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Setting the Scene

Introduction

This study tests the applicability and effectiveness of applying GIS-based analytical techniques within investigations into the morphology and topographical location of a sample of hillforts in Britain. This chapter sets out the study's context by discussing past approaches to hillforts. It begins by detailing how ideas surrounding their appearance has changed. This is followed by an exploration of the key approaches to the examination of hillforts for example through Central Place Theory, typological classifications and investigations focusing on assessing their physical position within the landscape. This background is concluded by introducing and examining the key influences, approaches and aims of this research.

This work was AHRC funded and is part of the Atlas of Hillforts in Britain and Ireland Project; one aspect of this focuses on assessing concepts of regionality within hillforts across England, Wales, Scotland, Northern Ireland and Ireland (2015). As will be explained in greater detail in Chapter 2, this work does not attempt to identify patterns of location which can be categorised as 'national', i.e. typical of Scotland or Wales, as the samples used are small and not representative of the variability between hillforts within any one country. Rather, it utilises the testing of a methodology within a variety of test areas (again, detailed in Chapter 2) as an opportunity to explore the characteristics of topographical setting and the morphological characteristics of hillforts. This enables an investigation into whether there are any similarities and differences which may be meaningful within the wider context of hillforts and their surrounding landscape.

Interpretations of the appearance of hillforts

Immigration

Early hillfort studies focused upon interpreting individual site function and origins. The political climate at the beginning of the twentieth century greatly influenced the directions taken within hillfort studies and this can be seen within Hawkes' work in particular (1931). Hawkes saw hillforts to be the result of conflict due to threats from Celtic immigration (1931). He believed that hillforts protected 'country folk . . . [and] their stock' (1931, 76). His work was also influenced by classical literature as he talked a lot about the movement of tribes and showed that such detailed information could only be retrieved from such writings (Ibid.). It is now generally accepted that these writings focused upon military and political subjects (James & Rigby 1997, 4-5), they formed militaristic propaganda. Hawkes used these writings together with the archaeological evidence as opposed to interpreting the evidence alone.

Four decades later, Hogg analysed the distribution of hillforts along the Welsh coast and argued that their size, form and shape failed to display a clear sense of identity (1972). However, he suggested that their distribution may reflect the spread of people arriving at various points along the coast of Wales (Ibid., 12). Similarly, Chitty assessed the location and date of objects within the Welsh Marches to investigate how and when the people that constructed the hillforts came into the area (1937). Both Hogg and Chitty analysed the archaeological evidence alone. However, by taking into account the distribution and form of various types of sites and material culture they were able to begin to question its wider social implications. This approach was motivated by the foci of contemporary studies which assessed population movement, and is explored below.

Political and social instability: defence or display?

Interpretations based on population movement began to decline and new reasons for the appearance and development of hillforts were suggested. For example, Simpson maintained the belief that when hillforts were constructed there was a mass movement of people (1964). She saw this as an invasion that caused the natives to construct hillforts as a defensive mechanism (1964). However, climate deterioration between the Bronze Age and Iron Age exacerbated land deterioration (Champion 1999, 103), consequently good land was sought after and there was a need to define space (Moore 2007, 274).

Some interpretations revolved around stronger feelings of insecurity, these suggested that hillforts actually originated from a need for defence. Their origins were interpreted as a response to a defensive need and their defensive function defined the site (Sutton 1966). Similarly, Dyer saw hillforts as a military construction which offered the 'best protection possible to its inhabitants' (1992, 5).

For some, morphology defined the defensive function of hillforts. These interpretations imply that hillforts were a design that was based upon a functional need, a design that was enforced upon an area as a result of external stimulation. For example, Hogg's definition of hillforts was based upon sites which had 'substantial defences, usually on high ground and probably built between about 1000 B.C. and A.D. 700' (1979, 1). The topographic and defensive definition of hillforts was also supported by Bray and Tramp who defined a hillfort as a 'fortified hilltop' (1970, 104). Bowden's interpretation argues that the name, form and location of these sites suggest that they are by

definition a defended place (2011, 2). Fox also argued that the form of a hillfort's enclosing earthworks gave it a defensive function, in particular she argued that the sites with widely spaced ramparts were defensive (1961).

