibility, shifts in agricultural management practises and varying levels of intensity of pasture maintenance are also seen in the northern Cheviot Hills and the Scottish uplands (Tipping 2010, 178). Narrow ridged cultivation plots, known as ‘cord rig’, are found in the Cheviot uplands and are associated with later prehistoric settlements, likely from the Iron Age. As there is no evidence within pollen analyses for cereal cultivation in the Iron Age in the upland valley, it is hypothesised that these plots could have been garden plots used for growing vegetables (*ibid.,* 182).

Evaluating 75 pollen sequences from across Britain, using both marginal and optimal sites from the Late Bronze Age and the Early Iron Age, Dark concluded that no widespread land desertion was apparent for Britain, but abandonment of upland areas in Wales was one of a number of regional variants (Dark 2006). Five of the nine sequences taken from Welsh sites show temporary woodland regeneration phases in this period. Those with reduced agricultural activity are all sites above 150mOD, suggesting that Welsh marginal sites saw a shift away from the uplands with higher levels of abandonment compared to the rest of Britain (*ibid.*, 1391).

However, the results appear to be varied throughout the Iron Age in north Wales. Cultivation activity at Cefn Graeanog in Gwynedd has been correlated with periods when the hut group was occupied 315-85BC; buried soil and ditch deposits has indicated woodland clearance, pastoral activity and cereal cultivation at Bryn Eryr Iron Age/Romano-British farmstead, Anglesey; an increase in clearance is seen to the north east of Bryn y Castell hillfort in Snowdonia c. AD 40 and various periods of clearance and pastoral activity has been noted at the Breiddin hillfort, specifically deforestation and continued grazing from the Late Bronze Age and throughout the Iron Age (Caseldine 1990, 69-74).

The uplands of the Clwydian Range appear to have been continued to be in use throughout the Late Bronze Age into the Iron Age (Grant 2009, 24) and may be described as a local variant within the ‘regional variant’ of Wales described by Dark, above. Peat core analysis at the hill of Moel Llys y Coed (grid ref: SJ1471 6493), a small basin mire at around 445m OD, has suggested that during the Bronze Age, woodland was probably confined to slopes and steeper valley sides, whilst elsewhere was predominantly a more open landscape (*ibid.*). Grazing and cultivation

are suggested by the presence of ribwort plantain, yarrow, bugloss and barley (*ibid.*, 24-25). The pollen record in the Clwydian Range shows a continuation of Bronze Age cultivation with an emphasis on increased grazing during the Iron Age.

Grant notes that at 2600BP (650BC) a clearing episode, including burning, may indicate the start of a phase of renewed clearance linked to the development of the hillforts. Wider-scale vegetation changes had already taken place in the Bronze Age (Grant 2009, 25). These earlier changes, if linked to the development of the hillforts, could suggest an earlier horizon for their establishment on the Clwydian Range, or that these vegetation changes contributed to further pressure on the land (*ibid.*). The renewed wood clearance noted by Grant may also have been sought to improve the quality and extent of pasture if this resource was under pressure (Whittle 1982, 200). The Late Iron Age in the Cheviot Hills in northern England saw rapid and whole-scale clearance of woodland, probably for the extension of farming land (Tipping 2010, 183-184), with intensification of farming including maintenance of pasture, growth of rye and barley, establishment of hay meadows and terracing, suggesting a planned and organised landscape in the area, rich in hillforts and prehistoric enclosures (Mercer & Tipping 1994, 14-17). Studies indicate that large- scale clearance took place in much of north central Britain c200-100 calBC, with Northumberland referred to as 'an area of cereal cultivation' throughout the Iron Age by Huntley (2007, 136), spreading to the lowlands in the Later Iron Age.

Interestingly, *Calluna*, heather, was only present at very low levels in the Clwydian Range at this time, which is not typical of other upland areas of Wales (Lynch et al 2000, 141). Heather dominated moorland, which favours poor, over-exploited soils, was common in the Late Bronze Age to the west of the Clwydian Range at the Brenig, Hiraethog (Hibbert 1993) and to the east on the Sandstone Ridge (Chiverell et al, forthcoming). Grant suggests that the continued lack of *Calluna* throughout the Iron Age in conjunction with fertility of the land and grazing pressure "*may help explain the importance of the Clwydian Hills to the Iron Age cultures of the area during this period as evidenced by the hillforts... Many of the uplands were already dominated by heather moorland, and as such, fertile land would have been a scarcer and a valuable resource"* (Grant 2009, 26).

5.1.3 The archaeological setting

Whittle suggests that whether the uplands were being exploited for localised domestic production, with population overspill onto marginal land, or with the creation of 'regional economies' linking lowland and upland, this prompted the beginnings of social division. This was through division of land or division of labour with interchange of products, showing communal involvement, hierarchies of control and the creation of wealth, illustrating interaction through exchange links (Whittle 1982, 199). This is evident during the Bronze Age by the quality of finds recorded during this time in this area, such as the harness hoard from Parc-y-Meirch, Dinorben containing objects of Scandinavian origin (Piggott 1952-3, 184) and the Caergwrle Bowl, with its symbolism of boats and waves (Green 1985, 116). It is thought that the shale used to make the Caergwrle Bowl originates from Dorset (*ibid*, 117).

The hills have been occupied or exploited by humans since at least 30,000 BC, with the cave sites of Ffynnon Beuno and Cae Gwyn near Tremeirchion providing evidence of human activity from the Palaeolithic period (Grant 2009, 3). The area also boasts Britain's second largest artificial prehistoric mound, Gop Cairn at Trelawnyd, dating to the Neolithic period (Brown 2004, 37).

During the transition between the Late Bronze Age to the Iron Age, 'monumentality' shifts from 'ritual' monuments, such as barrows, to the settlement record including the hillforts (Karl 2007, 168). Lynch & Davies also suggest that climatic deterioration would have led to conflict, which in turn led to a growing investment in physical security for groups of families through the construction of fortified settlements (Davies & Lynch 2000, 146). These occurrences, coinciding with an increase in weapons, could suggest a period of social tension (Davies & Lynch 2000, 145).

Periods of different intensities are also evident in this monumentality, as in the excavation record that ditches are seen to silt up, followed by subsequent clearing out and re-cutting and different phases of building of the ramparts; an increase or decrease in size, multivallation and additional works (Cunliffe 2005, 41; 46; 241; 260; 347 etc) also suggesting defences could have been as much for control and display as for warfare (Davies & Lynch 2000, 139). Karl highlights that enclosure suggests ownership and social status, as much as it does defence (Karl 2007, 169).

The continued use of monumentality, alongside the exploitation of the uplands with regional and wider exchange links, suggests a highly organised and structured society, one that has been present in the archaeological record in Britain from an early stage in the Neolithic period (Burgess 1980). In 1958, Savory published an overview of the (then) recent or unpublished finds of the Late Bronze Age in Wales and how these distributions could indicate cultural groups that may be the precursors of the tribal groups referenced by the Romans (Savory 1958). He suggests that the area of the Cornovii-Deceangli, i.e. north east Wales and the Marches, had stronger links with the east (Savory, 1958, 50), with 'Yorkshire' socketed axes being found along with horse-harnesses, such as the hoard at Parc y Meirch from northern Europe (Savory 1958, 48). Savory concludes that further investigation of the hillforts may deepen knowledge of the "*final stages of Bronze Age metalworking and the first stages of occupation of such sites*" (Savory 1958, 49).

Burgess suggests that territorial divisions may be apparent by looking at the distribution of metal work (Burgess 1980, 249). Inspired by Savory's 1958 work, focusing on Late Bronze Age metal work, he finds that unlike south east Wales with a majority of south welsh socketed axes, north west Wales with a high majority of 'late' palstaves, and the Marches' spear hoards, the north east has a mixture of socketed axe types and some from other parts of Britain, such as Irish bag-shaped, Yorkshire and south Welsh ribbed (Burgess 1968; 1980, 249 & 272). He suggests that the rapid spread of iron arriving too quickly for the bronze-working to develop would have meant a collapse of the Ewart Park workshops. This, alongside climate change, would have meant an unsettled society, shown by the burst of hillfort construction, including the rebuilding of existing but decayed ramparts such as Dinorben, the Breidden and Moel y Gaer Rhosesmor and new sites such as Moel Hiraddug, alongside planned interiors (Burgess 1980, 275-6).

In 1980, Savory suggested that by the early Iron Age, comparing distribution of important chance finds of early Iron Age metalwork and hillforts with the distribution of Neolithic and Bronze Age chance finds and burial sites, the emphasis for settlement in the First Millennium BC had shifted from the interior uplands to the main river valleys and fertile seaboard (Savory 1980, 291-2). At this time, around the middle of the First Millennium BC, the population was beginning to recover after a

decline from the end of the Middle Bronze Age through to the Late Bronze Age (Davies & Lynch 2000, 142).

Some models for population densities have been attempted using hillfort evidence (Stanford 1972b; Alcock 1965 etc). In his 'sceptical viewpoint' of hillfort functionality, Guilbert attempts to estimate hillfort population, but warns that this can only be attempted if there is confidence that all of the structures have been located, the sequence of construction has been defined and the usage of these structures has been established (Guilbert 1981c). The excavations at the Flintshire hillfort of Moel y Gaer, Rhosesmor are used as an example. These found evidence of some buildings with hearths, some without and one that has been interpreted with the role of a guard hut due to its orientation towards the entrance, see Figure 3.7, even though its ground plan mirrored other buildings interpreted as 'houses' (*ibid*, 106). Guilbert also considers the four-post buildings, found on site at Moel y Gaer as well as other hillforts in the area, suggesting that although these are often interpreted as grain stores, this function has not been adequately proven and they could even be interpreted as dwellings (*ibid*, 106-7). He continues that those structures interpreted as 'dwellings' have no proof that they were roofed, and that hillforts were possibly not even for human habitation; their internal structures considered with a number of different functions, such as stabling, garaging of vehicles, mortuary structures or shrines (*ibid*, 109-110). This highlights the care that must be taken when interpreting monuments' functions and that previous 'interpretations' should be considered as such, and not proof.

In north east Wales, alongside the hillforts, the small amount of enclosures that have been typologically dated to the Iron Age or Romano-British period in this area (Manley 1990), including the discovery of an unenclosed Iron Age settlement at Prestatyn (Blockley 1989), are testament to the amount of settlements yet to be rediscovered, making population estimations during these periods ill-advised. From a sample of 60 small settlements thought to date to the Iron Age or Romano-British period in the then county of Clwyd (now parts of Conwy, Denbighshire, Flintshire and Wrexham), Manley identified 13 enclosure sites with field systems which may be contemporary. This included the enclosures of Bryn Teg, Cerrigydrudion and Tyddyn Tudor Enclosure A, Llanfihangel Glyn Myfyr. Manley noted the probability of many of the 'undiscovered' sites to have been destroyed and warns of unlikely concealment

of ‘Dark Age’ sites within his sample - an unresolved problem without excavation (Manley 1991, 103-105).

Manley tentatively suggests that, in some cases, hillfort-enclosure pairings may emerge in view of the spatial correlation between the two. However, he warns that until further exploration and discoveries he could only conclude that both the hillforts and enclosures were attracted to locations within or peripheral to good agricultural land (Manley 1991, 107-8) During his sample of small settlements in Clwyd, Manley noted that although the hillforts in the area, 37 in total, did not have an overall preference for a particular altitude, the enclosures were entirely within the band 0-400m OD, the hillforts occupying a slightly more elevated position between 50m and 500m OD. In relation to altitude, the settlements surveyed showed a greater affinity to the hillforts than to the Roman sites which were mostly sited below 150m OD (Manley 1991, 103-4).

On the Clwydian Range, by the end of the Iron Age and into the First Millennium AD, clearance and grazing declined, with a reduction of grassland, regeneration of woodland and scrub, and an increase in varieties of plants whose presence suggests a reduction of cattle grazing due to lack of trampling (Grant 2009, 26-27).

During the onset of Romano-British occupation, the area was exploited for its mineral wealth, highlighted by the earliest lead ingots found in north east Wales dating to AD 74 (Blockley 1991, 120) and a bronze-smithing site in Prestatyn, manufacturing trumpet brooches and harness bits, dating from c.AD 90/100 to c.AD 160 (Blockley 1991, 121). Other working sites have been located at Flint and Ffrith, Wrexham (Brown 2004, 86) as well as a pair of metalworking mould-stones found in a posthole dated c. Fourth Century AD or later, found at Dinorben hillfort (Brown 2004, 88). With the control of copper and lead ores in Wales in both the Bronze Age and the Romano-British period, Savory proposes that these resources were also exploited, to an extent, during the Iron Age (Savory 1980, 306).

In north east and mid Wales, 13 Roman forts have been confirmed (Silvester 2004, 1-2), including the ‘lost fort’ of Varis, thought to be located near to St Asaph (Blockley 1991, 117). In addition, a small number of fortlets and significantly more marching camps have been identified (Silvester 2004, 3-5), such as Ty’n y Wern near Ruthin (Waddelove 1991, 18-20).

During the early explorations of the hillforts on the Clwydian Range, a number of Roman artefacts and coin hoards have been found, including two hoards of Roman coins in the 1800's, one of which totalling 1500 coins, within Moel Fenlli hillfort (Davies 1983, 89). Mostly consisting of Samian ware, these finds were the reason the hillforts were interpreted as dating to the Romano-British occupation, or to have been built by the contemporary natives to protect their territory in the same period (Wynne-Ffoulkes 1850a, 88).

The main hillfort evidence for Romano-British occupation, or use, comes from Dinorben hillfort at St George Abergele, a few miles west of the Clwydian Range. Although the hillfort is a multi-period site, with remains dating back to the Late Bronze Age, the hillfort was utilised during the Romano-British period (Savory 1971b, 76), bull-headed bronze escutcheons found during excavations (Gardner & Savory 1964, 146-148) date from around the late First Century AD (Brown 2004).

During Stapleton's excavations of Moel y Gaer hillfort in Bodfari, no Roman remains were discovered, prompting him to conclude that the hillfort "*was at least never occupied by the Romans*" (Stapleton 1909, 237). Other than a deer antler, the only other 'artefact' found was a haematite ring (Stapleton 1909, 235). The hillfort in question stands above a haematite mine in Tremeirchion and although early use of the mine has never been proven, the amount of mineral exploitation in the surrounding area by the Romans suggests that they would have been aware of this resource. Close to Bodfari in the 19th Century a Roman cremation burial site was found, the burials found within red and black urns (Davies 1949, 35-6).

One of the most obvious features of the Romano-British occupation in today's landscape are the roads; one linking Chester (the Roman fort of Deva) with St Asaph and Caernarfon, running through Flint and through the Clwydian Range at Rhuallt Hill, where the current A55 trunk road now runs. A smaller road is proposed along Halkyn Mountain to Holywell running through Hawarden, leading on a minor road from Northop Hall through Halkyn and Pentre Halkyn (Margary 1957, 79-82), possibly running near to Moel y Gaer Rhosesmor hillfort. A further Roman road is known linking the Legionary tile works in Holt (dated from c.AD90 to c.AD125) with Watling Street (Blockley 1991, 119-120).

A road links Chester with Caer Gai in Bala running through Caergwrle past Caer Estyn hillfort, Ffrith (at the meeting point of several deep valleys), north of Corwen past Moel y Gaer hillfort on Llantysilio Mountains and the hillforts of Moel Fodig and Caer Drewyn, on to Glan yr Afon running under Caer Euni hillfort, Cefnddwysarn and onwards to Bala (Margary 1957, 77-78). Corwen sees a second road branch off here up to the Vale of Clwyd to St Asaph, identified during the CPAT Roman Roads project, 2002-03 (Silvester & Owen 2003).

Longueville Jones, in his list of early British remains of Wales, lists possible prehistoric roads and trackways around the Clwydian Range, but it is unclear how he has come to these conclusions other than looking at prehistoric remains and linking them spatially. He specifically lists 'ancient roads' Bwlch Agricola, the road to the south, and Bwlch Pen Barras, the road passing below the northern side of Moel Fenlli hillfort and adds reference to it possibly being used by the Romans (Longueville Jones 1855, 268-269) probably because of the Fourth Century AD Roman coins found there (Brown 2004, 89). He also suggests that there "*is every reason to believe*" the existence of two ancient roads running east and west of the Vale of Clwyd, on higher ground, but does not specify what these 'reasons' are (Longueville Jones 1855, 269). It is possible that the routes through the Clwydian Range, running below the slopes of hillforts in many cases, would have been exploited for millennia.

Roman shrines are relatively unknown in this area, but geophysical results by Chester University during 2008 at Caer Alyn hillfort, Wrexham, produced a square or rectangular enclosure with an interior sub-rectangular feature orientated NE-SE in the centre of the hillfort, which could suggest such a structure (Gondek 2008, 6). A possible temple site near Llanfair Dyffryn Clwyd, south of Ruthin has also been found using aerial photography (Jones 1999, 23). However, neither of these sites can be proven without excavation.

Six of the 40 hills of the Clwydian Range have hillforts upon them. Fifteen (37.5%) of the 40 hills have probable Bronze Age cairns, barrows or tumuli on their summits, with many more having a number of these on their lower slopes. Only two (33%) of the hillforts currently have evidence of cairns on their summits, indicating that there

is no reason to suggest that the hills with hillforts upon them were chosen specifically because of their Bronze Age burial heritage.

Many of the finds on the hillforts have been chance finds, such as the three Bronze Age flat axes found on Moel Arthur after erosion, or through those which have been excavated. Many chance finds have been recorded in the Historic Environment Record, which shows that out of the 40 hills, ten of the hills have recorded prehistoric artefact finds upon them, which includes all six hillforts. Interestingly, only one of the hills/summits has artefact evidence but no hillfort or tumulus, which is Moel Llys y Coed, where 3 prehistoric flint flakes were found on Offa's Dyke Path in the 1970s (Dunn 1970, 10).

However, it must be stressed that chance finds are simply that, and an absence of evidence on the eighteen hills without any chance finds, no excavation nor evidence of a burial cairn or smaller prehistoric enclosures, does not mean this provides evidence of absence of prehistoric activity on these particular hills.

Finds and dating on the hillforts themselves are discussed in chapter 4.

5.1.4 Water sources

The pass through the Clwydian Range at Bodfari would have been an important route for many years. The hillfort overlooks the confluence of the Afon (river) Chwiler with the River Clwyd (Brown 2004, 77). Furthermore, the site of Ffynnon Deifer, a well named after St Deifer, an early patron saint of Bodfari Church (RCAHMW 1912, 3), lies 200m north west of the Afon Chwiler, 600m south of the hillfort, possibly signifying an earlier site.

In addition to the Afon Chwiler, many small streams flow from the watershed to both the east and the west of the Clwydian Range, several of which provide passes through the range (Grant 2009, 2). In the central section of the Clwydian Range, Penycloddiau to Moel y Gaer Llanbedr, the spring line is approximately 350m (Gale 1999, 93), whereas the hillforts sit at 333m (Moel y Gaer), 422m (Moel Arthur) and 381m (Penycloddiau) OD. Without the necessary water source, it is argued that these enclosures could not have been intended for warfare, as they would have failed if under attack or siege due to the lack of water resources. However, it is

possible that water could have been stored and collected by gullies and drains. Hollows in the defences of Old Oswestry have been posed as storage water tanks (Brown 2009, 88); they still hold water today. Their creation for this use, however, is not certain.

The nearest water courses, wells or springs for the Clwydian Range hillforts is never more than 550m away, if not significantly less. It has been suggested that the south eastern gap in the ramparts with "*sloping path... down the face of a cliff on the east side of the fortress*" at Penycorddyn Mawr, to the west of the Clwydian Range, was created as an easy access to the spring below and termed 'the water gate' by Willoughby Gardner after his excavations there (Gardner 1910, 52). Certainly, this was the nearest water supply for the hillfort and it warrants further investigation into where the easiest approach to water supplies for other hillforts may be, currently under investigation by Campbell, University of Liverpool (Campbell, forthcoming).

Moel Fenlli and Penycloddiau hillforts are the only hillforts of the six in the Clwydian Range that have obvious water sources within the enclosure (Gale 1999, 92). At Moel Fenlli, a series of earthworks were found surrounding the spring, the spring pool thought to be scarped into the hillside with a large platform on the slope above and a dam along the southern edge, a linear hollow suggested as a leat to drain excess water (Brooks & Laws 2006a, 9). Two hut platforms were excavated but remain unpublished (Hayes 1959a; 1959b; 1959c; 1959d; 1959e). A number of possible hut platforms surrounding the pond at Penycloddiau hillfort were located during magnetic susceptibility, fluxgate gradiometer and resistivity surveys in 2008 (Brooks & Laws 2008b).

From the Late Bronze Age into the Iron Age, the practise of deposition in watery locations is seen, such as the finds at Llyn Cerrig Bach 50 miles (80km) to the west on Anglesey (Fox 1946) and highlighted by possible 'votive' deposits at Llys Arwel near Penycorddyn Mawr (Green 1985, 282). The hoard, thought to be votive offerings dating to the Romano-British period, could suggest a shrine existed nearby (Blockley 1991, 126-7). Wetland deposition has been interpreted as votive (Bradley 1990), which would suggest that watery places would be thought of as 'special'. Dinorben hillfort lies above what is still today known locally as a holy spring Ffynnon Gygidog. A pattern may begin to emerge that that the hillforts are situated near to

places where rivers or streams converge, wells or springs, possibly signifying a place that was revered (Brown 2004, 77), or if not for spiritual reasons, then simply for the ability to survive by providing water.

5.2 Geographical characteristics

Contour data of the Clwydian Range was studied to identify a number of locations with a distinct summit and similar topography to the hillforts of the Clwydian Range for use in a comparative study. This study attempts to find suggestions as to why particular hills within the Clwydian Range were chosen to build hillforts upon, but others not. A total number of 40 hills were identified as hills with steep slopes[32] and with an area of flatter ground on the summit, see Figure 5.1. These included the six hills in the Clwydian Range which have hillforts upon them.

[32] Some of the hills included did not have steep slopes for the whole circumference of the summit but sat on a spur. These have also been included as the hillforts of the Clwydian Range are not limited to summits, but also include sites like Moel y Gaer Llanbedr which sit on a hill which projects out from the main ridge of hills. Data has been collected to directly compare the hills which were chosen to build hillforts on with hills not chosen. This data will allow direct comparisons to be made with regards to features of the hills.

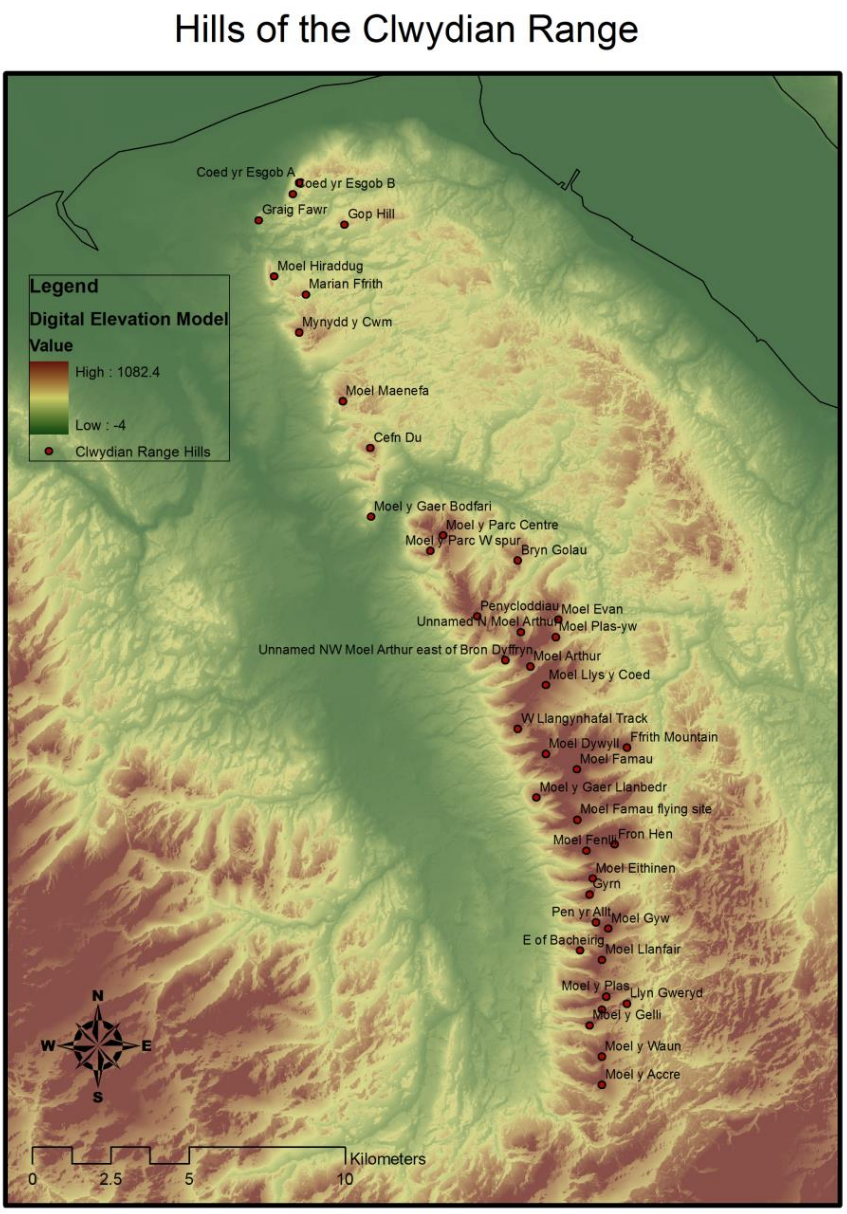

Figure 5.1. Hills of the Clwydian Range, identified as hills with steep slopes and with an area of flatter ground on the summit

Using these selected hills, 15% of hills in the Clwydian Range have hillforts upon them. Compared to the Long Mynd in Shropshire, where there are over 30 hills with contour data preferable for hillfort building, only 2 hillforts are present, representing 6.5%. However, the small ridge of hills a short distance (around 2kms) east of the Long Mynd has one hillfort, Caer Caradoc, and two smaller settlements between its four hilltops.

5.2.1 Height of hills

The hills chosen as hillforts appear to sit upon hills which are at average height within the Clwydian Range, see Figure 5.2 & Table A3.14. The highest hillfort in the Clwydian Range is Moel Fenlli at 511m OD[33], close to the highest hill and a central point on the range, Moel Famau at 554m OD.

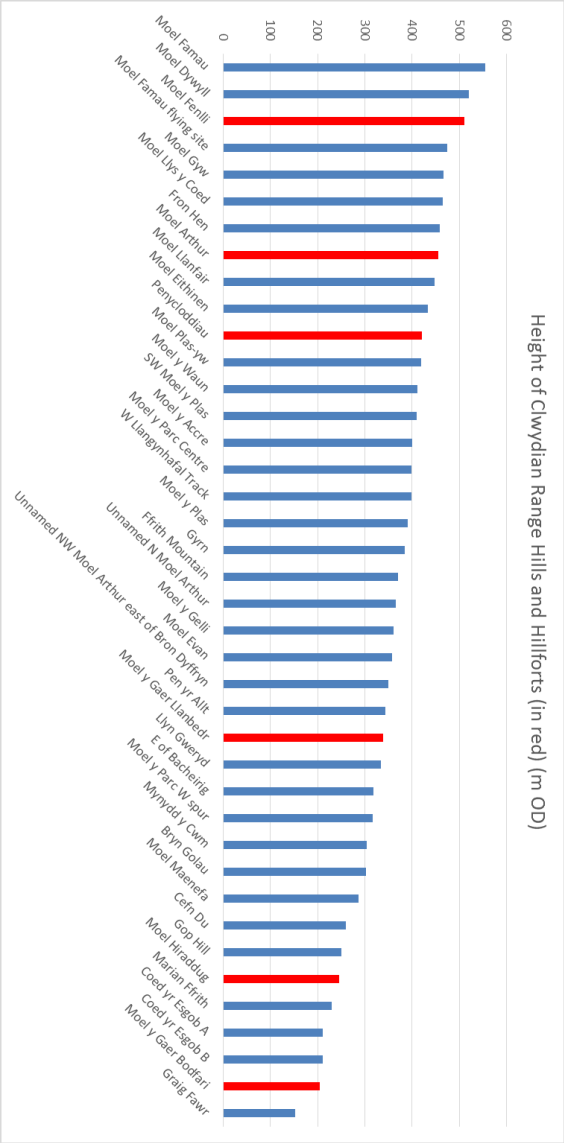

Figure 5.2. Height of the hills and hillforts of the Clwydian Range with hillforts shown in red, hills without hillforts in blue. The graph demonstrates that the hillforts of the Clwydian Range were not built on the highest surrounding hills and that height, therefore, was not a determining factor during site selection

[33] Despite the HER stating the height for Moel Fenlli is 500m

The two hillforts with the lowest altitudes are Moel Hiraddug and Moel y Gaer Bodfari; the two most northerly hillforts, both sitting within a range of 201-250m OD. These are placed within the northern sector of the Clwydian Range which itself sits lower than the central and southerly sections of the range, from the Wheeler Valley southwards.

To compare, the height range of hillforts within the Dwyfor district on the Llŷn Peninsula reveals the majority of sites sit under 250m OD (Waddington 2013), see Figure 5.3. No sites are higher than 500m; the highest hillfort on the Llŷn Peninsula being Tre'r Ceiri hillfort, sitting at 480m OD.

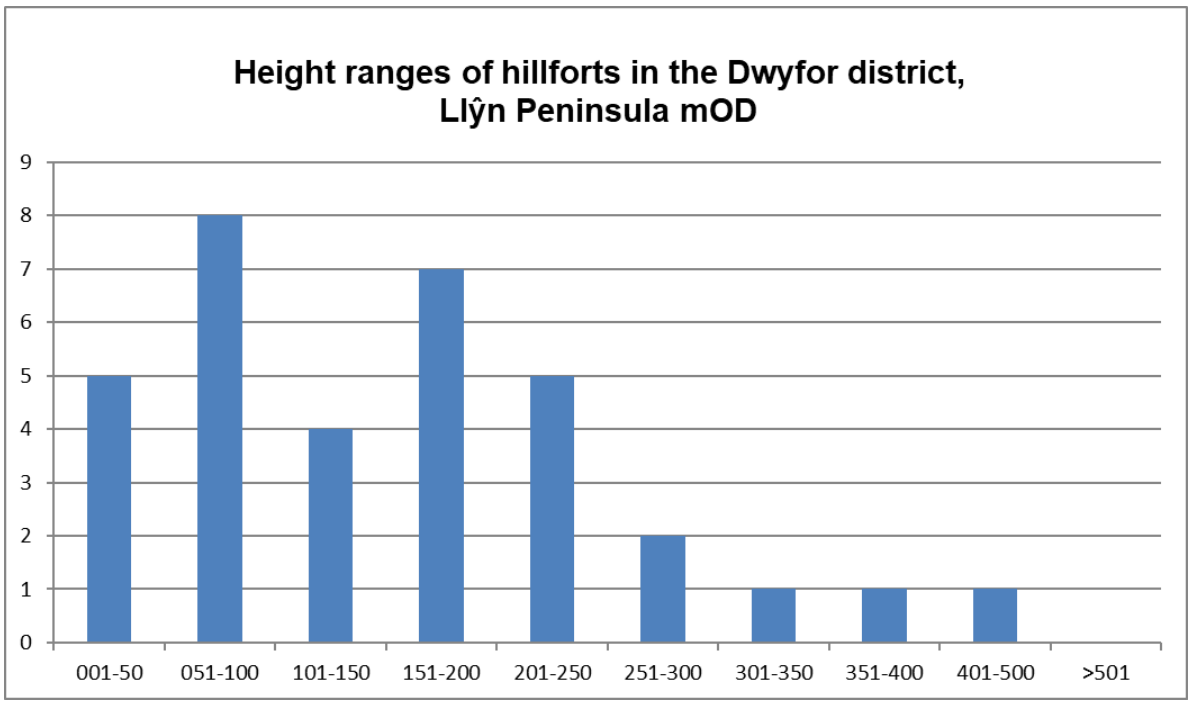

Figure 5.3. Hillfort height in Dwyfor district on the Llŷn Peninsula Gwynedd, north west Wales (Waddington 2013)

Looking at a wider range of data, using the whole county of Gwynedd, hillfort height band data provides similar results to Llŷn data. Gwynedd provides a higher amount sitting at higher altitudes, see Figure 5.4, probably due to the higher overall altitude of Gwynedd as a county.

Gwynedd as a county sits at an overall higher altitude than the Clwydian Range, but the hillforts of the Clwydian Range sit on a higher average altitude than the hillforts of Gwynedd. The Clwydian Range does have hills which sit within the most popular

altitude bands for hillforts in Gwynedd, but in the Clwydian Range they have chosen to build hillforts on higher hills.

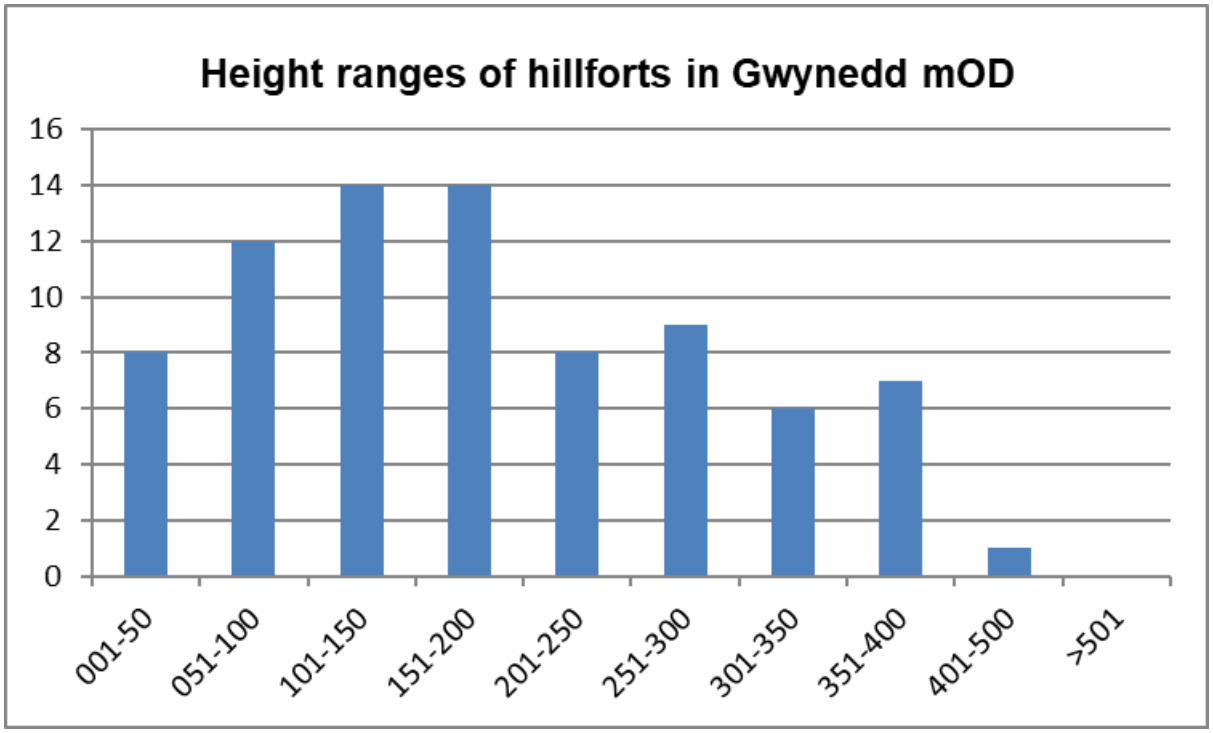

Figure 5.4. Hillfort height data for the county of Gwynedd, north west Wales (Waddington 2013)

For the whole of north west Wales (Waddington 2013) including Anglesey, Gwynedd and parts of Conwy, using altitude data from definite hillforts, the results can be seen in Figure 5.5. The only sites which sit above 501m OD within north west Wales are unenclosed settlements (Waddington 2013, 69).

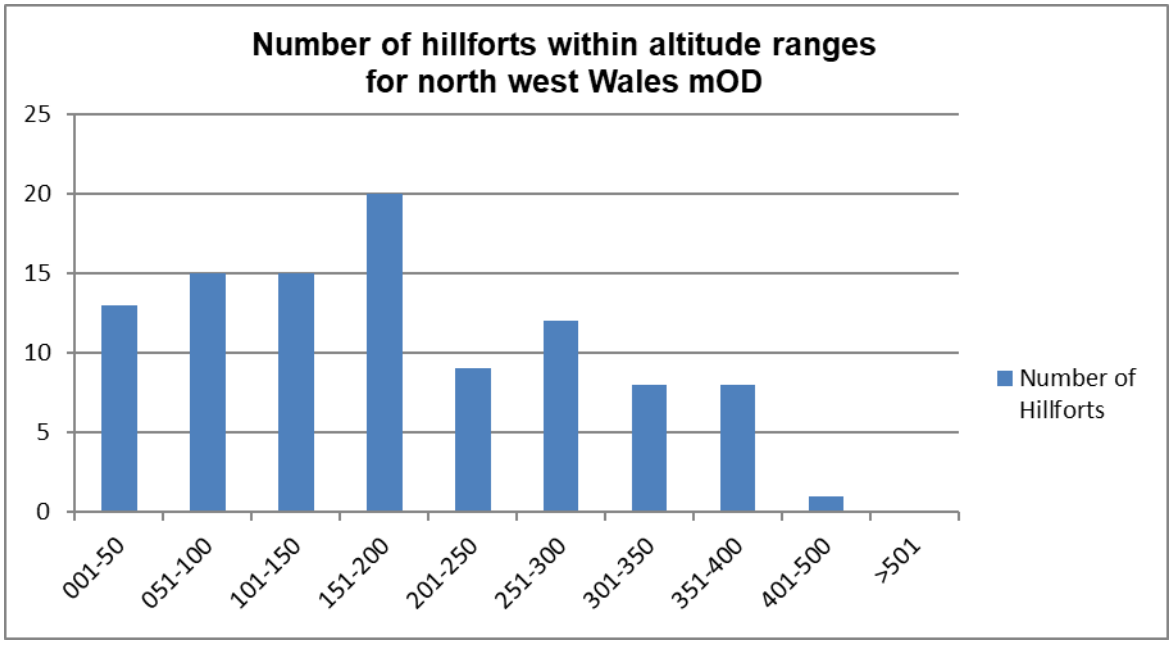

Figure 5.5. Hillfort height data in north west Wales (Waddington 2013)

Altitude data for hillforts within the 30-mile (48km) radius of the Clwydian Range, taking in most of north Wales, Powys, Shropshire and Cheshire can be found in Figure 5.6.

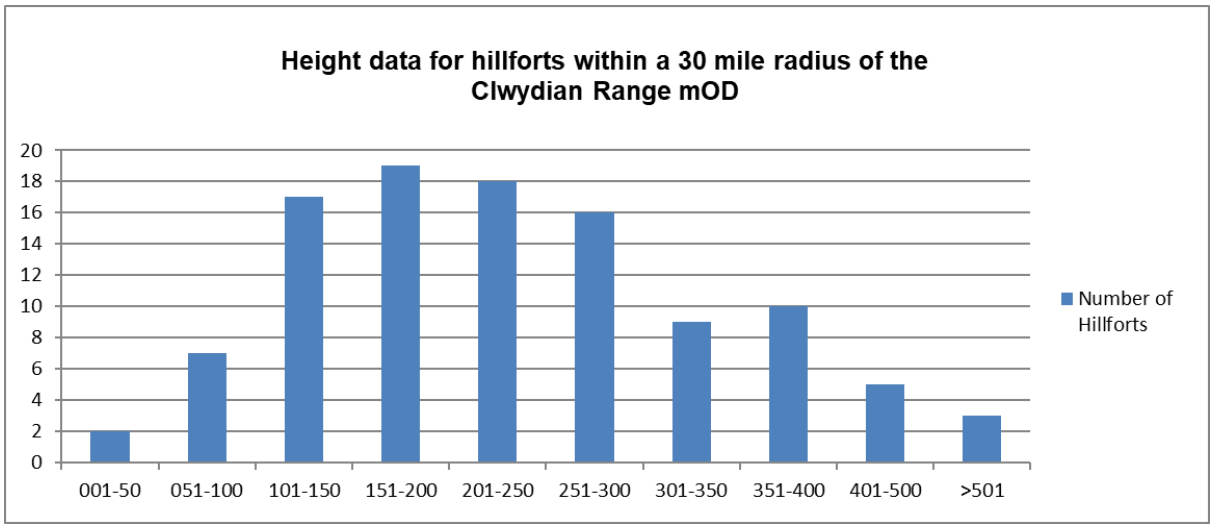

Figure 5.6. Hillfort height for a 30-mile radius surrounding the Clwydian Range, including much of north Wales, Powys, Shropshire and Cheshire

To compare the results with a similar area, further south down the borderlands of Wales, the Brecon Beacons hillforts show a less diverse result, but still a wide range of heights for hillforts, as seen in Figure 5.7.

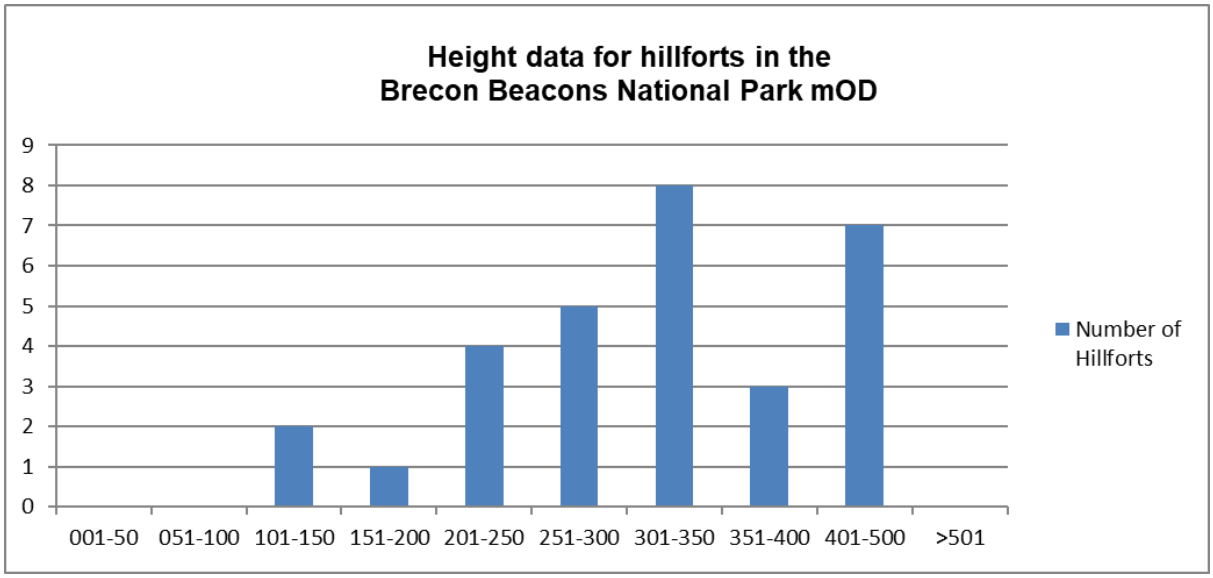

Figure 5.7. Hillfort height data for the Brecon Beacons

From the results above it can be seen that the hillforts of north west Wales and from the wider study area surrounding the Clwydian Range have a fairly even distribution of height categories, but the hillforts of the Clwydian Range and the Brecon Beacons appear to favour higher hills, see Figure 5.8 and Table A3.8.

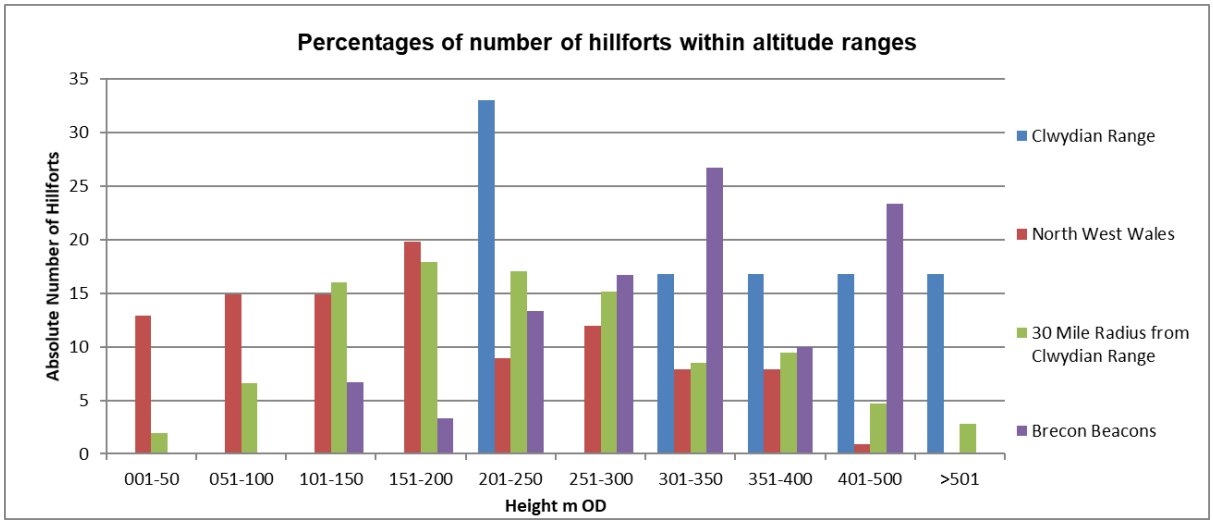

Figure 5.8. Hillfort altitudes (%) for selected areas in Wales

The Clwydian Range hillforts sit upon hills ranging from 205-511m OD, with a mean average of 365m OD, median 379.5m OD and a range of 306m OD.