On the contrary, other scholars saw the location of hillforts to aid and sometimes define their function. For example, Avery believed that hillforts were distinguished by their height advantage over those who approached them; consequently, he argued that the term 'hillfort' should only be used for sites with this advantage (1976, 4). This view was long standing, for example, Anderson also took location into account but he saw hillforts as an adaptation of an already elevated, defensive location (1883, 271). Similarly, Harding, in the most recent account of hillforts, noted that they may have been 'tactically' positioned to take advantage of naturally defended and visually commanding positions which are also located close to resources (2012, 15).

The defensive interpretation of hillfort function was not adopted by everyone. Very early in Irish hillfort studies, Westropp argued that the enclosing banks and ditches of 'Celtic forts' were a 'passive defence for these houses, and [were] only raised against a sudden attack, not against undermining, battering or other siege work' (1896/1901, 638). Similarly, Crawford and Keiller argued that the enclosing earthworks at sites such as Hod Hill 'were designed to repel invaders, not to stand a siege' (1928, 8). This interpretation was maintained by Bowden and McOmish who highlighted that during the Iron Age, there were underlying tensions that meant that there may have been militaristic motivations, but sites were developed to repel aggression (1987). They also argued that hillforts formed centres for a 'detached elite' and enabled them to legitimise their place within the social system as opposed to offering a safe place (Ibid.).

However, Lock argued that interpretations which relate to the appearance and maintenance of hillforts need to move away from giving the impression of a period of endemic warfare (2011). He based his interpretation on the fact that there is limited evidence for warfare across Britain, although he admits that hillforts may still have resulted from feelings of insecurity (Ibid.). Instead, based upon the rise in defining communities through enclosure, Lock argues that cosmological threats were seen to risk the cohesion of the social group (Ibid.). Activities and places were created to enhance and protect social cohesion, an example of such an activity could be the maintenance of agricultural land and the construction and maintenance of hillforts (Ibid.).

Similarly, Fox recognised that hillforts were used in times of peace (1961). During these times, the morphology of the enclosing earthworks had a social and ceremonial function as they provided 'an approach of dignity to the principal enclosure' (Fox 1961 45-46). Cunliffe saw the definition and form of hillforts to have changed over time in relation to defensive need (1971). According to Cunliffe, the gates to these structures were initially designed to impress but by the first century BC they formed a defensive function (Ibid., 66).

However, Westropp had much earlier argued that the enclosing works to a hillfort were an accessory and not a necessity (1896/1901, 638). The non-defensive interpretation of banks and ditches has increasingly been adopted by researchers. For example, Harding argues that multivallation is not necessarily evidence for hillfort development, it may have been used as a status symbol to impress (2012, 13). Hillforts were not necessarily defensive, similarly the expenditure upon enclosing works was not always directly proportional to the defensive need to enclose (Ibid.,13). Hamilton and Manley also argued that the enhancement of hillforts and the delineation of space outside of them was an indicator of competition between hillforts rather than defensive (2001).

A non-utilitarian interpretation of hillfort enclosure was also put forward by Hingley who argued that their banks and ditches potentially distinguished insiders from outsiders so that they were about inclusion and exclusion (1990). This interpretation was also reflected within Richard Bradley's work which saw hillforts as public monuments (2005). Harding also acknowledged that hillforts may have been positioned to be visually prominent (2012, 15), which was also argued by Sharples (2010) and Cunliffe (2006). The creation of such visually prominent monuments could have been in an attempt to legitimise the status and/or social position (Parker Pearson 1984, 71) of those that were within the site. Kelly argues that there should be a dichotomy between 'public and restricted performance sites' (2015, 27), however in the case of hillforts the writer wishes to investigate whether this is visibly the case. The process by which the visibility of the enclosing works of hillforts compared to their interiors provides an insight into the public and/or private nature of hillforts is explored later in this book.

A central place

Although there was a great deal of variation within interpretations as to why and how hillforts began to be constructed, these sites were predominantly interpreted as 'central places' i.e. they served a wider, dispersed community. However, interpretations surrounding the extent and role of these central places have varied greatly. As a place for community activities, it was believed that their role as a central place may have varied over time. For example, Collis argued that hillforts are evidence of the centralisation of defence (1994a, 34; 1994b, 131) and redistribution (Ibid. 1994b, 131). Similarly, Köhler saw them as acting as defence for a community with their location also being advantageous for access to resources (1995, 165).

Interpretations of hillforts being central places went beyond seeing them as places that satisfied a practical and functional need towards seeing them as a place of social interaction. For

example, in the 19th century, Westropp saw Irish hillforts to have acted as places of assembly such as a church or a place of worship; however, he also postulated that they could have been cattle enclosures (1896/1901, 637). Much later, Harding amongst others, also saw hillforts as places of assembly for ritual or social purposes (2012, 282). According to Barclay and others 'the hillfort created an obvious and visible site and was also a focus of communal action which bound people together' (2003, 250). As Sharples argued, the construction of enclosures such as hillforts defined the relationships of the people that were involved within this process (2010). The construction of hillforts was a change, a change of site form; which was inevitably caused by wider social changes. Community is spatially defined (Lock and Gosden 2005, 133), in this case they were potentially defined, on one level, by the walls of the hillfort. These communities arose from 'historically embedded relationships and are nurtured through encountering and reacting to new situations and people' (Ibid.).

Approaches to hillfort research

Landscape analysis-systems theory

Central Place Theory was introduced by Christaller in 1933 (Ullman 2005) and was popular in archaeology during the 1970s. It worked upon the basis of a 'functional interdependence between a town and the surrounding rural area' (King 1984, 29). This form of economic modelling was used by Clarke to assess the distribution of sites surrounding Cadbury hillfort in Somerset (1972). Through modelling the settlement pattern, Clarke postulated a landscape scale site hierarchy, with Cadbury being the central place that was surrounded by a series of dependent settlements and farmsteads (Ibid.). Also on a hierarchical basis, Cunliffe saw hillforts as home to ruling elite (1972; 1978). On a socio-economic basis, Cunliffe also postulated that the elite also lived in the 'large farmsteads of Little Woodbury type' and those that they ruled over brought surplus to the hillforts which acted as redistribution centres and areas for group gatherings (Ibid.,333).

Still in the 1970s, Hogg recognised the difficulty in defining territories with such a limited number of sites that were positioned in clearly defined land units (1971). He therefore tested quantitative methods of calculating territories (Ibid.). The most popular method was Thiessen Polygons. This modelled site territories, and weighted distances between the hillforts and their territorial boundaries (Ibid.). However, using models to define territory is not realistic, as if territories did exist during the Iron Age, they would not have been calculated through modelling. The land units associated with hillforts, for example, could have been defined by the land's ability to provide the community with the required resources, Cunliffe defined this as a 'zone of exploitation' (1991, 24).

Regardless of their unrealistic expectations, the application of Thiessen Polygons to hillfort research encouraged the equation of enclosure size with territories (Hogg 1971). Williams equated enclosure size with importance and argued that size was a direct reflection of the amount of surplus which came from the surrounding landscape (1988). This surplus, and subsequently the size of the site, was affected by the quality and type of land that was within the settlement zone (Ibid.). The correlation of site size with site importance was argued earlier by Clarke who stated that within a 'fully developed, Celtic settlement hierarchy' the largest sites (oppida) provided the highest order goods and services (1972, 864). Equating a site hierarchy with a social hierarchy became influential in Cunliffe's later interpretation of hillforts and enclosures in Hampshire. Here he argued that the size, siting and complexity of hillforts implied that they were built under coercion. This set them aside from other settlements as the construction of such a site would have needed a large group of people (1972; 1978; 1991).