Hillforts within the north west Wales research area by Waddington sit upon hills ranging from 10m OD to 480m OD with a mean 184.2m OD, median 180m OD and range 470m OD.

Hillforts within the wider radius of the Clwydian Range hillforts, including the six Clwydian Range hillforts themselves, sit upon hills ranging from 10m OD to 520m OD with a mean of 234.5m OD, a median 215m OD and a range of 510m OD.

Hillforts of the Brecon Beacons sit upon hills ranging from 107m OD to 460m OD with a mean of 318.7m OD, a median 320m OD and a range of 353m OD.

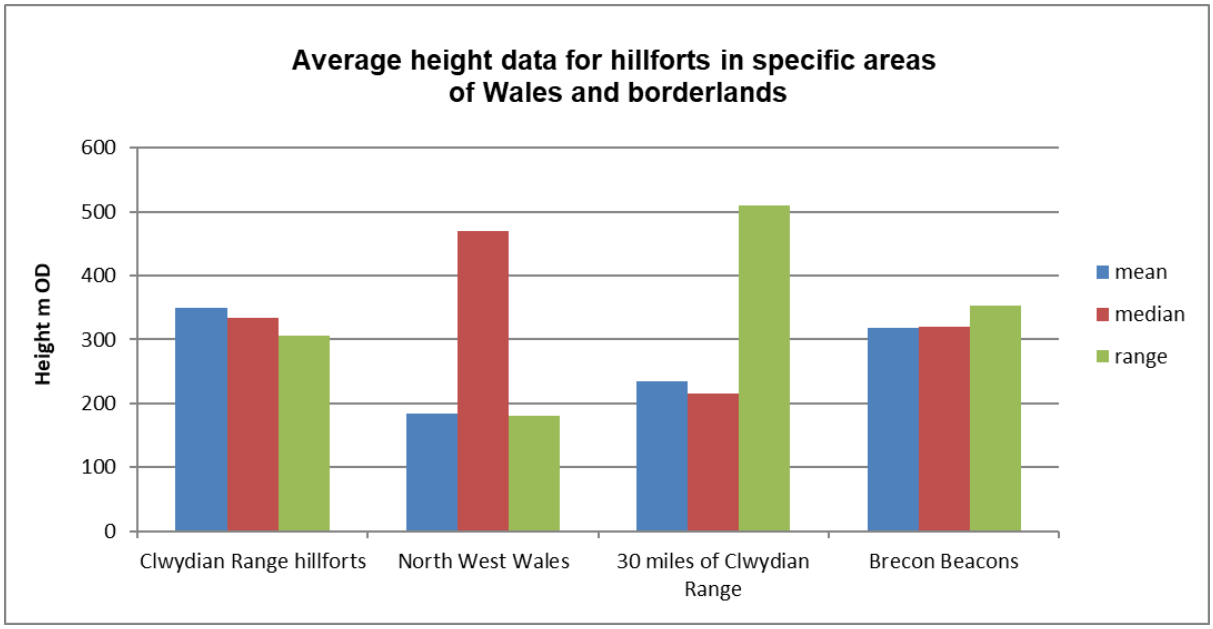

Figure 5.9. Average height of hillforts in selected areas in Wales and the borderlands including much of north Wales, Powys, Cheshire and Shropshire

From this information, it is demonstrated the hillforts of the Clwydian Range sit at a higher than average altitude for this part of Britain, see Figure 5.9 and Table A3.9. As the north west Wales hillforts and the hillforts within a 30-mile radius of the Clwydian Range categories both include a number of hillforts sitting at a low altitude of under 100m OD, these bring the average numbers down significantly.

5.2.2 Logistics/practicalities

5.2.2.1 Water sources

Out of all of the hills of the Clwydian Range chosen to sample by their contour data, see Figure 5.1, only two of the hills have water sources within the enclosures. These two hills are home to the hillforts of Moel Fenlli and Penycloddiau. This may suggest that the addition of a fresh water source within the ramparts would have been a reason for choosing these particular hills to build hillforts upon.

However, all hills on the Clwydian Range have water sources within walking distances from their summits, most within 250 metres and many directly adjacent to the summits on the slopes of the hills. It is not clear if these would have been useable resources all year round.

The other four Clwydian Range hillforts' sources, although within a short walk of the site to reach water, would have had to have been accessed using the steep slopes of the hill and may have been difficult to reach. For example, Moel y Gaer Bodfari has a number of water resources surrounding the hill, including the Afon Chwiler, but due to the almost promontory nature of the site, access to the river would have been a longer walk to use an accessible route.

Both half of the hills and half of the hillforts have water sources on the summits or directly adjacent to the summits on the slopes of the hills themselves. This suggests, alongside the figures that only two out of the six hillforts have water sources within the ramparts, indicating that the need to have a water source on site was not a major factor when choosing the hills to build hillforts upon. Often, this is suggested as a reason why hillforts could not have been intended for warfare, as the lack of water within the defences would have been useless in a siege situation or even, in fact, for simply living on the hills. The two roundhouses discovered during the excavation of Moel y Gaer Llantysilio showed the traces of their drip gullies surrounding the house (Grant 2010). It is possible that this water could have been collected and stored for future use. It must also be considered that water is a luxury to have on site for many communities even today, many of which have to walk for miles to collect their daily water. It is more than feasible that the hillfort users collected water from outside the hillfort on a regular basis, complimented by Penycorddyn Mawr's eastern 'water gate'

(Gardner 1910, 52). This also suggests that a water source inside a hillfort was not a necessity and therefore questions the use of these enclosures for siege warfare.

5.2.2.2 Size

When identifying the hills to be included in this study, see Figure 5.1, a general measurement was taken of the hilltop summits using OS contour data.

It was found that although a measurement around the summit of the hill did not always define where the hillforts ramparts lay (such as Penycloddiau and Moel Fenlli 'tipped' forts), the areas of most of the 'summits' (i.e. flatter top, taken from contour data) did generally match up with the area enclosed by the ramparts, albeit sometimes a slightly different place on the hilltop.

There were two hillforts where this was not the case; at Moel Arthur hillfort, where the conical hill does not appear to have a large amount of flat summit, and Moel Fenlli hillfort, which alongside it being a 'tipped'/ not a true contour fort (see below), the hill itself is also quite tipped and sits at a westerly aspect. The area of flat top upon the hilltop is roughly only 2.5ha, compared to approximately 8.3ha enclosed by the hillfort's ramparts. This shows that ramparts are not always defined by the break in slope, contours or steepness surroundings the hill.

The summits on hills which were not chosen as hillforts range from around 1.2ha to 20ha, with the majority of sites falling below 5ha, as do the hillforts similarly ranging from 1.6ha up to 17.7ha (enclosed) in the Clwydian Range, up to 37ha for those wider afield. There are a small number of hills which have a large summit area, but none are larger than the area enclosed by Penycloddiau hillfort, one of the largest hillforts in Wales.Therefore, it can be concluded that the hills without hillforts would not have been discounted as places to build hillforts just because of the size of their summit area.

5.2.2.3 Aspect

Many of the hillforts lie on either flat-topped hills or do not appear to have an aspect in one particular direction. However, Moel Fenlli and Penycloddiau's ramparts, although classed as contour hillforts, have not been built following the natural contours of the hill, but sit on an aspect of the hill crossing the contours. This allows

Moel Fenlli to have a wide aspect to the west, overlooking the Vale of Clwyd and Penycloddiau to face towards the south.

Moel y Gaer Bodfari also has a wide aspect to the south as, although the ramparts closely follow the contours, the geology of the hill itself presents a large amount of ground within the hillfort with a predominantly southern aspect.

Despite researching which hills may have been suitable hills for hillforts considering contour data, see Figure 5.1, without any ramparts being present it is difficult to say whether they would have had certain aspects. For example, the contours on the hills of Penycloddiau is not overly biased towards the south but the hillfort has been built to straddle the contours, exaggerating this 'tilt' towards its aspect. It is interesting, therefore, that the ramparts of Moel y Gaer Bodfari are not built in the same way and the site appears to be a true 'contour fort'.

It is possible, however, that if some hills on the Clwydian Range did, and certainly still do, have a southerly or easterly aspect, that they would have been deliberately kept unenclosed as these would have been prime locations for arable usage.

A discussion must be held here regarding the visibility of the interior of the hillforts at this point. With the 'tipping' of Penycloddiau and Moel Fenlli and a similar arrangement at other forts including Caer Drewyn a few miles away in southern Denbighshire, the deliberate building of the forts in this way may reveal some clues as to their function.

This also highlights the inappropriateness of the term 'hillfort' when considering that outsiders can see clearly the activities of the occupants of the site; not a defensive factor. These sites have been specifically built to sit in this way, suggesting that they wanted to be seen. This could be to attract people; the hillforts being places to gather or to trade. Alternatively, these monuments could have been built to show off power and status; whether this be of a powerful person or family, or for the whole wider community, who would have been part of the process of building and conserving the banks and ditches.

5.2.2.4 Access

Many of the passes through the Clwydian Range, from east to west, could be thought to date back in use to earlier times. These include Bwlch Pen Barras where alongside two hoards of Roman coins, a prehistoric black polished stone hammer and ceramic hoards and have been found (Brown 2004, 89); the pass now forming the route from Llangwyfan to Nannerch, overlooked by Penycloddiau hillfort and the pass of Bwlch y Frainc, overlooked by Moel Arthur hillfort. Brown (2004, 79) suggests that the hillfort is strategically located here specifically to control access across the range from east to west. The hillfort of Moel y Gaer Llanbedr is sited on the Clwydian Range but does not overlook a pass *through* the Range, the views to the east obscured by the higher Moel Famau but sits on a spur overlooking the Vale of Clwyd itself. It is possible, then, that this is strategically sited to control access through the Vale.

A Roman road is thought to pass through the gap that Moel y Gaer Bodfari overlooks, where the current A541 Mold-Denbigh road runs today. Because of this Roman road's location between the forts at Chester and Caernarfon and the name 'Bodfari' (the 'f' in Welsh pronounced as a 'v', to create 'Bod-vari', 'bod' generally depicting a settlement), Pennant believed that the hillfort was the location of the 'lost fort of Varis' (Rhys 1883, 138). In 1833, Lewis described the hillfort as "defending the pass at Bodfari" (Lewis, 1833a BOD) and in 1909, Stapleton describes the location of the hillfort as seen to "*command the entrance to the valley*" (Stapleton 1909, 232), suggesting that early investigators looked upon the hillfort's situation as being strategic for controlling this pass.

The Clwydian Range has several "bwlchs" or passes east-west through the range. Five, 83%, out of the six hillforts on the range directly overlook or sit adjacent to these passes, with the other hillfort, Moel y Gaer Llanbedr, directly overlooking the Vale of Clwyd. 79% of the 34 hills selected as 'potential hillfort sites' from their contour data but which do not have hillforts overlook passes, suggesting that location for access or domination over an access route through the Clwydian Range may have been preferable. Six of these 'potential hillfort site' hills overlook the same passes as some of the hillforts.

A small number of these ‘potential hillfort site’ hills overlook what are seen today as ‘main’ passageways through the Clwydian Range such as the North Wales Expressway; the A55. This route has been heavily modified to build the dual carriageway, but c.2000 years ago would have been a Roman road through the range (Silvester & Owen 2003, 80). This lies ‘undefended’ by any hillfort. If one was to suggest that the hillforts were built to overlook main passes through the range, one would expect a hillfort to overlook this particular pass. This pass’ earlier origins can be inferred by a number of prehistoric artefacts discovered along the route. These include a looped bronze palstave found 1861 in Rhuallt wood (Davies 1949, 99-100) and a ‘developed flat axe’ the HER reports to have been found and recorded in 1999.

Other prehistoric finds along routeways through the ridge of hills include two plano-convex knives near Moel Hiraddug, (Silvester & Owen 2002, 60), two gold bracelets and two Bronze Age “other gold objects” found in a field below the hillfort in Bodfari (Davies 1949, 42). At Bwlch Pen Barras, the pass to the north of Moel Fenlli hillfort, finds include a Neolithic polished stone hammer (Smith 1884). The eastern side of Bwlch Pen Barras has been also been noted as a Roman Road, towards the villages of Llanferres (Burnham et al 1993 271-273). A number of Roman finds have also been located in the land surrounding Moel Hiraddug, including a fragment of a lead lamp near Cwm found in 2003, recorded through the Portable Antiquities Scheme (ID LVPL-850648). The land surrounding Moel y Gaer Bodfari and the pass which follows the Afon Chwiler has also been a place of Roman activity, including the discovery of cremation urns thought to be Roman in 1908 (Davies 1949, 35-37).

The routes which are overlooked or in close proximity to hillforts have yielded more prehistoric finds than routes that do not have hillforts. This may indicate that the passes with hillforts were in more use during prehistory than others, and therefore, may indicate why the hillforts were built on hills overlooking them.

Seven of the 40 hills on the Clwydian Range are *not* in close proximity to a routeway or pass through the hills and this includes Moel Famau. It is possible that Moel Famau was not chosen as a hillfort because although it has steep contours with a relatively flat area on the summit, it is too inaccessible to and from nearby passes.

The other 33 hills are either directly overlooking a pass or can easily access a pass from the hilltop. Some of these are closer to passes than others. Interestingly, although Penycloddiau overlooks and dominates a pass through the hills to the south and was even built in such a way that the enclosure appears to be ‘tipped’ in the direction of this pass, it is still several hundred metres from the pass itself and on average takes around 20 minutes at a fast walking pace to descend the hilltop to the pass below. Discounting the hilltops which are not ‘easily accessible’ or do not directly overlook a pass, Penycloddiau hillfort has the third farthest distance from its pass of all 33 hills and is the ‘least accessible’ of all six hillforts, distance-wise. Moel y Gaer Llanbedr’s western entranceway also appears to be in a particularly inaccessible position for people entering the hillfort, located at the top of a steep slope facing the valley. However, this could have been more convenient or accessible for those wanting to leave the hillfort.

5.3 Visibility

This chapter has so far been concerned with characteristics of the landscape and its features surrounding hillforts and how these may have affected site location. Factors such as sensory stimuli may also have been significant when choosing the location of a site for a monument (Fisher et al 1997; Phillips 2003; Llobera 2007; Fitzjohn 2007). It has been suggested that visibility is the principle way in which humans relate to and interpret their landscapes (Wheatley & Gillings 2002, 201) and visibility to and from the location may have played an important role. The visibility from the hillforts will be scrutinised through viewshed analysis, with attention to both the *amount* of visible surroundings and *what* is visible, considering hillfort sites and non-hillfort sites, and intervisibility.

5.3.1 Background

In the 1980s, archaeology began to develop a more widespread use for Geographical Information Systems (GIS) in order to record, manipulate and interpret spatially referenced data electronically (Wheatley & Gillings 2002, 201; Chapman 2006, 17). This transformed the future of the archaeological record, its accessibility and its management.

Spatial analyses and visibility investigations have been popular in archaeology for a number of years, including use by antiquarians long before the computer and often undertaken in a qualifiable approach and difficult to quantify (Wheatley & Gillings 2000). Visibility studies through the use of GIS have gained momentum since the 1990s with the advent of faster computers and viewshed analysis being easily available on a number of GIS software packages (Wheatley 1995; Fisher et al 1997; Lake et al 1998; Wheatley & Gillings 2000 etc). This enabled archaeologists to easily and quickly conduct visibility studies through the use of a digital model of a landscape terrain on a computer, without necessarily the need to visit the site/s in question and generating quantifiable results.

This approach was met with criticism from theoretical archaeologists, such as those developing approaches concerning landscape phenomenology developing at a similar time, concerning the importance of immersion and experience (Tilley 2004). Although it is accepted that 'seeing (and experiencing) for yourself' is an important component in understanding a site and its views (Tilley 1993), the speed, accessibility and quantifiable results gained from undertaking analysis such as this through GIS reinforces its value (Gillings & Wheatley 2001). In addition, 'seeing for yourself' can only occur in today's landscape; certain features which still exist today may not be as noticeable to the naked eye as they once were (Llobera 2007, 54).

There are a number of different methods which have developed over the years which can be applied when conducting viewshed analysis through the use of GIS. A selection is outlined below.

Line of sight analysis calculates whether visibility occurs between two individual points on a map, or whether 'obstructions' occur in between the two points using an underlying digital terrain model.

Single viewshed analysis is used to calculate the visibility of 360° of the landscape surrounding the individual input point, using an underlying digital terrain model. This then displays all pixels/cells which are visible from the input point.

Total viewshed analysis performs viewshed analyses from each individual pixel on the digital terrain model and then calculates the most visible points in a landscape.

As this method essentially calculates an individual viewshed for each individual pixel, it requires massive computational power and time.

Cumulative viewshed analysis includes multiple viewsheds from multiple, selected input points, such as Neolithic long barrows, and combines them to create a single, unified map. This method displays, between a selected group of points within an area, whether and how often they are visible; the 'summed result' (Wheatley 1995).

This technique was utilised further to find, and subsequently investigate on the ground, potential 'significant places' which may today be unknown, due to erosion for example. This was done by calculating the most visible places from groups of contemporary monuments through cumulative viewsheds, theorising that they may have been positioned to have a view of a 'significant place' (Llobera 1996). Investigations into views from cursus monuments found that an early cursus monument, cursus A, in the Yorkshire Wolds had a visual connection with long barrows which continued for the length of the extensive monument, and which may explain its dog-leg design (Chapman 2006, 132-135).

The idea that sight could not be classed solely as 'visible' (1) or 'not visible' (0) led to the development of the 'fuzzy viewshed'. This calculated the values as distance from the 'viewer'/input point increased and subsequently the deterioration of view. Higuchi viewshed analysis was developed in order to take into account visual indexes, developed by Higuchi, within three visible zones and other physical and social attributes. This considers perception; that sight of immediate, short-distance surroundings, the 'foreground', would be near perfect (1) and that clarity declines towards the 'middle ground' and subsequently objects become indistinguishable (0), without a sense of depth towards the long-distance, or 'background', where only pronounced landscape features can be made out (Wheatley & Gillings 2000).

Llobera developed this work further, utilising three visible 'zones' of foreground, middle-ground and background. Whilst looking at the visibility of clusters of round barrows in the Yorkshire Wolds, he extended on work into intervisibility, investigating areas of 'shared visibility' from where multiple monument clusters are visible. He distinguished different ranges of view of a monument depending on size and appearance and included variability within investigations due to the uncertainty of contemporaneity between monuments (Llobera 2007). Subsequently, Llobera called

for the wider use of visualisation in archaeology and highlighted the need for a new speciality in archaeology, namely ‘Archaeological Information Science (AISc)’ (Llobera 2011).

More recently, with the ongoing advances in computer processing speed and capability, 3D modelling, virtual reality and augmented reality are more widely used for interpretation and learning. 3D modelling has been integrated into visibility studies to investigate, and attempt to replicate and represent, visibility and perception in archaeological landscapes. This can help to investigate impact on architectural evolution, aids contextualisation and understanding of space and place and has been argued to more closely replicate visual experience (e.g. Wilson 2012; Sullivan 2017).

Developing this idea further, the use of ‘circuit-based modelling’ (varying and potential options for movement, rather than point-to-point) and, as computers and processing-power improve and become more accessible, multivariate total surface modelling, intertwined with other techniques will help to discover connections and variables in the future. This, it is hoped, will lead to exploring ‘potentials’ - possible interpretations and new questions - rather than attempting to find (unattainable?) definitive answers (Llobera 2012, 501; Howey & Brouwer Burg 2017).

The development of ‘viewsheds’, the term first introduced as an analogy to the ‘watershed’ (Nutsford et al 2015), has led to the development of other ‘sheds’, such as ‘sound-sheds’ and ‘smell-sheds’ to investigate other sensory experiences (Frieman & Gillings 2007, 5). However, the use of visual ‘shed’ analyses has been criticised in the past.

5.3.2 Issues

The following issues have been considered:

5.3.2.1 Theoretical issues

A main criticism of viewshed and visibility analysis in archaeology is the emphasis of the exercise being on sight, rarely taking into account the other senses such as sound, smell, perception and ‘experience’ (Bender 1993; Tilley 1993; Wheatley & Gillings 2000, 2; 13; Tschan et al 2000, 45-46; Conolly & Lake 2006). When

considering GIS analysis using visibility, other immeasurable factors may be an issue, such as eyesight, mobility, simplification and causation (Wheatley & Gillings 2000; Frieman & Gillings 2007, 6; Gillings 2017). The primacy of vision over other senses has been questioned (Frieman & Gillings 2007) and the relevance of conducting GIS viewshed analysis has been doubted when compared to 'experience' and whether it, and the spatial points and 'fixed' locations it utilises, can be considered representative (Howey & Brouwer Burg 2017); "*the plan shape of a viewshed depicted in a GIS map bears little resemblance to the experience of people on the ground and is therefore of limited interpretive value*" (Thomas 1993).

The sole use of GIS excludes influence of cultural factors or natural components which could have affected site selection (Tilley 1993; Wheatley & Gillings 2002, 202). It has been argued that "*past populations could not analyse a landscape to find the most suitable position in terms of visibility*" (Chapman 2006, 23) and therefore there may have been more 'suitable positions' which were just simply not known about on the ground, but which a viewshed map could draw attention to.

However, visibility is suggested to be the primary way that humans relate to and interpret landscape, according to studies in social science (Chapman 2006, 84). Llobera argues that prehistoric monuments were built to be 'noticeable' in the landscape and that without investigating and examining their setting and their relation to other monuments we would fail to understand their role (Llobera 2007, 53). That being said, visual analysis and interpretation must also consider that our perception today, through whichever individual or mix of sensory experience/s, will be linked to our own past experiences and culture (Frieman & Gillings 2007, 12-13; Howey & Brouwer Burg 2017, 7). It could, therefore, be considered an individual encounter which cannot be replicated with or understood compared with one experienced at the same location multiple centuries ago.

The viewshed itself has been considered a poor representation of human visibility and has developed over time to take into account perception, see above. Perception is influenced by the distance from viewer to view. Objects which are closer to the viewer are "*perceived as having more significance than distant objects"* due to object size and clarity (Nutsford et al 2015). The experience of confronting an 'embodied emotional encounter' has an alternative impact to seeing a scaled depiction on paper

or a screen (Lock & Pouncett 2017, 131). Fuzzy viewsheds and Higuchi viewsheds take this into account by applying a standardised index for clarity deterioration, see above. Perception is also argued to be influenced by the vertical dimension, the slope, aspect and elevation, of the terrain as well as the distance. The 'Vertical Visibility Index' was developed to provide a more accurate representation of the perception of view by calculating the visibility between a 'viewer' and the top (e.g. up-slope) and bottom (e.g. down-slope) point of each visible cell instead of just from the cell centre (Nutsford et al 2015).

Visual studies can often be considered environmentally-focussed and deterministic and that they focus on measurable aspects which affect the interpretation and therefore do not reflect reality (Chapman, 2006, 83). "*…Maps are very susceptible to subjective impressions; it is often easy to see the patterning that is desired in a particular map*" (Hodder & Orton 1976, 241). Work into the analysis of visibility from Bronze Age cairns in Mull used viewshed and cumulative viewshed analysis[34], with a firm concentration on statistical theory and found that the cairn sites seemed to be positioned in the landscape, so they had a large visible area of the sea, compared to other 'non-sites' (Fisher et al 1997). The use of statistical theory within GIS enables the user to state any relationships "*with definite confidence, not merely suggested"* (Fisher et al 1997, 591). This had been a downfall of many previous archaeological studies using GIS; that sites are tested for visibility but then not followed up by using non-sites for comparison and statistical rigour (Fisher et al 1997, 583). Monuments on hills may have been studied for visibility and intervisibility but hills without monuments have not been studied and no control sample utilised. The possibility that hills are intervisible rather than the monuments that sit upon them has not yet been fully considered and will now be challenged.

Almost two decades ago, it was proposed that, instead of the archaeological use of digital geographical-based tools being driven forward by technological advances of

[34] Viewshed analysis shows all of the cells that are visible from a specified location (Conolly & Lake 2006, 300), combined or multiple viewshed analysis is the combination of two or more viewsheds (Conolly & Lake 2006, 227) and cumulative viewshed analysis is the sum of multiple viewshed maps where the cells are coded according to how many viewsheds they fall within (Conolly & Lake 2006, 291); occasionally referred to as the 'number of times seen' map (Fisher et al 1997, 588).

GIS-based research, archaeology should begin to develop its own discipline-specific tools - ‘Archaeological Information Systems (AIS)’ - and to create unified frameworks and approaches (Tschan et al 2000). Llobera calls for digital methods to work with interpretative landscape archaeology complementarily – to find a middle-ground between theory and practise – understanding a human’s view from a location to be a ‘situated perspective’ (Llobera 2012). Qualitative methods cannot serve an interpretation of past experience alone and nor can quantitative.

Rather than a middle-ground and the use of GIS as a tool to apply to existing theoretical concepts, Gillings proposes that the researchers working with GIS should begin developing their own unique theoretical frameworks and introduced the potential for an affordance-based framework for investigating past landscapes (Gillings 2012). Most recently, following the years of development and investigation, there has been a call for an agreed, coherent theory-driven approach to visibility studies in archaeology, an agreed terminology and a clear theoretical framework moving forward (Howey & Brouwer Burg 2017; Gillings 2017).

The investigation of visibility of or from sites can still be argued as valuable analysis. Visibility can have a “*central analytical role*”; the visual characteristics of a site are the ones most likely to be remembered and referred to (Gillings & Wheatley 2001). Visibility of a landscape has an element of ‘permanence’ compared to the other senses’ sources more difficult to retrieve (Wheatley & Gillings 2002, 201; Llobera 2007). Through archaeological excavation we may be aware of a location where the ‘clank’ and heat of metalworking once occurred, the smells and scraping sounds where butchery was once performed or where a hearth and its crackles, smells and indescribable feeling of ‘home’ and nostalgia once burned. But these insights only represent a snapshot in time or a (potentially) temporary or intermittent event. A view of a landscape presents a longer-term encounter, albeit only a *partial* representation of human experience in a place and space, but one of the many factors nonetheless. Viewshed analysis is a developing tool, one of many, providing useful data to *aid* interpretation of landscapes and its features and how these may have been perceived, experienced and interacted with in past times. This will continue to develop as a bespoke theoretical agenda is established in the future.

5.3.2.2 Computational issues

5.3.2.2.1 Algorithms

Different GIS packages use different procedures for calculating the results and can therefore produce different results (Conolly & Lake 2006, 228). For this research ArcGIS ArcView 9.3.1 has been used solely for the analyses.

5.3.2.2.2 Curvature of the Earth

The wider study area is made up of the 30-mile (48km) radius from the most northerly Clwydian Range hillfort, Moel Hiraddug, located at grid reference SJ063784, and the most southerly Clwydian Range hillfort Moel Fenlli, SJ163601. The study area spans such an area that the curvature of the earth must be taken into account[35], as "*the effect of the curvature of the Earth's surface is to reduce the elevation of a target by approximately 7.86m for every 10km from the viewpoint*" (Conolly & Lake 2006, 228-9).

5.3.2.3 Experimental Issues

5.3.2.3.1 The edge effect

A viewshed may become truncated if some of the sites tested are nearer to the edge of the viewshed and the visibility from them 'cut off' as it is 'over the edge' (Lake et al 1998, 37; Wheatley & Gillings 2000, 11-12; Conolly & Lake 2006, 229). The core study area as the Clwydian Range hillforts will be surrounded by a wider 'buffer' of the 30-mile radius of the core study area and it is these six sites which will be tested in detail.

5.3.2.3.2 Reciprocity

The viewsheds generated from a point can suggest if the viewer can see the target, but it is possible that the target may not be able to see the viewer and therefore the viewshed is not reciprocal (Conolly & Lake 2006, 229-230). Where the viewshed is calculated from the observer point, it is seldom tested to check if the view is reciprocated; it must be stated whether the calculations are for the specific point *having visibility* or *being visible*, preferably calculating both if this is possible (Fisher

[35] The effect and importance of taking into account the curvature of the earth has been demonstrated in Appendix Two.

et al 1997, 584). This study will calculate the amount of surroundings visible from the feature, i.e. the hillfort.

5.3.2.3.3 Digital Elevation Model (DEM) quality

The DEM used is at 10m resolution and will be acknowledged as an acceptable representation of the elevation of the topography. However, viewsheds generated can be tested for accuracy in the field.

5.3.2.3.4 Sensitivity

A number of parameters have been used within a test study, see Appendices One and Two, to test the sensitivity of the data, including observer height, target height, location of points within the hillfort and the usage of polylines as features to calculate the viewshed from.

Also tested is the effect of the location of these points and features within the monument using map information gained from EDINA Digimap OS collections, or from using survey data created during topographical surveys of the hillforts.

As the monuments tested have suffered from thousands of years of erosion, banks subsiding, ditches filling, and the possibility of palisade fences, walkways and towers collapsing with no trace remaining by sight today, a number of variables have been tested to seek the sensitivity of the height of the observer at a number of intervals.

5.3.2.4 Substantive issues

5.3.2.4.1 Palaeoenvironment & palaeovegetation

The issue of little acknowledgement of the palaeoenvironment and/or vegetation has been highlighted as a key criticism for many archaeological visibility studies (e.g. Tschan et al 2000). To consider potential obstruction and barriers to view, Llobera created the ‘gradient viewshed’ which encoded these factors into calculations (Llobera 1996).

Using the results from the peat core analysis from the Clwydian Range (Grant 2009), it can be understood that the tops of the hills in this rural area were free from trees and so the modern ‘barren’ DEM can be accepted as a representation of the

landscape in the Iron Age. A lack of knowledge of individual patches of vegetation is accepted.

5.3.2.4.2 Contrast

As monuments in the landscape *today*, often with tree and heath cover, the sites may blend into the background of the wider landscape and this is an example of where GIS technology, especially the use of Higuchi viewsheds, can be of great use in computing visibility, alongside the time benefits (Wheatley & Gillings 2000, 6; Ogburn 2006).

When looking at the visibility *of* hillforts, as large monuments with possible activity within them such as smoke rising and surrounding buildings, the targets can be understood to have contrasted with the wider landscape when in use. The viewsheds created are accepted as being a representation of view under certain conditions and circumstances, requiring interpretation.

5.3.3 Visibility analysis method

Through viewshed analysis, this study examines whether the visibility of the landscape from a hill was a main factor when taking into account its suitability for a hillfort before the site was chosen and the hillfort subsequently built. The visibility from the summit or from a circuit around the hill may have been considered in site determination. Where multivallation and multiple-phases of sites occur, it will be explored whether or not ramparts were added to increase visibility from the site.

Initially, a viewshed from each hillfort in the Clwydian Range has been calculated using the 3D analyst viewshed feature on the ArcGIS 9.1 software. The viewshed calculated all visible and non-visible cells on the Digital Elevation Model (DEM) from the observation point (Chapman 2006, 83). Due to the size of the monuments at the observation point, a polyline has been produced, following the line of the ramparts, to become the observation feature, rather than a randomly chosen point within the multiple-hectare sites. A viewshed has then been calculated using a polyline generated using points from across the whole of the feature rather than one given point.

5.3.3.1 Single point viewsheds

Visibility was calculated from the summit of hillforts as a single point viewshed. These calculations are used to compare between other hillforts and non-hillfort hills.

The results from the single point viewsheds are compared with polyline viewsheds to determine the accuracy of single point viewsheds for sites enclosing a large area.

Single point viewsheds are also used at particular features at different heights to calculate whether the addition of structures could have helped increase visibility of the surrounding landscape.

5.3.3.2 Polyline viewsheds

Polylines have been used to test visibility from a range of points within sites, such as rampart lines, including multi-phase construction, and interior locations.

These calculations are used to compare the visibility from the Clwydian Range hillforts to other hillforts in the wider area to test for correlations or differences in results.

Polylines are also used to compare the visibility from sites built on a slope to their contour lines to test whether they were built in this way to increase visibility of the hillforts' surroundings.

5.3.3.3 Aspect – non-numerical observations

In addition to collecting data as 'number of pixels' visible on the DEM from the point/s inputted, which represent the amount of land or sea visible or not visible from the input feature, non-numerical representation is also used.

Viewshed maps generated by the visibility calculations are studied to ensure changes in direction of view and aspect is examined, as the use of quantitative values solely fails to detect these.

5.3.3.4 Other Considerations

A number of studies have studied the view to hillforts - from the 'outside' to within - and argued the impact of this on the hillforts' defensibility or monumentality (Bowden

& McOmish 1987; 1989; Hamilton & Manley 2001). Considering hillfort function, including warfare, symbolism and monumentality or control, view from a site *outward* into the landscape may also have been considered an important factor (Gale 1999, 112; Matthews 2006). A view of a landscape could ensure approaching traffic would be seen with forewarning, that potentially subservient communities were behaving accordingly, that crops were growing, if floods were occurring and a view of the surrounding landscape could potentially highlight boundaries and/or allow visibility of neighbouring communities.

The method used, utilising single and multiple input points from a monument's topography, to generate a single viewshed of the surrounding landscape has been chosen to give an overall viewshed map for each individual monument. Multiple points have been used in most cases as it is acknowledged that one point/pixel can only represent the view from that particular point in the landscape or pixel in a model. View changes with movement and there are a vast number of different 360° 'views' that can be experienced from within/on/from a monument which covers an area larger than a 'stride'.

It is accepted that the input points chosen are selective and that these few select points cannot be accurate for every point, pixel or footprint across an entire monument, but that the output of a viewshed using multiple points can begin to represent an understanding and appreciation of the different views from the monument/s.

In this instance, single/binary viewshed maps have been created due to:

a) The viewshed analysis is to give an overall indication and calculation of amount and aspect of view of the landscape from a monument to be compared with others in the same way, and is not designed to test visibility of particular items in the middle or distant landscape, apart from:

b) In intervisibility experiments, the size of the monuments including the addition of original architecture, movement and activity, such as smoke from hearths etc., would have increased the prominence and contrast of the monuments in the landscape, making them easier to detect and/or identify (Gillings 2017, 123). The viewshed range has been set to no more than 25km; a distance

demonstrated as visible between hillforts in person during the Hillfort Glow experiment (Robinson & Soper 2011).

A maximum viewing distance was required to be calculated to avoid the edge effect (Conolly & Lake 2006, 229). During visibility tests from hillforts at night, the furthest seen was approximately 25 miles, or 40km, between Penycloddiau hillfort on the Clwydian Range to Maiden Castle in Cheshire (Robinson & Soper 2011, 11). During intervisibility analysis in 2006, Matthews made reference to Meteorological Optical Range which to have over 27 nautical miles visibility (approximately 31 miles, 50km) and the weather would have to be 'exceptionally clear' (Matthews 2006, 36). The radius of the viewshed was set at a limit of 25km, unless stated otherwise[36].

Where viewshed analysis is concerned, most studies choose a height of 1.7m above the ground for observation of a human (Chapman 2006, 85). For the purposes of this study and using the results from these analyses, an average height of a human as 1.7m is accepted. Sensitivity in the viewshed has been understood through further viewshed analyses at specific points using different heights at the monuments to allow for erosion or features such as towers and bridges. Erosion of the monuments will have affected the height the observer once stood above ground; the loss of any features such as a wooden wall walk could deduct several metres from the observers' original height above ground. It is good practise to repeat visibility analysis with a range of variables in order to understand whether the results are robust or highly sensitive to small changes (Conolly & Lake 2006, 230-232).

Non-archaeological sites, e.g. hills without hillforts, see Figure 5.1, have also been tested as a control sample.

As there is currently no evidence to suggest that the hillforts are contemporary, nor dates of any phasing suggested at sites (Brooks & Laws 2006-2009; Brooks 2011), spatial relationships between the sites may be affected by their lack of co-existence (Hodder & Orton 1976, 18). The question of the sites being temporarily or permanently occupied may also be an issue (*ibid.*, 19), and possible differential site function. However, even if not in use at the same time, at the last phase of hillfort

[36] A test study was conducted using the non-hillfort site of Moel Famau and can be found in Appendix One. A number of techniques have been conducted using single input points in multiple locations and a polyline input feature.

use in the Clwydian Range, the newest hillforts would have been aware of the older sites even if these would have been classed as 'monuments' themselves from this time.

5.3.4 Visibility Results

5.3.4.1 Clwydian Range hillforts

5.3.4.1.1 Comparing visibility from summit points and rampart polylines

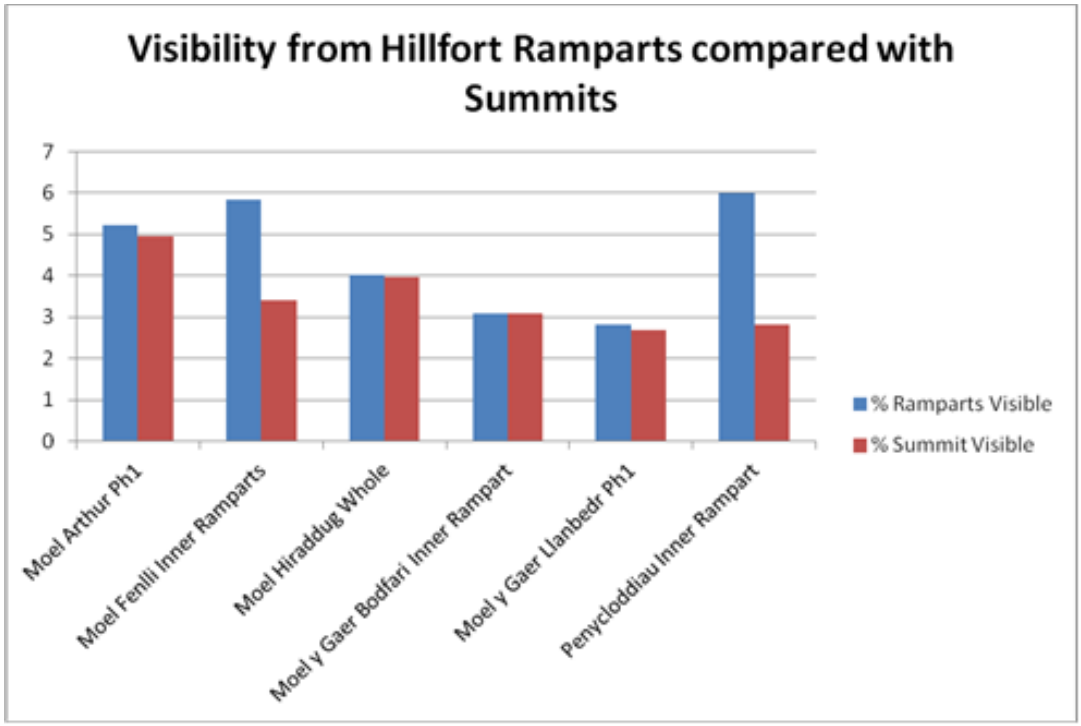

Figure 5.10. Percentage of visible surroundings from ramparts and summits depicting visibility from the summit (red) and rampart circuits (blue) for Moel Arthur Phase 1 (Ph1), the inner ramparts of Moel Fenlli, the main outer circuit of Moel Hiraddug, Moel y Gaer Llanbedr Phase 1 (Ph1) and Penycloddiau's inner ramparts demonstrating that visibility of the surrounding landscape is higher from the rampart circuits (multiple points) than the summit point

Using the six hillfort sites in the Clwydian Range, conducting the viewshed analysis using a polyline at the ramparts rather than a single point at the hill's summit increased the visibility of the landscape, see Figure 5.10 and Table A3.10. For example, the summit of Moel Fenlli could see 3.39% of the landscape when tested using the summit at the cairn on the hill and this rose to 5.8% when calculating the visibility from the inner ramparts of the site.

In other cases, generally observed at the sites which enclose a much smaller area, very little difference was seen between the visibility from the summit and the rampart polyline viewshed. Moel y Gaer Llanbedr's summit saw 2.67% from the summit of the hill and this number rose by just 0.15% when calculating from the main circuit of the ramparts, thought to be the first phase of the site. Moel y Gaer Bodfari's summit was calculated with a visibility of 3.07% compared with the ramparts' visibility of 3.09%, a negligible difference of only 0.02%.

Moel Hiraddug's point was taken at its summit at the highest point of the large hill and the overall visibility at this point was calculated as 3.96%. For this exercise, the polyline was plotted using the outer circuit of the hillfort as seen today, see Figure 5.23, and little change was observed between the polyline and the single point at the summit despite its large size.

Moel Arthur's summit achieved the highest visibility at 4.9%. Calculating the visibility using the ramparts, results increased by 0.25% using the outer ramparts as a polyline, thought to be the first phase of the site.

Neighbouring hillfort Penycloddiau's summit, the highest point at the cairn, had visibility of 2.83% of the landscape. Using a polyline of the hillfort's inner ramparts, this increased by 3.16% to 5.99%, the highest difference in visibility when comparing the input feature as a point at the summit with a polyline depicting the ramparts. The second highest difference in visibility between the summit and the line of the ramparts was Moel Fenlli hillfort, both of these being the largest enclosed areas of the six, respectively, and also being 'tipped' hillforts, where the ramparts enclose the summit of the hill but do not strictly follow the contours.

All hillfort ramparts had a higher visibility percentage of the landscape than using points at their summits, see Figure 5.10. Therefore, this shows that previous studies using only points to calculate visibility for large features in the landscape are not accurate. If generalisation has previously been made that viewshed results for a single point applies to the entire feature, they must be reconsidered.

Numerical results can be generated to show change in values and amount of land visible, see Figure 5.10. However, these figures may not represent changes that can be seen by the naked eye. Small changes can be detected between the summit

viewsheds and the rampart viewshed by the amount of pixels visible. It will now be explored whether these small changes in quantitative form represent impact on aspect and features visible.

When comparing the aspect from the ramparts with the aspect from the summit, change is visible. For example, Moel y Gaer Llanbedr, which sits on a western spur of the Clwydian Range and surrounded by higher ground to its east, has a strong westerly aspect with good command over the Vale of Clwyd. When comparing the view from the summit to the ramparts, the rampart view has an increase in visibility for the immediate surrounding landscape, see Figure 5.12. This is shown in the maps showing visibility of the immediate surrounding landscape masked from the summit by the rest of the hill itself, as seen in Figure 5.11.