Another big influence upon hillfort studies in the 1970s was systems theory. This suggested that to understand an object or a site, an understanding of the cultural system within which it sits needs to be established (Clarke 1978). This is a 'unit system in which all the cultural information is a stabilized but constantly changing network of intercommunicating attributes forming a complex whole-a dynamic system' (Ibid., 42). The need to understand systems through a series of single sites was suggested by Hodges' who recognised that to be able to identify the trade networks of hillforts within Ireland there needed to be more excavations (1975).

Systems Theory influenced research programmes. At Danebury for example, to question the 'system' and the site's function Cunliffe employed a large sampling strategy (Cunliffe 1984; Cunliffe and Poole 1991). Within the first series of excavations (1969-1978), focus was put upon sampling as much of the site as possible to establish a site function and construction sequence (Cunliffe 1984). The excavation was accompanied by an aerial photographic interpretation of the landscape around Danebury; this depicted the settlement pattern (Palmer 1984). Subsequent excavation seasons (1979-1988) continued the extensive process of sampling to establish a site chronology at Danebury (Cunliffe and Poole, 1991). This work provided the basis to understanding Danebury's function within its wider landscape context. Danebury is one of the country's most extensively excavated hillforts and provides a dataset where questions of functionality could be feasibly answered. Cunliffe acknowledged this potential and continued to try to establish the function of Danebury within his latter Danebury Environs publication where he also aimed 'to forward our knowledge of the organization of the landscape in the first millennium BC' (2000, 14)

Although there has been an extensive investment into the investigation of Danebury and its landscape, Cunliffe acknowledges that any 'system' in one area was not necessarily the same as in another (2001). Regardless of whether scholars acknowledged the potential for cross-regional variation in social systems, designing research

projects to investigate system mechanics as opposed to questioning their existence immediately implies that systems were indeed in place. This also imposes a system and rigidity upon the archaeological record that may not have existed within the past.

The role of enclosures within a hillfort system, is there a difference?

Central Place Theory influenced the socio-economic interpretation of hillforts as a comparison to other enclosures. Cunliffe saw hillforts as a level of social organisation that was above a farmstead or a hamlet that were potentially separate phenomena (1991, 312). Cunliffe also argued that the presence of these substantially 'different' sites created social difference (Ibid.), similarly Champion believed that hillforts were a means to social differentiation due to their economic role (1994, 133). According to Stanford, hillforts were a different class to enclosures because of the density of buildings and the types of houses that were in them (1971, 48).

These interpretations imply that enclosures were of a lesser social status or of a lesser social function than hillforts, although this has subsequently been argued against. Some areas lack hillforts entirely, these are visible in Figure 1. The absence of hillforts within these areas implies that hillforts per se did not have a fundamental role in social organisation or social activities that could not be undertaken elsewhere. This is supported by both Harding and Hill who noted that there is no evidence for any specialist activities having taken place in hillforts which did not in enclosures (Hill 1996, 99; Harding 2004, 295).

McOmish has suggested that the difference between hillforts and enclosures was that the latter had a greater longevity of use and were less disrupted than the former (1989, 108-109). Enclosures have been more disturbed by modern agricultural practices as they tend to be located in lowland areas where this activity is at its highest, whereas the majority of hillforts are located in uplands and are less susceptible to damage.

Bradley argued for a continuum of enclosure which meant that small enclosures could still be interpreted as hillforts (2007, 247). The idea of a continuum of enclosure was maintained by Wigley who saw indications for the evolution of enclosure techniques from the simplest enclosure to the more complex and impressive hillfort (2007). These interpretations were related to an increase in the investigation of site morphologies.

Typologies and classification systems

In the Nineteenth Century Anderson assigned very broad typologies to Scottish hillforts; these were based upon whether or not they were of stone or earth construction (1883). However, hillforts came to be increasingly classed on a cultural basis. For example, the map of Southern Iron Age Britain was based upon geographical location and cultural affinities which had been gleamed from material culture derived from excavations (Rivet 1961, 30-31). Similarly, Piggott developed a classification of Scottish hillforts which was based on the cultural affinities of those who constructed them (1966).

Chitty's map of the Iron Age B south-western culture plotted 'camps' based upon their entrance type (1938). This typified the increasing focus upon hillfort typologies, for example, although the map of Southern Iron Age Britain was primarily based upon Iron Age cultures it also plotted the size and vallation of the hillforts (Rivet 1961). The vallation categories were divided into multivallate and univallate whilst site size was categorised as: under 3 acres, 3-15 acres and 15+ acres (Ibid. 1961).

Forde Johnston also defined hillforts on a morphological and locational basis (1976), he identified seven location types which were;

- Hill-top situations
- Promontory and semi-contour situations ('sites in which there is an easy, or relatively easy approach on one side, the other three sides being defended either completely or in part by nature'),
- promontory and semi-contour situations ('the approach to the site is on a front which accounts for roughly half the circuit')
- ridge-top situations ('embraces sites in which there is an easy or relatively easy approach on two sides')
- cliff-edge and plateau-edge situations ('there is a level, or at least an easy, approach on three sides with natural defences only on the fourth side')
- Hill-slope situations
- plateau and low-lying situations

Based on morphology he produced eleven site types:

- Type I – single enclosure site of 2-12ha, with single banks and ditches and a simple gap or inturned entrance
- Type II – single enclosure site with stronger defences than Type I (size and/or 2 banks and ditches), inturned or entrance cut through defences
- Type III – single enclosure site up to 20ha, strong multivallate defences and elaborate entrance
- Type IV – Very large singe enclosure 23ha+, univallate and multivallate
- Type V – small single enclosure site (less than 2ha), simple defences, simple entrance and many sites are circular in plan
- Type VI – small single enclosure site, multivallate (up to 4 banks and ditches)
- Type VII – Coastal promontory forts
- Type VIII – Small multiple enclosure site, simple entrance
- Type IX – Very large multiple enclosure site, simple entrance
- Type X – Standard size multiple enclosure site, with univallate/multivallate defences, entrances same as I and II