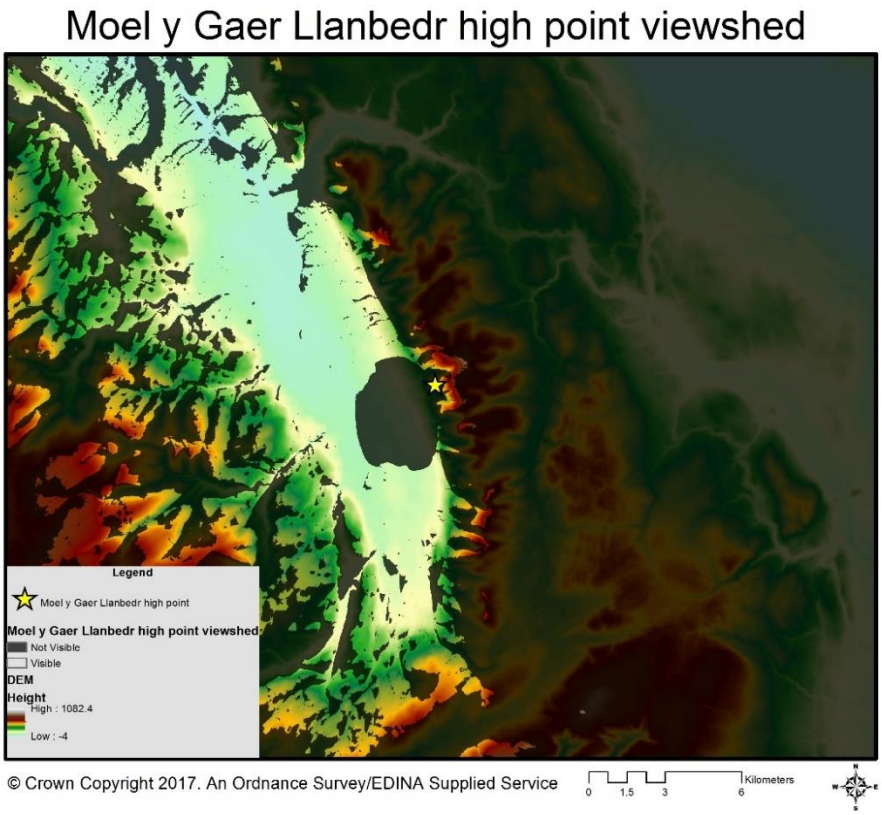

Figure 5.11. Viewshed from Moel y Gaer Llanbedr summit, with the star representing the highest point of the hill/hillfort. Darker shaded areas represent pixels/view not visible from the summit point and coloured (representing relief as per the Digital Elevation Model - DEM) areas showing pixels/view visible from the summit point. There is a clear view from the hillfort up and down the Vale of Clwyd to the west of the hillfort but immediate views to the west are blocked by the hill itself, as are views to the east where areas of higher ground lie

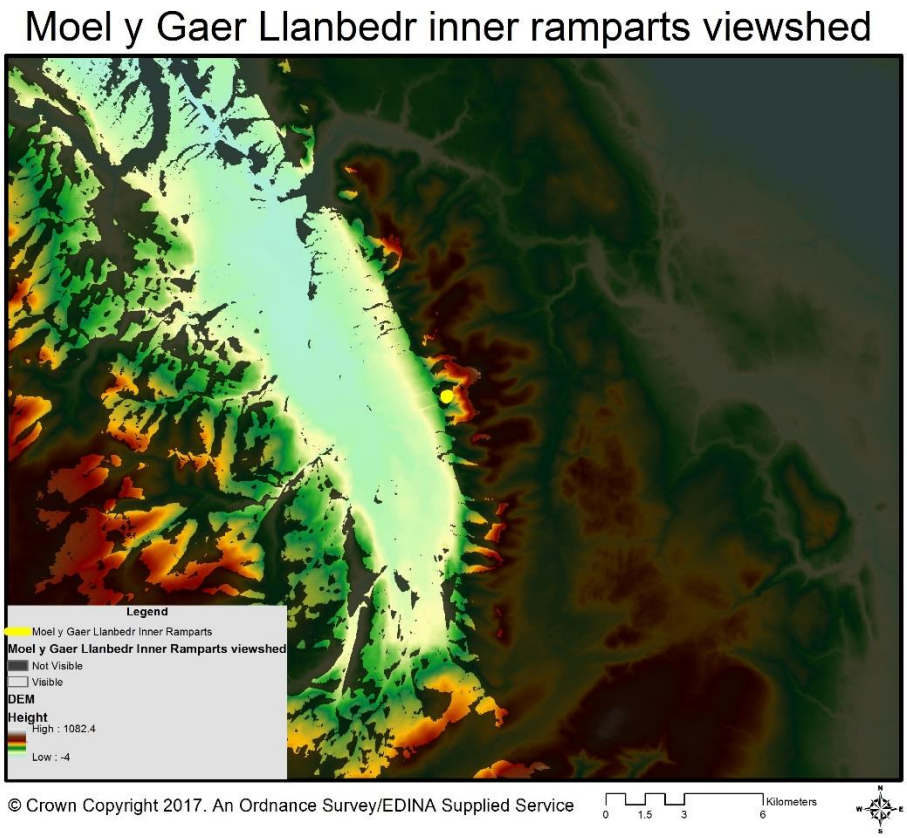

Figure 5.12. Viewshed from Moel y Gaer inner ramparts. The yellow line represents a user-generated polyline drawn around the inner ramparts of the hillfort. Darker shaded areas represent pixels/view not visible from the inner rampart polyline and coloured (representing relief as per the Digital Elevation Model - DEM) areas showing pixels/view visible from the inner rampart polyline. Views north and south of the Vale of Clwyd is clear to the west of the hillfort but views to the east are obscured by higher ground

In the case of Moel Hiraddug, much less of the immediate surrounding landscape of the hillfort is visible from the summit than from the ramparts, see Figures 5.13 and 5.14. Moel Hiraddug shows an aspect looking down the Vale of Clwyd to the south and also north towards the sea. From these tests, it appears that Moel y Gaer Bodfari and Moel y Gaer Llanbedr are just visible from Moel Hiraddug according to the viewshed from the ramparts, see Figure 5.14. Moel y Gaer Bodfari is the only Clwydian Range hillfort visible through the viewshed at the summit point, see Figure 5.13. Moel Hiraddug also appears to have a clear view down the north Wales coast to the west where other hillforts such as Castell Cawr, Dinorben and Penycorddyn Mawr lie.

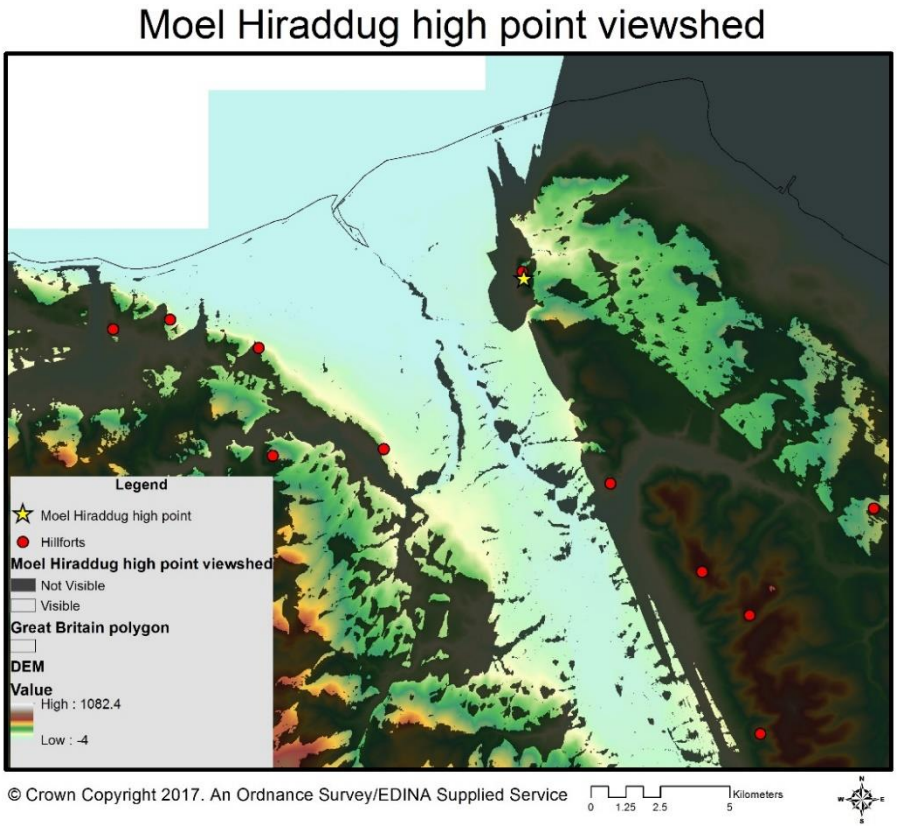

Figure 5.13. Viewshed from Moel Hiraddug summit with the star representing the highest point of the hill/hillfort. Darker shaded areas represent pixels/view not visible from the summit point and coloured (representing relief as per the Digital Elevation Model - DEM) areas showing pixels/view visible from the summit point. There is a clear view from the hillfort up and down the Vale of Clwyd to the west, along the coast (represented by the black line) including some hillforts on the north Wales coast (represented by red dots) and some lower-lying ground to the east and south east. Immediate views to the west are blocked by the hill itself, as are views to the south down the Clwydian Range

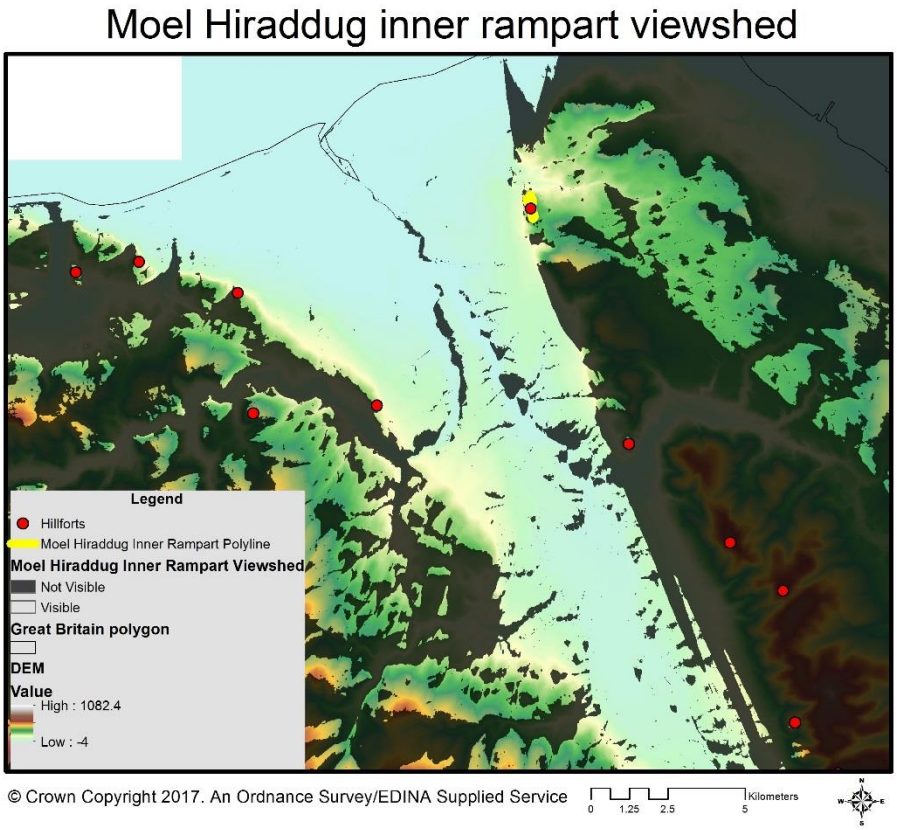

Figure 5.14. Viewshed from Moel Hiraddug inner rampart. The yellow line represents a user-generated polyline drawn around the inner ramparts of the hillfort. Darker shaded areas represent pixels/view not visible from the inner rampart polyline and coloured (representing relief as per the Digital Elevation Model - DEM) areas showing pixels/view visible from the inner rampart polyline. Views north west and south west of the Vale of Clwyd is clear to the west of the hillfort alongside views down the coast (represented by a black line) including the hillforts located there (represented by red dots). Land immediately surrounding the hillfort is mostly visible from the ramparts but most of the Clwydian Range to the south of the hillfort is obscured

The viewshed of Moel y Gaer Bodfari, which sits on a lower hill overlooking the Aberwheeler Valley which runs east to west through the Clwydian Range, has a strong aspect of the Vale of Clwyd but less so in other directions mostly due to the higher ground surrounding the hillfort. Figure 5.15 depicts the topography of the surrounding area, including the clear pass through the hills at this location. Figure 5.17, which shows the ramparts' viewshed from the inner rampart of Moel y Gaer Bodfari, shows the visible areas along the pass running east to west to the south of the hillfort. There is a clear section of the pass not visible from the summit point, see

Figure 5.16 and there are some patchy ‘blind spots’ from the inner rampart, as seen in Figure 5.17.

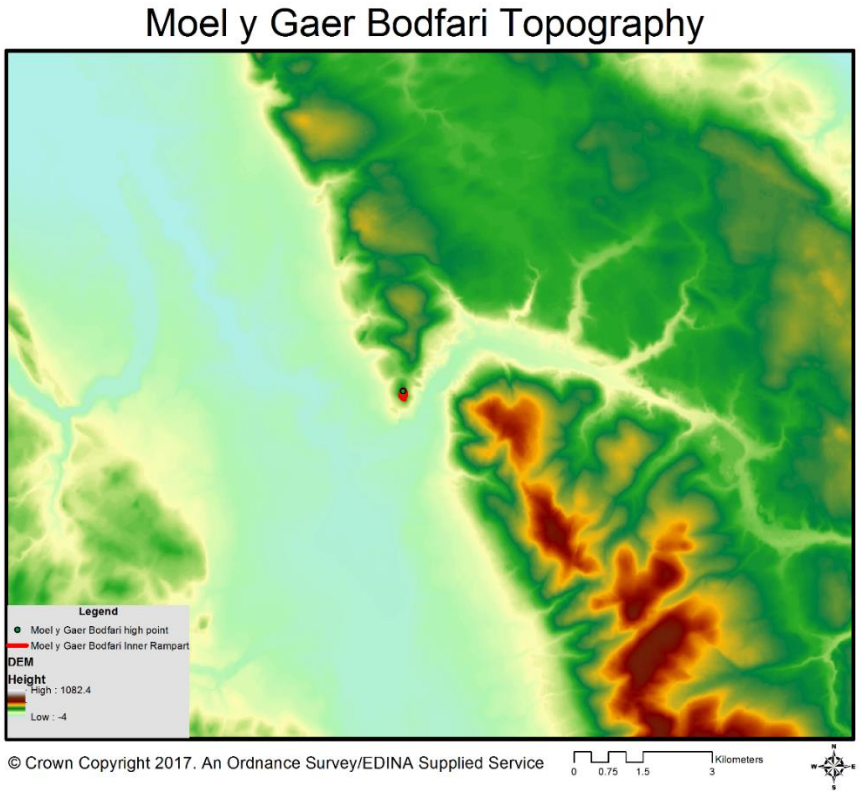

Figure 5.15. Topography surrounding Moel y Gaer Bodfari, with colours depicting relief from the Digital Elevation Model (DEM). The summit point of the hillfort is depicted as a green dot, with the ramparts as a red line. The Vale of Clwyd is instantly recognisable running north to south to the west of the hillfort, whilst the smaller Chwiler Valley runs east, just to the south of the hillfort, which sits on a spur where the two river valleys converge

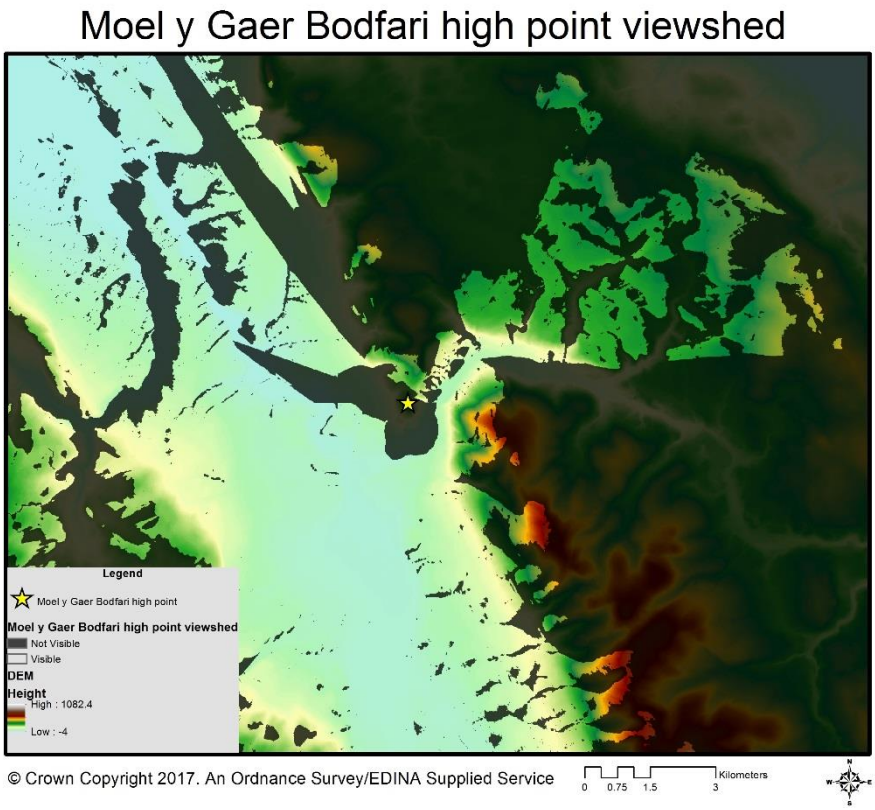

Figure 5.16. Viewshed from Moel y Gaer Bodfari summit with the star representing the highest point of the hill/hillfort. Darker shaded areas represent pixels/view not visible from the summit point and coloured (representing relief as per the Digital Elevation Model - DEM) areas showing pixels/view visible from the summit point. There is a view from the hillfort up and down the Vale of Clwyd to the west, but with land immediately surrounding the hillfort blocked by the hill itself. Much of the view to the north and south east is obscured by higher ground, with patchy visibility to the north east. Much of the Chwiler valley is visible to the south, running east, apart from a small patch obscured by the slope of the hill

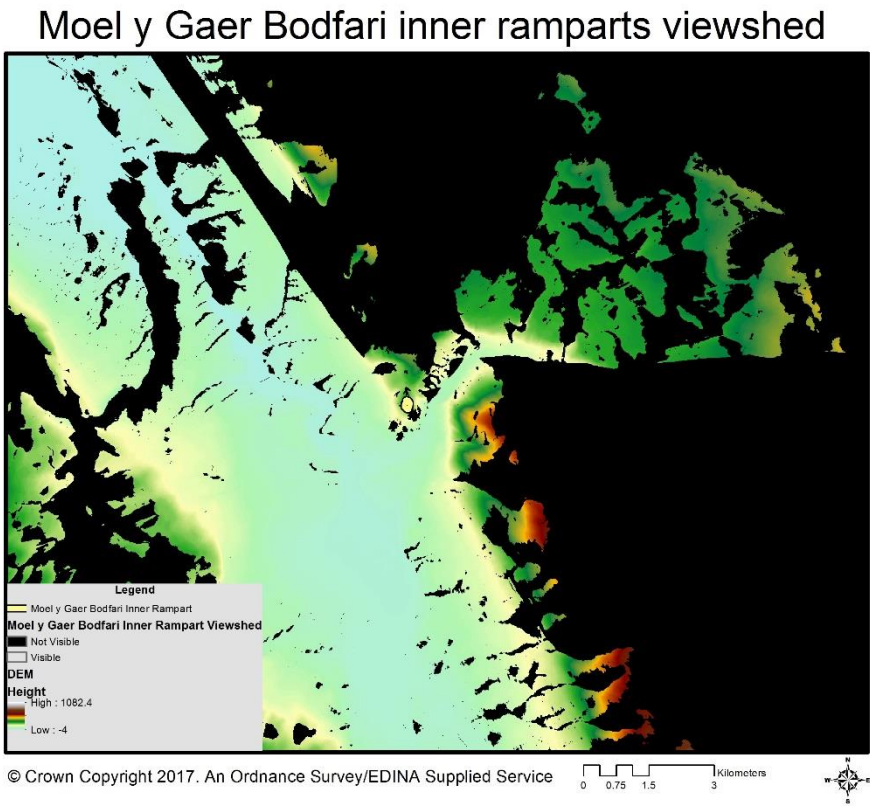

Figure 5.17. Viewshed from Moel y Gaer Bodfari inner ramparts. The yellow line represents a user-generated polyline drawn around the inner ramparts of the hillfort. Darker shaded areas represent pixels/view not visible from the inner rampart polyline and coloured (representing relief as per the Digital Elevation Model - DEM) areas showing pixels/view visible from the inner rampart polyline. Much of the views north west and south across the Vale of Clwyd is clear. Land immediately surrounding the hillfort is mostly visible from the ramparts, including the Chwiler Valley running east to the south of the hillforts. Most of the Clwydian Range to the north and south west of the hillfort is obscured

Comparing the aspect of the summit and the ramparts of Moel Fenlli in Figures 5.18 and 5.19, shows the largest difference in amount of land visible. Conducting the viewshed from a polyline on the hillfort's ramparts, Figure 5.19 increases the view to the east substantially, enabling a view to the River Dee towards Chester and into Cheshire as well as the Wirral and additional pieces of land within the current county of Flintshire including Halkyn Mountain where the hillfort of Moel y Gaer Rhosesmor is situated. However, this result from the summit, as seen in Figure 5.18, highlights the sensitivity of viewshed analysis when using only one point in calculations. The summit of Moel Fenlli is known to reveal wide views, including to the east to Cheshire and beyond, as demonstrated during the Hillfort Glow experiment

(Robinson & Soper 2011) and therefore the ‘point’ at which the viewshed has been calculated may not represent the true ‘summit’ at the site.

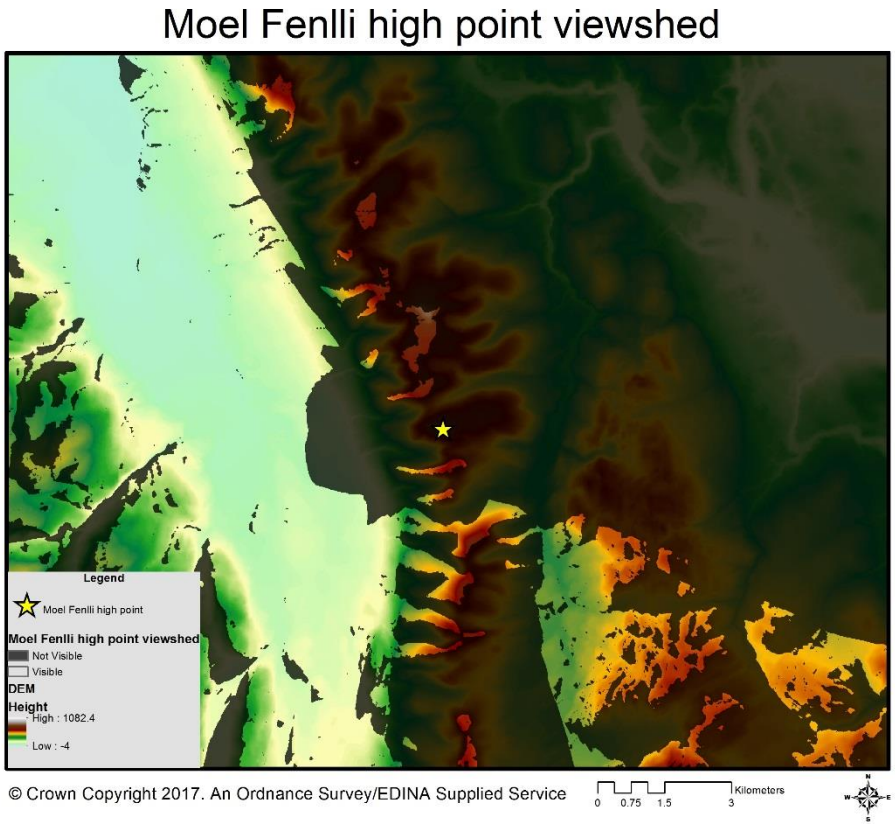

Figure 5.18. Viewshed from Moel Fenlli summit with the star representing the highest point of the hill/hillfort. Darker shaded areas represent pixels/view not visible from the summit point and coloured (representing relief as per the Digital Elevation Model - DEM) areas showing pixels/view visible from the summit point. There is a view from the hillfort up and down the Vale of Clwyd to the north west and south west, but with land immediately surrounding the hillfort is blocked by the hill itself. Much of the land to the north, east and south is shown to be not visible from the summit point, demonstrating the limits of viewshed analysis and the effect of human choice of input point location; Moel Fenlli is known to have much wider panoramic views from the true summit point

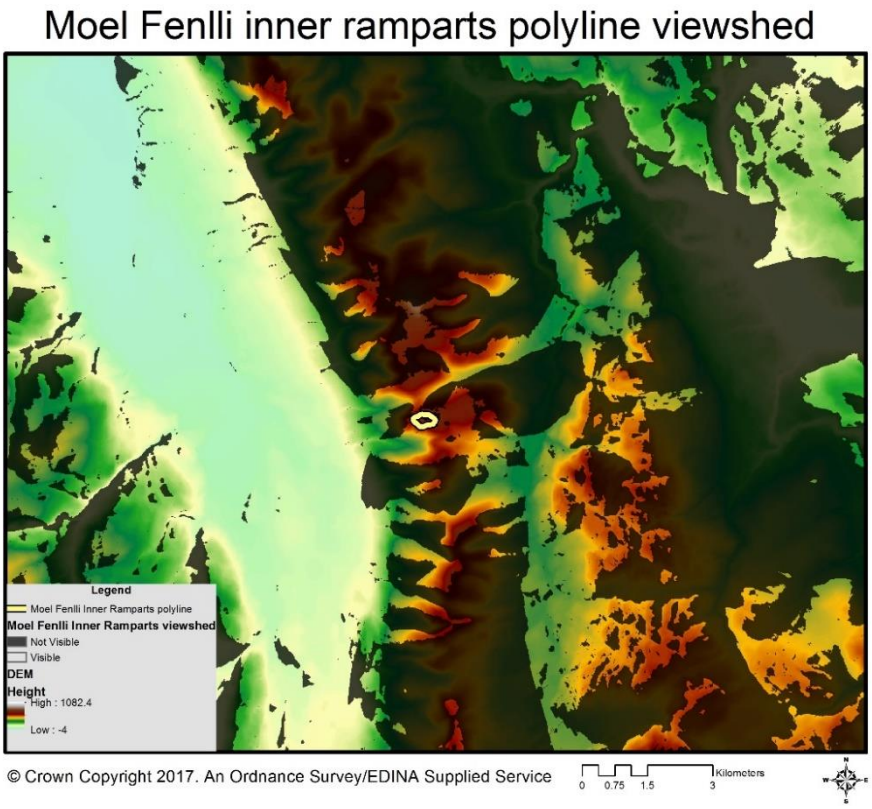

Figure 5.19. Viewshed from Moel Fenlli inner ramparts. The yellow line represents a user-generated polyline drawn around the inner ramparts of the hillfort. Darker shaded areas represent pixels/view not visible from the inner rampart polyline and coloured (representing relief as per the Digital Elevation Model - DEM) areas showing pixels/view visible from the inner rampart polyline. Much of the views north west and south west across the Vale of Clwyd is clear as is the pass of Bwlch Pen Barras which runs west to east through the Clwydian Range just to the north of Moel Fenlli. Much of the Clwydian Range to the north and south is obscured, but higher points and unobscured areas are visible in patchy areas surrounding the hill

Figure 5.19 above shows the pass of Bwlch Pen Barras clearly visible running east to west through the Clwydian Range to the north of the hillfort. The Vale of Clwyd can also be clearly seen as a visible area. However, due to the size of the hillfort blocking the immediate surrounding area when viewing from the summit point, as seen in Figure 5.18, the view of two adjacent enclosures is blocked. Two enclosures known as ‘Moel Fenlli enclosure west’ and ‘Halfway House’ sit on the lower slopes of the hill to the west of the hillfort. These enclosures are shown to be visible from the hillfort using the viewshed on the ramparts, see Figure 5.29 but would not be visible from the summit point.

Penycloddiau, the largest hillfort of the six on the Clwydian Range, also shows a significant difference between the viewshed from the ramparts, see Figure 5.21, compared with just from the summit, Figure 5.20. From the ramparts there appears to be an overall general distribution of visibility in most directions. From the summit the view is limited including much less visibility to the Vale of Clwyd, probably due to the sheer size of the hillfort itself blocking the view. However, this also presents problems of 'input point positioning' as at Moel Fenlli demonstrated above seen in Figure 5.18, as there are known to be wide views in all directions from the true summit of Penycloddiau.

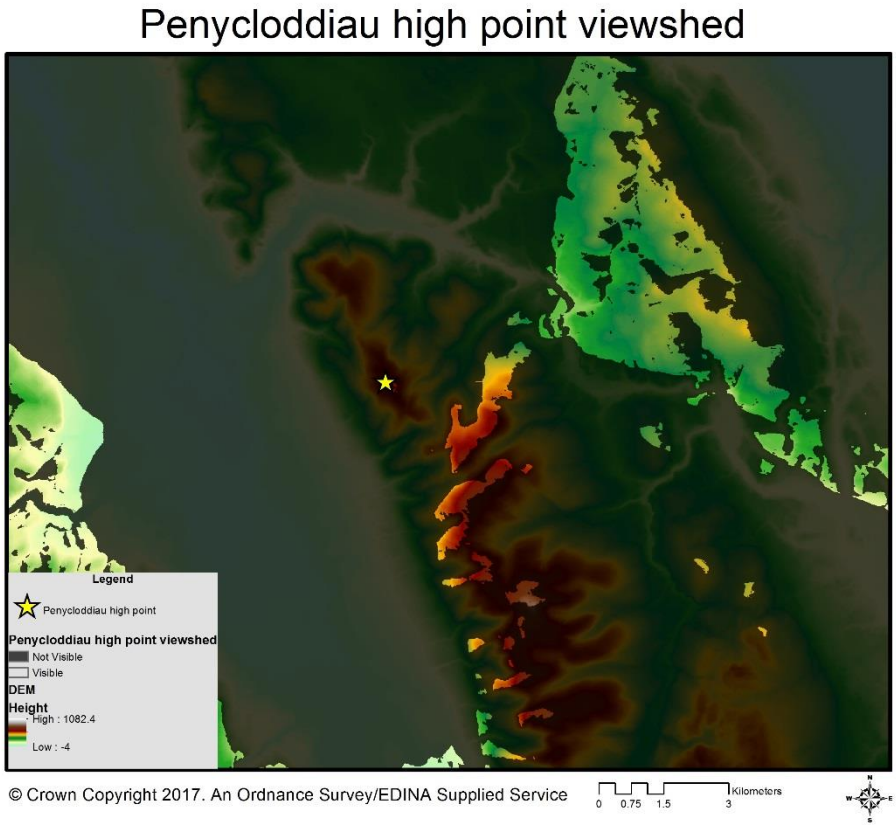

Figure 5.20. Viewshed from Penycloddiau summit with the star representing the highest point of the hill/hillfort. Darker shaded areas represent pixels/view not visible from the summit point and coloured (representing relief as per the Digital Elevation Model - DEM) areas showing pixels/view visible from the summit point. Much of the land surrounding the hill is shown to be not visible from the summit point, demonstrating the limits of viewshed analysis and the effect of human choice of input point location; Penycloddiau is known to have much wider panoramic views from the true summit point

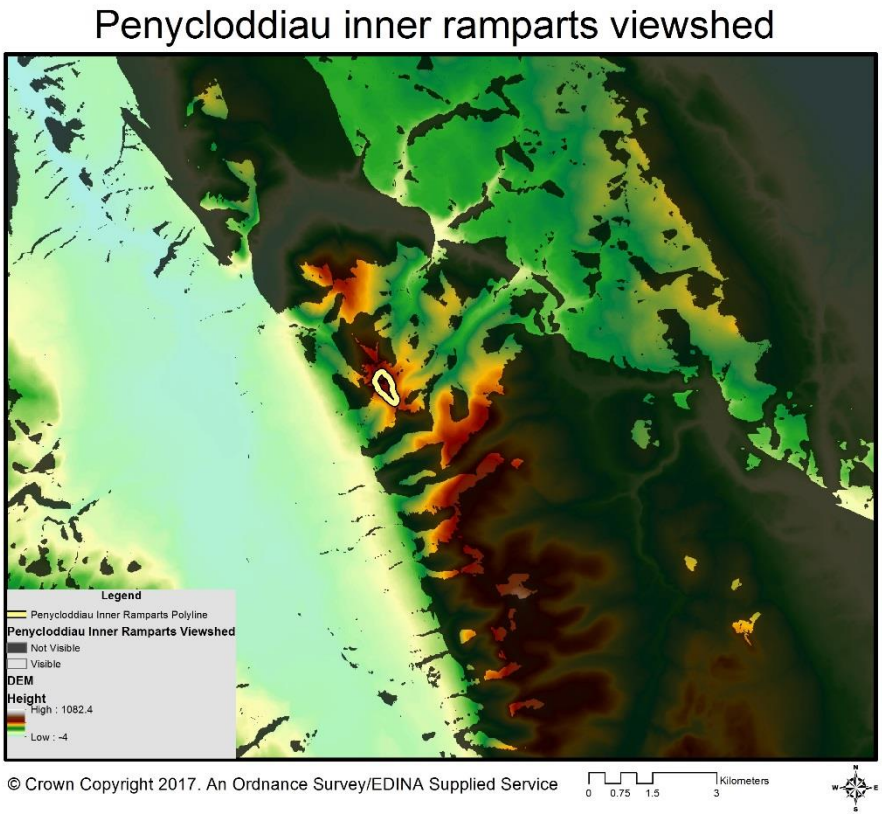

Figure 5.21. Viewshed from Penycloddiau inner ramparts. The yellow line represents a user-generated polyline drawn around the inner ramparts of the hillfort. Darker shaded areas represent pixels/view not visible from the inner rampart polyline and coloured (representing relief as per the Digital Elevation Model - DEM) areas showing pixels/view visible from the inner rampart polyline. Much of the views north west and south west across the Vale of Clwyd, as is a large area to the north east. Much of the Clwydian Range to the north and southeast is obscured although some higher summits and slopes of the Clwydian Range are visible

5.3.4.1.2 Viewsheds from multi-phase ramparts

As well as Moel Fenlli, Penycloddiau and Moel y Gaer Bodfari's inner ramparts, the three multi-phase hillforts of Moel Hiraddug, Moel Arthur and Moel y Gaer Llanbedr were tested using multiple polylines, see Figure 5.22 and Table A3.10. These hillforts have had original univallate phases suggested after survey and/or excavation (Brassil et al 1982; Brooks & Laws 2006b; Brooks & Laws 2007). Polylines were tested on what has been considered to be the rampart line of the initial phase of the hillfort followed by a secondary rampart line to test whether the addition of multiple phases of ramparts could be explained as an exercise to increase visibility.

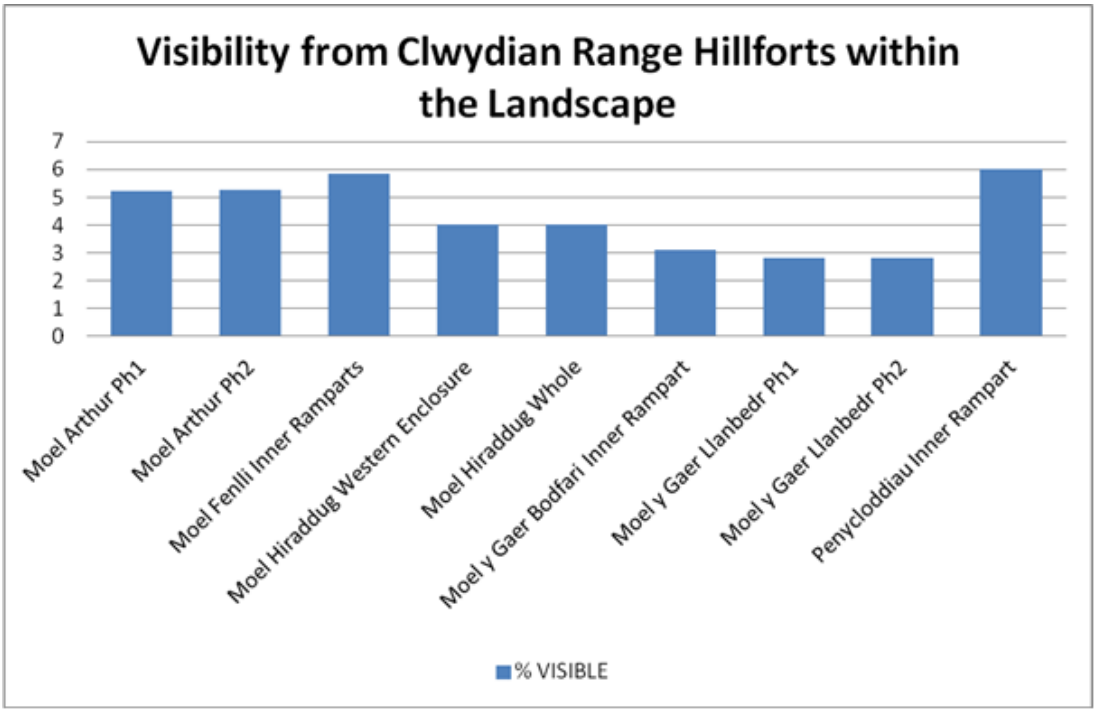

Figure 5.22. Percentage of surrounding area visible from Clwydian Range hillforts' multi-phase ramparts, including visibility analysis undertaken using a polyline depicting different phases of multivallation (e.g. Ph1/Ph2 etc) and/or areas enclosed (e.g. inner rampart), showing negligible change in visibility of the surrounding landscape by adding multivallation and/or phases of rampart building at hillforts on the Clwydian Range, demonstrating that additional ramparts were not built to increase the amount of visible land

Moel Arthur and Moel y Gaer Llanbedr showed a slight increase in visibility of the landscape with the addition of supplementary ramparts but this increase was negligible, and the change would not be identifiable to the human eye. Adding the line of the ramparts which make up 0.26ha 'annexe' of Moel y Gaer Llanbedr to the polyline, thought to be a later phase of the site (Brooks & Laws 2007); the amount of visible land increased by less than 0.01%. Similarly, with Moel Arthur and the additional inner rampart added to the polyline, the hillfort's secondary phase (Brooks & Laws 2006b, 3), the amount of land visible increased by less than 0.03%. Therefore, it can be concluded that additional ramparts were not built to increase the amount of visible land from the hillforts in these examples.

Due to the site's phasing being unclear (Brassil et al 1982, 81), two polylines were drawn to firstly depict the western enclosure on the summit of the Moel Hiraddug followed by the entire outer circuit of the ramparts, see Figure 5.23.

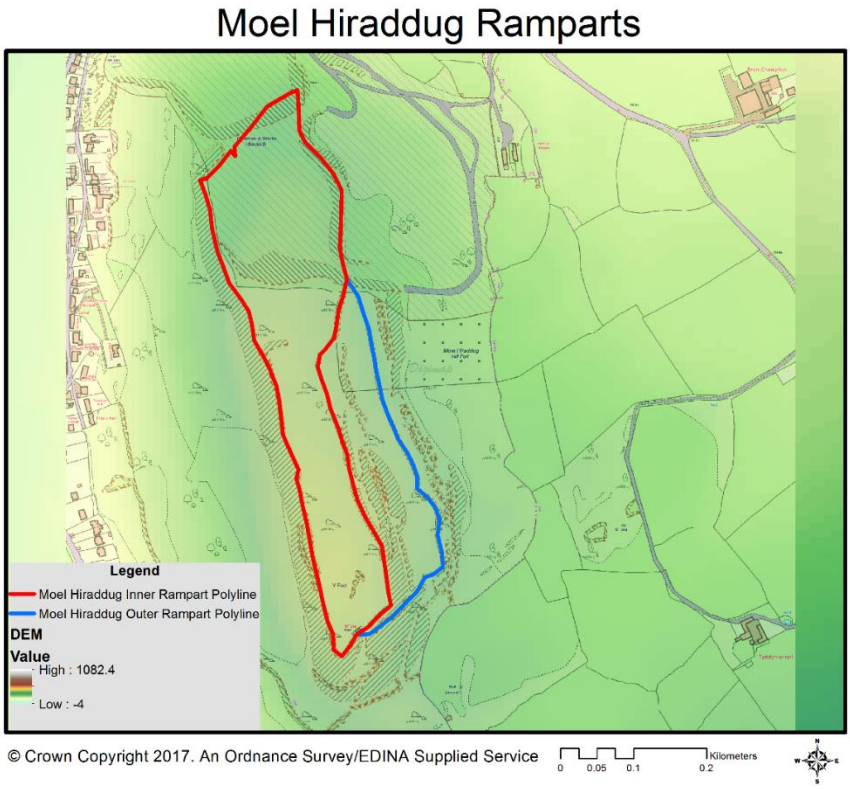

Figure 5.23. Moel Hiraddug primary ramparts shown with a red line depicting a user-generated polyline following the Inner Rampart on the western enclosure and a blue user-generated polyline (continues beneath but obscured by the northern and western extent of 'Inner Rampart Polyline) following the entire main outer circuit of Moel Hiraddug. These overlie a coloured DEM showing relief and local Ordnance Survey map of the surrounding area showing ramparts and local features

The western enclosure (inner rampart) at the summit of the hill calculated a visibility of 4.028%, see Figure 5.24. Increasing the area of the polyline to include the entire circuit of the outer ramparts to the east (not including outlying, satellite sections of rampart on the southern side, or the possible annexe etc), see Figure 5.25, slightly decreased the visibility from the ramparts to 4.025%. This indicates that the inner rampart of the hillfort has higher visibility than the 'outer' ramparts as seen today. Aspect does not appear to have been affected by the addition of multiple ramparts as the map views are almost identical, see Figures 5.24 and 5.25.

Therefore, it can be concluded that the addition of extra ramparts and phases to the site would not have been to increase visibility of the landscape.

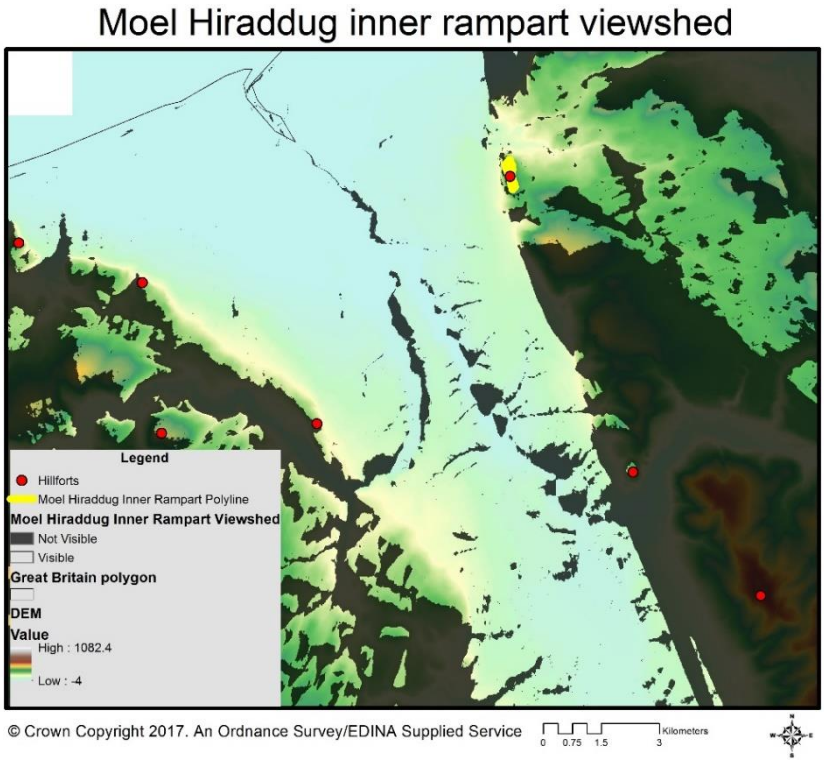

Figure 5.24. Viewshed from Moel Hiraddug western enclosure. The yellow line represents a user-generated polyline drawn around the inner ramparts of the hillfort (those shown in red in Figure 5.23). Darker shaded areas represent pixels/view not visible from the inner rampart polyline and coloured (representing relief as per the Digital Elevation Model - DEM) areas showing pixels/view visible from the inner rampart polyline. Surrounding hillforts are shown as red dots and the north Wales coastline as a black line to the north west of the map

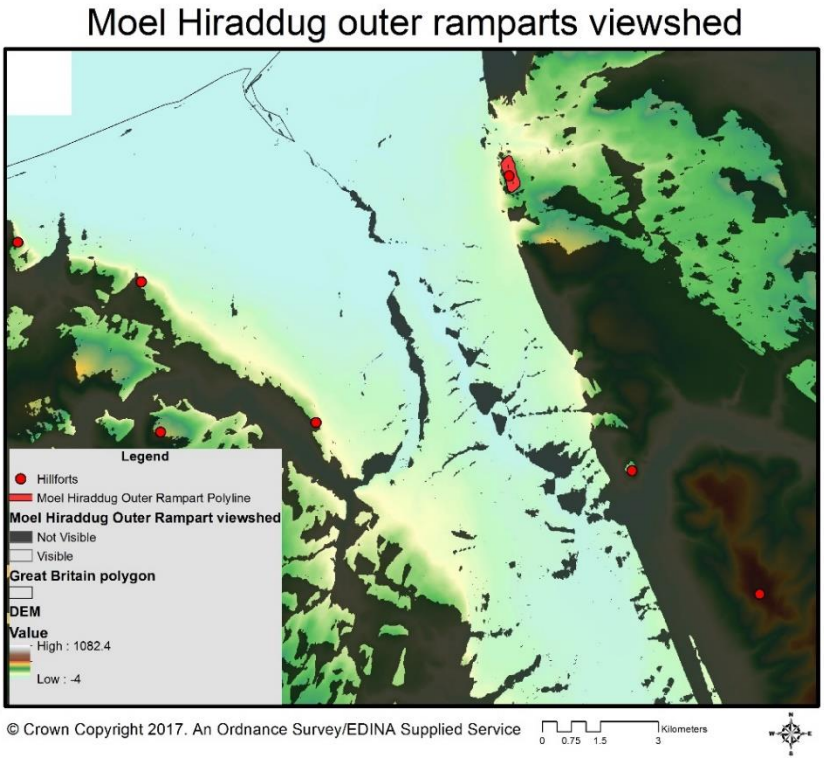

Figure 5.25. Viewshed from Moel Hiraddug outer ramparts. The red line represents a user-generated polyline drawn around the inner ramparts of the hillfort (those shown in blue in Figure 5.23). Darker shaded areas represent pixels/view not visible from the inner rampart polyline and coloured (representing relief as per the Digital Elevation Model - DEM) areas showing pixels/view visible from the inner rampart polyline. Surrounding hillforts are shown as red dots and the north Wales coastline as a black line to the north west of the map

5.3.4.1.3 Comparing viewsheds from 'tipped hillforts' and their associated contour lines

A viewshed was calculated using the outline of Penycloddiau, Figure 5.27 and Moel Fenlli's ramparts, Figure 5.26, on the true contours of the hills the hillforts sit upon. This was done to compare whether the 'tipped' hillforts were built on a slope, rather than as true 'contour forts', to increase visibility of the surrounding area, when compared to a viewshed from the true ramparts, see Figure 5.28.