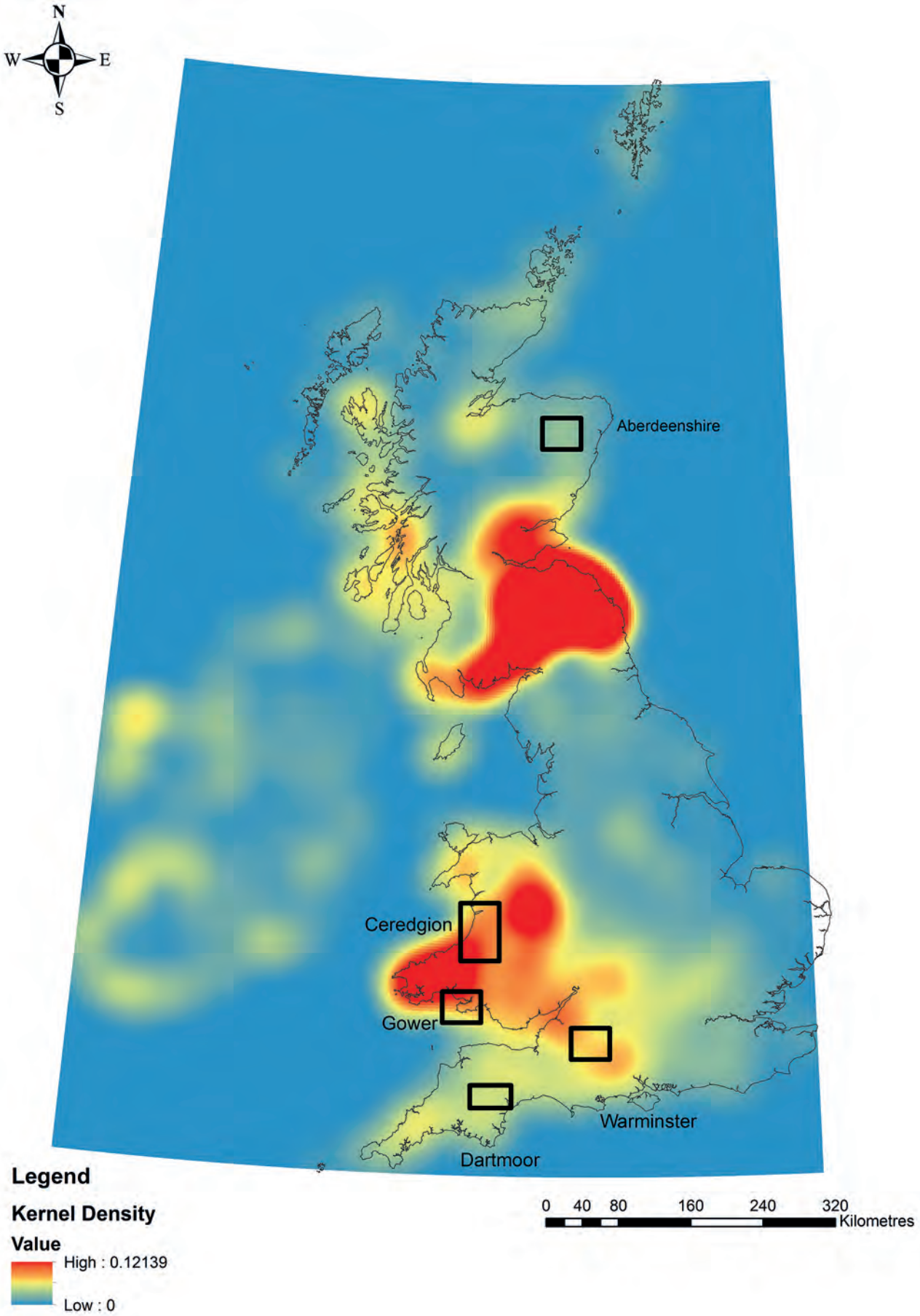

Figure 1 Distribution density map of Hillforts in Britain (©Atlas of Hillforts in Britain and Ireland Project 2018; Contains OS data © Crown copyright and database right (2018))

- Type XI – Multiple enclosure sites with enclosures physical separate

RCHAMS in 1915 and Forde-Johnston based their typologies upon physical evidence as opposed to enforcing an interpretive classification. Forde-Johnston also classified the regions where the site types occurred, here he defined Type I- IV and Type X-XI as the Wessex tradition and the remainder the Western tradition (Ibid.). This demonstrates that the concept of 'culture' and cultural groups still had an influence within archaeological research even when the focus of the work had changed.

In Wales and the Marches, the distribution map of hillforts and defended enclosures emphasised site size. For example, Simpson defined classes as over 15 acres, 3-15 acres and 3 acres (1964). Similarly, Hogg mapped the hillforts of south-west Britain (including Wales), south-east Britain and northern Britain (including Scotland) based upon size but also using their vallation type (1975).

Defining hillfort typologies based upon banks and ditches has been prominent across Ireland from an early date. Westropp's study of Irish forts initially focused upon their architectural features although he later arranged them into regions, subsequently he arranged them into types (1896/1901). Looking at Westropp's site types, ringforts seems to be the only class which could include hillforts, he divided them by size; 'typical' and 'large' sites (Ibid.). His other classes of site included 'the walled islands' which were marsh and lake forts, and rectilinear forts which were later in date than the curvilinear walled structures of the Bronze Age. According to Westropp, the second most important site type is the cliff/promontory fort whose defence relied upon cliffs or slopes. His final class of site was motes (both simple and complex) (Ibid.). Much later, Raftery compiled a classification system that was based upon the character of enclosing earthworks (1972). This included 3 classes, class 1 comprised sites with a single line of defence; class 2 had two or more lines, and class 3 were inland promontory forts (Ibid.).