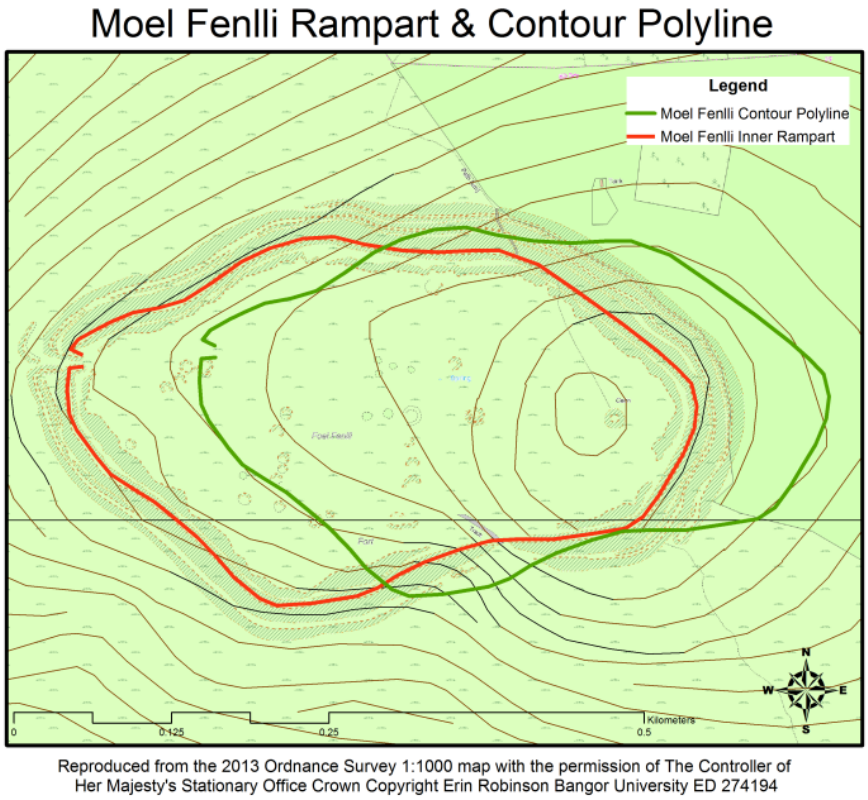

Figure 5.26. Polylines depicting Moel Fenlli inner rampart and replicated on contours. The red user-generated polyline follows the inner ramparts of the hillfort, as seen on the underlying OS map. The green polyline is a replica of the inner rampart polyline, moved to the east to sit along the contours, which can also be seen on the underlying OS map

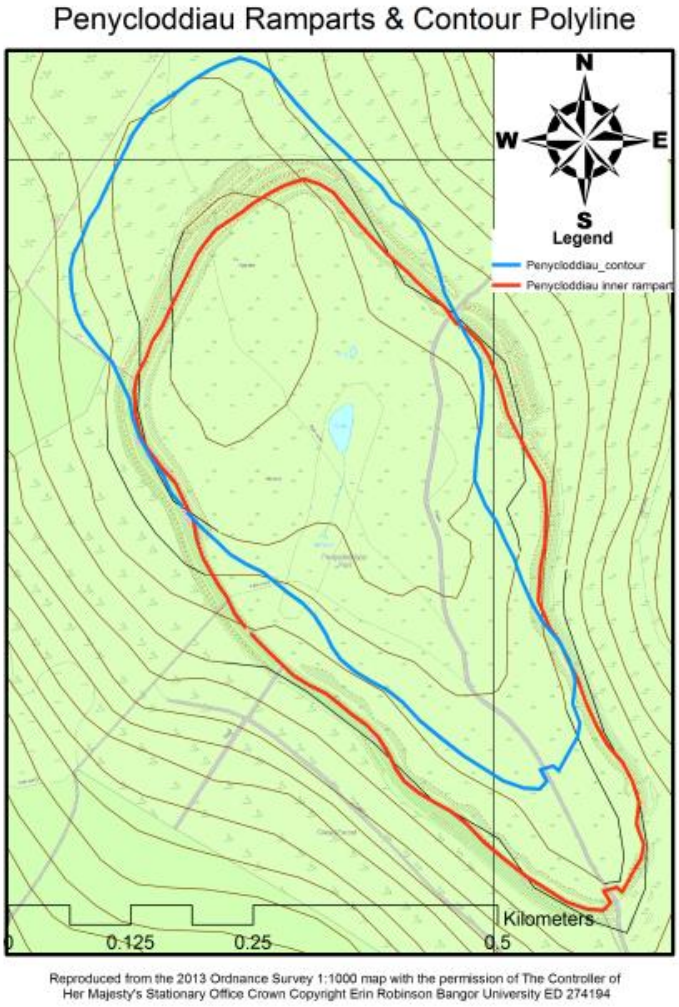

Figure 5.27. Polylines depicting Penycloddiau's inner rampart and replicated on contours. The red user-generated polyline follows the inner ramparts of Penycloddiau hillfort, as seen on the underlying OS map. The blue polyline is a replica of the inner rampart polyline and moved to the north to sit across the contours, which can also be seen on the underlying OS map

Calculating the visibility of the surrounding landscape from Penycloddiau using a replica polyline of the ramparts upon the contours, the results increased from 5.99% to 6.22%. A similar result was witnessed at Moel Fenlli, where the land visible from the ramparts was 5.82% compared with an increase to 5.99% when calculating the viewshed from the polyline at the true contours of the hill.

These results suggest that in both cases, the tipping of the hillforts' rampart lines had a negative rather than positive effect on the total amount of visibility of the surrounding landscape, see Figure 5.28 and Table A3.11.

When comparing the line of the ramparts with contour lines, it is apparent that the 'tipping' of the hillfort on Penycloddiau ensured that a flatter piece of ground to the south of the hillfort was included within the enclosure. If this contour line had been followed the whole way around the summit to make the ramparts, the hillfort would have been incredibly large, possibly even doubling the already 20 hectares the hillfort proper encloses. Where the northern ramparts cut across the contour line to enclose the summit, multivallation has been constructed, possibly to further protect this weaker, flatter side. A similar approach can be seen on the eastern ramparts of Moel Fenlli.

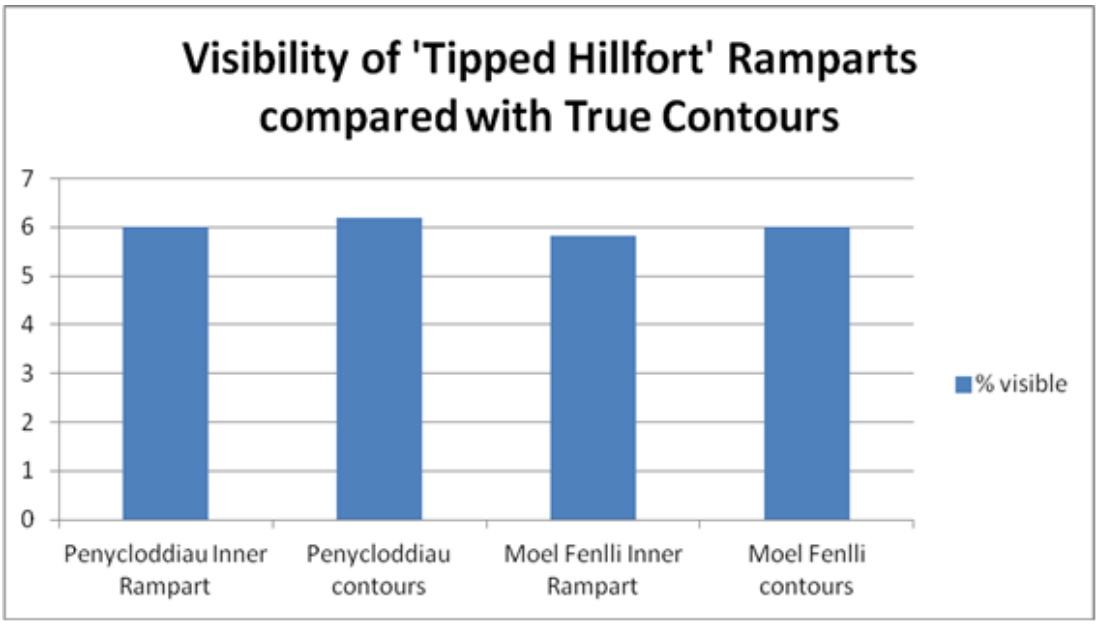

Figure 5.28. Comparison of percentage of visible surroundings from ramparts and contours of 'tipped hillforts'. A small increase in the total surrounding area visible is seen when generating a viewshed from the contour lines compared with the true ramparts. This indicates that the 'tipped hillforts' of Moel Fenlli and Penycloddiau were not built to sit on an angle across the contours of their hills to increase overall visibility

Although change appears to be slight numerically, visibility maps were scrutinised to investigate, qualitatively, whether aspect and visibility of certain areas were affected by the building of the hillfort on a slope, see Figures 5.29 to 5.32.

When comparing the viewshed from Moel Fenlli's inner rampart with the same area taken from the viewshed using the contour polyline, see Figures 5.29 and 5.30

respectively, an increase in visibility of certain nearby areas can be seen from the ramparts proper that cannot be seen if the ramparts had been built on the contour line.

For example, on the north side of the hillfort, a visible line following the current pathway up the hill from the below “bwlch”/pass to the western entrance can clearly be seen on Figure 5.29, but the view is masked from the contour polyline, see Figure 5.30.

Alongside this, areas of land to the west immediately below the hillfort and around 1km from the hillfort are only visible from the rampart line, not the contour polyline. This is even though slightly more of the *interior* of the hillfort can be seen from the contour lines as opposed to the rampart line proper.

In addition, the enclosures which sit to the west of the hillfort on the lower slopes are not visible from the contour line but are just visible from the ramparts.

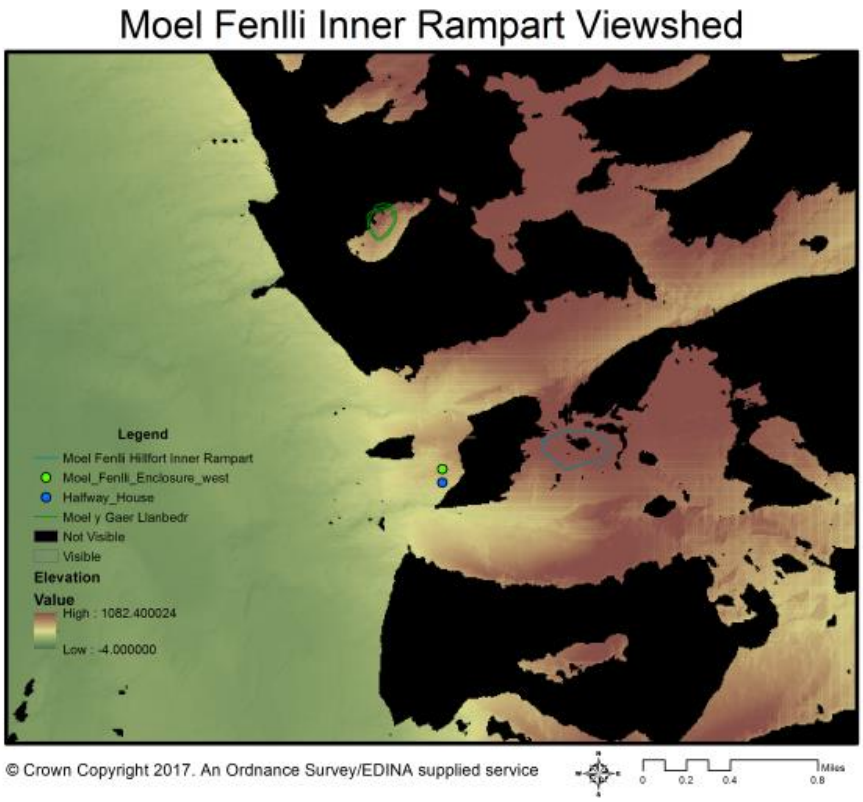

Figure 5.29. Viewshed from Moel Fenlli inner ramparts. Darker shaded areas represent pixels/view not visible from the inner rampart polyline and coloured (representing relief as per the Digital Elevation Model - DEM) areas showing pixels/view visible from the inner rampart polyline. The inner ramparts of Moel Fenlli are depicted as a blue user-generated polyline towards the centre of the map. To the hillfort's west, a green and blue dot represent the locations of two undated enclosures, thought to be prehistoric, and clearly visible within this viewshed. Also visible is much of the hillfort of Moel y Gaer Llanbedr, depicted as a green polyline to the north west of Moel Fenlli. The path from the pass of Bwlch Pen Barras to the north of Moel Fenlli, which leads up to the western edge and entrance to the hillfort, is also shown to be visible on this viewshed

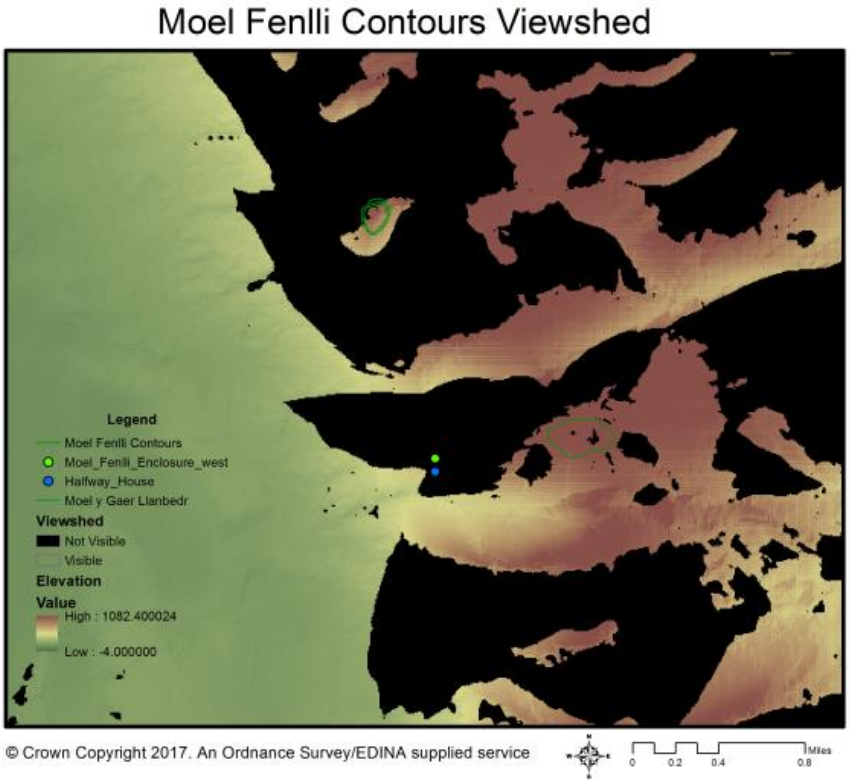

Figure 5.30. Viewshed from Moel Fenlli contours. Darker shaded areas represent pixels/view not visible from the contour polyline and coloured (representing relief as per the Digital Elevation Model - DEM) areas showing pixels/view visible from the contour polyline. The contour polyline on Moel Fenlli is depicted as a light green polyline replicated from the rampart polyline, see Figure 5.26, towards the centre of the map. To the hillfort's west, a green and blue dot represent the locations of two undated enclosures, thought to be prehistoric, and not visible within this viewshed from the contour polyline. The path from the pass of Bwlch Pen Barras, to the north of Moel Fenlli, which leads up to the western edge and entrance to the hillfort, is also obscured from view on this viewshed from the contours. Much of the hillfort of Moel y Gaer Llanbedr, depicted as a darker green polyline to the north west of Moel Fenlli is visible

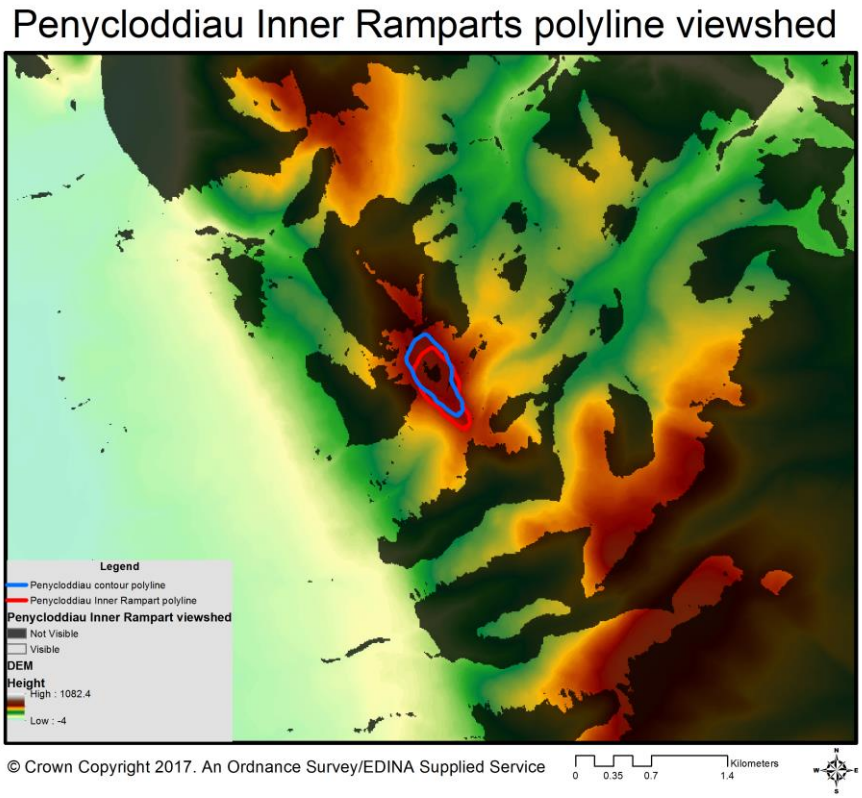

Figure 5.31. Viewshed from Penycloddiau ramparts. Both the inner ramparts polyline and the 'contours' polyline are depicted here in red and blue, respectively, with this viewshed being calculated from the inner ramparts. Darker shaded areas represent pixels/view not visible from the inner rampart polyline and coloured (representing relief as per the Digital Elevation Model - DEM) areas showing pixels/view visible from the inner rampart polyline. Much of the surrounding landscape is visible in patches, with a stretch of land to the south of the southern entrance of the hillfort visible from the Vale of Clwyd to the west passing through the Clwydian Range to the north east

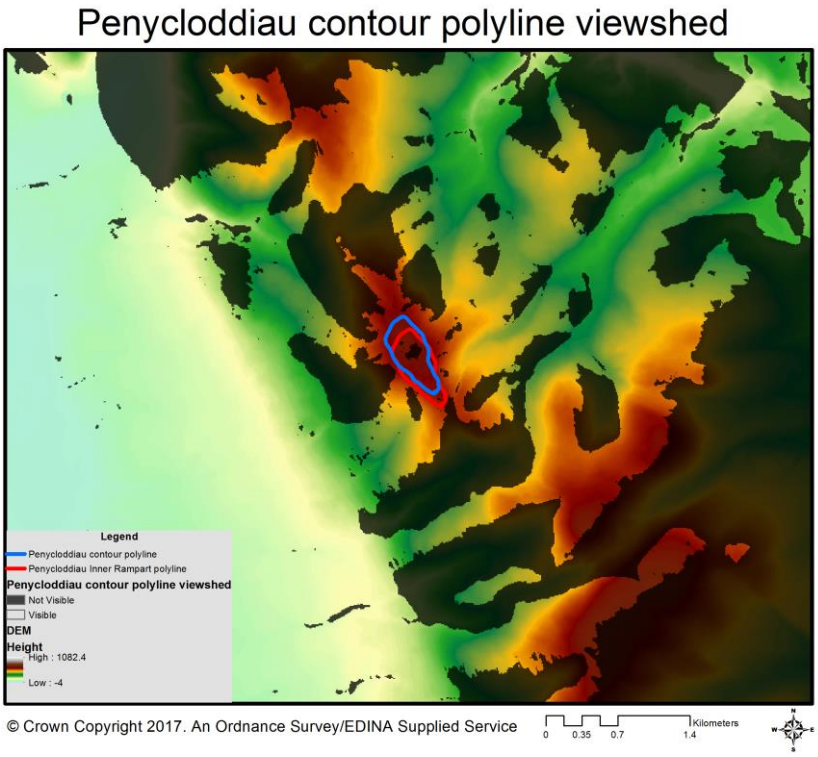

Figure 5.32. Viewshed from Penycloddiau contours. Both the inner ramparts' polyline and the 'contours' polyline are depicted here in red and blue, respectively, with this viewshed being calculated from the replicated contours polyline. Darker shaded areas represent pixels/view not visible from the contours polyline and coloured (representing relief as per the Digital Elevation Model - DEM) areas showing pixels/view visible from the contours polyline. A stretch of land to the south of the southern entrance of the hillfort is shown as being obscured by nearby higher ground

When considering the same of Penycloddiau, although the amount of surrounding landscape visibility is increased by using the contours rather than the ramparts proper, see Figure 5.28, there appears to be a stretch of land near the southern entrance which would not have been visible from the ramparts if they had been built on the contours, see Figure 5.32 rather than in their real 'tipped' position, see Figure 5.31.

The results of these two comparisons at Moel Fenlli and Penycloddiau suggest that tipped hillforts may have been positioned in this way in order to see specific features in the landscape.

5.3.4.1.4 Viewsheds from hillforts including interior points

Calculating visibility from a single point at the summit or a number of points surrounding the hillfort disregards views from other points within the interior of the feature which may reveal additonal aspects.

To test whether including interior points had an impact on visibility, a series of user-generated polylines (made up of points defined by the user) were drawn on to the hillfort to include points at the entrance(s), the ramparts at the north, south, east and western edges and within the interior at the north west, north east, south west, south east and the summit and/or central point of the enclosure.

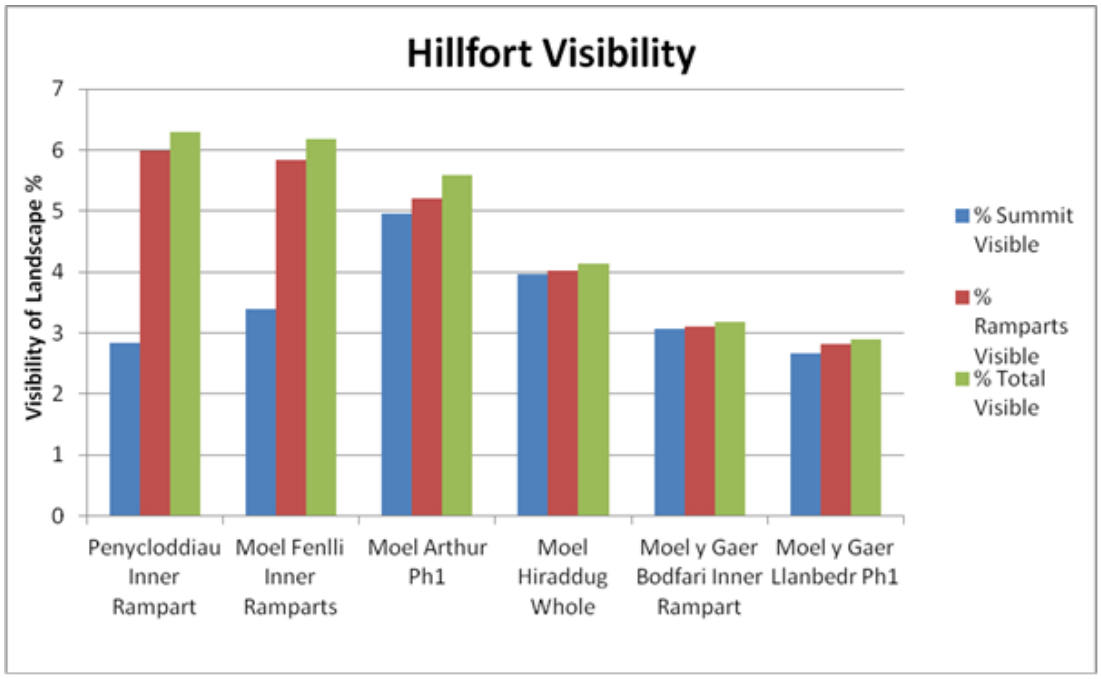

Figure 5.33. Comparison of percentage of visibility of surrounding landscape from features from the summit point (blue), user-generated polyline depicting Whole (see Figure 5.23)/Inner/Phase 1 (Ph1) ramparts (red) and a user-generated polyline incorporating the entrance(s), the ramparts at the north, south, east and western edges and within the interior at the north west, north east, south west, south east and the summit and/or central point of the enclosure (green), for the six hillforts of the Clwydian Range, demonstrating that an increase in overall visibility is higher, and more representative, from a polyline representing more dispersed points across the hillfort than when limited to a single point at the summit or to a rampart circuit

Comparing these results with summit single-point viewsheds and polyline rampart viewsheds of the hillforts, an increase in visibility can be seen in all calculations even

though fewer ‘points’ overall were used for the viewshed including interior points, see Figure 5.33 and Table A3.10. When comparing the summit point viewshed with the polyline including interior points, the view and aspect increased in all cases. However, in each case there does not appear to be a considerable difference in the aspect of the view from the viewshed from the ramparts compared with the addition of interior points.

It was considered whether hillforts which sit at a higher point in the landscape or those which enclose a larger area have a higher visibility of the landscape. The general trend appears to be positive considering such a small dataset. However, there does not appear to be an outright correlation between height nor size of hillfort with the visibility. Little increase can be seen between the visibility of Moel Fenlli enclosing 8.3ha and Penycloddiau enclosing more than twice the area, around 17.7ha. Although larger, Penycloddiau sits almost 100m lower than Moel Fenlli.

5.3.4.1.5 Viewsheds from entrances

Viewsheds were conducted at hillfort entrances to explore whether different types, styles or locations of entrances could be connected with visibility of the landscape. It was tested whether the height of the entrance, potentially by the location of a bridge at this point across the height of the entrance, would have an impact on the viewshed results. For this exercise, five hillforts on the Clwydian Range with a total of seven entrances were tested. Moel Hiraddug was excluded, due to the destruction of a significant amount of the site through quarrying, including at least one entranceway.

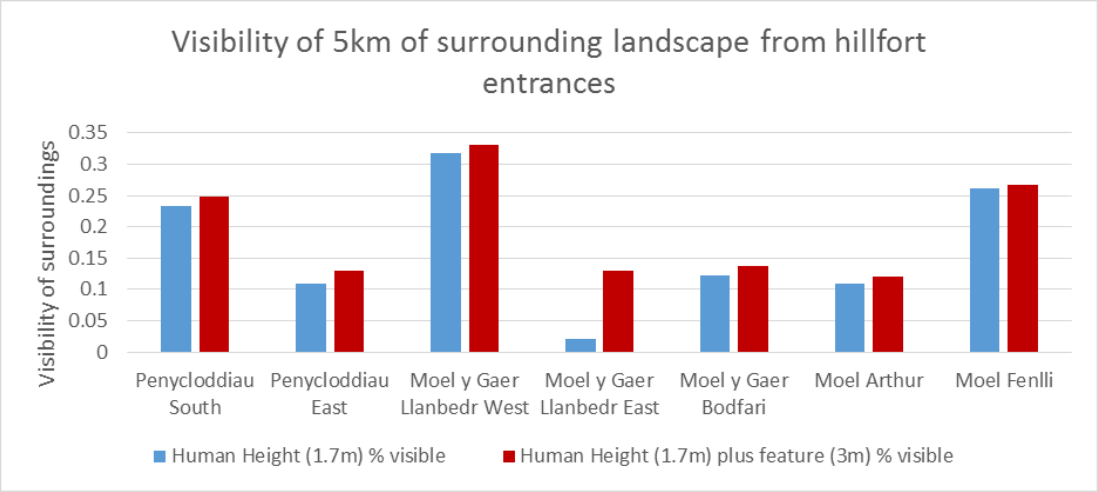

Figure 5.34. Percentage of visibility of the surrounding 5km landscape from hillfort entrances at five of the Clwydian Range hillforts calculated from the height of a human (1.7m) and from the height of a human plus 3m to compare whether the increase in height of a tower or structure at the entrance would have an impact on the surrounding view, demonstrating that in all cases the total amount of landscape visible within 5km increased with the addition of height, but in only one case was there a significant increase in surrounding visibility; at Moel y Gaer Llanbedr's complex, eastern entrance

Initially, viewshed analysis was used at one point located at the entranceways, using a height of an average human being at 1.7m, testing visibility on a radius of 5km and then again in the same position with the addition of 3m height to represent a hypothetical structure at the location, see Figure 5.34 and Table A3.12.

The entrance with the highest visibility was revealed as the western entrance of Moel y Gaer Llanbedr, which overlooks the Vale of Clwyd, at 0.31%. This compared with its eastern, much grander-designed counterpart with a result of just 0.02% of 5km of the surrounding landscape, the lowest result of all seven entranceways.

Moel Fenlli's sole entranceway, also located on the western slopes, had the second highest visibility at 0.26%, closely followed by Penycloddiau's southern entrance with a result of 0.23%.

Penycloddiau's eastern entranceway alongside Moel Arthur's entrance, also facing east, both revealed visibility results of just 0.1% of the surrounding landscape. Moel y Gaer Bodfari's sole entranceway, with a northern aspect, had a slightly higher result with 0.12%.

By increasing the height of the point taken to calculate the viewshed, the visibility results increased accordingly, but in most cases, not extraordinarily. The point was increased to include 3m in height to represent a structure such as a bridge, suggested as a characteristic of some Welsh border sites (Cunliffe 2005, 372), in addition to the height of a human at 1.7m.

The order of the most visible hillfort entrances did not differ, although the impact at each site did. Moel y Gaer Llanbedr's western entrance again resulted in the highest visible entranceway of the six hillforts' entrances and increased by 0.02% to 0.33%. The hillfort's eastern entranceway, however, increased significantly with the added height of 3m giving it six times more visibility of the landscape at 0.13%. Moel Fenlli's entrance on the western side of the hill, similarly to Moel y Gaer Llanbedr's western entrance, saw very little impact by the addition of height with an increase of visibility of just 0.007% to 0.267%, although still the second most visible entranceway of the seven entrances. Penycloddiau's southern entrance increased from 0.232% to 0.248%, but its eastern entrance saw a larger impact, increasing its result by 0.02% to 0.12% visible. Moel Arthur's sole entranceway at its eastern edge increased by 0.018% to 0.12% and Moel y Gaer Bodfari's northern aspect entrance increased by a slightly larger amount from 0.12% to 0.136%, see Figure 5.34.

From these results it can be seen that the smallest impact of the addition of height at the entrances was seen at the already highly visible sites on a western aspect. The one entranceway with a significant change in visibility with the addition of height was the complex eastern entranceway at Moel y Gaer Llanbedr.

Taking into account the view and aspect that the addition of height allows, certain features become visible which may have previously been not visible. With the addition of height at Moel Fenlli's entraceway, the two enclosures which sit to the west of the hillfort become entrirely visible. For example, the prehistoric enclosure to the west of Moel Fenlli, Halfway House enclosure, would have only just have been visible from the ramparts without the addition of height. The same applies to Moel y Gaer Llanbedr's eastern entrance which, with the addition of height, would have been able to see a number of locations where enclosures are situated such as Rhydonen and Llanynys. At Moel Arthur, only three enclosures are known to exist within 5km of the hillfort, all of which are undated. None of these would have been

visible from the hillfort at human height or with the addition of height at the entranceway. The same applies to Penycloddiau. Four enclosures are within 5km of Moel y Gaer Bodfari, three of which are visible from human height from the hillfort and the addition of 3m height at the entrance does not reveal the fourth. Six enclosures are visible from Moel Hiraddug, only one sits out of sight.

It can be concluded that structures were not added to increase overall visibility of the surrounding landscape. Due to the lack of dating evidence, it cannot be assumed that any of the hillforts and enclosures are contemporary, but this exercise demonstrates that with the addition of height, certain features in the landscape may have been visible. It also highlights the need for consideration of the impact of erosion on user height when conducting visibility calculations.

5.3.4.2 Visibility from other hillforts in the surrounding landscape

To compare whether the Clwydian Range hillforts are representative and show any correlation or similarities in visibility with other hillforts in the surrounding area, a number of tests were carried out on hillforts surrounding the Clwydian Range.

Twelve hillforts in the surrounding area were chosen to test visibility. It has been shown that the most inclusive test uses a polyline which includes points on the rampart, points on the interior and the high point or central point of the hill. Similarly to when testing the Clwydian Range hillforts, points were taken as a polyline on the ramparts at north, south, east and west, at any entrances evident, on the interior of the hillfort at NE, SE, NW and SW and at either their central point or the high point within the hillfort.

Out of the eighteen in total (six of which being the Clwydian Range hillforts), it was observed that all six Clwydian Range hillforts fell into the top half of the results for visibility of the surrounding landscape within 25km, and five of the six within the top third, see Figure 5.35 and Table A3.13.

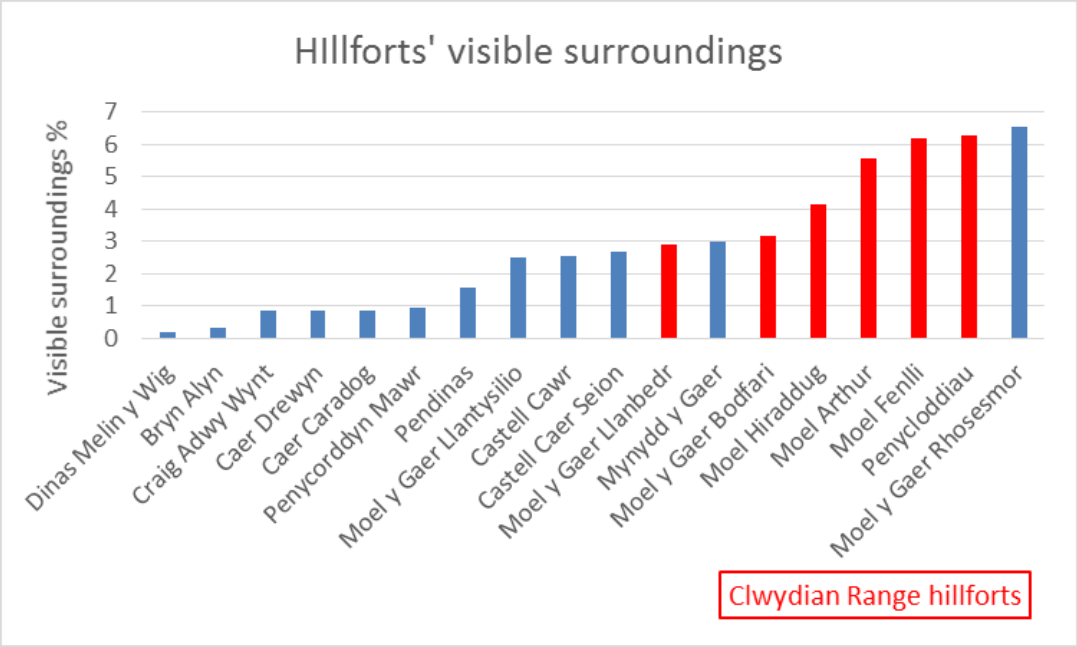

Figure 5.35. Percentage of visibility of surrounding landscape from selected hillforts from the wider study area, including the six hillforts of the Clwydian Range, calculated from user-generated polylines incorporating the ramparts at north, south, east and west, at any entrances evident, on the interior of the hillfort at NE, SE, NW and SW and at either their central point or the high point within the hillfort, sorted from least visibility of the landscape to highest visibility of the surrounding landscape in a 25km radius, demonstrating that all six Clwydian Range hillforts fall within the top half of the results

The Pearson correlation formula, below, has been used to analyse results between visibility and the height and the size (enclosed area) of hillforts and height and visibility from hills.

$$r = \frac{n(\Sigma xy)-(\Sigma x)(\Sigma y)}{\sqrt{[n\Sigma x^2-(\Sigma x)^2][n\Sigma y^2-(\Sigma y)^2]}}$$

There is a strong positive correlation of 0.595 between height and visibility for hillforts in the wider study area, see Figure 5.36 and Table A3.13. Interestingly, for the Clwydian Range hillforts alone, there is a very strong positive relationship of 0.845. For the wider study area, not including the Clwydian Range hillforts, the relationship is still positive, but weak at 0.29. The Clwydian Range hillfort results, therefore, increase the overall result.

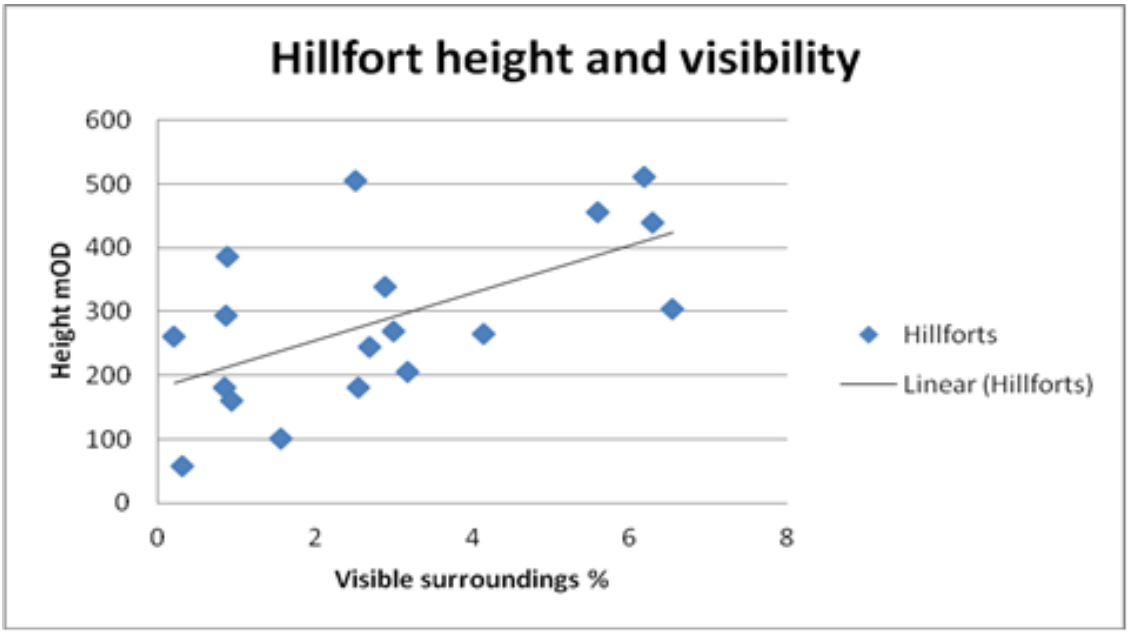

Figure 5.36. Hillfort height and percentage of visibility of the surrounding landscape, showing a positive correlation between the height of a hillfort and the percentage of visibility of its surrounding landscape within a 25km radius, for the wider study area, see Figure 5.35, demonstrating that higher hillforts have higher visibility of the surrounding landscape

The general trend for the Clwydian Range hillforts suggests that the larger the area enclosed, the larger the visible area in the surrounding landscape with a strong positive relationship of 0.576 using Pearson correlation, see Figure 5.37 and Table A3.13.

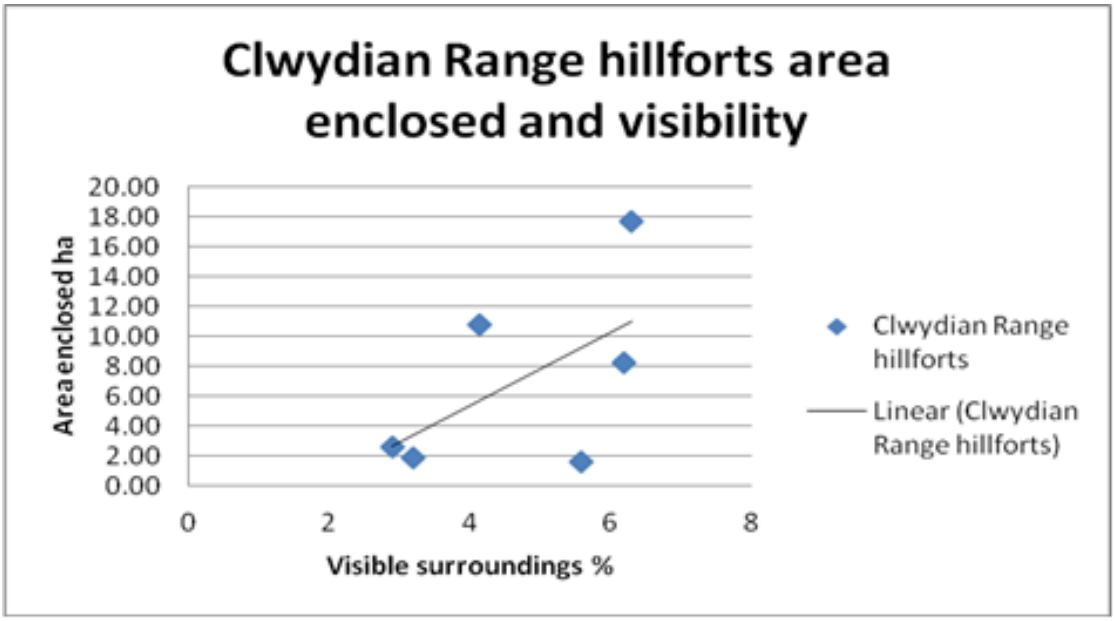

Figure 5.37. Clwydian Range hillforts size and percentage of visibility of the surrounding landscape, showing a positive correlation between the enclosed size of a hillfort and the percentage of visibility of its surrounding landscape within a 25km radius, for the six hillforts of the Clwydian Range, demonstrating that larger hillforts on the Clwydian Range have higher visibility of the surrounding landscape

For the 12 hillforts not on the Clwydian Range, the correlation of size to visibility is negligible at -0.163, using Pearson correlation, suggesting that unlike the Clwydian Range hillforts, they do *not* have a wider view of the landscape the larger the area they enclose, see Figure 5.38. As with the Clwydian Range hillforts, however, some of the smaller hillforts have more visible surroundings than the larger ones.

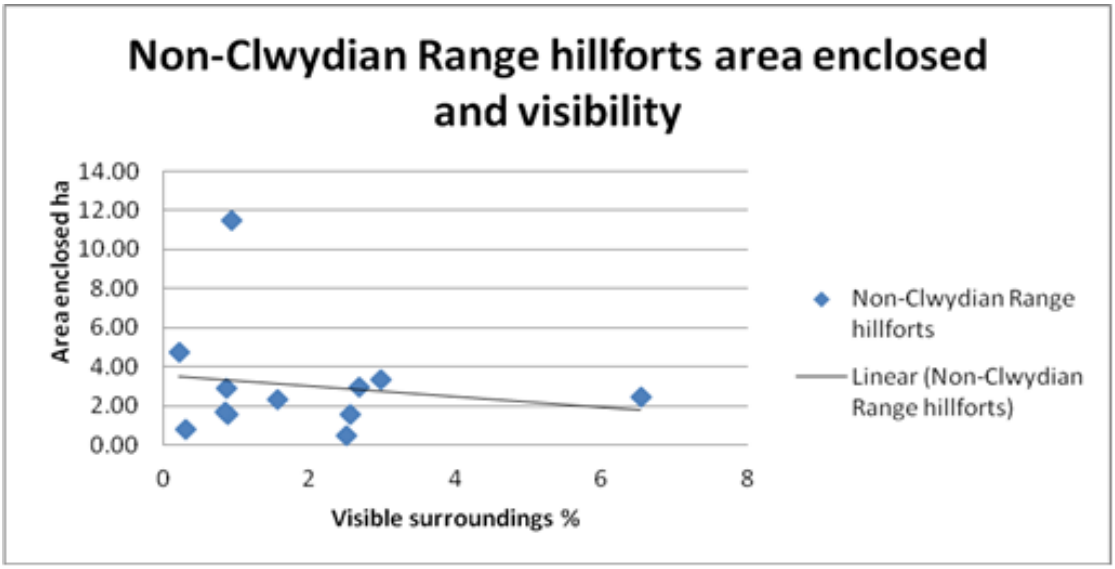

Figure 5.38. Non Clwydian Range hillforts size and percentage of visibility of the surrounding landscape, showing a negative correlation between the enclosed size of a hillfort and the percentage of visibility of its surrounding landscape within a 25km radius, 12 hillforts nearby to the Clwydian Range see Figure 5.35, demonstrating that for these hillforts not on the Clwydian Range, the larger the hillfort, the lower the percentage of overall visibility of the surrounding landscape within a 25km radius

5.3.4.3 Visibility from non-hillforts

To test whether the hills the hillforts were built upon were chosen because of increased visibility compared to other hills in the area, viewshed analysis was carried out on the summits[37] of the 40 hills (inclusive of the six hillforts) on the Clwydian Range, shown in Figure 5.1, see Figure 5.39 and Table A3.14.

[37] Summits were chosen as single input points for viewshed analysis as it was assumed that if considering visibility when choosing a site, the high point would have been used. It has been demonstrated that hillforts' ramparts do not always follow the contour line or break in slope and therefore it cannot be assumed where they would have lain.

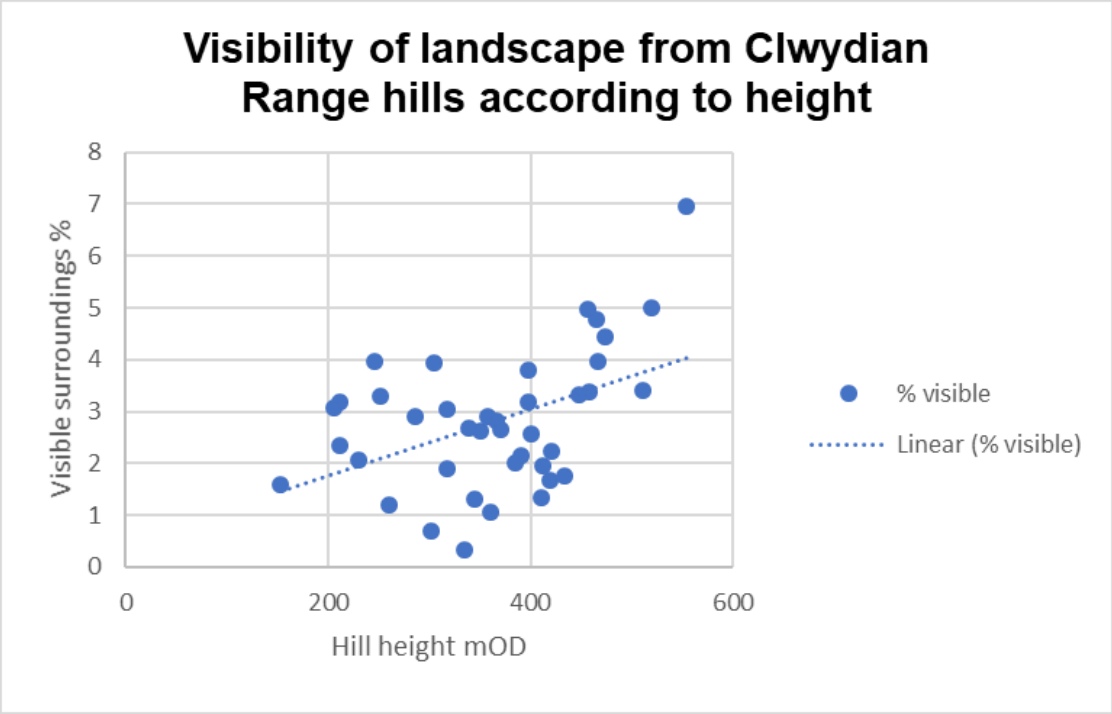

Figure 5.39. Percentage of visibility of surrounding landscape from hills and hill height, showing a strong positive correlation between hill height and percentage of visible surroundings within a 25km radius, demonstrating that higher hills generally have higher visibility of the surrounding landscape

A strong positive relationship of 0.459, using Pearson correlation, was found between height of hills and visibility of surrounding landscape, see Figure 5.39. Interestingly, from their summits, the six hills with hillforts upon them had a weak positive relationship as a group of 0.299, using Pearson correlation, whereas the remaining 34 Clwydian Range hills which had not been chosen as hillforts sites had a strong positive relationship of 0.515 between height and visible surroundings.

It was observed that five of the six of the Clwydian Range hillforts sat within the most-visible half of the group, with the sixth hillfort, Moel y Gaer Llanbedr, having the 21st highest visibility out of the 40 hills, see Figure 5.40 and Table A3.14.

This demonstrates that hillforts were located on the more visible hills on the Clwydian Range and, therefore, their visibility of the landscape may have been a consideration when choosing the hills to build the monuments upon but is not likely to have been the most important factor.

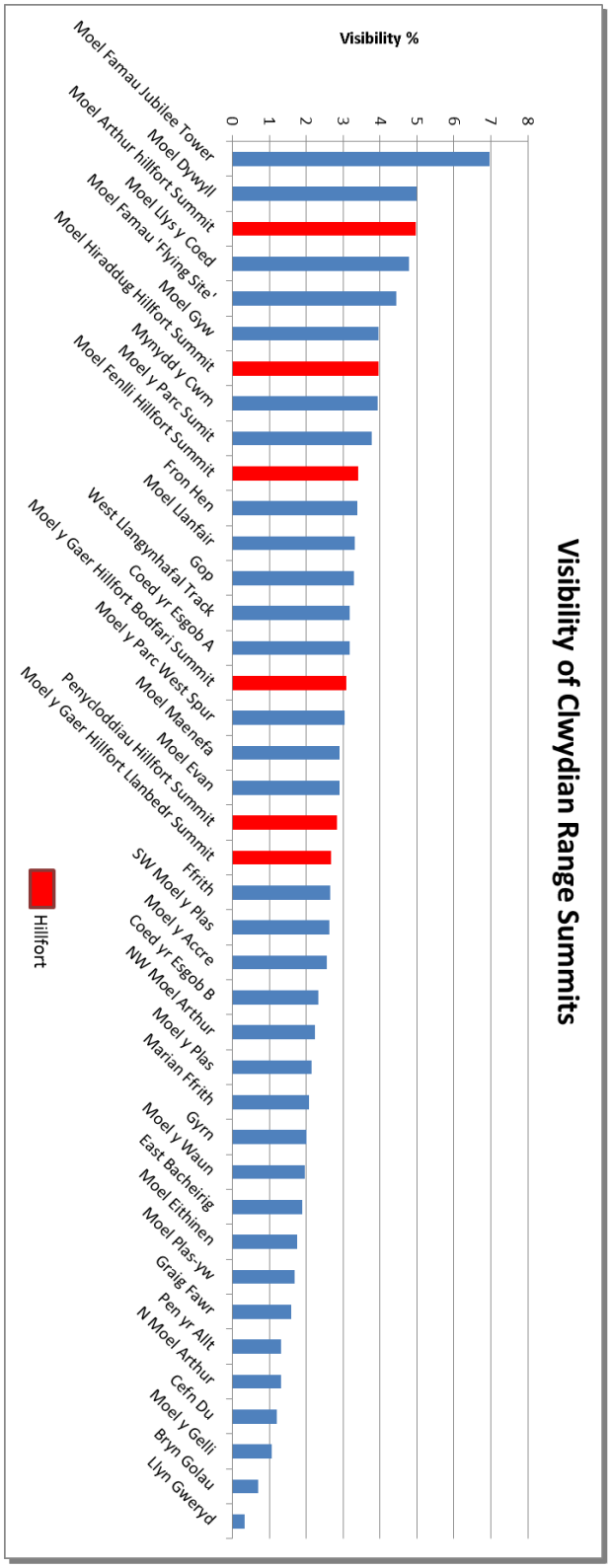

Figure 5.40. Percentage of visibility of surrounding landscape from Clwydian Range hill summits, including those with hillforts (in red), demonstrating that the hillforts were built on some of the hills with higher visibility of the surrounding landscape and therefore overall visibility from a hill may have been a consideration when selecting a location for a hillfort

5.3.4.4 Intervisibility of hillforts

Maps generated from polyline viewshed calculations were used to calculate intervisibility between the six hillforts of the Clwydian Range and any other hillfort within a 25km radius of the sites themselves.

The results from these have been compared with intervisibility calculations from viewsheds generated for a number of other hillfort sites in the surrounding area, see Figures 5.41 and 5.42 and Table A3.15. This is to test for distinctive patterns in hillfort intervisibility within the six hillforts of the Clwydian Range and/or hillforts in the area in general.

To explore whether or not intervisibility is distinctive to hillforts in particular, intervisibility has been tested using single point viewsheds to compare results between a hillfort site summit and a non-hillfort site summit. The sites were chosen as two locations at a similar height, in a similar location and with similar percentage of visible surroundings, taken from the results of the visibility study above.

A series of experiments were undertaken to test which hillforts of the Clwydian Range were intervisible with others surrounding. A surrounding area of 25km was used and calculations were made in relation to the number of hillforts visible from the input points compared with the amount of hillforts located in the 25km radius. The data used was from viewsheds calculated using interior and rampart input points.

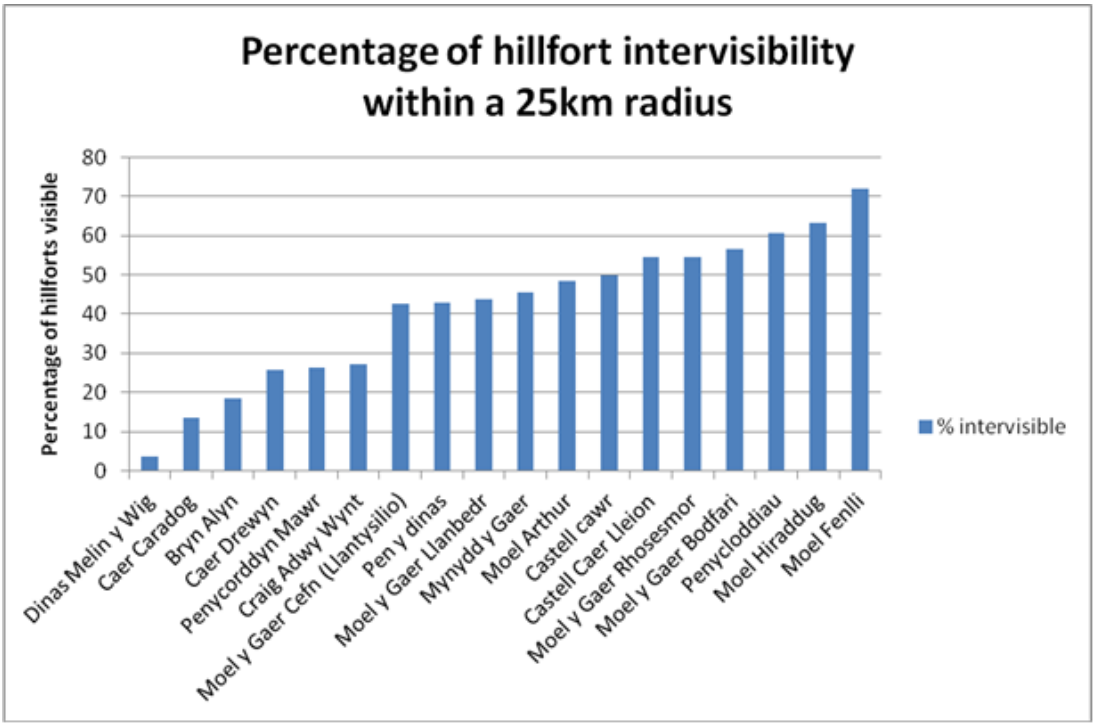

Figure 5.41. Hillfort intervisibility, showing the percentage of hillforts visible of hillforts located within a 25km radius of the site, for hillforts on the Clwydian Range and others in the wider study area

Working with percentages of hillforts visible compared with the amount of hillforts within a 25km radius, the results show that in all cases, approximately half the hillforts are visible from the hillforts on the Clwydian Range, see Figure 5.41 and Table A3.15. The largest hillforts on the Clwydian Range have the highest percentage of hillforts visible and this suggests a correllation between hillfort size and percentage of surrounding hillforts being visible from the site.

Moel y Gaer Llanbedr and Moel Fenlli both have 31 hillforts located within a 25km radius, but Moel Fenlli can see 22 in total, almost one third more of them than Moel y Gaer Llanbedr, which is only able to see 13, see Figure 5.42 and Table A3.15. This exercise demonstrates that the hillforts with the highest amount of hillforts in their surrounding area are not neccessarily the most intervisible hillforts.

However, the exercise raised key issue of viewshed analysis; namely reciprocity. Some hillforts are visible from one to another but this is not reciprocated, for example, Moel Hiraddug and Moel Fenlli. This is simply an outcome of chance as to where the user chooses to place the point on the map to create the viewshed from. Therefore, it can be concluded that with intervisibility studies from monuments larger

than a single point, the more points used to create a polyline across the ramparts and interior, the less the errors encountered.

The Clwydian Range hillforts are the most intervisible out the eighteen tested hillforts compared with other local sites within 25km. The top four intervisible hillforts are four on the Clwydian Range. All six Clwydian Range hillforts sit in the higher sector for intervisibility, see Figures 5.41 and 5.42 and Table A3.15.

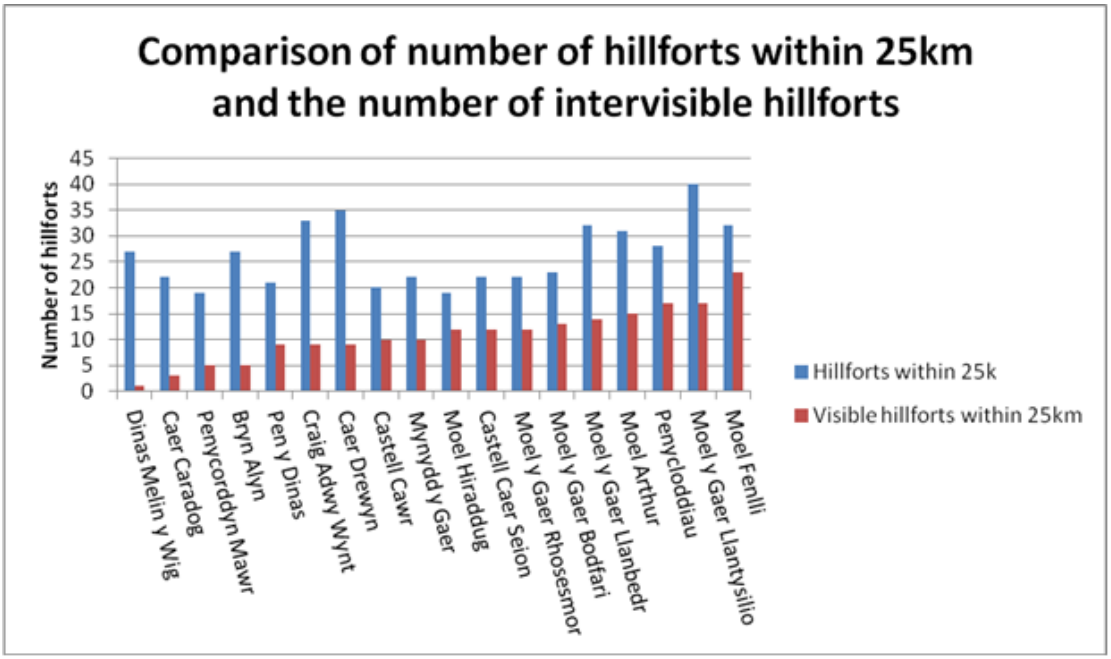

Figure 5.42. Hillforts surrounding and visible from other hillforts, showing the number of hillforts within a 25km radius of each hillfort and the number of visible hillforts from each hillfort within a 25km radius, for hillforts on the Clwydian Range and others in the surrounding area, demonstrating that the higher concentration of hillforts surrounding does not increase intervisibility

As with the six Clwydian Range hillforts, for hillforts which are surrounded by the highest number of hillforts, this does not necessarily mean that they are intervisible with those hillforts. For example, Dinas Melin y Wig has a number of hillforts within a 25km radius but can only see itself from its own viewshed.

However, this again highlights the issue with user determination of points the viewshed is calculated from. When conducting the viewshed from Moel Fenlli, it was seen that a small section of Dinas Melin y Wig hillfort *could* be seen from the southernmost ramparts, even though this view was not reciprocal. This is due to the location of the ‘points’ chosen to conduct the viewshed from on each; an important

aspect to consider when exploring intervisibility using a small number of points spread across an enclosed area, as this can lead to assumptions and errors being made.

5.3.4.5 Intervisibility of non-hillfort hills

It is a possibility that the intervisibility of the hillforts is a by-product of the fact that these monuments are generally siutated on hill summits, likely to have good vantage points, see other hill summits and therefore see other hillforts. A test was conducted to compare two neighbouring, similar height summits; one with a hillfort at Moel Arthur, the other without a hillfort at Moel Llys y Coed. Both summits had the same number of hillforts within a 25km radius.

Moel Arthur hillfort high point could see 4.9% of surrounding landscape at a height of 456m OD compared with the nearby site of Moel Llys y Coed non-hillfort high point, which had an overall surrounding visibility of 4.7% at a height of 465m OD. The non-hillfort site's viewshed was able to view 3.2% more hillforts than the hillfort site. This figure includes counting Moel Arthur hillfort in both cases, visible from Moel Llys y Coed and, of course, from itself. These results suggest that hill summits are intervisible with other hill summits. Therefore, hillforts may generally have good intervisibility with other hillforts because they too are built on hill summits. In addition, it demonstrates that hillforts were not built on hills which had the highest intervisibility with other hillfort sites and therefore, intervisibility may not have been an important factor in site selection.

This chapter has explored the landscape context of the Clwydian Range hillforts and of those within the wider study area. This included their geographical and archaeological setting, resources and visibility of their surroundings. These studies and their results will now be considered as a whole in a wider discussion of the importance of the setting of hillforts during initial site establishment and use.

5.4 Discussion

The Clwydian Range hillfort sites have been studied in their landscape setting, with comparisons with other hillforts in the surrounding area and also with hills which were not chosen to have hillforts built upon them, see Figure 5.1. Aspects such as

climate, vegetation and nearby resources have been considered, as well as their visibility of the surrounding landscape.

A positive relationship between hillforts and earlier monuments, such as Bronze Age burial chambers, has been investigated (Gale 1999). However, on the Clwydian Range, it is no more likely that a hillfort will be built around a barrow than not. It may be that these sites both favoured tops of hills and that is why their association has been noted. However, the preference for the hillfort builders to choose hills to build upon with earlier origins has not been disproven. In many cases, earlier activity is represented by artefactual finds. These hills may have had a long association with the local communities and represent an intangible heritage not visible in the archaeological record.

The climate is seen to deteriorate at the end of the Late Bronze Age into the Early Iron Age, just as this monument type is thought to originate. It is suggested that the impact this had on agriculture and population could have led to an apparent need to define territory and therefore the introduction of enclosed settlements. The question remains, however, why build on the summits of hills when the upland zone was becoming more hazardous?

With regards to vegetation and agriculture, activity on the Clwydian Range during the Iron Age does not appear to be typical in the wider area, such as Mynydd Hiraethog (Denbigh Moors) and the Cheshire Sandstone Ridge, both of which also have hillforts. As heather begins to predominate on other hill ranges in Wales, the Clwydian Range *continues* to be cultivated. This does not demonstrate *relocation* on to these hills once other areas have become over-exploited, but that the hills have a long-standing tradition of this practise. Grazing also increases on the range at this time and this, in conjunction with the fertile land, would have made the Clwydian Range a much sought-after resource.

This may explain the number of hillforts on the Clwydian Range. It may account for the continued use of land throughout the centuries by the change of different hills' use, perhaps on a rotation cycle. One hillfort and its associated grazing land may have been in use for a certain period, from years to decades to centuries, before changing to another hillfort with grazing land elsewhere. This would consider if the hillforts themselves were used for grazing within, or if the sites had a different use

and the lands surrounding them were exploited for agriculture. That is to say, when the rotation occurred, the ‘old’ hillfort may have been closed down in favour of it becoming open grazing land for a time to maximise the benefits of the soil, not dissimilar to the medieval three-field system. This would signify a sophisticated land management system which would have needed buy-in from the community and those farming the lands. If this were the case, the effort in devising this appears to have paid off, as evidenced by the longevity of use.

The renewed burning and clearing of trees seen in the pollen record at around 650BC, may signify activity specifically being carried out in order to build the hillforts. It may also signify an attempt to increase the fertile land. The climatic changes occurring in this period would have added to the pressure and scarceness of what the Clwydian Range continued to have to offer when surrounding areas were failing. If the hillforts were found to be broadly contemporary and with a much longer continuous use throughout the Iron Age, this again signals the importance of the Clwydian Range as an agricultural commodity and the hillforts being a symbol of ownership directly associated with specific areas of, and possibly protecting or controlling this valuable land.

Investigating water sources on the summits or near to the summits of the hills does not appear to have been a factor when choosing the hills to build hillforts upon. The percentage of hillforts which have water sources within or nearby them is exactly the same as hills which have water sources on their summits or close-by. This brings into question the use of hillforts as fortresses, a theme much debated. The requirement for water is a basic human need and the ability to withdraw access to it is seen as a key weapon. The ability for any fort to withstand a siege without direct access to water, no matter how much they would have been able to store and collect through rainfall, would not have been a long-term solution. Access to water does appear to have been important, with all hillforts located near to water sources, but the majority of these are outside the ramparts.

With all six hillforts on the Clwydian Range either overlooking a pass through the hills or overlooking the Vale of Clwyd itself, the fact that the hillforts were built on these particular sites to dominate the passes is a suggestion which warrants further exploration. It should also be noted that the passes which are overlooked by Moel y

Gaer Bodfari and Moel Hiraddug near Dyserth are the only two places within the Clwydian Range where a river runs through the hills, with Afon Chwiler in Bodfari and the River Ffyddion in Dyserth, both tributaries of and converging with the River Clwyd to the west. Incidentally, the hill which is closest in distance to a “bwlch” – being a pass or a gap - and a hill which also boasts a water source near to the summit of the hill is Moel y Gelli, which interestingly is home to a ‘prehistoric enclosure’. Other prehistoric enclosures are located along the pass of Bwlch Pen Barras, overlooked by Moel Fenlli and along the route east of Moel Arthur hillfort. A number of prehistoric sites are recorded in the immediate surroundings of the Clwydian Range, including ones in the Vale of Clwyd, on the slopes of the Clwydian Range itself and also enclosures on the limestone outcrop to the east of the hills. After studying small enclosures in ‘Clwyd’, Manley suggested that further research may provide a link between the hillforts and enclosures as ‘pairing’ (Manley 1991, 107-8). Initial visibility studies into ‘tipped’ hillforts and entrances suggest that the location of the rampart line and the addition of height at entrances may have been chosen in order to gain view to particular features in the landscape, including enclosures.

Entrances built facing west had the best visibility of the surrounding landscape regardless of the height they were built. Entrances built facing the east, despite being more common, had the worst visibility of the surrounding landscape. Due to the erosion of potential features which may have made up the hillfort, such as walkways and towers as well as erosion of ramparts, additional height was added to points at entrances to determine whether the addition of a high feature at this point would have increased the view from the hillfort. In all but one case, there was little impact. This was the eastern entranceway of Moel y Gaer Llanbedr, which is a complex dogleg entranceway, facing the hill it is connected to on a spur. The addition of height had the most impact on eastern entrances, an interesting result due to the relationship between eastern entranceways on the Clwydian Range with additional features. These include the long corridor ‘inturned’ entranceway at Moel Arthur, the complex dogleg entranceway at Moel y Gaer Llanbedr and the additional spur of rampart seen on the southern arm of the eastern entrance at Penycloddiau. Easterly orientations are a common feature in roundhouses and hillfort entrances. With the correlation of additional architectural features and the impact of view by the

addition of height, this easterly orientation may have further relevance, but the impact on most entrances, including easterly ones, suggests that the addition of height was not in order to increase view. In the cases where view did increase, it may have been a by-product, not the main purpose. It was considered whether the addition of ramparts may have been to increase visibility from a hillfort. Likewise, it was seen that calculating viewsheds from ramparts including multivallation, compared to the original univallate site, did not increase visibility. It is possible that multivallation and the addition of features and height did increase visibility *of* a site and/or draw attention to it in the wider landscape. This may have been to highlight a sense of power, authority, and ostentation. It may also have acted as a symbol or a beacon in the landscape for travellers to be guided towards, as visitors.

The overall aim for the investigations using viewshed analysis was to determine whether hills may have been chosen for hillforts because of their view and their visibility of land, other hillforts and other potentially contemporary features. It was discovered that although calculating visibility from the summit did not often have a great difference compared with using many points across the enclosure including the ramparts and the interior, it did have an impact on the aspect and the ability to see certain features within the landscape. In addition, it was seen that if only a small number of locations within the feature were intervisible with other features, this could often be missed by the user error of where the input points were located. When conducting viewshed analysis, better accuracy will be gained by more points used as input features, especially when considering large features. This shows that earlier studies which use simple polylines or points to determine larger features, may not be accurate regarding what can be seen from a feature. It is important to state that where just one point within the feature has been measured, results can only be stated for that particular point. If the feature is comprised of an area rather than one single point/pixel, the results are not representative of the entire feature. It also demonstrates that looking at the map of *what* the point/polyline can see, qualitatively, is as important as the quantifiable numerical values, if not more so. Little change was seen when calculating the results in numerical form, but change could be sometimes seen in aspect on the maps and in the field and would be missed if looking at numerical values alone.

It was considered whether hillfort sites had good visibility simply because they were located on hills or whether the hillforts had been deliberately located on the hills which had most visibility of their surrounding landscape. The hillforts of the Clwydian Range were built on some of the hills with the highest visibility of the surrounding landscape despite not being the highest hills, but not the hills with *the most* visibility. With regards to size, studying the Clwydian Range on average, it was seen that the hillforts had higher visibility of the surrounding landscape the larger they were. This was not representative on other hillforts in the surrounding area. The third highest hill on the Clwydian Range was selected to have a hillfort, Moel Fenlli, so height does not appear to be an issue as to why the other hills were not chosen as hillfort sites. Most hillforts in the surrounding area appear to have quite a generous view of their surrounding landscape, but one site in particular presents an anomaly; namely Dinas Melin y Wig. This hillfort sits on a rocky spur with steep slopes but is surrounded by higher hills. Its viewshed measures just 0.2% of the surrounding 25km landscape, compared to an average within the sample measured of 2.8%. Even more surprisingly, Penycorddyn Mawr, enclosing approximately 11.5ha in size, only revealed a viewshed of 0.9% despite taking nine points for the polyline inputted for the calculations. These results demonstrate that the Clwydian Range hillforts and their hills have better visibility on average for the surrounding area, but a wider view does not appear to have been a leading priority for builders of hillforts in general in the area.

Intervisibility studies, (using polylines including points on ramparts and the interior), showed that hillforts which have the most hillforts surrounding them may not be the most intervisible hillforts. The investigations also confirmed that this is not always reciprocal. In these particular investigations, this was due to the human choice of where to locate the points which made up the polyline. As discussed above, it was shown that if only certain points were visible from, or to, the hillforts, this could be easily missed if only a limited number of random points were used. Comparing intervisibility, a study was undertaken between a hill with a hillfort and a neighbouring hill of similar height. It has been demonstrated that with regards to intervisibility the non-hillfort hill could, in fact, see more hillforts and it was confirmed that intervisibility of hillforts may be due to the location of the hillforts on summits of hills and these hills being prominent in the landscape. Taking the issue of contemporaneity into

account, it is possible to conclude that hillforts were not built on specific hills in the Clwydian Range to be intervisible with other hillforts. In addition, hillforts are intervisible because they sit on hill summits which are intervisible. More importantly, it highlights the importance of control samples in any intervisibility study. Future investigations utilising Higuchi viewsheds of Wheatley and Gillings (2000) and Llobera's areas of co-visibility and variables (2007) would be interesting to compare.

The hillforts which showed the largest change between measuring visibility from the summit, from the ramparts and the most visibility overall were the two largest and the two hillforts built off the contour lines on a slope. It was investigated whether the process of building these hillforts on a slope may have been carried out to increase their visibility of the surrounding landscape by calculating a viewshed for comparison from the real contour lines. It was found that the process of 'tipping' the hillfort in fact decreased the overall visibility from both hillforts. Although the change could be interpreted as negligible, this still leads towards the conclusion that these hillforts were not built as 'tipped' to increase the visibility of the overall surrounding landscape. With regards to change of aspect of these two calculations, the 'tipping' of Penycloddiau allowed views of the approach to the south entrance. At Moel Fenlli, 'tipping' allowed visibility of the current pathway up to the entrance of the hillfort, apparently invisible from the contours, and additional visibility to the immediate west of the hillfort and an area of land where two enclosures of uncertain date are sited. This suggests that hillforts may have been positioned in order to have view of specific features in the landscape and may provide further evidence for Manley's suggested hillfort-enclosure pairings (Manley 1991, 107-8). More so, this demonstrates that solely considering quantifiable values from visibility analysis can lead to incorrect assumptions; qualitative values, i.e. aspect, has to be considered to observe small but potentially significant changes in view. If this is to be investigated further in the future, the distance from these 'specific features' from the input point/monument must be taken into consideration and alternative methods, such as Higuchi viewsheds, applied where appropriate.

5.5 Conclusions

In conclusion, the importance of the setting of hillforts during initial site establishment is still to be determined.

The proximity of the Clwydian Range hillforts to the fertile land may be significant and may explain the number of hillforts on this range of hills.

The Clwydian Range is unusual insofar as that there is a very strong positive correlation between the heights of hillforts and their visibility of the landscape, much more so than other hillforts in the wider study area. With regard the Clwydian Range hillforts, there is also a positive correlation between the area enclosed and visibility, with only a negligible correlation for this for other hillforts in the wider study area. The amount of view, as a whole, does not appear to have been the main priority for where these hillforts, or others in the wider study area, were built. However, the aspect to and visibility of particular features in the landscape, such as pathways, routeways, enclosures and rivers, may have been an important factor. Conversely, direct access to water on site was not.

Hillforts do not appear to have been built on hills in order to see the maximum number of other hillforts. It has been demonstrated that at least one non-hillfort hill is able to see more hillforts from the summit than a similarly positioned hillfort and suggests that intervisibility between a number of hillforts was not a consideration during site location.

This chapter has explored the setting of the hillforts of the Clwydian Range and of the wider study area. Previous chapters have reported on their architecture and dating. It is now time to bring these aspects and their results together and consider all three aspects in an integrated approach.

CHAPTER 6

DISCUSSION

The six hillforts on the Clwydian Range are regularly spoken about as a group due to their proximity, but do other factors, such as architecture, their visibility in the landscape and their dating evidence continue this trend? Hillforts in a wider area of 30 miles from the Clwydian Range hillforts have also been studied to search for comparisons between the hillforts across most of north Wales and the English border.

Information on excavated hillforts' architecture, such as ramparts and entrances has been collated and compared between the wider group of hillforts, as has their dating evidence, mainly through radiocarbon dating. The use of GIS has examined the view from hillforts and hills without hillforts and intervisibility between the hilltops and features upon them.

This final chapter will bring together the results, themes and discussions from previous chapters in an attempt to present a combined consideration of the hillforts of the Clwydian Range and their surroundings, including the hillforts of the wider study area. Patterns within the wider study area have begun to present themselves, within architectural styles and dates. The integration of these results with GIS data, such as location and viewshed analysis, enables additional scrutiny over the hillforts and their potential connections.

6.1 Prehistoric patterns?

From the results, it is possible to conclude that hillforts most likely had multiple phases of use and occupation. It has not been determined whether these episodes had gaps of time between them when the enclosures were out of use, but a change in architecture and activity certainly signifies a renewed interest, a change of behaviour or possibly a change of function. Although some dates do fall victim to the Iron Age recalibration curve plateau, a number of early dates suggest early beginnings for some of the sites.

Much of the radiocarbon data available for the sites provides dates for pre-rampart deposits, activity or occupation. However, some do originate from the ramparts

themselves or associated features and can allow a general chronology to be considered. Dates from pre-rampart horizons can also aid more accurate dating where these dates overlap, if the assumption of a rampart being built within a general timeframe can be allowed.

Pre-rampart settlement includes Moel y Gaer Rhosesmor, where settlement evidence was radiocarbon dated to 891-431BC (HAR-606) and Dinorben, where a pre-rampart ditch, possibly associated with three palisades, was built by 795-428BC (CAR-128). Although tempting to believe that these early settlements date to the earlier horizons of their scientific dating evidence, their later existence must be considered. Eddisbury's palisade with counterscarp ditch was OSL dated to 635-585BC (Garner 2012b, 20). Considering Moel y Gaer Rhosesmor's initial rampart on site was dated between 820-408BC (HAR-604) and Dinorben's initial rampart to after 772 (CAR-167) but before 402 (CAR-123, CAR-124), it is possible that their previous enclosure by palisade was nearer in time to Eddisbury's OSL date in the Early Iron Age, as a wide gap between these architectural styles of enclosure cannot be assumed. On the Clwydian Range, upland clearing activity is seen in the pollen record at around 650BC and may be linked to the building of these enclosures (Grant 2009, 25).

Beeston Castle's ramparts revealed examples of Late Bronze Age pottery - interesting because the site had an ongoing history much further on throughout the prehistoric period with an initial palisade enclosure and ultimately well into the medieval period as a castle site too. Today's archaeology of the site is currently being formed, as it acts as a popular visitor attraction, in the care of and staffed by English Heritage.

The Breiddin too has revealed very early dates for its initial rampart structure. These two early hillforts, both having initial ramparts revealing material radiocarbon dated between the 13th and Ninth and 12th and Sixth Centuries BC respectively, force reconsideration of terming hillforts as 'Iron Age' as they push the initial establishments of *ramparted* hillforts, not just palisaded enclosures, back towards and into the Late Bronze Age. Considering the change in climate at this time, the onset of the Sub-Atlantic phase dating to 1000-500BC (Davies & Lynch 2000, 140), the establishment of these sites may be linked.

Leaving the results from the Breiddin to one side temporarily as an anomaly, the early radiocarbon results from Beeston have been discussed previously and may not be conclusive. Artefactually, the initial rampart was dated by two Ewart Park axes found deposited within, dating to around 800-700BC. Other initial ramparts have dating material which spans from around this time, including Old Oswestry from c700BC (artefactual) and Dinorben built after 772-413BC (CAR-167) and before 753-402BC (CAR-123, CAR-124). A cluster of early dates, between the Eighth Century and Fourth Century do suggest a period of activity in the Early Iron Age where a number of hillforts were being built.

Considering both the architectural and dating results from the study, almost all initial ramparts found on site include a strong element of stone in their architecture. This includes both stone walls and stone-faced banks. This predominance of stone walls, or the perception of them through the use of facing demonstrates a trend across the wider study area. The use of stone facing as an alternative to a stone wall to present a façade demonstrates similarities with the hillforts of north Ceredigion. Here, hillforts have been shown to sit within two main façade schemes, using complex, non-utilitarian architecture to monumentalise architecture (Driver 2013, 129). Driver reports that this pattern is consistently implemented in the construction or remodelling of the hillforts (*ibid.)* implying regional organisation (*ibid.*, 151); a similar arrangement through the use of stone could be stated for the wider study area in north Wales and the borders.

Interestingly, the preliminary results for *structures* on sites appear to follow the opposite trend. Those roundhouses which utilise posts or stakes are generally dated earlier, i.e. from Eighth Century BC, than those dated made from stone, all of which date from the Fourth Century BC.

The second half of the millennium also records activity on a number of hillforts, during the period around the Fourth Century BC to around the end of the Iron Age and the period where Romano-British Britain is being established. Although care must be taken not to generalise long ranges of single radiocarbon samples, four hillforts report their ‘range’ of date to finish within around 80 years of each other, all in the First Century AD.

Similarly, Moel y Gaer Rhosesmor's initial rampart, following a palisaded enclosure, dates to between the Third and the First Century BC. Its foundation trench for the initial rampart was dated to between 820 and 408BC. A deposit showing vegetation clearance which overlay the initial rampart but below the second rampart was dated to between 346-43BC, providing a timeframe for the development of the site.

The rampart at Moel y Gaer Llanbedr revealed dates for the body and facing dating between 788-486BC and 788-433BC respectively. A third date from the same rampart gave results of 507-235BC, which could lead to a narrowing down of the rampart being built at some time in the Fifth or early Sixth Century BC if the rampart is indeed from one phase. From overlying deposits sampled, ramparts at Castell Caer Seion had been built by the Third Century BC and Bryn y Castell in the latter half of the First Millennium BC.

When referring directly to this area, Cunliffe described the Welsh Marches as comparable to Wessex. However, he states that where the mid Borders may be responding to similar influences as the Wessex hillforts, more northerly sites would have been more influenced by local issues; one reason for this being the topography of the region, and also being evidenced within material culture.

The evidence from the excavated examples shows that the two hillforts with very early ramparts and a long period of use are both border hillforts, namely the Breiddin and Beeston. All other hillforts which have been dated, and all within the First Millennium BC and certainly having activity within the period termed the 'Iron Age', are widely spread out across the region.

Those which show an ongoing (with or without gaps of time in between) level of activity are also well distributed. Dinorben, Moel y Gaer Rhosesmor and Moel Hiraddug are all within Wales and all lie within the northern edges of the country. However, they all lie within a small cluster of a few miles. It is possible to single out these as a group 'responding to local pressures'. Alternatively, with the level of complexity behind their ongoing maintenance and development and their similarities in style, through use of materials or certain features, this could too show that these were developing and responding to a larger more widespread issue than what Cunliffe infers are confined to a much smaller area than 'Wessex' and the southern Marches. This is not necessarily the case. With the north west in close proximity,

including Deva at Chester, the Isle of Anglesey to the west and a coastal edge linking to Ireland and much farther communities, it does not make sense that the 'pressures' Wessex is responding to is any more important or vast than those which may have affected these sites.

With regards to entrance types in mid Wales, Driver reports two main architectural traditions for north Ceredigion. The Pen Dinas façade scheme, utilises a natural cliff edge, with pronounced terracing along the length of the site and with gateways located at the 'narrow ends' set back from the main façade. (Driver 2013, 96). The Cors Caron façade scheme has a gateway and façade at the narrow end of a prominent ridge, but without extensive artificial defences for the remainder of the circuit, instead concentrating effort to elaborate the part of the circuit which would be seen on approach, to have maximum impact (*ibid.*, 104; 139). Wessex has also been described as having two broad types; those similar to Hambledon Hill, with inturns and complex outworks, and those like Beacon Hill with inturns but simple additional outworks projecting from the main ramparts, the two groups distributed to the west and east (Cunliffe 2005, 376; Payne et al 2006, 47; 154) although this grouping must have simplified the results substantially, not taking into account simple, early gaps etc. The hillforts in the wider study area of north Wales and the borders show a broad and complex arrangement, with simple gaps, inturns, outworks, blocking, relocation, development and guardchambers evident in a number of examples.

Guardchambers appear to be a feature of the area and are not widely seen outside north Wales, the borderlands and south into Northamptonshire (Driver 2013, 72; Cunliffe 2005, 369-373). The guardchambers in the wider study area of north Wales and the borders show multiple instances of reformation and development. A guardchamber at Eddisbury was in existence at some time from 771-169BC and burned and remodelled between 359 and 169BC. At Moel Hiraddug, the first phase of a guardchambered entranceway, succeeded by modification at least twice to the guardchamber/s, took place around the time of the blocking of the initial simple entrance dated to between the mid Eighth and Fourth Centuries. These dates appear to coincide with the results elsewhere. The establishment of guardchambers at Croft Ambrey and Rainsborough have been dated to Sixth – Fifth Century BC (Cunliffe 2005, 372).

Generally, the results for hillforts in the wider study area show that the longer the passageway, the more postholes evident. It is extremely unlikely that all of these held doors blocking the passageway. It is possible, however, that some of these may have been utilised to hold barriers to block part of the width of the passageway, blocking the view to the interior, creating the need for someone or something wanting entry to the enclosure to slow down, zig-zag and make a considered entry. The grooves observed running up masonry above some postholes along entrance passageways may also be a trace of a horizontal static structure such as this. This could also go some way to explain the location of three postholes seen in a number of cases, set in an almost right-angled triangle, and suggest the use of both doors and screens.

With regards to guardchambers' postholes at their point of entry, the entrances of which run at right angles to the entranceway passage, it is often seen that a central posthole sits within the gap. Here, it is easy to imagine a double leafed door, creating a 'room' out of the recess. However, other explanations can be considered. For instance, if horizontal 'barriers' were erected along the main hillfort entrance passageway to restrict movement, a similar arrangement can be imagined running from posthole to posthole utilising the central 'doorway' postholes of the guardchamber. This would force people to fork and turn left or right into the 'guardchamber' to access the hillfort on the other side of the screen. For those hillforts with two guardchambers may be for additional control - segregating groups; men and women, rich and poor, or simply as an entry and exit point. Those which evolved from one guardchamber to two may have done this as a response to need, as more control was needed. This set-up is not dissimilar to a turnstile entry point seen today at a visitor attraction or festival. The use of hillforts as sites for celebration, markets and/or the coming together of groups has been widely discussed. The need for 'event control' is not impossible.

Nevertheless, this theory only goes some way to attempt to explain a few of many different complexes of postholes at entrances and guardchambers in hillforts. Where guardchambers are present, there are postholes on the outer corner where the passage meets the chamber in every instance. This includes on both sides of the passage where there are two guardchambers present. A 'screen' here would be unfeasible. A more likely explanation is that they are for a door/s whether for the

guardchambers or the entrance passage, supports for a roof structure or even simply just single posts. At Moel Hiraddug's Main Inner entranceway, a hearth was found in both the west and east guardchambers, the east having multiple phases, most probably used throughout the phases of development of the guardchamber (Davies, J. L. 2016. Meeting with Erin Lloyd Jones, 25 November). The location of a hearth within a guardchamber would make the theory of these features being thoroughfares much less feasible.

For those with multiple postholes running along the passage, what was the need for so many posts if they were not for doors, barriers or screens? The architecture at an entrance, the first close-up impression a first-time visitor would see before entering the enclosure, may have needed to look pleasing, to impress or impose, to show wealth and the ability to spend for aesthetics not just practicality. The use of wood lining an entranceway, creating columns and contrasts, would have created an impression. The use of aesthetics to monumentalise entrances can be seen in mid Wales. Many hillforts in north Ceredigion exhibit work above and beyond basic enclosure and defence "*for a higher symbolic purpose, often requiring more work*". Reference is made to the Denbighshire hillfort of Moel Arthur for its similarities and these parallels may be evidence of shared ideas and design concepts across western Britain (Driver 2013, 129-133).

Another explanation for additional postholes at entrance passageways is that they represent the remaining architecture for an overhead wooden structure such as a bridge. At two hillforts with little evidence for complexity at their entrances, additional postholes at the entranceway may reveal a similar set up. At Beeston, little evidence for the entranceway survives, mostly due to the subsequent building of a medieval castle. In addition, some posts at the entranceway were seen to have been removed prior to a subsequent prehistoric building phase. These posts, sitting further back inside the enclosure but which appear to be associated with the entrance have been suggested as a possible location for a wooden tower. A 'fighting platform' has also been suggested at the entrance. Earlier, it was theorised that the postholes could also represent the wood within or making a wooden version of an inturned entrance at this point. Postholes which may be associated with an otherwise simple (albeit relocated) entrance gap have been found at Bryn y Castell.

Evidence elsewhere suggests that relocated entrances were more developed than the ones they replaced. Two theories are that the posts here suggest some additional structures to add to an otherwise simple entrance, or that the second entrance at Bryn y Castell was not a replacement for the initial one which was later blocked up. At present, there is no evidence to definitely state that the north east entrance was blocked and then *replaced* by the north entrance. However, the proximity of the two does lend itself to that theory, see Figure 3.12.

The blocking of entrances is a well-known feature in Wessex hillforts, often on univallate sites at the stage they are developed and often at an opposing entrance (Payne et al 2006, 138) rather than a replacement. The blocking of the south west entrance at Danebury has been dated to the Fourth Century BC (Payne et al 2006, 58). In Northumberland, there is evidence for entrances being deliberately blocked and recreated elsewhere, such as St Gregory's Hill (Oswald et al 2006, 51). The narrowing of passages is also recorded, such as Castle Hill (*ibid.,* 52) and a possible identification of one at Humbleton Hill and a pair reported during 19th Century excavations at Yeavering Bell (*ibid.* 52-55). The blocking of the initial entrance gap at Moel Hiraddug's Main Inner entrance dated to between the mid Eighth to the Fourth Centuries BC. It is possible that the hillfort and entrance architecture of north Wales and the borders influenced those looking to develop their existing sites elsewhere, or that there was more of a communication and link between Wales and the north of England than those in the south.

The presence of relocated hillfort entrances in the area has given rise to some discussion regarding the connections between the hillforts in north Wales. Moel Hiraddug and Dinorben hillforts both have simple gap entrances later narrowed and/or relocated and developed to include inturns and guardchambers. Moel Hiraddug has evidence for this at its north west and Main Inner entrances, see Figures 3.2 & 3.3, and Dinorben at its south east, see Figure 3.11. At Dinorben's north entrance its initial gap was narrowed only to be later blocked completely. At Bryn y Castell evidence has been found for two simple gap entrances in close proximity, one of which blocked, see Figure 3.12, the second with subsequent amendment. At Eddisbury, there is certainly evidence for amendment due to the presence of a 'faced' inner wall, possibly originally an outer wall. Upon excavation, Varley reported that the south guardchamber had been modified and the entrance

had originally had a single guardchamber, the north chamber added on subsequently. After more recent excavations, Garner found a larger footprint of the guardchamber, unexcavated by Varley, see Figure 3.13. It is possible that this patch can be assigned to the original guardchamber and Varley's footprint was the later stone lined chamber. A radiocarbon date taken from a sample within Garner's excavation in this location dated to 359-169BC.

There is evidence for one other possible 'relocated' entrance within the results. The palisaded enclosure at Moel y Gaer Rhosesmor is thought to have had its entrance gap in the west, see Figure 3.7, and the only known hillfort entrance within the ramparts is located in the south east. The radiocarbon dates give a range of years for roundhouses thought to be associated with the palisaded enclosure which do not overlap with dates revealed from timber from within Rampart A, with at least 30 years between each other. However, the hillfort entrance has not been excavated and it is not impossible that the original palisade, if it continued to the east on a similar line as the later ramparts, also had an entrance gap in the south east. In which case, the western palisade entrance gap could be classed as a 'blocked' entrance, rather than a relocated one.

The relocation of an entrance, especially when it is to be redeveloped completely, may have been the most feasible and efficient option. Whilst the new complex was under construction, access at the original point need not necessarily have been disturbed. Once the new passage was open for business, the original defunct passage could be blocked up without too much inconvenience to the users of the fort. Trying to construct new inturns with incorporated guardchambers within an existing entrance's standing remains may have been more difficult, architecturally - better to start from scratch, perhaps, or adapt one at a time. The hillforts do show evidence for single inturns, single guardchambers and subsequent development to incorporate two guardchambers. However, one of these instances is at Moel Hiraddug at a relocated entranceway, not the development of an existing one. In addition, if this were the case, it is puzzling why they would make the choice to initially establish the eastern guardchamber in the first phase of redevelopment, which was so close to the original gap entrance. The initial building of the western guardchamber at this location would have caused least disturbance to access.

For those with developed entrances which were not relocated, but developed at the original site, this could be down to the lack of an alternative option for access into the fort. This may have been due to topography. Alternatively, the building works at this point may not have caused inconvenience due to the fact that the fort was not at that point being used, possibly being prepared for reoccupation after a period of disuse. This could be undertaken over years or perhaps months if the site was for seasonal use. However, if a workforce was assigned the task of redeveloping an entrance while the site was in use, considering the logistics of the work including the necessary materials, this may have only taken a few days. The need or want for a newly developed entrance at a tried and tested, successful existing location, may have outweighed the inconvenience of finding a temporary alternative access route for this short period of time. Many hillforts also have evidence for multiple entranceways. A diversion to a secondary entrance may have been in place as the work was carried out.

The evidence of phased development or amendment of entrances is seen throughout a number of sites. As well as the examples above where simple gap entrances are relocated, those which are developed see the addition of hornworks, inturns, guardchambers and more. The simple gap entrance appears to be phased out across hillforts over time and elaboration is common. Some hillforts do not show amendment of their entrances, but their (proposed) single phase passageways are highly developed. Although no dating evidence is available for these, it is possible that these ‘developed’ single phase entranceways and, therefore, the hillforts themselves, are later than those with initial, subsequently developed, single gap entrances.

The vision of these building works taking place on site, not dissimilar to a building site today albeit without the mechanical aid and colour-coded hard hats[38], may also aid in interpreting the use of ‘odd’ postholes in these locations. Just as putlog holes are still visible in medieval castles, some of the postholes, sometimes with evidence for reuse, could be the remnants of scaffolding for original or remedial works at the site.

[38] That is not to say that the project manager was not distinguishable somehow from his/her labourers.

To return to Moel y Gaer Rhosesmor, the rampart which lay over the gap found in the palisade perimeter showed no evidence for a gap in the ramparts. The hillfort entrance within the ramparts lies in a completely different position from the palisade gap. This may suggest a difference in use of the site by the palisaded enclosure users compared with hillfort builders. The layout and size are not dissimilar, but the complete change of access route into the hillfort to reach the entrance, if so, is a large change in activity on the hill. From this, it is possible to propose that the palisaded enclosure was used by a different group (read 'generation') than the hillfort builders and may have been unusable by the time the hillfort plans were being devised, therefore a completely new design was able to be proposed.

The palisade entrance faces west and leads on to the moorland of Halkyn Mountain, see Figure 3.7. The hillfort entrance faces south east and leads down the hill to slightly lower ground, by today the villages of Rhosesmor and Halkyn. This may also suggest a different function for both the palisade and the hillfort proper, such as pastoral and accessibility. It can also be suggested that a second palisade gap/entrance was located nearer the hillfort entrance and not yet known about; the palisade gap excavated could have been a secondary entrance which was not recreated when the ramparts replaced the fence.

Returning, then, to the excavated Wessex hillforts with blocked entrances at Danebury, Liddington and Segsbury, the east entrance continued in use whilst the others were blocked. In each case in Wessex, the blocked entrance is directly opposite the principle surviving and often developed example, reconfigured in the Middle Iron Age (Payne et al 2006, 159). Ralston has suggested that some entrances may have been temporarily blocked, even walled up in stone, when not in service but otherwise left open (Ralston 2006, 72). The blocking of the entranceways may be considered a temporary measure which subsequently became permanent in some cases, perhaps in Wessex, but this does not appear to stand true in the examples in north Wales. As discussed, many of them were relocated. In addition at Dinorben, for example, the north entrance was first narrowed and then blocked completely. The development, or perhaps more accurately termed 'evolution' of entrances in north Wales was a deliberate and widespread act.

The many features discovered at hillfort entrances may go some way to explaining the function of the hillfort, inasmuch as what was coming in and out, potentially indicated by size and width of the passage, and abiding by what rules, if any, encountering what manner of obstacles - whether physical or intangible. Examining entrances and their function can certainly aid the interpretation of the function of the hillfort itself.

Common features recorded at the hillforts could be explained by practicality. It has been demonstrated that the orientation of some entrances may not concur with the location of the entrance within the hillfort. Some entrances turn to an angle within the passageways and some passageways are skewed to sit at an angle, the ramparts almost overlapping. Brassil suggests that this skewing of the entrances at Moel Hiraddug was an attempt to control visitor flow, encouraging movement along a path or in a certain direction (Brassil et al 1982, 20). The skewing of the entrances would have also increased the view from the hillfort down the pathway, rather than sitting at a 90-degree angle to it. The pathway runs along the contour line, on a ridge which looks to have been deliberately cut, allowing a gentler ascent to the hilltop compared with a short but steep climb scaling the hill vertically. The use of a skewed gap entrance in these positions, following the line of the pathway and with it the contour of the hill, seems to be the most sensible design to use. The ridge cut into the hill leads the path directly into the phase two (relocated) entrance at this point. This feat of engineering may be contemporary with the development of the entranceway, and if so this adds a great amount of complexity and project management on to what is already seen to be massive building and construction works. For hillforts in mid Wales, Driver identifies a similar arrangement where certain approaches were developed, despite not being the easiest solution (Driver 2013, 132).

The location of the Clwydian Range hillforts, in association with passes through the range, has been discussed and the location of their ramparts and entrances appear to have been designed to have a view of these and the approach to the hillfort. Driver also reported that hillforts in eastern, upland Ceredigion also appeared to have a relationship with passes through the mountains (Driver 2013, 113).

The width of passage may signify a function for the hillfort, or alternatively eliminate some suggestions. For example, the approximate (known) widths of excavated

entrances within the wider study area range from 1-4m; a vast contrast. The style of entrance ranges throughout the different sizes; Moel Hiraddug's north west entrance is 1.5m across in its final, developed form as is Dinorben's north east entrance's second phase simple gap, whereas Bryn y Castell's (understood to be) initial simple gap entrance is 4m from edge to edge, as is Penycorddyn Mawr's complex inturned guardchambered entrance.

Nevertheless, a correlation is seen where hillforts' entrances are amended, widths decrease in size. This could signal a change in use of the site as its use continued or was returned to. An entrance width of 1m, not dissimilar to a single doorway today, could adequately fit a single-file human through. However, this would create a pinch-point if the hillfort was to welcome groups of animals or people. The average entrance width is 2.6m. The axle length of 'cart burial No1' found at Wetwang slack was 1.81m and 'cart burial No 3' axle at least 1.83m (Dent 1985) and so it can be assumed that an entrance of 2m or wider would have been able to accommodate people, animals and potentially vehicles too. As entrances' widths reduce, this may signify the change from the use of the hillfort. A large entrance could signify a pastoral use, if animals were to enter through the passage. A wide entrance could also accommodate groups of people as well as groups of animals. The use of carts and wheeled vehicles would also have been possible. As entrances were made smaller, the use of hillforts may have changed to something less concentrated, the need only being for a single, relatively narrow passage. But the question remains as to why it was necessary to deliberately block up entrances to make them narrower. Even without the use of wheeled vehicles or large animals, the blocking of part of an entrance passage suggests that these things were not *allowed* entry, otherwise a wider entrance would still have served a purpose for less-concentrated single-file users.

In contrast, upon excavation, Varley reported that the entrances at both Eddisbury and Maiden Castle 'catered' for pedestrians initially and were later developed and showed evidence for wheeled vehicles (Varley 1964, 97) suggesting the opposite. Wheel ruts were also discovered at Dinorben (Gardner & Savory 1964, 25). Some additional evidence is available for vehicles in the excavated hillforts, albeit limited. In a wider area, but still within north Wales, the metalwork hoard of Llyn Cerrig Bach, Anglesey contained fragments of iron wheels, horse bits, terrets and lynch pins, and

the crescentic-shaped decorated bronze plaque also found was possibly a decorative element of a chariot. Two other plaques were found in the Tal y Llyn hoard in Gwynedd, were trapezoid in shape and made of brass. A concave-sided triangular plaque was also part of the metalwork hoard found at Moel Hiraddug hillfort. Fragments of horse-bit were found near the hillfort Pen y Ddinas near Tal-y-Bont, a lynch pin on the Breiddin (British Museum Celtic Art Database) and elaborate Late Bronze Age horse harness and jangles were found on the western slopes of Dinorben hillfort.

The use of metalling on roads and instances of repair may suggest heavy traffic and the need for a more robust uniform surface. Seven excavated hillforts show evidence for a surface of sorts within their entranceways, many of these at multiple entrances and throughout different phases. These entrances also range in widths, ranging from 1-4m.

The skeleton, or ‘skeletons’ as reported in a brief publication just after the time of discovery at Moel Hiraddug lay underneath a roadway which led from the Main Inner relocated entranceway, see Figure 3.2. The blocking of the old entranceway and the building of the new one was dated to between the Eighth and Fourth Centuries BC and the inhumation/s date to somewhere before that time, as the roadway runs through the relocated entrance and the club end of the relocated entrance sits over the burials. A roadway at Beeston Castle has also been radiocarbon dated, which dates the sealing of the final phase of the prehistoric road system to between the Ninth and Second Century BC.

Single guardchambers and inturns are not necessarily always built on one particular side of an entrance, nor is the presence of guardchambers mutually exclusive with wider or narrower entrance passages. Guardchambers are associated with longer passageways, but that is to be expected, to allow room for them within the entrance. However, the modification of entranceways may still hold a key to the change of use of the hillfort over time. Entrance gaps are phased out and are blocked or become more elaborate but are also seen to get narrower. Entrance gaps develop an inturn, usually two, and sometimes outworks. Where there is evidence of guardchambers, these too get smaller and are occasionally built as a single feature but later develop to house a pair. The function of these features is still to be discovered, but the

development and the need, in one guise or another, of these to be included and to have a second built if not originally planned/built, demonstrates that they were sought after. If the features were for a place to pay a ‘fee’ for entry or tax, for example, this could suggest an increase in footfall, needing an additional ‘pay point’. However, this does not explain why the actual area to pass through gets narrower and why some entrances are taken out of use completely. If the features are true to their name, this demonstrates a need for more control, and the need for two people authorising entry to or exit from the site.

The narrowing of a gap, the decommissioning of entrances and the increase of points of interaction within an entranceway exhibits a need for control. Even if large groups were to visit the site, the pinch points may have been deliberately made to slow down traffic, so that every head could be counted and accounted for or interacted with.

Conversely, practicality for certain characteristics is not the only explanation. A clear preference for both an easterly location and an easterly aspect can be seen throughout the entrances excavated within the wider study area, see Figures 3.8 & 3.9. It is possible that these entrances were modified and developed over the years as they were the most visited and used, and, therefore, the ones most likely to be seen by approaching traffic and visitors, just as has been reported in north Ceredigion (Driver 2013, 139). The eastern entrances do all appear to have multiple features and developments within them, such as inturns or guardchambers, but the ‘east’ entrance does not always appear to have been the ‘main’ entrance to a site. As an illustration, Old Oswestry’s west entrance is a highly developed example and Moel Hiraddug’s North West entrance shows multiple phases of development and amendment. On the Clwydian Range, for example, the hillforts had much better and wider views to the west, but the eastern entrances are always present and appear to be more developed than the non-easterly ones known. This suggests that the easterly location of an entrance was more important than the view from it. The two hillfort entrances where dates are available are both examples of amended designs and entrances with an easterly aspect; Moel Hiraddug’s Main Inner between the Eighth and Fourth Centuries BC and the southern guardchamber of Eddisbury’s East entrance between the Fourth and Second Centuries BC.

At a number of hillforts, later modification is evident. Often, this is seen in the form of amendment to the rampart by heightening and/or widening. In a number of cases, hillforts' entrances have been modified. As these monuments continue to be used throughout the centuries, whether with or without gaps of time in their use and/or occupation, some modification to make the enclosure functional is evident. However, in some cases the modification witnessed may possess more meaning than pure function.

For example, where capping of the rampart is seen, this could be for a functional use, such as for securing the rampart, for making steady the top of the wall for walking upon, or possibly for aesthetics. The ongoing excavations at Penycloddiau hillfort have found an (undated) capping of limestone across the top of the rampart in the eastern section, where excavated. At Moel y Gaer Rhosesmor, a stony capping along the top of the final phase rampart was discovered upon excavation. Both of these appear to have been later additions to the original rampart on site. These neat additions to the rampart were a considered supplement to the structure, although the exact purpose is unknown. These possibly 'non-functional' additions to the architecture may have parallels with the hillforts in north Ceredigion, where defences were often aggrandised in order to heighten their appearance from certain approaches (Driver 2013, 135).

Often with multi-phased ramparts, a final dump of material on top of an existing structure is seen. In some cases, this addition is not of significant extra height (erosion notwithstanding) but may extend the rampart (usually) backwards to add depth. It is possible to imagine that the addition of a dump of rampart material to an existing rampart later in its life may signify much more than a reconsolidation of the surrounding enclosure walls. Where dates are available, they show that these existing structures, which had existed for some centuries, were still being used or had been returned to. With the extra rampart material dumped on top not necessarily adding to the 'function' of the rampart as a barrier, per se, this act of adding to a rampart may have been that new generation's way to mark their legacy, impact and impression.

As with additional material on existing structures, the discovery of previously used, burnt material at Moel y Gaer Llanbedr to create the north eastern rampart is not

unique. Two unique and divorced radiocarbon dates for Pendinas Llandygai suggest that the single-phase rampart may have used earlier material in its makeup. Rather than an addition to an existing rampart, this act of incorporating previously used material may represent a memorial to an earlier generation's existence within a new, initial rampart where none had previously existed. The same theory may apply to the vitrification of ramparts elsewhere.

Possible deliberate destruction has been proposed. At Moel y Gaer Rhosesmor, the final phase of use at the site was seen to have used 'sleeper beams' which had been removed following abandonment of the site. It has also been suggested that depressions at the entrance represent holes where upright timbers have been removed. Significant evidence of deliberate slighting of sites can be seen nearby on the Llŷn Peninsula at Castell Odo and Meillionydd double ringwork enclosures. The deliberate shutting down of the sites, destruction of ramparts on top of roundhouses, and the subsequent building of structures on top of the ruins, has been seen to have occurred at Meillionydd, which has evidence for more than eight main building phases and was in use between the Late Bronze Age and the middle of the Middle Iron Age. Woodhouse hillfort in Cheshire was originally thought to possibly be an unfinished hillfort until excavation proved its slighting, albeit with no clear evidence for when this occurred.

The action of undertaking such things, such as capping, dumping of material, burning and slighting may be for a wider community activity. The monumentality of hillforts may present more of an objective for these sites than practicality, occupation or warfare. The act of communities coming together to create the monuments, possibly through festivals or seasonal events, may be a continuation of the metallurgical gift exchange seen in the Bronze Age, evolving into a symbolic gift exchange of labour and resources in the Middle Iron Age through developed hillforts. Continuing with this theme, Sharples argues that the creating of the ramparts was a visible reminder to the groups of people who built them - creating a social relationship between those who lived/spent time within the boundary with those who lived/worked/spent time outside, dispersed in the surrounding countryside (Sharples 2010, 120-22). He argues that the construction and subsequent modification of the rampart acted as the main means of integrating communities at this time (*ibid*., 296) and that, generally, the size of hillfort or its ramparts indicated the size of a

community involved and therefore territory (*ibid.*, 305). However, in Wessex, by the Second Century BC, the renewal and renovation of ramparts begins to decline, and monumentality is replaced again by physical gift exchange through material culture (*ibid.*, 171).

In north Wales and the borders, a continued care for hillforts can be seen within the record. This includes re-digging ditches and the modification and alteration which may be termed 'development' or 'improvement' by significantly moving and/or altering entrances and adding to ramparts. Today, these activities on sites may be termed 'maintenance'. On heritage sites, or sites of cultural importance, this would be termed conservation.

It has been argued that the hillforts and ramparts may have first been built utilising material as a memorial to past generations. The act of the maintenance of the hillforts many years and generations after they were first built may also be so. The continued conservation of these sites is not dissimilar to how we maintain and conserve heritage sites today, for memory, culture, respect, community and tourism etc. Many heritage sites today are reused in different ways. Often, cultural buildings are converted into new establishments, such as bars and restaurants, often using this historic link and features as a unique selling point. Historic houses have now become popular visitor attractions. Many of these changes have all happened within one generation. It is not beyond the realms of possibility that hillforts too changed function throughout time and the modifications seen in the archaeological record may reflect the new group not only respecting what came before but modifying it to make a statement of a change of use, owner/s or generation.

Many of our historic sites in the 21st Century are under state care, whether listed buildings, scheduled monuments or under guardianship of statutory bodies. These are often open to the public to visit. But why? The tradition of our cultural importance presents a sense of belonging and connects us to our ancestry and community. This may simply be a continuation of the act of maintaining and conserving and reusing hillfort sites over many hundreds of years as seen in the archaeological record. This theory could also be applied to burial tombs with multiple burials, added cremations, sometimes added architecture and chambers, such as Trefignath on Anglesey, having two additional chambers built on to the original structure. These different

cycles of reuse and renewal may not just have been practical, but symbolic for a community's perceived responsibility and ownership.

A number of hillfort sites in north Wales and the border have seen reuse in later years, after the Roman occupation. Eddisbury hillfort was established as a Saxon burh. Beeston Castle hillfort in Cheshire and Castell Dinas Brân in Llangollen both had medieval castles built upon the Iron Age ramparts. Dinorben hillfort produced a wealth of material including Romano-British and medieval artefacts upon excavation. Many hillforts, sadly, have also been utilised for quarries.

The use of hillfort sites as historical visitor attractions and for heritage tourism continues today. Alongside a research project and original hillfort site, the reconstructed site of Castell Henllys in Pembrokeshire also acts as a successful visitor attraction and education centre. Maiden Castle is a key visitor attraction of the English Heritage in Dorset and the multi-period site of Old Sarum sits within an Iron Age hillfort near Salisbury. The Clwydian Range and Denbighshire County Council utilise the hillforts and their landscape as a marketing and promotional tool for the area.

The need for a connection with history does not appear to be a new desire. The change from reuse of historic sites, such as hillforts to burhs to castles, altered in the Victorian period with the establishment of the Grand Tour and tourism, and subsequently the re-adoption of historic sites, antiquity and archaeology. The quest for knowledge about our ancestors is ongoing. The continued connection with hillforts sites throughout prehistory may present the Iron Age's human's response to and a need for belonging, ancestry and tradition. The apparent careful respect of earlier structures on hillfort sites, such as burial chambers, can also attest to this. The re-digging of silted up ditches, the addition of rampart material to existing banks and additional banks added to enclosures, possibly only in parts as repair, could all be part of a wider need for human connection with the past – and, in the case of Iron Age communities, the more tangible past, within memory and almost certainly kept alive through oral history.

Similarly, the connection to community may go some way to explain the two instances on the Clwydian Range where the hillforts are 'tipped' across the contours, rather than the ramparts sitting neatly around the summit of the hilltop. Visibility

analysis calculated that the total amount of area seen from both Penycloddiau and Moel Fenlli decreased from the ramparts and areas within the hillfort in their actual positions compared with if the exact same points were taken but moved to sit on the true contours of the hill. The hillforts were not built on a slope to increase the amount of land seen from the enclosure. However, the viewshed of Moel Fenlli hillfort, although slightly less vast, did reveal views of the pathway up to the hillfort entrance and two (undated) enclosures on the lower slopes. The visibility of the enclosures, although undated and therefore impossible to assume contemporaneity, could suggest a relationship between them and the hillfort. This is not necessarily an elite (hillfort)/lower class ('outsider') relationship, but may suggest a stronger tie or bond, possibly an alliance. It provides an additional connection between them, not only proximity.

Additional research into tipped hillforts and hillslope enclosures would help to investigate whether this may have been a dedicated effort to increase the connection between the hillfort and the enclosures and/or the approach. This could be explained by the need for control; over land, over outlying settlements and over entry to the hillfort. There is also a possibility that the hillforts were tipped to increase visibility from the outside and transparency of activity within. The 'tipping' of hillforts such as Moel Fenlli and Caer Drewyn in Denbighshire and many hillforts overlooked by higher ground - a common feature of Welsh sites - may have provided a highly visible interior but that does not mean they were also indefensible; their architecture was a way to communicate strategic strength (Driver 2013, 135).

The view of the pathway seems logical; but wanting to know who and what was approaching the hillfort need not be seen in a negative manner of control, authority or defence, but one of common sense. However, more complex entrances, such as the multi ramparted, double dog-legged approach to Moel y Gaer Llanbedr's east entrance does the opposite, for the approacher at least. The view of the actual entrance gap to the hillfort is not revealed until the last minute. This is pre-reminiscent of the large Georgian and Victorian manor houses whose owners would create a landscaped driveway to approach the house but leave the 'grand reveal' until the last minute, building up suspense as the visitors approached. Similarly, Driver describes this feature at hillforts in mid-Wales as having the "*symbolic purpose of heightening the visual impact of the monumental parts of the building*"

and an ‘organised choreography’ (Driver 2013, 137). A more traditional view of the complex hillfort entrance is about security and control. The narrowing of the long, inturned passage corrals the visitor; a dog-leg turn would slow down and overlook anyone attempting entry. The blocking of the view into the entrance of the hillfort need only affect the person entering, not necessarily those on the inside looking out. For example, the ramparts at Moel Arthur, on either side of the long inturned entranceway with outworks, have been heightened. This height would have allowed occupants to have a clear view of the approach from the ramparts, whilst keeping the interior less visible to those outside.

The evidence collected from postholes at excavated entrances in the area may, at this point, have additional meaning. It has been found that in many cases, postholes do not stand in pairs, often appear in odd not even numbers and are frequently off-set from each other in entrance passages. One Roman source which refers to a hillfort entrance which had to be hastily blocked as the Romans approached (Ralston 2006, 72) may aid interpretation of these.

Evidence for links between the hillforts in additional ways to architectural features, dates and views can also be seen. Although pottery is scarce, Cheshire VCP has often been found, albeit often reported only in passing within excavation reports. Crucibles for metalworking have been found at a number of sites. This ‘clear divide’ between the north and mid Welsh Marches, and the segregation of the northern part from Wessex by Cunliffe is not a clear divide at all. Returning to Cunliffe’s model of ‘Developed Hillforts’, the patterns are seen throughout the area and within similar periods but with early beginnings. The study of whether the Welsh Marches influenced Wessex is a question worth further analysis.

The dating results of this study have shown that, although wide, a number of dates for phases of activity on the hillforts have been found. Similar modification of architecture at different sites have emerged in clusters of dates and it is proposed that certain fashions can be seen within the wider study area over time. These fashions may have arisen from a change in needs at the sites, and a change in function.

A main criticism of intervisibility studies between monuments is a lack of knowledge of whether the monuments are contemporary. This is especially so when looking at

prehistoric monuments such as ‘Bronze Age’ burial mounds or ‘Iron Age’ hillforts, where their dates of use could span hundreds of years or any time within that general period. However, it can still be assumed that these sites would have been aware of one another, no matter how long a period had passed between the use of them. In the 21st Century, we are still very much aware of these sites and their architecture and topography. They are well visited monuments and walking to them is a popular pastime, especially those on national walking routes such as the Offa’s Dyke Path National Trail. The ramparts still stand to an impressive height at least 2000 years after their erection, so much so that they are still visible to the eye from far and wide today. It has been shown that the early sites had ongoing activity on the hills over many years. Some of this activity included additional rampart building. The sites would have been aware of each other, whether they were in use at the same time or not.

This returns us to the issue of reuse of sites over time. The results have found that many hillforts have been used for hundreds of years throughout the Iron Age, with levels of activity on either side of this era also. For those referred to above which may have been ‘out of use’ when another was built nearby, but still aware of ‘the old fort’, if ancestry and memory were important elements to these sites and their selection and construction, why would a new site be chosen when an existing and out of use site lay nearby? The choosing of a site and the connection with the past may be relevant to the builders and the association of another site with another family or ancestry may have been out of bounds. Alternatively, the site may not have been fit for purpose, especially if the two functions of the sites were not the same. Driver suggests that for north Ceredigion an arrangement of ‘mutual separation’ can be observed, where derelict settlements and/or the ‘empty ground’ between hillforts, contemporary or not, was respected. A state of dereliction could also have been considered temporary (Driver 2013, 144).

Regarding spatial analysis alongside the results of the architecture studies and dates, there do not appear, yet, to be clear groupings differentiating areas or types of hillfort. Although the excavated hillforts’ sample size is relatively small, the trends appearing are well spread out across the wider study area and are not confined to other resources such as coastal edges or inland or the existence of a water source on site, for example. It has been found that view from a site may have been a factor

in site location for hillforts, but not the determining factor. However, when merging the results of view, architecture and dating, another trend has become evident. The hillforts with the largest amount of view of their surrounding area are those which have revealed evidence for ongoing or repeated use throughout the Iron Age. Therefore, although their establishment may not have considered view from the hill a deciding factor, the view appears to have been important in subsequent years. This suggests a change in priorities of the hillfort users, and a change in use of the hillforts themselves.

The study also showed that there are hills with higher visibility within the Clwydian Range which were not chosen as hillfort sites. 'How much' you could see from a hill appears to be less important than 'exactly what' you could see from a hill. This may have included approach, certain land and surrounding settlements. Returning to work undertaken in mid Wales, hillfort façades in north Ceredigion were developed to have a high visual impact for symbolic or strategic purposes. The orientation and location of this façade elaboration appears to have been carefully considered to be positioned towards key lands and passing/approaching traffic (Driver 2013, 139), demonstrating regional organisation (*ibid.*, 151) and a shared appreciation of the importance of the surrounding landscape. Driver also reports that the siting of hillforts in north Ceredigion suggests that they had a 'zone of influence' and control, and that this does not appear to have been a quantified, calculated area but defined by topography; features in the landscape shaping, revealing, excluding and concealing the view and therefore the extent of power (*ibid.*, 145-6).

The idea of positioning a hillfort in order to have view of specific features in the landscape is especially interesting for the hillfort of Dinas Melin y Wig in Denbighshire. The hillfort sits within a saddle, on a sizeable solitary hill but surrounded by higher hills within its own valley. There is a small gap which has a narrow view on to the Clwydian Range and through this, the hillfort of Moel Fenlli is just visible. The study showed that Dinas Melin y Wig's viewshed is tiny compared with all other hillforts. Once again, this demonstrates that the amount of view from a hill was not a prime factor in site location. This hillfort may demonstrate that these locations were solitary features and did not rely on the surrounding landscape on a day to day basis. The view of Moel Fenlli hillfort may be significant as a connection with the wider community, but similarly, this may be a simple coincidence. However,

Dinas Melin y Wig is overlooked by not only hills but a small enclosure of Iron Age type which itself has very wide views. The visible links with these features may indicate a connection with the wider community, even if it was not a daily exercise.

6.2 Lessons learned

The visibility studies on the hills and hillforts of the Clwydian Range and surrounding hillforts have presented a number of considerations. With any visibility studies in the future, on any monument, it is imperative that a number of factors are considered:

The amount of view may not be important, and therefore quantitative values generated from viewsheds cannot stand alone in interpreting visibility from monuments. Interrogation of viewshed maps to identify what the monument can see may hold more information to aid interpretation of site selection and position.

Single point viewsheds are not accurate enough to be used solely for large monuments. Multiple points on and within the monument, as a polyline for example, will provide a more accurate viewshed for the entire monument.

User error with point selection for the input for viewshed studies will inevitably include some inaccuracy. As computers become more powerful, it will be possible in the future to select each pixel from a DTM within a monument to generate a viewshed and give a much more accurate model of the view from the area selected within a sensible processing time. Until then, the points chosen by the user to generate a viewshed will not give a fully accurate representation of the view from the whole of the monument. This must be considered when investigating intervisibility, as false readings may be generated.

The reinvestigation of the radiocarbon samples from across a number of sites has been worthwhile to gain an overview of features dated in the area and any connections in style and period. The recalibration of all dates available has enabled an equal comparison between all results.

As more radiocarbon dates come to light, whether through the processing of older samples excavated but not previously investigated or if new samples are discovered during the current excavations at Penycloddiau and Moel y Gaer Bodfari, for example, the recalibration must be returned to if an overall comparison is required in

the future. As scientific techniques continue to evolve and improve, the recalibration of all data must be calculated using the same parameters to ensure consistency if comparisons are to be made.

6.3 Connections of community, control and conservation

The main aim of the study was to discover whether the hillforts of the Clwydian Range were connected in further ways than only their proximity to one another and whether the group of hillforts were distinctive from others in the area.

It can be concluded that with regards to the proximity and clustering of hillforts and in particular considering their multi-phase, multi-period use, the hillforts of the Clwydian Range are distinctive. Although material for dating is scarce, an issue which will not resolve itself, the comparison of architecture between the sites and others in the surrounding area, demonstrate that there was likely ‘overlap’ of the use of the hillforts within the late prehistoric period. In contrast to ‘Central Place Theory’, there is not obvious ‘central place’ or ‘main’ hillfort dominating or suppressing the others on the Clwydian Range.

With regards to the architecture, the ramparts of the Clwydian Range hillforts do not appear to be distinctive from the wider area. A general theme of stone, or the illusion of stone ramparts, is seen across the wider study area, often developed and added to, with a final phase of a dump of material on top, similar to many hillforts across Britain. Entrances of the hillforts on the Clwydian Range are not distinctive to this particular set of hills, but typical of a wider hillfort zone, more distinctive of north Wales and the Welsh borders, with possible preliminary links to northern England.

Through scrutiny of previous studies and research into the hillforts and additional information gathering, certain interpretations of the results can be made.

6.3.1 Community

Hillforts in this area of north Wales and the borderlands have early origins, some initially palisaded enclosures, dating back to the Late Bronze Age and Early Iron Age. Although height, size, view and proximity to certain resources, such as water, appear to have been desirable, they were not the most important factors in initial site location. Due to the climatic changes at this time and activity within the pollen record,

it can be surmised that this was an agrarian community. ‘Defence’, in a military sense, does not appear to have been the key aim of the hillforts in their initial guise. ‘Protection’ of assets may have been. Protection may be interpreted as safeguarding stock, crops, or even relationships; bringing together a community to uphold affiliations, associations and identity. Many were built in stone, or with the illusion of stone walls and often on sites with an earlier association with the past, sometimes incorporating material and artefacts from these places. Foundation trenches were laid initially, indicating where the enclosure boundaries would lie, demonstrating planning and forward-thinking, also seen in the layout of structures within the interior. The location of the sites was positioned in order to see certain things in the landscape, which included route-ways and smaller farmsteads in the landscape, tying in links with the wider landscape and community.

6.3.2 Control

Towards the Middle Iron Age, the hillforts with the widest views were renovated and remodelled, signifying a change of priority and therefore use. Entrances were blocked, relocated, narrowed and lengthened. Inturns were added to simple gaps and chambers were built into the passages. Ramparts were added to in size, shape and number. There appears to have been more pressure in developing the hillforts at this time; the use of those with wider views suggests that it was of upmost importance to be able to see activity further afield. This may indicate a breakdown in the wider community and an increased pressure to ‘protect’ assets, now from other humans, not just from loss of tradition or wild animals. This was done through utilising existing enclosures, which, with some additional development to increase control and access to what was held within, were ready to use without the need to start from scratch.

6.3.3 Conservation

Towards the Late Iron Age, a period of building activity is evident again on those hillforts which had continued (with or without a gap in time) in use. Ditches were cleared, dumps of new material were placed on top of existing ramparts, and some were carefully ‘capped’. It is this careful maintenance and addition to sites not necessarily adding to the ‘defensibility’, which suggests more conservation than

development. The act of maintaining these places may be seen as a renewed community interest, a way to keep a previously tumultuous group together and in peace. This group act of changing the ‘defences’ may have also signified the end of a certain use of the site and a new appearance to signify a new purpose. In addition, the act of caring for these sites may be a return to or continuation of a perceived importance of the past. As these sites had incorporated earlier features when first built, their continued care was a respect for their history and ancestry, just as we today protect, conserve and have an interest in.

6.4 Concluding remarks

Following the comparison of the excavated hillforts within the area, a number of features for future archaeologists to be aware of have emerged. A certain amount of ‘trends’ have been observed, and any further information which proves or disproves these potential links between the hillforts will help interpret the monuments in the future.

The evidence for the apparent ‘capping’ of ramparts has been noted in a number of examples. Guilbert reported this at Moel y Gaer Rhosesmor in stone and timber in its final phase. A ‘stone capping’ was also reported at Maiden Castle, Bickerton Hill. In Liverpool University’s investigation of Penycloddiau hillfort, a lime capping on the top of the inner rampart was found in the north east corner currently being excavated. This is especially interesting as the underlying geology on the hill is sandstone with elements of mudstone, siltstone and sandstone. The capping of limestone on the rampart is immediately obvious, mainly because of its colour against the bulk of the earth and stone rampart which would have been more so when first installed. It was seen to act as a capping for the inner core of the rampart and therefore prehistoric. Samples for further analysis were taken (Mason & Pope 2015, 22-23). Further evidence for ‘capping’ may also be considered at those hillforts where there is evidence for additional ‘rampart material’ phases atop an earlier rampart structure, such as Pendinas Llandygai. The act of ‘capping’ a rampart with wood or a mortar-like deposit such as the one found at Penycloddiau may present evidence for additional phases at a site, possibly by new generations or owners and/or a deliberate act to change the site through appearance or practicality. Modern excavation techniques will no doubt locate such subtle features, but older

excavations more than half a century ago, for example, may have missed delicate features such as this.

The use of earlier material requires future attention when investigating hillforts' ramparts. A number of sites have early beginnings at least as palisaded enclosures, let alone earlier activity demonstrated by the discovery of evidence for early burning, such as the radiocarbon results found at Helsby demonstrated in the colluvial deposits formed at the rear of the rampart. Artefacts, such as flints, have also been discovered on sites, but early artefacts within ramparts have also been found during excavations. For example, three Bronze Age flat axes were discovered, out of context, at Moel Arthur hillfort following storm damage. Bronze Age 'Ewart Park' axes were found within the first phase of rampart at Beeston Castle hillfort. A Late Bronze Age socketed axe was found during excavations of the Breiddin's entranceway as well as a number of other bronze artefacts at the site alongside radiocarbon dates. The deposition of artefacts, as well as their presence on site, suggests an earlier association with the hills before they were chosen as hillfort sites. It has been demonstrated that hills on the Clwydian Range were not necessarily chosen to be hillforts because of the presence of a Bronze Age burial mound, but this does not discount the importance of a location's previous significance with the past. The discovery of the use of earlier material at Moel y Gaer Llanbedr suggests that the use of a previous deposit was significant, especially considering the presence of slag within. It has been suggested that beneath the cairn on the ramparts' high point at Caer Drewyn hillfort lies an earlier mound. Earlier associations with sites may have inspired site selection. This may also help to explain the multiple phases of use and modification at sites across periods of time. The discovery of two human skeletons underneath a roadway through a second phase of entrance at Moel Hiraddug may also be an example of this. Although it was not determined through excavation if the burials were associated with the earlier phase one entrance or even an earlier context at the site, they were certainly deposited before the construction of the phase two, relocated entrance at the Main Inner entranceway, see Figure 3.2. This relocation has been dated to the period between the Eighth and Fourth Centuries BC. Additionally, the deliberate destruction of a site may be symbolic for the end of an association with past generations which used the site. As such, evidence for the deposition of earlier material within ramparts

should be considered alongside evidence from other sites within the vicinity to determine the significance of this practise.

The survival of artefacts may be determined by geology. Human bone has been discovered at Moel Hiraddug and Llanymynech hillforts, both of which sit on limestone hilltops. Dinorben too sat on a limestone hill, which ultimately led to its demise as at Moel Hiraddug, through quarrying. Yet, the artefact preservation at Dinorben was rich. Other excavated sites have not yielded as much as these sites due to the acidic soils. Din Sylwy hillfort, or Bwrdd Arthur on Anglesey, has had illegal metal detector activity reported on the site and too is made up a limestone and preservation may therefore be better than at other sites. However, Roman coin hoards have been reported at some sites which do not sit on limestone geology, and therefore the presence of metal is surprising. Moel Fenlli, for example, has had two occasions where Roman coin hoards have been discovered, yet sits on mainly mudstone deposits. Penycorddyn Mawr, however, sits on limestone geology but no finds were reported when it was excavated. Buckbean Pond within the Breiddin hillfort revealed some highly preserved artefacts, mostly wooden, due to the perfect conditions for preservation. Pottery and coins dating from the Iron Age are seldom reported at the sites. VCP is often referred to but usually in passing and little weighting put upon it, even though the presence of it does continue to strengthen the known links between the hillforts and the salt regions, namely Cheshire. It is accepted that pottery and coinage were not widely in use at the sites during the Iron Age.

The lack of metalwork, apart from at a small number of sites where the underlying geology may have increased the chance of survival, does not necessarily mean that a significant amount more was in circulation but has not survived in the ground. The metalwork ‘hoard’ at Moel Hiraddug was a chance find, for example. However, upon excavation of the Main Inner entrance at the same site, a number of iron objects were discovered including pins and a deliberately (?) bent sword, which were in extremely poor condition and almost did not survive excavation, retrieval and recording. Earlier excavations which have reported ‘corroded metal items’ may not have had the knowledge to have identified items which may have had more significance than they are currently given. Returning to Wessex, the renovation and renewal of ramparts began to decline in the Second Century and was replaced by

gift exchange (Sharples 2010). The metal objects found at north Wales and borders sites generally concur with these dates stylistically. Modification to ramparts, however, seem to have continued according to radiocarbon dates. The geology of a site will certainly aid future excavations if dating evidence is an objective of the investigation. The geology of the site may also help interpretation for site location. For example, both Moel Hiraddug and Llanymynech have evidence for mining and have mineral veins running through the underlying geology.

The presence of two blocked and subsequently relocated entrances on Moel Hiraddug, one on Dinorben and one of Bryn y Castell, see Figures 3.2, 3.11 & 3.12, with a number of other blocked but not (known to be) relocated entrances at sites in the region does begin to present a trend. The blocked and relocated entrances do not appear to have a set pattern, as are not reported to be present at all developed sites, but an awareness of their location is critical. If entranceways at hillforts are explored in the future, the dimensions of the area to be excavated must take into account the ability to explore and confirm/deny the presence of earlier structures associated. This includes the presence of the elusive ‘guard hut’. These features have been referred to and suggested by a number of people at a number of sites, but there is currently no excavated evidence apart from the orientation of a roundhouse aligned with a gap in the palisade at the pre-hillfort enclosure at Moel y Gaer Rhosesmor, see Figure 3.7. If the ‘guard hut’ is to continue to be discussed as a possibility, additional data must be pursued if investigations within the vicinity are being carried out.

6.4.1 Reconnection

Excavating the hillforts today requires a great deal of patience, planning and project management. The movement of the amount of soil and debris from massive ditches, for example, takes a huge amount of labour. I can personally account for the difficulty in extracting countless shovels of sharp shale stone from a steep hillside searching for the cut of a ditch, as at Moel y Gaer Bodfari. The movement of already loose stone takes only a fraction of the energy the original digging of these sites would have taken. Getting the materials to site, dividing out labour and roles, feeding the workforce and providing basic services all takes weeks of planning. The action of being on a hillfort, taking part in a not-dissimilar activity to that which would have

been undertaken in creating the site, goes a long way to aid understanding of what occurred there all that time ago.

The same can be said for the visibility studies. Although the landscape has changed somewhat in 2000 years, such as field systems, built up areas, roads etc, the topography has not significantly altered. Studying the view from hillforts, and the effects of the weather, time of day and even sound, cannot be beaten by actually visiting the sites.

Computer systems can provide an extremely resourceful method for calculating data, but the act of visiting a site and 'seeing for yourself' advances interpretation and experience. It will also result in less human error in calculations, as chosen pixels on a Digital Terrain Model will inevitably be fewer than footsteps exploring a hillfort.

The use of the sites today may not be so far different from their original functions. People walk along the hilltops today, some on a personal 'pilgrimage' to reach the summit of a hilltop, some following a national walking route from start to finish, many to watch fireworks on New Year's Eve - a ritual for some. They have become increasingly popular places to explore our past and discover history and our pre-Roman ancestors.

All of these traditions - pilgrimage, gathering, ritual and ancestry - may have been elements of and reasons for these monuments' creation. The continued conservation and preservation, using traditional skills and methods, is not a new activity on these hilltops. The regular clearing of ditches and rebuilding can be seen in the archaeological record. How we use and look after the sites today is from a continued history stemming from the Late Bronze Age.

It is imperative that promotion and awareness of the sites continues to reconnect local communities with their hillfort for this legacy to continue. Recent awareness-raising activity by the 'Hands Off Old Oswestry Hillfort' (HOOOH) Group are a fine example of this, formed after threat to the surrounding landscape by development emerged. Old Oswestry hillfort has gained national press and media attention due to this ongoing threat, but perhaps even most importantly, a reconnection with its surrounding community.

Those hillforts which have been excavated but the reports written up and published by second parties, such as Old Oswestry and Beeston Castle, hold a wealth of information which has added greatly to this study. However, no amount of detail and data held within site notes field diaries, plans and drawings can do justice for the experience of actually digging the site oneself. That is why I urge those who have not yet fully published their findings and their own experiences to do so.

Interim reports and notes within archives have been incredibly useful, but the additional data not yet published will no doubt add considerable data to the study. This data may not significantly change the results but will certainly contribute additional missing pieces to the jigsaw. It is with hope that this information also creates additional queries and areas to research and scrutinise in the future as the study of this elusive monument - the hillfort - continues.

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APPENDIX ONE

A test study using a non-hillfort site.

Moel Famau is the highest hill of the Clwydian Range and can be regarded as one of the most visible hills in the area, clearly seen from cities to the north and east such as Chester and Liverpool. It is the highest hill in north east Wales at 554m OD, is home to the Georgian monument of the Jubilee Tower, an Ordnance Survey trigonometry point and has a relatively flat summit surrounded by steep sides.

Tests were carried out using Moel Famau to determine whether changes in the positioning of a point on the summit of a hill would make an impact on a viewshed calculated using GIS software. It was studied whether a single point viewshed could be used to represent an entire 'summit' of a hill, or if positioning at different locations across the flat summit and using a polyline representing a contour line could change the amount of land visible or the aspect and/or parts of land visible.

A1.1 Visibility from points at a summit

Three points within 60m of each other were used as single point viewsheds at the summit of the hill, sitting at 554m OD. In addition, a polyline representing a contour line of the hill at 540m OD was used[39].

[39] Note that on this occasion, the contours were chosen by the user using Ordnance Survey data and not predefined by rampart line as will be the case with hillfort ramparts.

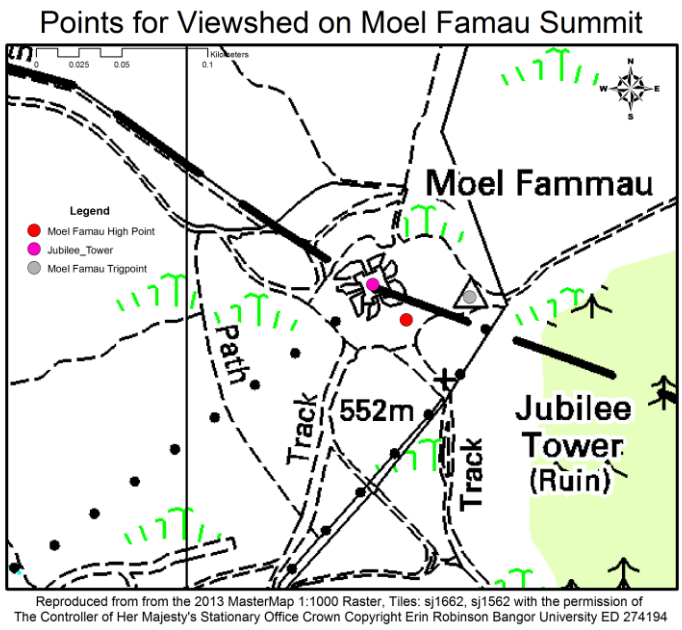


Figure A1.1. Input points on Moel Famau summit depicting the summit point of the hill (red), the Jubilee Tower monument (pink) and the location of the Moel Famau OS Trigpoint (grey), which were used as input points to generate a viewshed of the surrounding landscape

The three single points were chosen at the centre of the hill's six-figure grid reference at the highest point visible on the digital elevation model (DEM); the Ordnance Survey's trigonometry point sitting to the south east of the summit, and thirdly the location of the Jubilee Tower monument, see Figure A1.1.

The results will determine the method used for viewshed analysis on hillforts of the Clwydian Range and others within wider study area within the main study.

	Jubilee Tower	**Trig point**	**High Point**
Pixels not visible	99336270	101548131	102776605
Pixels visible	7433225	5221364	3992890
Pixels TOTAL	106769495	106769495	106769495
% land visible from point	6.961937021	4.89031441	3.7397292

Table A1.1. Visibility from summit locations on Moel Famau, showing the number of pixels visible and not visible from the three input points and the percentage of surrounding landscape visible from each

All three single points sit within the same contour line and lie within 30-60m of each other but show a large difference in viewshed; the 'Jubilee Tower' point is almost twice as visible as the high point located at the centre of the grid reference.

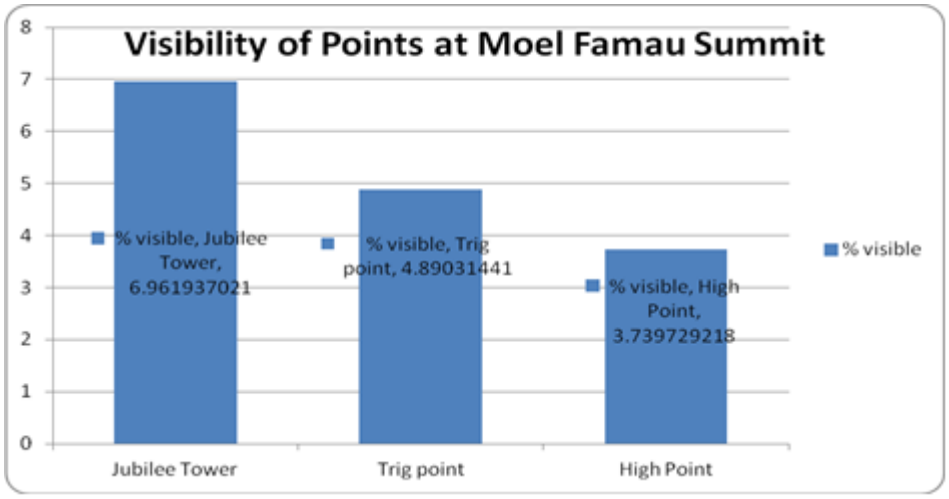


Figure A1.2. Percentage of surrounding landscape visible from three input points on Moel Famau summit, showing that the point with the highest visibility was the Jubilee Tower monument, followed by the Trigpoint. The 'summit'/high point on the hill had the lowest percentage of its surrounding landscape, in comparison

A1.2 Visibility from contours

When comparing the viewshed analysis results of the single input points at the summit with the results from a user-generated polyline representing a contour line of the hill, it was found that the contours of Moel Famau at 540m OD had more than twice as much visibility of the surrounding landscape at 8.2% than the DEM's high point measuring at 3.7% and 1.3% more visibility than the Jubilee Tower single input point which could see 6.9% of the surrounding landscape, see Table A1.2.

	Height (m OD)	% visible
Moel Famau Summit High Point	554	3.739729
Moel Famau Summit Trig Point	554	4.89031441
Moel Famau Summit Tower	554	6.961937021
Moel Famau Contours	540	8.203222

Table A1.2. Height and visibility from Moel Famau summit points and contours, showing that the user-generated polyline used to calculate visibility on the contours of the hill at 540m OD, at a lower height than the summit points at 554m OD, had higher visibility of the overall landscape

This shows a difference between contour visibility and summit visibility and suggests that the area of the summit of the hill itself may have a much broader view not represented by a single point within the 'interior' of the contour line, see Figure A1.3.

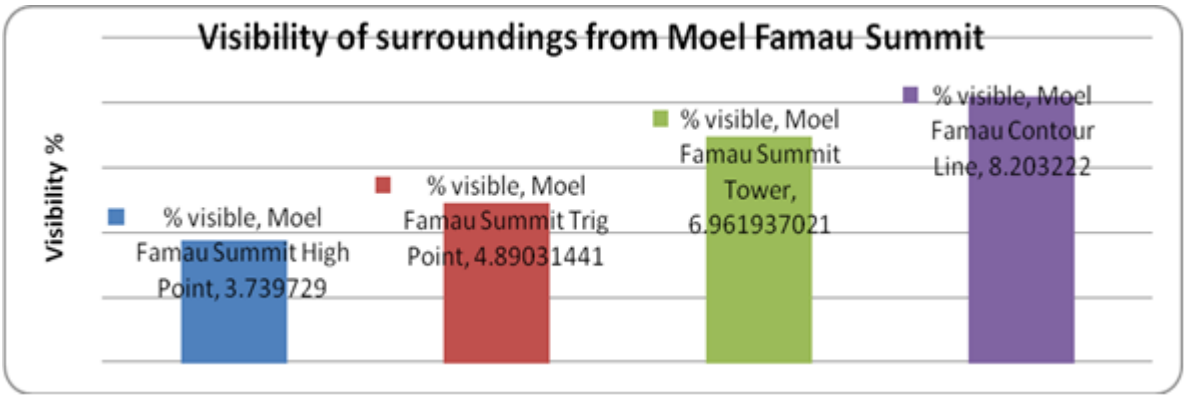


Figure A1.3. Percentage of visibility of surroundings from Moel Famau summit points and contours, showing that the user-generated polyline used to calculate visibility on the contours of the hill had higher visibility of the overall landscape than those calculated using a single input point

When considering that the polyline represents a number of points around the summit located on the 'edge' of a summit, adjoining land will inevitably be more visible.

In conclusion, when calculating viewsheds from hillforts, points both within the interior and upon the ramparts should be taken into consideration. This is especially relevant when conducting similar experiments for monuments which consist of an area of land rather than a single point.

A1.3 Visibility of hillforts

Using the viewsheds conducted for the above investigations, the results were used to look for whether the number of hillforts visible increased by using a polyline at a lower contour line compared with a viewshed from a single point at the summit of a hill, see Table A1.3. The results suggest that there is no difference, with 60% of hillforts within 25km visible from both the summit and the contours. Both summit and contours are able to view the same 18 of the same 30 hillforts located within a 25km radius of the point/s.

Hillforts within 25km	**Visible from Moel Famau summit**	**Visible from Moel Famau Contours**
Dinorben	1	1
Mynydd y Gaer	1	1
Bedd y Cawr	1	1
Moel y Gaer Bodfari	1	1
Moel Hiraddug	0	0
Moel Ffagnallt	1	1
Moel y Gaer Rhosesmor	1	1
Penycloddiau	1	1
Moel Arthur	1	1
Burton Point	1	1
Moel Fenlli	1	1
Moel y Gaer Llanbedr	1	1
Pwll y Clai Earthwork	1	1
Pen y Gaer	1	1
Craig Adwy Wynt	1	1
Caer Drewyn	1	1

Moel Fodig	1	1
Moel y Gaer Llantysilio	1	1
Bron Heulog	1	1
Caer Ddunod	0	0
Caer Caradog	0	0
Dinas Melin y Wig	0	0
Vivod	0	0
Dinas Bran	0	0
Pen y Gaer Trevor	0	0
Y Gardden	0	0
Bryn y Gaer	0	0
Bryn Alyn	0	0
Caer Estyn	0	0
Rofft	0	0
	18	**18**

Table A1.3. Visibility of hillforts from Moel Famau, showing the hillforts within 25km of the hill which are visible (1) and not visible (0) from the summit and from the contour line, demonstrating that although the same number of hillforts are visible from the summit from the contour line, in some cases these numbers represent different hillforts and, therefore, there is a difference in view, despite no difference quantitatively

A1.4 Conclusion

Considering the significant differences in results by using slight changes in location it can be determined that, when measuring visibility from hill summits, a single point viewshed may not give accurate results. This is especially relevant for visibility studies conducted using multiple features in the landscape as single points using recorded grid references. Information such as this can be found on the Historic Environment Record (HER), but it must be taken into account that recorded grid

references may not represent the true summit or centre of a feature located there and this itself may not be representative for the entire site.

It is recommended that the recorded grid references are used only as a guide and if using a single input point, this should be subsequently chosen by the user after studying the hill itself to determine the summit. It should also be stated that the viewsheds calculated are only for the single input point on the map and may not be representative of the entire hill's summit or enclosure of an area.

In addition, a considerable difference was observed between single point viewsheds and a polyline at the contours. The contour viewshed showed an increase in visibility compared with all summit points despite being at a slightly lower height.

The contour line of Moel Famau was chosen as the input by the user and for hillfort studies the input polyline is likely to be determined by the rampart line. Phasing and multivallation of hillforts must also be considered. It is recommended that with multi-phase sites, multiple viewsheds representing different phases should be conducted to compare the results to note any changes which arise. In addition, non-contour hillforts' viewsheds, such as those situated on a slope, can also be compared to the contours of the hills they sit upon to determine whether the building of a hillfort on a slope increased visibility of the surrounding landscape. The addition of points within the feature as well as the boundary will increase accuracy further, with regards to visibility from the enclosure, not constrained to its physical boundary, i.e. the ramparts.

The number of hillforts visible from Moel Famau's summit (Jubilee Tower) and its contours were identical. This may show that hillforts are visible from hills because they sit on the summits of hills and enclose a specific area at the top of said hill. To test this, it is recommended that a series of intervisibility studies using hillforts and non-hillfort hills on the Clwydian Range and in the surrounding area are carried out, to determine whether hillforts are highly intervisible with other hillforts and whether this is more/less so than hills without hillforts.

APPENDIX TWO

A test study using variables when computing viewsheds

Before beginning the spatial analysis of the Clwydian Range hillforts using viewsheds, there are a range of variables which need to be tested to assure the correct parameters and features are being used, especially considering the above issues.

Moel Arthur hillfort, located at grid reference SJ1452066030, was chosen to test a number of variables within the viewshed analysis, including observer height, height of the observed, curvature of the earth, location of points within the hillfort and the usage of polylines and polygons.

Locating these points and features have been georeferenced, using information gained from EDINA Digimap OS collections, or from using the survey created during the topographical survey of Moel Arthur hillfort commissioned by the Heather and Hillforts Project in 2006 (Brooks & Laws 2006b).

A2.1 Terminology

- OFFSETA - Observer height, height above the ground from which the viewshed is being calculated from. Default value = 1m
- OFFSETB - Viewed feature height, the height above the ground of the feature which is being viewed. Default Value = 0m
- Z factor - The conversion factor if the height units differ from the x, y units e.g. feet and metres. All of the units within the study are measured in metres, therefore the z factor for each test = 1
- Refractivity Coefficient - The coefficient refractivity of visible light in the air. Default value = 0.13.

A2.2 Curvature of the earth

The initial experiment was to test whether the curvature of the earth would make an impact within the confines of the study area; a 30-mile radius from the Clwydian Range hillforts. Within the immediate landscape of Moel Arthur hillfort, viewsheds using flat earth and curved earth, taken from a high point on the hillfort itself, the results were almost identical with negligible difference. Towards the limits of the

25km viewshed, the impact of the curvature of the earth is clear and demonstrates that it must be considered.

For example, Pen y Gaer Llanbedr y Cennin is a hillfort in the Conwy Valley, located at grid reference SH750693. The viewshed from Moel Arthur using flat earth, see Figure A2.1, shows that approximately half the hillfort is visible from the high point.

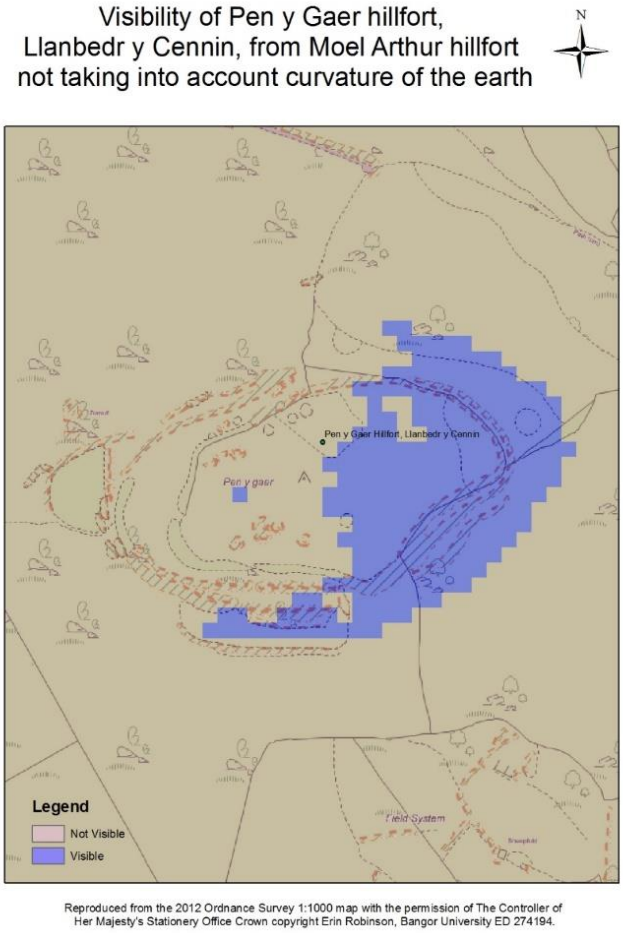


Figure A2.1. Visible areas of Pen y Gaer Llanbedr y Cennin from Moel Arthur hillfort using 'flat earth'. The input point from which the viewshed was calculated was the high point of Moel Arthur hillfort; this shows a section of the generated viewshed across the hillfort of Pen y Gaer hillfort, Llanbedr y Cennin with blue areas depicting areas which are 'visible' and beige as 'not visible' according to the viewshed calculations, with an underlay showing the details from the local OS map. This shows that approximately half the hillfort is visible from Moel Arthur hillfort, but does not take into consideration the curvature of the earth

However, when comparing the viewshed taking into account the curvature of the earth, much less of the hillfort at Llanbedr y Cennin is now visible, and only a small number of the ramparts, see Figure A2.2.

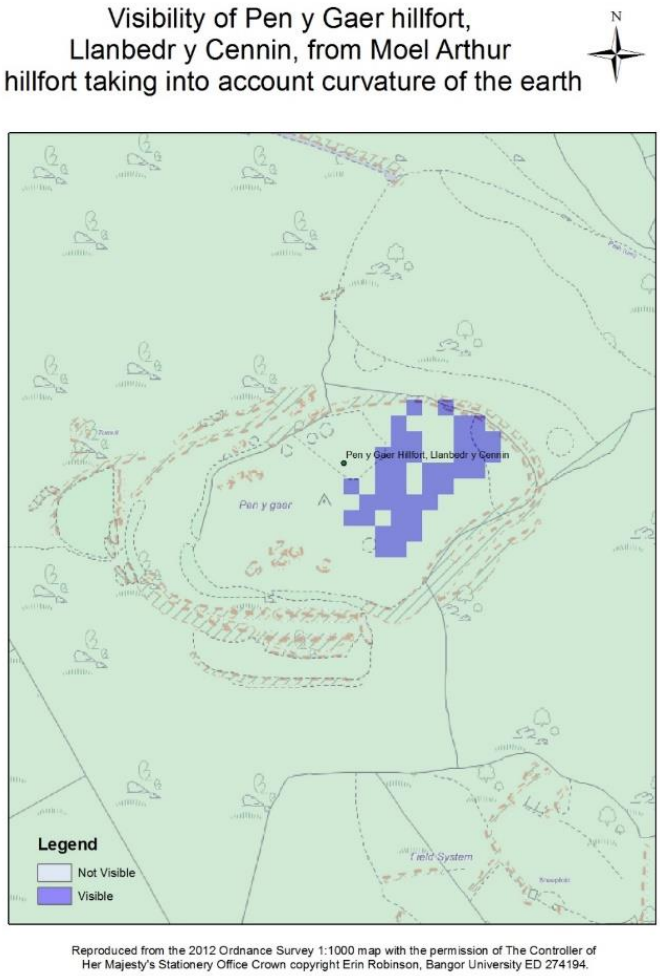


Figure A2.2. Visible areas of Pen y Gaer Llanbedr y Cennin from Moel Arthur hillfort after taking into account the curvature of the earth. The input point from which the viewshed was calculated was the high point of Moel Arthur hillfort; this shows a section of the generated viewshed across the hillfort of Pen y Gaer, Llanbedr y Cennin with dark blue areas depicting areas which are 'visible' and a lighter colour as 'not visible' according to the viewshed calculations, with an underlay showing the details from the local OS map. In comparison to Figure A2.1, much less of Pen y Gaer is visible from the same input point when taking into consideration the curvature of the earth. This demonstrates that the curvature of the earth has an effect on the viewshed results and should be considered in each calculation

A2.3 Reciprocity

To test whether the view is reciprocal from Pen y Gaer hillfort back to the high point at Moel Arthur, a viewshed was calculated from a ‘visible’ point within Pen y Gaer, taken from the viewshed generated from Moel Arthur hillfort taking into account curvature of the earth, see Figure A2.2.

Visible areas of Moel Arthur from the ‘visible’ input point at Pen y Gaer are shown in light green and areas which are not visible from the Pen y Gaer’s input point are shown in pink in Figure A2.3.

As part of Moel Arthur hillfort, including the high point, falls within the visible area within the viewshed map, and has been generated from a point which has been shown to be visible from Moel Arthur’s high point, see Figure A2.2, this demonstrates reciprocity.

Visibility from Pen y Gaer hillfort Llanbedr y Cennin
of Moel Arthur hillfort

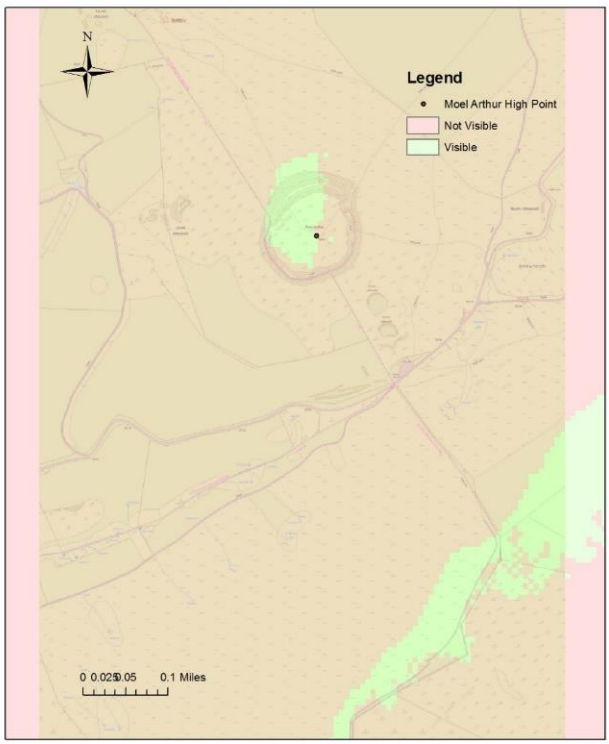


Figure A2.3. Visibility of Moel Arthur hillfort from Pen y Gaer Llanbedr y Cennin. The input point from which the viewshed was calculated was a point within the 'visible' area of Pen y Gaer on the viewshed from Moel Arthur, see Figure A2.3; this shows a section of the generated viewshed across the hillfort of Moel Arthur with green areas depicted areas which are 'visible' and beige/pink as 'not visible' according to the viewshed calculations, with an underlay showing the details from the local OS map. This demonstrates reciprocity of visibility between the two hillforts

A2.4 Representing features to calculate viewsheds from: points and lines

As the hillforts themselves are large monuments, a test was undertaken to look at the impact of using polylines to calculate viewsheds from, compared to a singular point within the monument. To ensure the accuracy of the polyline created, this was drawn from overlaying and georeferencing the 10m survey of Moel Arthur hillfort by Engineering Archaeological Services (EAS) (Brooks & Laws 2006b).

Polylines were created of the circumference of the hillfort using the outer rampart ‘ma_leas’ (Moel Arthur Line by EAS), using the inner rampart ‘ma_lieas’ (Moel Arthur Line Inner by EAS) and using the whole of the ramparts, creating a line to include both the inner and outer ramparts ‘ma_lweas’ (Moel Arthur Line Whole by EAS). These were user-generated and made up of 30, 32 and 45 user-generated points, respectively. Viewsheds were created enabling the inclusion of the curvature of the earth.

The comparison of the three polylines, shown in Figure A2.4, clearly show differences between the three viewsheds. It is also clear that the use of polylines representing ramparts must depict a more accurate output for the whole monument, rather than a single point within and, therefore, should be used for future viewshed calculations where appropriate.

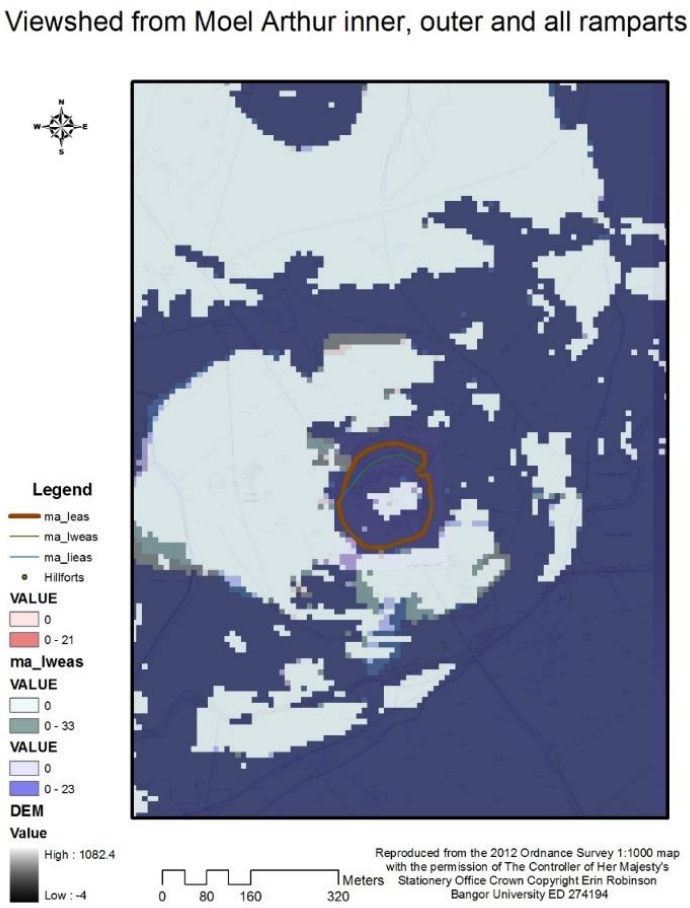


Figure A2.4. Overlaid viewsheds from Moel Arthur. This map shows three semi-transparent viewshed calculations overlaid to demonstrate subtle differences in results by using different input points/polylines depicting possible phases of architecture. The red line (ma_leas – Moel Arthur Line by EAS) and red/pink viewshed represents the input polyline and associated viewshed map for the outer rampart of Moel Arthur as mapped by EAS during their survey of the site. Blue (ma_lieas – Moel Arthur Line Inner EAS) is the circuit of the inner rampart and its associated viewshed. Green/grey (ma_lweas – Moel Arthur Line Whole EAS) represents the whole of the ramparts, including the inner rampart, as mapped by EAS in their topographical survey in 2006 and associated viewshed.

It must be considered that the view is dependent on the way the viewer is facing and their movement through the landscape (Wheatley & Gillings 2000, 7); the use of a polyline increases the likelihood of an accurate viewshed when taking this into account.

A2.5 Observer height and erosion

To test whether the variation of the observer height would make a considerable difference, a viewshed was computed at point ma_p1 (Moel Arthur pathway 1) to compare the difference between an observer height (OFFSETA) using the default value of 1m and OFFSETB = 0m with the observer and observed height (OFFSETA & OFFSETB), both using a height value of an average human being at 1.7m. The results of the comparison show a significant difference in the extent of the view.

In Karl & Butler's excavation of Moel y Gaer Llanbedr, it was suggested that the rampart excavated had been subject to much erosion and could have, at one time, have stood up to 2-3m in height in the area excavated (Karl & Butler 2009, 12).

To take into account the possible original height of the rampart, including the height of a human being atop the ramparts, a viewshed was computed from a point on the northern inner rampart, with an observer height of 4m (taking into account a possible rampart height of approximately 2.5m plus approximately 1.5m for the height of a human being) and an 'observed feature' height of 0m.

With the observer height increased to 4m to 'recreate' the rampart height, compared with an initial observer height of 1m, the views are increased to include additional extent to the north and east and a new aspect to the west, previously not visible. This demonstrates that the user height and erosion impacts on the viewshed calculations and that within any viewshed analyses, the 'offset' must be considered.

A2.5.1 The entranceway

Two well defined 'alcoves' are easily recognised on the ground in the inturned entrance at Moel Arthur and these have been described as 'guardchambers' (Forde-Johnston 1964a; 1965; Brooks & Laws 2006b etc). Although the function of these 'alcoves' has been much discussed (Guilbert 1979c; Bowden & McOmish 1987), the theory which led to the creation of the name by which they are commonly referred to, is that they could have stationed a hillfort resident to control, or 'guard', the entrance to the hillfort.

The entranceway passage to Moel Arthur is a well-defined ‘inturned entrance’, the inturning of the rampart creating a ‘funnel-like’ passage into the enclosure. The ‘guardchambers’ are located at the inside end of these inturns.

Viewsheds were carried out to test whether the view from these guardchambers would have been extensive enough to have been able to view anyone or anything approaching the hillfort, and to what extent this may have been. Alternatively, due to the location of the guardchambers, it was considered whether the inturned passageway blocked the view out of the hillfort to any extent.

Both guardchambers allowed relatively extensive views to the north east from their north-eastern aspect within the hillfort, which included views of most of the Wirral peninsula and Cheshire, see Figure A2.5. The approach path to the hillfort is also clearly visible from both north and south guardchambers.

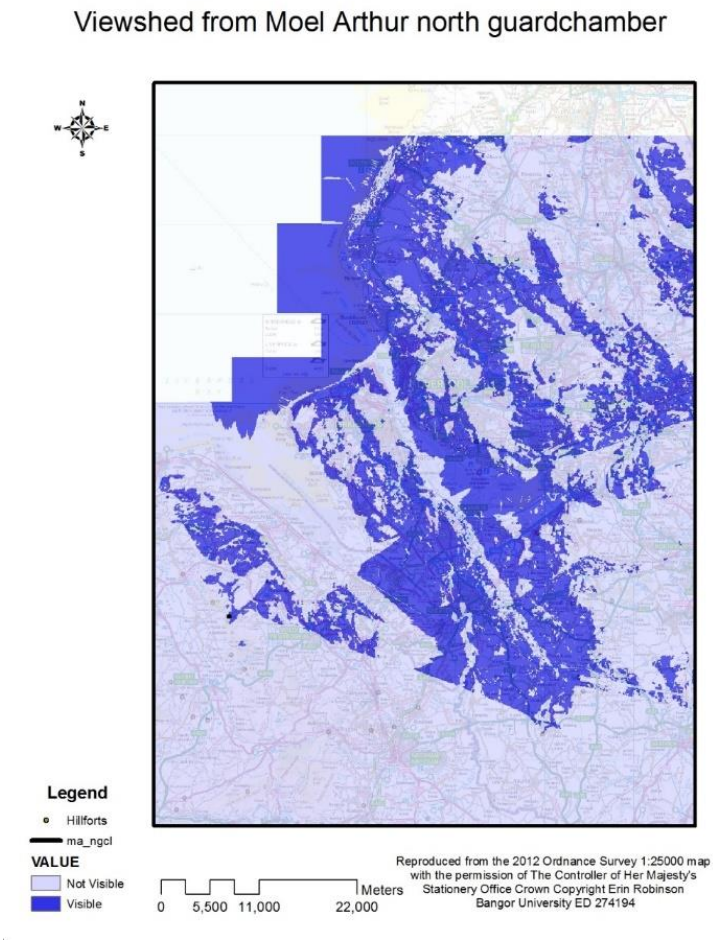


Figure A2.5. View from north guardchamber of Moel Arthur, with underlying OS map of north east Wales, the Wirral and Merseyside. The input polyline (ma_ngcl – Moel Arthur North Guardchamber Line) was drawn around the northern guardchamber as a user-generated seven-point polyline, using default values within ArcGIS for OFFSETA (the viewer) & OFFSETB (the view). The dark blue shows the area 'visible' and the lighter colour shows the area which is 'not visible'. The calculations show that the view from the guardchamber location has wide views across much of north west England

Although the guardchambers gave an extensive view of their respective aspects, it was tested to see if increased visibility would have been gained by a higher feature running over the entrance passage, such as a bridge within a palisade at the entranceway (Ralston 2006, 113-4).

To compute this, a viewshed was conducted from a point at the inside mouth of the inturn, in between both guardchambers 'ma_ent3' (Moel Arthur Entrance 3), but set at an observer height of 5m, to take into account the height of a potential feature to

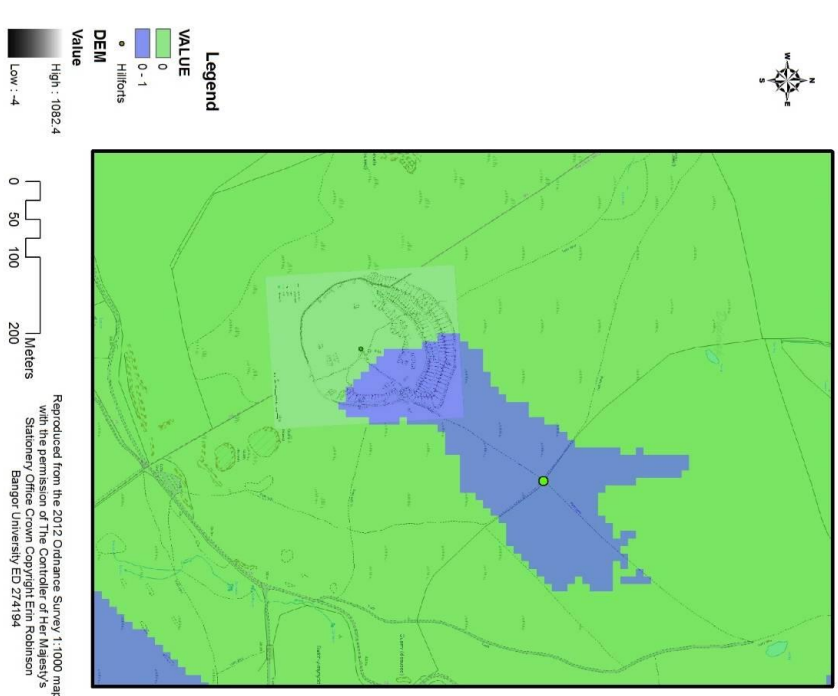
view from above the entrance passage. Compared with the view from the guardchambers using default offset heights, the extent of the view from the entranceway using an observer height at the entrance of 5m to depict a possible viewing platform, increased the view significantly.

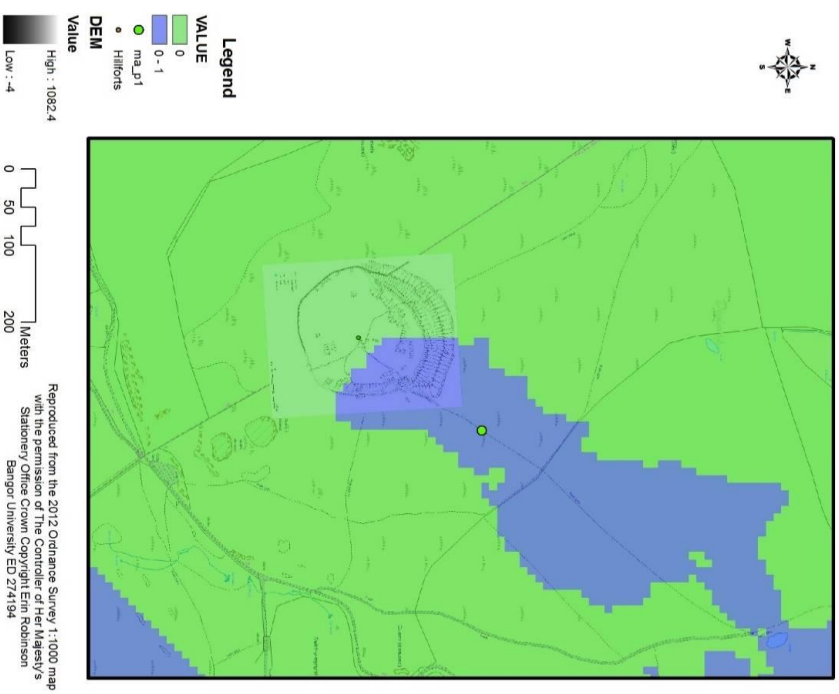
A2.5.2 Approach

When examining the route of approach to a pair of contemporary Iron Age enclosures, sited on either side of a paleochannel, connected by a causeway, near Doncaster, South Yorkshire, a viewshed study was undertaken to assess the visibility of the monuments as a user approached the site (Chapman 2000).

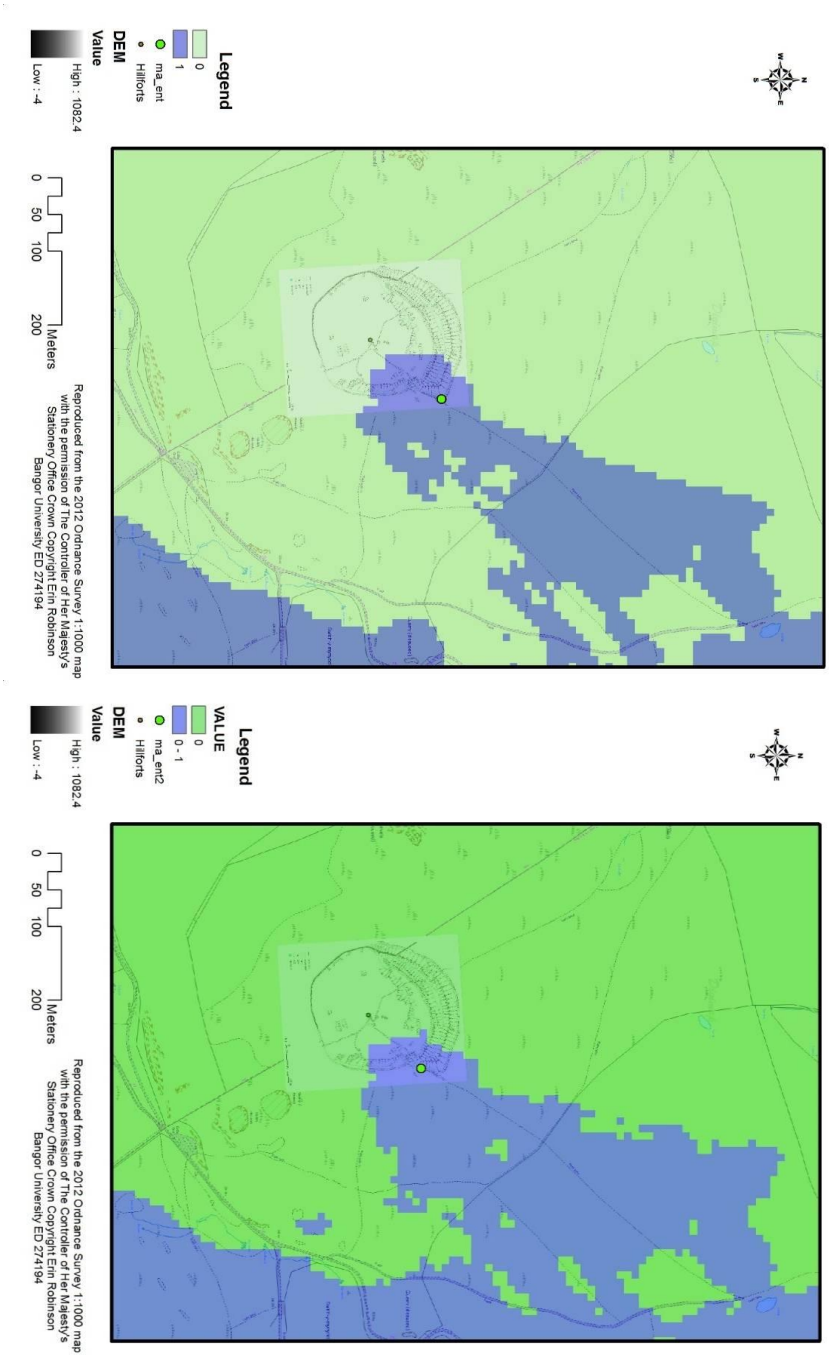
It was found that as the user approached the smaller, western enclosure, from the west (the route to avoid the paleochannel and utilise the causeway) and continued across the causeway, the view to the eastern enclosure was hidden until within the monument itself, the view from inside the monument only showing the inside of the eastern enclosure and little externally (Chapman 2000, 57). It was suggested that this highlighted the separation between the monuments and the sense of place and arrival and sense of becoming internalised when arriving within the larger, eastern enclosure, only accessible by using this route (Chapman 2000, 58).

To determine whether the approach to Moel Arthur hillfort demonstrated a similar sense of arrival by blocking the internal area until arrival within the entrance, a series of viewsheds were computed using points on the approach to the hillfort entrance, see Figures A2.6 to A2.10. The observer height (OFFSETA) was set at 1.7m for this example, alongside an ‘observed’ height of 1.7m (Figures A2vi-A2x) as per Chapman’s experiment with the enclosures of a similar period, computed using the observer height and observed height as the average height of a human being today at 1.7m (Chapman 2000, 56).





Figures A2.6 & A2.7. Visibility of surroundings from the approach path to Moel Arthur hillfort from two locations on the path to the hillfort's entrance (e.g. ma_p1 – Moel Arthur pathway 1), with underlying local OS map and hachered survey of the hillfort showing rampart detail. Blue represents the area 'visible' from the input point/s and green 'not visible', showing that as the input point moves towards the hillfort, no more of the interior becomes visible but the view outwards changes. This can also be seen in Figures A2.8 and A2.9



Figures A2.8 & A2.9. Visibility of surroundings from the entrance passage to Moel Arthur hillfort from two locations approaching the hillfort's entrance (ma_ent1 – Moel Arthur entrance 1, ma_ent2 – Moel Arthur entrance 2), with underlying local OS map and hachered survey of the hillfort showing rampart detail. Blue represents the area 'visible' from the input points and green 'not visible', showing that as the input point moves within the hillfort entrance passage, less of the interior becomes visible but the view outwards increases

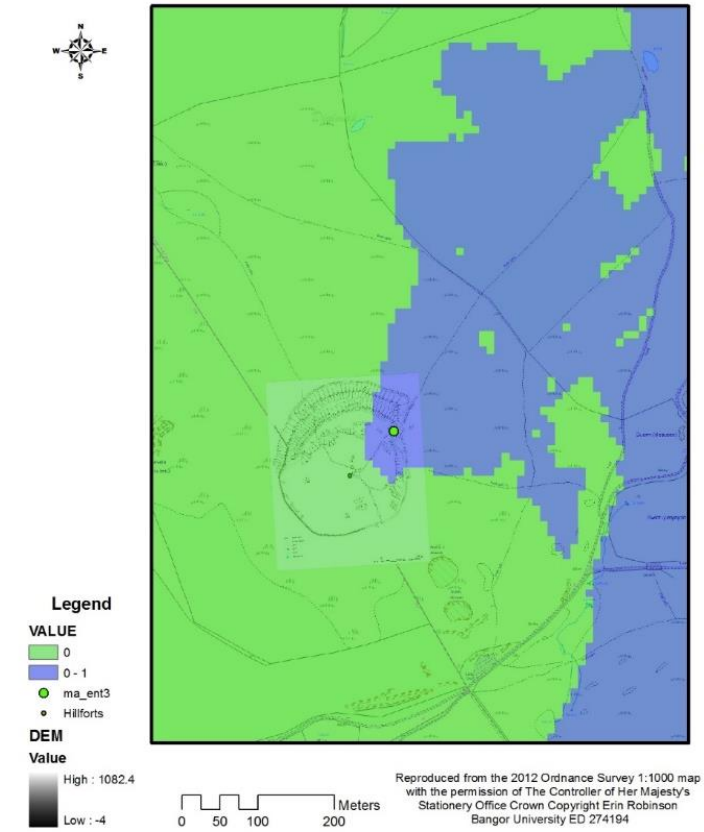


Figure A2.10. Visibility of surroundings from Moel Arthur inturned entrance passage. Visibility of surroundings from the entrance passage to Moel Arthur hillfort (ma_ent3 – Moel Arthur entrance 3), with underlying local OS map and hachered survey of the hillfort showing rampart detail. Blue represents the area 'visible' from the input point and green 'not visible'. From this location, within the inturned entrance of the hillfort, little of the interior can be seen but there is a clear view down the entrance passage of the surrounding landscape to the north east

One limitation of Chapman's study was that any subsequent erosion of the ramparts, i.e. the loss of height from the banks themselves and with a possible fence on top, was not taken into account and this may have obscured the view further.

The viewshed, see Figure A2.10, demonstrates that the majority of the hillfort interior is obscured from view when standing at the inside of the entrance passage as well as the approach.

A2.6 Discussion

The above test study has explored various variables to use when computing viewsheds for a hillfort, to aid the methodology for applying this for a wider study area using all six hillforts of the Clwydian Range and the wider study area.

The initial test to explore the effect of the curvature of the earth, seen in Figures A2.1 and A2.2, showed a significant difference between ‘flat earth’ and ‘curved earth’ results within a 30-mile radius from Moel Arthur and, therefore, all other tests must take this into account. This is an automatic function within ArcGIS 9.3.1.

Another function in ArcGIS 9.3.1 available is the consideration of the coefficient refractivity, the default value being 0.13. This has not been tested in the Moel Arthur study, but the effect of the light, air, weather etc should be considered when using visibility analysis and the scale to which is could affect sight should be taken into account.

The test computing a viewshed from a single point on the hillfort ramparts compared with using a polyline to define the entire ramparts showed a significant difference, see Figure A2.4. For viewshed analysis from the ramparts themselves, it was seen that using a user-generated polyline to define these features seemed to show the quickest and most holistic results. Although the points provided positive results, without knowing exactly where a user may have been standing to view outside the hillfort, the use of the polyline enables us to see multiple possible ‘views’ from the entire circumference rather than one random point picked by the user generating the viewshed in 2012.

This led to the question of which banks to use, as some hillforts within the study area are multivallate; some of these being suggested at secondary phasing. When testing the difference of viewshed from the inner rampart, the outer rampart and a line depicting the whole of the ramparts, as seen in Figure A2.4, although there was a slight difference, it was seen that the second phase of rampart building with the incorporation of the inner rampart, did not seem to increase visibility a great deal. Therefore, a polyline depicting the entire hillfort in its latest phase (unless known to be post-prehistoric) could be used. However, it is suggested that for additional features, such as annexes, an additional viewshed for this feature would be advised.

For the interior of the hillfort, points/polylines will continue to be used, although the use of a polygon as the ‘observer’ could also be explored but would require major computer processing space and time. A key downfall of many landscape-scale visibility analyses using viewshed analysis, especially those using multiple monuments, is the use of singular points to represent the site itself. The quantifiable values, calculating what is visible and not visible, is taken from whether the point used to represent the observed feature is visible or not. However, the viewshed from Moel Arthur hillfort to Llanbedr y Cennin, Figure A2.3, shows that the hillfort is visible, but the point to locate the hillfort imported using x, y coordinates from the HER record lies within the area which is not visible from Moel Arthur. If the result had been taken using this point only to calculate the results, it would have been a negative response, even though a high percentage of the hillfort gives a positive result.

The investigation into using the observer height as a variable, showed changes in the result, by making small changes in the observer height. From previous hillfort studies, such as the excavation at Moel y Gaer hillfort, Llanbedr (Karl & Butler 2009), the extent of the erosion on the ramparts has been suggested and this can be postulated for other hillforts in the area. Therefore, if calculating a viewshed from a polyline depicting the ramparts, an observer height of 4m could be used, to consider any erosion of the ramparts themselves alongside the height of the human being viewing the outlook. From the interior, it is harder to attempt to recreate any obstacles, such as buildings, which may have altered the extent of view from the hillfort, but we can be confident that the ground level has not been altered in any significant way except in extreme circumstances, such as those which have been subjected to extensive quarrying.

Ramparts and a possible palisade atop these may have offered a barrier to the outside world to some extent, and this can only be factored in by modifying the DEM or importing and amalgamating a model of how the hillfort may have looked. This may also help where the monument is known to be severely eroded, such as the quarry at Moel Hiraddug, or possibly where there may have been further outer ramparts, such as those reported to have been ploughed away in the 1980s at Moel y Gaer Llanbedr (Brown 2004, 71)

This is also the case from the view outside of the hillfort when attempting to look inside, see Figures A2.6 to A2.10. The test to consider the approach to the hillfort to establish whether the view of the interior increased as the user approached or entered the hillfort, showed that even when inside the hillfort, the view of the interior was minimal. However, the topography of the site would suggest that this would be the case - the conical hill does not lend itself for easy viewing from anywhere but the sky. The approach to hillforts should still be considered as a 'flatter' hill may have meant that the visible areas increased as you approached the site and this may be why the inturned and 'staggered' entrances were introduced; namely to limit visibility to the interior until inside the hillfort itself and to increase the 'grandeur' of the monument to allow a 'big reveal' when granted entrance. If this was the case, many of the hillforts are overlooked by higher topography and views into the hillforts are often more considerable the further away the user is standing, if this enables height.

When considering the view from the guardchambers, a number of factors similar to the above must be kept in mind; such as if there were gates in the entranceway where they were located and if they were kept open. Moel Arthur's guardchambers offer extensive views towards their aspect and the approaching pathway down the inturned entrance, see Figure A2.5. However, those hillforts with 'staggered' entranceways, such as at Moel y Gaer Llanbedr, the view from a guardchamber would be much less extensive; down a short corridor before a blind dog-leg turn to the north/left.

The aspect of the entranceways and guardchambers can be explored further to investigate whether the view from these features shows any patterns where there is use of an inturned entrance, a staggered entranceway, whether it is a single inturn or double and whether the hillfort has signs of a possible guardchamber, or two, and phases of these. The addition of observer height at the entrance may increase the vista significantly to suggest that the location of a walkway and/or tower at this point would have been a significant piece of architecture, if the view from the hillfort was considered important.

APPENDIX THREE

Tables

Entrance Name	Aspect
Moel Arthur	NE
Penycloddiau S	SE
Penycloddiau East	E
Moel Fenlli	W
Moel y Gaer Bodfari	NE
Moel y Gaer Llanbedr NE	NE
Moel y Gaer Llanbedr W	W
Moel Hiraddug NW	N
Moel Hiraddug Main Inner	SE
Moel Hiraddug South	S
Moel Hiraddug Main Middle	S
Moel Hiraddug Main Outer	S
Moel Hiraddug East	SE

Table A3.1. Aspect of known entrances on the hillforts of the Clwydian Range

Hillfort	Rampart Name	Rampart Phase	Palisade?	Stone Inner Face?	Wood Inner Face?	Stone Outer Face?	Wood Outer Face?	Stone Core?	Earth Core?	Wood Core?	Ditch?
Beeston Castle	Only?	1	Y								
Beeston Castle	Only?	2							Y	Y	
Beeston Castle	Only?	3							Y	Y	Y
Beeston Castle	Only?	4		Y				Y		Y	
Breiddin	ii	1		Y		Y		Y			
Breiddin	iii	1		P		P			Y		Y
Breiddin	Inner?	1						Y	Y	Y	
Breiddin	Inner?	2		Y		Y		Y	Y		
Bryn y Castell	Only	1				Y		Y			

Bryn y Castell	Only	2				Y		Y			
Bryn y Gaer	Only	1				Y		Y			
Caer Caradog	Only	1						Y	Y		Y
Caer Estyn	Only	1				Y		Y			
Caer Estyn	Only	2				Y		Y	Y		
Castell Caer Seion	Inner Bank interior	Unknown						Y	Y		
Castell Caer Seion	Main east and south	1				Y		Y			
Castell Caer Seion	Main west initial	1						Y			Y
Castell Caer Seion	West Outer/ outwork	1		Y		Y		Y	Y		
Castell Caer Seion	West Outer/ outwork	2				Y					Y
Castell Caer Seion	Western enclosure Inner	1		Y		Y		Y			

Craig Rhiwarth	Inner	1						Y	Y		
Craig Rhiwarth	Inner	2				Y		Y			
Dinas Llanfairfechan	2nd	1				Y		Y	Y		
Dinas Llanfairfechan	Inner	1				Y		Y	Y		
Dinas Llanfairfechan	Lower	1				Y		Y	Y		
Dinorben	Inner	1a	Y								
Dinorben	Inner	1b	Y								
Dinorben	Inner	1c	Y								Y

Dinorben	Inner	2		Y		Y		Y		Y	
Dinorben	Inner	3		Y		Y					
Eddisbury	Inner	1	Y								
Eddisbury	Inner	2		Y		Y			Y		Y
Eddisbury	Inner	3							Y		
Eddisbury	Outer	1				Y		Y	Y		Y
Helsby	Inner	1				Y		Y			
Helsby	Inner	2				Y					
Helsby	Outer	1?									
Kelsborrow	Only	1?						Y	Y	Y	

Llanymynech	Inner	1?		Y				Y	Y		
Llwyn Bryn Dinas	X	1				Y		Y	Y		Y
Llwyn Bryn Dinas	Y	2						Y	Y		
Llwyn Bryn Dinas	Z	3						Y			
Maiden Castle	Inner	1?		Y		Y			Y	Y	
Maiden Castle	Outer	Unknown				Y			Y		
Moel Arthur	Inner	Unknown									
Moel Arthur	Outer	Unknown						Y	Y		Y
Moel Fenlli	Inner	Unknown						Y	Y		Y
Moel Fodig	Only	1				Y			Y		
Moel Hiraddug	Eastern main inner	1		Y		Y		Y			Y

Moel Hiraddug	Eastern middle	1		Y		Y		Y	Y		Y
Moel Hiraddug	North	1				Y			Y		
Moel Hiraddug	North	2		Y		Y		Y			
Moel Hiraddug	Outer	1		Y		Y		Y			Y
Moel Hiraddug	South	1							Y		
Moel y Gaer Bodfari	Inner	1				Y		Y	Y		
Moel y Gaer Bodfari	Middle	1				Y		Y			
Moel y Gaer Bodfari	Middle	2				Y		Y			
Moel y Gaer Bodfari	Middle	3						Y			
Moel y Gaer Llanbedr	2nd	Unknown						Y	Y		

Moel y Gaer Llanbedr	Annexe	Unknown									
Moel y Gaer Llanbedr	Inner	Unknown				Y		Y			
Moel y Gaer Rhosesmor	Inner	1	Y								
Moel y Gaer Rhosesmor	Inner	2			Y	Y	Y	Y		Y	
Moel y Gaer Rhosesmor	Inner	3							Y		
New Pieces	Inner	1?			Y	Y		Y	Y		Y
New Pieces	Outer	1?		Y		Y		Y	Y		
Oakmere	Only?	1?							Y		Y
Old Oswestry	2nd	1						Y			

Old Oswestry	3rd	1				Y		Y	Y		Y
Old Oswestry	3rd	2						Y	Y		
Old Oswestry	4th	1						Y	Y		
Old Oswestry	5th	Unknown						Y	Y		
Old Oswestry	Inner	1		Y		Y			Y		Y
Old Oswestry	Inner	1?	Y								
Old Oswestry	Inner	2						Y	Y		
Pen y Gaer Llanbedr y Cennin	Inner	1				Y		Y			Y
Pen y Gaer Llanbedr y Cennin	Middle	1						Y	Y		Y

Pen y Gaer Llanbedr y Cennin	Outer	1				Y			Y		2
Pen y Gaer Llangollen	Only?	1?				Y		Y			
Pendinas Llandygai	Only	1		Y		Y		Y		Y	
Pendinas Llandygai	Only	2						Y			
Penycloddiau	Inner	Unknown				Y					
Penycloddiau	Outer	Unknown									
Pen y Corddyn Mawr	Annexe	Unknown				Y		Y			
Pen y Corddyn Mawr	Inner	1		Y		Y		Y			

Pen y Corddyn Mawr	Outer	1						Y			Y
The Berth (main)	Only?	1						Y			
The Berth (main)	Only?	2				Y		Y			
Woodhouses	Only?	1		Y		Y		Y	Y	P	

Table A3.2. Evidence (Y - yes or P - possible) for excavated evidence for palisades, ditches and of earth, wood and stone material used in the excavated hillfort ramparts in the wider study area

Hillfort	Phase (as known)	Original Entrance Name	Location	Type	Relocation?	Inturn/s?	Guard Chambers?	Amendment?
Beeston	1	Phase 2B	E	Gap	N	N	N	N
Beeston	2	Phase 3A	E	unknown	N	Poss		Overlying bank plus a platform to the rear
Beeston	3	Phase 3B	E	unknown	N			Stylistically new bank
Beeston	4	Phase 3B	E	unknown	N			Rear posts removed and filled
Breiddin	1	Entrance	E	Club Gap	N	N	N	
Breiddin	2	Entrance	E	Club Inturn	N	1	N	Inturn added North/ Right

Breiddin	3	Dismantled		Destroyed	N			Dismantling OR reconstruction of inturn
Bryn y Castell	1	North East	NE	Gap	N	N	N	
Bryn y Castell	2	North Entrance	NE	Relocated Gap	moved 9m west/ right	N	N	Blocked and moved 9m west/ right
Bryn y Castell	3	North Entrance	NE	Repair	N	N	N	repair after being washed away - gully
Dinorben	1	1st Entrance	NE	Gap	N	N	N	
Dinorben	2	2nd Entrance	NE	Gap	N	N	N	Narrowed
Dinorben	3	Blocking	NE	Blocked	N			Blocked

Dinorben	1	Period II	SE	Gap	N	N	N	
Dinorben	2	Period IIa	SE	Gap	N	N	N	Bastion
Dinorben	3	Period III	SE	Relocated, Inturned, GCs	5m West/ Left	2	2	Relocation and development
Dinorben	4	Period IV/III	SE	Inturned, Reduced GCs	N	2	2	West/ Left GC reduced
Dinorben	5	Period V	SE	Inturned, Reduced GCs	N	2	2	GCs reduced, roadway relocated
Eddisbury	1	North West Area One	NW	Inturned	N	2	N	N
Eddisbury	1	Eastern Entrance	E	possible phase 1 hollowway	N		N	

Eddisbury	2	Eastern Entrance Phii	E	phase 2 inturn single GC	N		1	
Eddisbury	3	Eastern Entrance Phase iii	E	Inturned GCs	N	2	2	Inturned GCs
Eddisbury	4	Eastern Entrance Phase iiib	E	Destroyed GC- fire (or before Phase 3?)	N			N
Maiden Castle	1	Entrance	NE	inturned	N	2	N	
Maiden Castle	1	South Entrance	S					Later blocked

Moel Hiraddug	1	North West gateway	NW	overlap gap	N	1	N	N
Moel Hiraddug	2	North West gateway	NW	Inturned	N	2	N	narrowing and inturn
Moel Hiraddug	3	North West gateway	NW	Inturned GC	N	2	1	Guardchamber /hut and buttressing
Moel Hiraddug	1	Main Inner Phase i	Central E	Gap	N	N	N	N
Moel Hiraddug	2	Main Inner Phase iia	Central E	GC	Moved 6m west/ left	Y	1	Blocked and moved 6m west/left

Moel Hiraddug	3	Main Inner Phase iib	Central E	GC reduced	N		1	GC reduced in size
Moel Hiraddug	4	Main Inner Phase iic	Central E	GCs (double circular)	N	Y	2	
Old Oswestry	1	West Period 2	W	Gap	N	N		
Old Oswestry	2	West Period 3	W	Inturned	N	2 only south exca-vated		Southern / right inturn added
Old Oswestry	3	West Period 4/5	W	Inturned	N	1		

Pen y Corddyn Mawr	1	North West	NW	Club Inturn	N	2	N	
Pen y Corddyn Mawr	1	South	S	Inturned angled gap	N	1	N	
Pen y Corddyn Mawr	1	North East	NE	Inturned GCs	N	2	2	

Table A3.3. Features of excavated entrances in the wider study area, including location (E – East etc), type and whether there is evidence for relocation, inturns, guardchambers (GCs) and/or amendment (Y – yes, N – No, Poss – possible)

Hillfort	Entrance Name	Phase (as known)	Original Entrance Name	Location	Aspect	Type	Relocation?
Beeston	Entrance	1	Phase 2B	E	E	Gap	No
Beeston	Entrance	2	Phase 3A	E	E	unknown	No
Beeston	Entrance	3	Phase 3B	E	E	unknown	No
Beeston	Entrance	4	Phase 3B	E	E	unknown	No
Breiddin	Entrance	1	Entrance	E	E	Club Gap	No
Breiddin	Entrance	2	Entrance	E	E	Club Inturn	No
Breiddin	Entrance	3	Dismantled			Destroyed	No
Bryn y Castell	NE	1	North East	NE	NE	Gap	No
Bryn y Castell	N	2	North Entrance	NE	NE	Relocated Gap	moved 9m west/ right

Bryn y Castell	N	3	North Entrance	NE	NE	Repair	No
Dinorben	NE	1	1st Entrance	NE	NE	Gap	No
Dinorben	NE	2	2nd Entrance	NE	NE	Gap	No
Dinorben	NE	3	Blocking	NE	NE	Blocked	No
Dinorben	SE	1	Period II	SE	SE	Gap	No
Dinorben	SE	2	Period IIa	SE	SE	Gap	No
Dinorben	SE	3	Period III	SE	SE	Relocated, Inturned, GCs	5m West/ Left
Dinorben	SE	4	Period IV/III	SE	SE	Inturned, Reduced GCs	No
Dinorben	SE	5	Period V	SE	SE	Inturned, Reduced GCs	No

Eddisbury	North West	1	North West Area One	NW	NW	Inturned	No
Eddisbury	East	1	Eastern Entrance	E	E	possible phase 1 hollowway	No
Eddisbury	East	2	Eastern Entrance Phii	E	E	phase 2 inturn single GC	No
Eddisbury	East	3	Eastern Entrance Phase iii	E	E	Inturned GCs	No
Eddisbury	East	4	Eastern Entrance Phase iiib	E	E	Destroyed GC - fire (or before Phase 3?)	No
Maiden Castle	Entrance	1	Entrance	NE	E	inturned	No
Maiden Castle	South Entrance	1	South Entrance	S			
Moel Hiraddug	NW	1	North West gateway	NW	N	overlap gap	No
Moel Hiraddug	NW	2	North West gateway	NW	N	Inturned	No

Moel Hiraddug	NW	3	North West gateway	NW	N	Inturned GC	No
Moel Hiraddug	Main Inner	1	Main Inner Phase i	Central E	SE	Gap	No
Moel Hiraddug	Main Inner	2	Main Inner Phase iia	Central E	SE	GC	Moved 6m west /left
Moel Hiraddug	Main Inner	3	Main Inner Phase iib	Central E	SE	GC reduced	No
Moel Hiraddug	Main Inner	4	Main Inner Phase iic	Central E	SE	GCs (double circular)	No
Old Oswestry	W	1	West Period 2	W	W	Gap	No
Old Oswestry	W	2	West Period 3	W	W	Inturned	No
Old Oswestry	W	3	West Period 4/5	W	W	inturned	No
Pen y Corddyn Mawr	NW	1	North West	NW	NW	Club Inturn	No

Pen y Corddyn Mawr	S	1	South	S	S	Inturned angled gap	No
Pen y Corddyn Mawr	NE	1	North East	NE	NE	Inturned GCs	No

Table A3.4. Excavated hillfort entrance locations and excavated hillfort entrance aspect from the wider study area

Hillfort	**Entrance Name**	**Phase (as known)**	**Approx Length m**	**Approx Width m**
Beeston	Entrance	3	unknown	3
Breiddin	Entrance	2	unknown	3.6
Bryn y Castell	NE	1	2	4
Bryn y Castell	N	2	2	1
Bryn y Castell	N	3	2	1
Dinorben	NE	1	3	3
Dinorben	NE	2	3	1.5
Dinorben	SE	1	2	2.5

Dinorben	SE	2	2	2.5
Dinorben	SE	3	7.5	3
Dinorben	SE	4	7.5	2.5
Dinorben	SE	5	11	2.5
Eddisbury	East	3	16	2.4
Eddisbury	North West	1	unknown	2.3
Maiden Castle	Entrance	1	15.24	2.4
Moel Hiraddug	Main Inner	1	6	3.4
Moel Hiraddug	Main Inner	4	12	3
Moel Hiraddug	NW	1	3.7	3.7
Moel Hiraddug	NW	2	3.7	1.5
Moel Hiraddug	NW	3	3.7	1.5
Penycorddyn Mawr	NE	1	10.7	4
Penycorddyn Mawr	NW	1	10.7	3.4

Penycorddyn Mawr	S	1	8.2	2.7

Table A3.5. Data from Figures 3.16 and 3.17. Entrance passage length and width at excavated hillforts.

Hillfort	Entrance	Phase		Width	Length	Area
Dinorben SE Ph3 GC1	SE	3		3.7	3	8.7135
Dinorben SE Ph3 GC2	SE	3		3.7	2.7	7.84215
Dinorben SE Ph4 GC1	SE	4		3	3	7.065
Dinorben SE Ph4 GC2	SE	4		3.7	2.7	7.84215
Dinorben SE Ph5 GC1	SE	5		2.1	3	4.9455
Dinorben SE Ph5 GC2	SE	5		1.8	2.7	3.8151
Pen y Corddyn Mawr NE	NE	1		3	3.7	8.7135
Pen y Corddyn Mawr NE	NE	1		4.6	3	10.833
Moel Hiraddug NW	NW	3		3.7	3.7	10.74665
Moel Hiraddug MI Ph4 GC1	Main Inner	4		3.8	2.8	8.3524

Moel Hiraddug MI Ph4 GC2	Main Inner	4		3.8	2.8	8.3524
Eddisbury E GC1	East	2		unknown	unknown	
Eddisbury E GC1	East	3		4.6	3.7	13.3607
Eddisbury E GC2	East	3		4.6	3.7	13.3607
			Sum	46.1	40.5	113.9428
			Average	3.546154	3.115385	8.764827

Table A3.6. Data from Figures 3.18 & 3.20. Guardchamber dimensions, presenting the width and breadth and area, calculated using Abπ, of recorded excavated guardchambers in the wider study area. The hillfort name is followed with the location of the entrance (e.g. SE – south east), the phase (e.g. Ph2 – Phase 2) and where two guardchambers have been found/measured, the number depicting the guardchamber itself (e.g. GC1 – guardchamber 1).

Hillfort	C14_ID	Pre-recalibration date	Error (+/- date)	Recalibration date from	Recalibration date to	% confidence
Beeston	HAR-6464	2300	80	-750	-166	95.4
Beeston	HAR-6468	2290	70	-728	-171	95.4
Beeston	HAR-6469	2370	80	-770	-231	95.4
Breiddin	BM-1160	2108	31	-204	-45	95.4
Breiddin	BM-1161	2141	28	-353	-59	95.4
Breiddin	BM-878	2750	41	-996	-816	95.4
Breiddin	BM-879	2778	71	-1113	-807	95.4
Breiddin	BM-881	2429	55	-757	-403	95.4
Breiddin	BM-885	3024	62	-1427	-1059	95.5
Breiddin	HAR-1286	2320	80	-751	-196	95.3
Breiddin	HAR-1287	2320	70	-748	-198	95.5
Breiddin	HAR-1413	2180	80	-396	-46	95.4

Breiddin	HAR-1615	2690	70	-1018	-766	95.4
Breiddin	HAR-1616	2760	70	-1107	-802	95.4
Breiddin	HAR-1617	2050	80	-355	125	95.4
Breiddin	HAR-1761	2690	80	-1055	-571	95.4
Breiddin	HAR-467	2410	100	-797	-235	95.4
Breiddin	HAR-467	2410	100	-797	-235	95.4
Breiddin	HAR-468	2190	80	-397	-51	95.4
Breiddin	HAR-842	2270	80	-728	-101	95.4
Breiddin	HAR-842	2270	80	-728	-101	95.4
Breiddin	QL-1080	2200	90	-411	2	95.4
Breiddin	QL-1080	2200	90	-411	2	95.4
Bryn y Castell	HAR-6234	2180	100	-411	51	95.4
Castell Caer Seion	Beta-254607	2240	40	-393	-204	95.4
Dinorben	CAR-123	2430	60	-761	-402	95.4
Dinorben	CAR-124	2360	60	-753	-235	95.4
Dinorben	CAR-128	2500	70	-795	-428	95.4

Dinorben	CAR-131	2170	60	-378	-56	95.4
Dinorben	CAR-132	2050	60	-341	74	95.4
Dinorben	CAR-167	2470	60	-772	-413	95.4
Eddisbury	Beta-317521	2410	30	-739	-401	95.4
Eddisbury	NZA-36592	2176	25	-359	-169	95.4
Eddisbury	NZA-36593	2260	25	-396	-210	95.4
Eddisbury	NZA-36593	2260	25	-396	-210	95.4
Eddisbury	NZA-36648	2483	25	-771	-515	95.4
Eddisbury	NZA-36654	2251	25	-392	-209	95.4
Llanymynech	CAR-534	2020	70	-204	130	95.4
Llanymynech	CAR-535	2170	70	-384	-52	95.4
Llwyn Bryn Dinas	CAR-708	2151	70	-382	-41	95.4
Llwyn Bryn Dinas	CAR-798	2100	60	-357	25	95.4
Llwyn Bryn Dinas	CAR-800	2210	70	-401	-63	95.4

Moel Hiraddug	CAR-372	2300	65	-728	-193	95.4
Moel Hiraddug	CAR-373	2360	65	-756	-233	95.4
Moel Hiraddug	CAR-374	2380	60	-756	-368	95.4
Moel y Gaer Llanbedr	SUERC-30897	2490	35	-788	-486	95.4
Moel y Gaer Llanbedr	SUERC-30901	2510	35	-794	-524	95.4
Moel y Gaer Llanbedr	SUERC-30902	2510	35	-794	-524	95.4
Moel y Gaer Llantysilio	SUERC-43981	2182	28	-386	-205	95.4
Moel y Gaer Llantysilio	SUERC-43982	2121	29	-345	-51	95.4
Moel y Gaer Llantysilio	SUERC-43983	2235	28	-360	-171	95.4
Moel y Gaer Rhosesmor	HAR-1122	2210	70	-401	-63	95.4
Moel y Gaer Rhosesmor	HAR-1125	2430	140	-840	-197	95.4
Moel y Gaer Rhosesmor	HAR-1126	2510	100	-821	-401	95.4
Moel y Gaer Rhosesmor	HAR-1196	2420	80	-780	-388	95.4

Moel y Gaer Rhosesmor	HAR-1197	2560	90	-892	-410	95.4
Moel y Gaer Rhosesmor	HAR-1294	2380	70	-769	-263	95.4
Moel y Gaer Rhosesmor	HAR-1353	2390	80	-782	-259	95.4
Moel y Gaer Rhosesmor	HAR-603	2190	80	-397	-51	95.4
Moel y Gaer Rhosesmor	HAR-603	2190	80	-397	-51	95.4
Moel y Gaer Rhosesmor	HAR-604	2530	90	-820	-408	95.4
Moel y Gaer Rhosesmor	HAR-606	2570	70	-891	-431	95.4
Moel y Gaer Rhosesmor	HAR-606	2570	70	-891	-431	95.4
Pen y Ddinas Great Orme	Beta-254961	2270	40	-403	-206	95.4
Pendinas Llandygai	HAR-1672	2060	70	-353	79	95.4

Table A3.7. Recalibrated radiocarbon dates, showing original reported dates with +/- year error, followed by recalibrated date range (where the 'minus' sign indicates BC) and confidence rating (%)

Altitude	Clwydian Range	North West Wales	30 Mile Radius from Clwydian Range	Brecon Beacons
001-50	0	12.9	1.20	0
051-100	0	14.9	6.02	0
101-150	0	14.9	15.66	6.7
151-200	0	19.8	19.28	3.3
201-250	33	8.9	15.66	13.3
251-300	0	11.9	19.28	16.7
301-350	16.75	7.9	7.23	26.7
351-400	16.75	7.9	7.23	10
401-500	16.75	0.9	4.82	23.3
>501	16.75	0	0.36	0

Table A3.8. Data from Figure 5.8. Hillfort altitudes (%) for selected areas in Wales. See also Tables A3.16, A3.17 and A3.18

	Mean Height	Median Height	Range Height
Clwydian Range hillforts	349.6	333	306
North West Wales	184.2	470	180
30 miles of Clwydian Range	234.6	215	510
Brecon Beacons	318.7	320	353

Table A3.9. Data from Figure 5.9. Average height of hillforts in selected areas in Wales

Input feature	% Summit Visible	% Ramparts Visible	% from "total" polyline
Moel Arthur Ph1	4.963701	5.217547	
Moel Arthur Ph2		5.246158559	5.586547666
Moel Fenlli Inner Ramparts	3.398163	5.83027	6.175743256
Moel Hiraddug Western Enclosure	3.960227	4.0283	
Moel Hiraddug Whole		4.025835	4.138248456
Moel y Gaer Bodfari Inner Rampart	3.077959	3.097696	3.180619239
Moel y Gaer Llanbedr Ph1	2.676042	2.821045	
Moel y Gaer Llanbedr Ph2		2.827601	2.890486614
Penycloddiau Inner Rampart	2.830216	5.99355	6.290188959

Table A3.10. Data from Figures 5.10, 5.22 & 5.33. Comparison of percentage of visible surroundings from Clwydian Range hillforts

	% visible
Penycloddiau Inner Rampart	5.99355
Penycloddiau contours	6.204312
Moel Fenlli Inner Rampart	5.83027
Moel Fenlli contours	5.999504

Table A3.11. Data from Figure 5.28. Comparison of visible surroundings from ramparts and contours of 'tipped hillforts'

Hillfort Entrance	Human Height (1.7m) % visible	Human Height (1.7m) plus feature (3m) % visible
Penycloddiau South	0.232829	0.248847792
Penycloddiau East	0.109416	0.129070236
Moel y Gaer Llanbedr West	0.31818	0.330424787
Moel y Gaer Llanbedr East	0.020166	0.130157629
Moel y Gaer Bodfari	0.121646	0.13653973
Moel Arthur	0.108751	0.120680828
Moel Fenlli	0.260601	0.267131421

Table A3.12. Data from Figure 5.34. Visibility from hillfort entrances

Hillforts	% visible	height (m)	Size (ha)
Moel Arthur	5.586547666	456	1.62
Moel Fenlli	6.175743256	511	8.26
Moel Hiraddug	4.138248456	265	10.74
Moel y Gaer Bodfari	3.180619239	206	1.87
Moel y Gaer Llanbedr	2.890486614	339	2.57
Penycloddiau	6.290188959	440	17.70
Bryn Alyn	0.312655782	58	0.80
Caer Caradog	0.877242137	385	1.54
Caer Drewyn	0.856628572	294	2.93
Castell Caer Seion	2.688813879	244	2.94
Castell Cawr	2.554027253	180	1.58
Craig Adwy Wynt	0.847832052	180	1.67
Dinas Melin y Wig	0.208857408	260	4.74
Moel y Gaer Cefn (Llantysilio)	2.509687809	504	0.48
Moel y Gaer Rhosesmor	6.541295339	303	2.45
Mynydd y Gaer	2.985965233	270	3.35
Pen y Ddinas	1.563342601	100	2.33

Penycorddyn Mawr	0.934909358	160	11.48

Table A3.13. Data from Figures 5.35, 5.36, 5.37 & 5.38. Hillfort visibility, height and area

	Height (m OD)	% visible
Moel Famau Jubilee Tower	554	6.961937
Moel Dywyll	520	4.989108
Moel Arthur hillfort Summit	456	4.963701
Moel Llys y Coed	465	4.790291
Moel Famau 'Flying Site'	474	4.433779
Moel Gyw	467	3.960799
Moel Hiraddug Hillfort Summit	246	3.960227
Mynydd y Cwm	304	3.940952
Moel y Parc Summit	398	3.784762
Moel Fenlli Hillfort Summit	511	3.398163
Fron Hen	458	3.386198
Moel Llanfair	447	3.311747
Gop	251	3.301394
West Llangynhafal Track	398	3.178377

Coed yr Esgob A	211	3.170954
Moel y Gaer Hillfort Bodfari Summit	205	3.077959
Moel y Parc West Spur	317	3.042417
Moel Maenefa	286	2.895708
Moel Evan	358	2.894672
Penycloddiau Hillfort Summit	366	2.830216
Moel y Gaer Hillfort Llanbedr Summit	339	2.676042
Ffrith	370	2.646296
SW Moel y Plas	350	2.632257
Moel y Accre	400	2.557303
Coed yr Esgob B	211	2.336058
NW Moel Arthur	420	2.241715
Moel y Plas	390	2.15656
Marian Ffrith	230	2.075083
Gyrn	384	2.005421
Moel y Waun	412	1.955087
East Bacheirig	318	1.899699
Moel Eithinen	434	1.766784

Moel Plas-yw	419	1.678883
Graig Fawr	153	1.588075
Pen yr Allt	410	1.326264
N Moel Arthur	344	1.320903
Cefn Du	260	1.200407
Moel y Gelli	361	1.07176
Bryn Golau	302	0.708466
Llyn Gweryd	334	0.343264

Table A3.14. Data from Figures 5.2, 5.39 & 5.40. Clwydian Range hill visibility and height

Hillforts	Hillforts within 25k	Visible hillforts within 25km	% intervisible
Bryn Alyn	27	5	18.51851852
Caer Caradog	22	3	13.63636364
Caer Drewyn	35	9	25.71428571
Castell Caer Seion	22	12	54.54545455
Castell Cawr	20	10	50
Craig Adwy Wynt	33	9	27.27272727
Dinas Melin y Wig	27	1	3.703703704

Moel Arthur	31	15	48.38709677
Moel Fenlli	32	23	71.875
Moel Hiraddug	19	12	63.15789474
Moel y Gaer Bodfari	23	13	56.52173913
Moel y Gaer Cefn (Llantysilio)	40	17	42.5
Moel y Gaer Llanbedr	32	14	43.75
Moel y Gaer Rhosesmor	22	12	54.54545455
Mynydd y Gaer	22	10	45.45454545
Pen y Ddinas	21	9	42.85714286
Penycloddiau	28	17	60.71428571
Penycorddyn Mawr	19	5	26.31578947

Table A3.15. Data from Figures 5.41 & 5.42. Hillfort intervisibility

Site name	District	Unitary Authority / County	Height mOD
Braich y Ddinas Hillfort (Destroyed), Penmaenmawr	ABERCONWY	Conwy	350
Caer Bach Hillfort	ABERCONWY	Conwy	400
Camp, Erw Goch	ABERCONWY	Conwy	200
Cerrig y Dinas Hillfort, Llangelynin	ABERCONWY	Conwy	300
Conwy Mountain (or Castell Caer Lleion)	ABERCONWY	Conwy	180
Dinas Allt Wen Hillfort, Above Dwygyfylchi	ABERCONWY	Conwy	240
Dinas Camp Hillfort	ABERCONWY	Conwy	315
Hillfort, N of Cefn Coch	ABERCONWY	Conwy	280
Pen y Castell (Caer Oleu) Hillfort, Maenan	ABERCONWY	Conwy	160
Pen y Ddinas Hillfort, Great Orme	ABERCONWY	Conwy	250
Pen y Gaer Hillfort, Llanbedr y Cennin	ABERCONWY	Conwy	300
Caer (Pen y Gaer) Hillfort, Llanddeiniolen	ARFON	Gwynedd	150
Caer Carreg-y-Fran Hillfort, Above Cwm y Glo	ARFON	Gwynedd	175
Castell Gron, S of Pant Ifan	ARFON	Gwynedd	150

Craig y Dinas Hillfort, Pontllyfni	ARFON	Gwynedd	60
Dinas Dinlle Hillfort, Llandwrog	ARFON	Gwynedd	25
Dinas Dinorwig Hillfort	ARFON	Gwynedd	160
Dinas Promontory Fort, Y Felinheli	ARFON	Gwynedd	15
Dinas Ty-du Hillfort, N of Maen-llwyd	ARFON	Gwynedd	320
Enclosure (Fortified), Gadlys, Llanwnda	ARFON	Gwynedd	85
Hut Group (Enclosed), Llanllechid	ARFON	Gwynedd	270
Maes y Gaer Hillfort, Above Aber	ARFON	Gwynedd	226
Pen y Gaer Hillfort, Cilfodan, Bethesda	ARFON	Gwynedd	260
Pendinas Hillfort, Llandegai	ARFON	Gwynedd	115
Pier Camp Hillfort, Garth, Bangor	ARFON	Gwynedd	65
Small Fort Near Nantlle	ARFON	Gwynedd	210
Carn Fadryn Hillfort	DWYFOR	Gwynedd	350
Carn Pentyrch Hillfort, Llangybi	DWYFOR	Gwynedd	220
Carreg y Llam Hillfort, Site of, Pistyll	DWYFOR	Gwynedd	120
Castell - Hillfort, Pared Mawr	DWYFOR	Gwynedd	100
Castell Caerau Camp, Hillfort, Gyrn Goch	DWYFOR	Gwynedd	220

Castell Hillfort, Above Llanengan	DWYFOR	Gwynedd	60
Castell Odo, Aberdaron	DWYFOR	Gwynedd	146
Circular concentric enclosure, E of Conion	DWYFOR	Gwynedd	185
Circular concentric enclosure, Bwlch y Ffordd Isa	DWYFOR	Gwynedd	65
Circular concentric enclosure, SE of Meillionydd Bach	DWYFOR	Gwynedd	190
Circular/concentric enclosure, Maesoglan Farm, Buan	DWYFOR	Gwynedd	55
Concentric Circle Enclosure, N of Bryn Rhydd	DWYFOR	Gwynedd	50
Concentric circular enclosure, Bodgyri	DWYFOR	Gwynedd	35
Concentric circular enclosure, Castell Caeron, N Slope of Mynydd Rhiw	DWYFOR	Gwynedd	190
Craig y Tyddyn Camp, Hillfort, Dolbenmaen	DWYFOR	Gwynedd	130
Creigiau Gwineu Hillfort	DWYFOR	Gwynedd	220
Dinas Emrys Hillfort	DWYFOR	Gwynedd	130
Dinas Hillfort, Above Beddgelert	DWYFOR	Gwynedd	200
Dinas Promontory Fort, Porth Iago	DWYFOR	Gwynedd	20
Double ringwork enclosure, Pen-y-Gaer, SW of Llanbedrog	DWYFOR	Gwynedd	75

Fortified Enclosure, Wyddgrug	DWYFOR	Gwynedd	85
Garn Boduan Hillfort	DWYFOR	Gwynedd	260
Hillfort, Garn Saethon	DWYFOR	Gwynedd	230
Moel y Gest Hillfort, W of Porthmadog	DWYFOR	Gwynedd	260
Nant y Castell Hillfort, SW of Llanbedrog	DWYFOR	Gwynedd	73
Pen y Gaer Hillfort, Above Aberglaslyn	DWYFOR	Gwynedd	200
Pen y Gaer Hillfort, Llanaelhaearn	DWYFOR	Gwynedd	390
Pen y Garreg Hillfort, Clynnog	DWYFOR	Gwynedd	190
Pen-y-gaer Hillfort, Above Afon Soch	DWYFOR	Gwynedd	80
Possible Hillfort, Mynytho	DWYFOR	Gwynedd	160
Promontory Fort, Trwyn Porth Dinllaen	DWYFOR	Gwynedd	30
Promontory Fort? & Hut Circle (Possible), Ynys Enlli	DWYFOR	Gwynedd	10
Tre'r Ceiri Hillfort, Llanaelhaearn	DWYFOR	Gwynedd	480
Y Foel Hillfort, Pontllyfni	DWYFOR	Gwynedd	220
Bryn Castell Hillfort, Uwch Mynydd	MEIRIONNYDD	Gwynedd	320
Bryn y Castell Hillfort, NW of Llyn Morwynio	MEIRIONNYDD	Gwynedd	370
Caer Euni Hillfort	MEIRIONNYDD	Gwynedd	360

Caer Hillfort, Ystum-Gwadnaeth	MEIRIONNYDD	Gwynedd	320
Castell Mawr Hillfort, S of Rhoslefain	MEIRIONNYDD	Gwynedd	130
Coed Dol Fawr Promontory Fort	MEIRIONNYDD	Gwynedd	180
Craig y Castell Hillfort (Tyddyn y Coed Camp)	MEIRIONNYDD	Gwynedd	252
Craig y Dinas Hillfort, Above Dyffryn Ardudwy	MEIRIONNYDD	Gwynedd	350
Craig Yr Aderyn Hillfort, Dysynni	MEIRIONNYDD	Gwynedd	170
Enclosure (Remains of), Cefn Ddwysarn, Llandderfel	MEIRIONNYDD	Gwynedd	290
Enclosure, Mynydd Mynyllod	MEIRIONNYDD	Gwynedd	370
Hillfort - Foel Caethle, Tywyn	MEIRIONNYDD	Gwynedd	165
Hillfort - Moel Faner, Above Nannau	MEIRIONNYDD	Gwynedd	300
Hillfort - Moel Offrwm Lower Camp, Above Nannau	MEIRIONNYDD	Gwynedd	310
Hillfort (Poss), Dinas Oleu	MEIRIONNYDD	Gwynedd	115
Hillfort, Bwlch	MEIRIONNYDD	Gwynedd	120
Hillfort, Byrllysg	MEIRIONNYDD	Gwynedd	120
Hillfort, Castell Llanaber	MEIRIONNYDD	Gwynedd	300
Llechlwyd Promontory Fort, Tonfanau Quarry, Tywyn	MEIRIONNYDD	Gwynedd	75

Moel Dinas Hillfort, Above Garreg	MEIRIONNYDD	Gwynedd	189
Moel Goedog Camp	MEIRIONNYDD	Gwynedd	380
Pared y Cefnhir Hillfort, Above Llynau Cregennen	MEIRIONNYDD	Gwynedd	370
Pen y Bryn, Defended Settlement	MEIRIONNYDD	Gwynedd	130
Pen y Dinas Camp	MEIRIONNYDD	Gwynedd	230
Promontory Fort, Castell y Gaer	MEIRIONNYDD	Gwynedd	125
Settlement - Moel Offrwm	MEIRIONNYDD	Gwynedd	360
Settlement, Clogwyn Arllef	MEIRIONNYDD	Gwynedd	180
Tal y Garreg hillfort, Tonfanau Quarry, Tywyn	MEIRIONNYDD	Gwynedd	150
Unfinished Enclosure, Craig-y-castell 2	MEIRIONNYDD	Gwynedd	295
Ynys For Defended Settlement	MEIRIONNYDD	Gwynedd	29
Caer y Twr Hillfort, Holyhead Mountain	YNYS MON	Ynys Mon	200
Circular concentric enclosure, Y Werthyr Hillfort, Bryngwran	YNYS MON	Ynys Mon	45
Din Sylwy (Bwrdd Arthur) Hillfort, Llanddona	YNYS MON	Ynys Mon	160
Dinas Gynfor Promontory Fort	YNYS MON	Ynys Mon	50
Dinas Promontory Fort, Porth Ruffydd	YNYS MON	Ynys Mon	15

Hillfort, Caer Idris	YNYS MON	Ynys Mon	55
Hillfort, Mynydd Llwydiarth	YNYS MON	Ynys Mon	125
Parciau Hillfort (Bryn Ddiol)	YNYS MON	Ynys Mon	100
Promontory Fort (Possible), Ynys y Fydlyn	YNYS MON	Ynys Mon	20
Twyn y Parc Promontory Fort	YNYS MON	Ynys Mon	30
Y Werthyr Hillfort, Llantrisant	YNYS MON	Ynys Mon	63

Table A3.16. Hillfort height in north west Wales from Figure 5.5, including data for Dwyfor district, Figure 5.3 and Gwynedd, Figure 5.4

Site Name	Approx height mOD
Bedd y cawr hillfort	150
Beeston	155
Blodwell Rock Camp	225
Bodfach hillfort	184
Breiddin	365
Bron Heulog Hillfort	365
Bryn Alyn promontory fort	58
Bryn Euryn Camp, hillfort	131
Bryn Y Gaer Hillfort	200
Bryngwyn Wood Hillfort	212
Burton Point	8
Bwlch y Cibau enclosure	160
Bwrdd Arthur Hillfort, Llanddona	164
Caer Bach Hillfort	410
Caer Caradog hillfort	385
Caer Ddunod hillfort	290

Caer Drewyn hillfort	294
Caer Estyn hillfort	150
Caer Euni Hillfort	365
Caer Pencraig	130
Castell Caer Seion	244
Castell Cawr hillfort	180
Castell Dinas Bran hillfort	320
Cerrig Gwynion hillfort	460
Cerrig y Dinas, Llangelynin	312
Coed y Gaer Hillfort	355
Coed y Llan hillfort	231
Craig Adwy Wynt hillfort	180
Craig Fawr enclosure	291
Craig Rhiwarth hillfort	532
Craig yr Ychain hillfort	270
Dinas Allt Wen Hillfort, Dwygyfylchi	255
Dinas Llanfairfechan	320

Dinas Melin y wig hillfort	260
Dinorben	160
Eddisbury	158
Gaer Fawr Hillfort	219
Glan Frogan Hillfort	251
Helsby	140
Kelsborrow	136
Llanymynech Hillfort	225
Llwyn Bryn Dinas Hillfort	261
Llys y Cawr Hillfort	281
Maes y Gaer Hillfort	226
Maiden Castle	211
Moel Arthur hillfort	456
Moel Fenlli Hillfort	511
Moel Ffagnallt Hillfort	287
Moel Fodig hillfort	240
Moel Hiraddug	265

Moel y Gaer Bodfari	206
Moel y Gaer Llanbedr	339
Moel y Gaer Llantysilio	504
Moel y Gaer Rhosesmor	303
Mynydd y Gaer Camp	270
New Pieces Enclosure	300
Oakmere promontory fort	75
Old Oswestry Hillfort	165
Olivers Point	140
Pen Llys Hillfort	220
Pen y Castell, Maenan	170
Pen y Ddinas, Great Orme	100
Pen y Gaer hillfort	232
Pen y Gaer hillfort (Llangollen)	290
Pen y Gaer, Llanbedr y Cennin	370
Pen y Gorddyn Hillfort	274
Pendinas, Llandegai	140

Penycloddiau	440
Penycorddyn Mawr	160
Perwlwyn Coppice Hillfort	190
Plas Uchaf Enclosure	129
Pwll y Clai earthwork	208
Roft Promontory Fort	65
Soldier's Mount Hillfort	165
Soldiers Ring Hillfort	270
The Berth	97
Trefnanney Gaer Hillfort	125
Trewylan enclosure	148
Vivod hillfort	335
Winllan Enclosure	190
Woodhouse Hillfort	137
Y Gardden hillfort	179
Yr Allt hillfort	150

Table A3.17. Approx (known) height for hillforts within 30 miles of the Clwydian Range, Figure 5.6

Site Name	Height mOD
Pen Ffawyddog Hillfort; Ffawyddog Gaer Hillfort	107
Cross Oak Hillfort	140
Pendre Hillfort	182
Llangenny Camp	220
Coed y Gaer Hillfort	229
Allt yr Esgair Enclosure	245
Slwch Tump Hillfort	247
Coed Mawr Hillfort	260
Penmyarth Hillfort/Myarth Camp	277
Coed Fennifach Camp	289
Coed y Caerau Hillfort	290
Plas y Gaer Hillfort	297
Coed Pentwyn Hillfort	305
Coed y Brenhin Hillfort	312
Tyle Clydach Hillfort	320
Twyn y Gaer Hillfort	320

Gelli Nedd hillfort	320
Craig y Rhiwarth Hillfort	325
Pen-y-crug hillfort	330
Twyn y Gaer Hillfort	343
Tump Wood Hillfort	356
Nant Tarthwyni Hillfort II	381
Allt yr Esgair Hillfort	395
Nant Tarthwyni Hillfort I	411
Dol y Gaer hillfort	426
Rhyd Uchaf Enclosure II	430
Bryn Melyn hillfort	440
Castell Dinas, hillfort	450
Crug Hywel Hillfort	455
Mynydd Llangorse Hillfort	460

Table A3.18. Hillfort height in the Brecon Beacons, Figure 5.7