Instead of basing typology on the number of banks and ditches, Fox used their form, particularly their spacing. Here, she distinguished hillforts on the basis of whether they had closely spaced or widely spaced ramparts (1961). Like the map of southern Britain, Fox contextualised her discussion of hillfort morphologies with pottery typologies which led her to imply that the hillforts had cultural affiliations (Ibid.). This idea of cultural regionality was continued by Feachem who also explored hillfort typologies spatially through their morphology (Ibid.)

Although the basis of typologies moved away from a primarily cultural one, there was still a strong sense that some had a social interpretation applied to them. For example, in the 1967 RCAHMS survey of Peeblesshire functional meaning was implied within the typological series with site types such as 'homesteads' (1967). The typological series comprised:

- Unenclosed Platform Settlements
- Palisaded Works
- Homesteads and Settlements with Timber Houses
- Forts
- Dun
- Settlements with Stone Houses, and Field-systems.
- Scooped homesteads and scooped settlements

The application of social interpretation upon typological systems continued with the 1994 RCAHMS survey of south-east Perth (1994). In this instance the interpretive impact was not to the same extent as in other examples as the majority of the classes were based upon physical form, the only interpretive category was 'fortifications':

- Unenclosed circular buildings
- Enclosed crescents
- Palisaded sites
- Fortifications
- Enclosures
- Interrupted ring-ditches
- Souterrains
- Cropmarks of rectangular buildings

However, the concept of typologies was not adopted or agreed with by every scholar. Individually hillforts do not have a uniform morphology particularly the number of banks and ditches, for example Pen y Bannau in Ceredigion is univallate on all sides apart from its north-eastern side which is multivallate. Consequently, the distribution maps that are based upon vallation sequence are a very broad generalisation of hillfort typologies that do not reflect reality. This was highlighted by Bedwin who stated that the 'blanket term 'hillfort', is probably more of a hindrance than a help' (1984, 47). Harding also argued that classification systems imply regularity in design and function that may never have been intended (2012, 14).

Recent views typified by Driver have moved away from typologies and have examined the variability of hillfort morphology in Wales on a site by site basis (2005a; 2005b; 2007; 2013). Driver's views are explored and expanded upon later in this book. However, as a generalisation, Driver examined hillforts in relation to the topography by assessing whether or not the hillfort morphology adhered to the topography, or whether a design was enforced upon the landscape. At Castell Grogwynion, for example, Driver found that in order to implement a straight façade the northern terrace had to be cut through the bedrock (2005b, 97; 2013, 132). To test this further, Driver examined and compared how individual sites responded to topographical situations. In the majority of cases, he found that the hillforts did not follow the principal of least effort as might be expected (Ibid. 2013, 133).

Driver also investigated the degree to which the morphological components to these sites were functional or symbolic (2005a; 2013). He found that topography could be utilised to falsify an image. For example, it was found that the impression of the banks which enclose a hillfort

could be accentuated and falsified by the slope and form of the land on which it was constructed. In some cases, the nature of enclosing banks and ditches and entrances went beyond satisfying a functional need towards a symbolic accessory.

Driver's assessment of hillfort morphologies required the hillforts to be broken down into their core architectural components (2005a; 2013). This allowed him to study the morphological variation within and between sites, he was no longer reliant upon static site typologies (Ibid. 2005a; Ibid. 2013). Breaking down sites into their core components allowed Driver to analyse patterns across his study area. This allowed him to question whether they exhibited evidence of regionality (Ibid. 2005a; Ibid. 2013).

He also studied the variable morphology of the hillforts in relation to the dynamic landscape in which they sit. This landscape was defined as one of movement and visibility (Ibid. 2005a; Ibid. 2013). He accounted for how the morphology of a site varied across its circuit in relation to the location of routeways, topographical features and contemporary sites (Ibid. 2005a; Ibid. 2013). This enabled him to investigate what influenced site location and form, for example was it solely the terrain or were they designed to portray a particular image by disproportionately allocating resources within a particular area of the site (Ibid. 2005a; Ibid. 2007; Ibid. 2013). This approach was suggested by Cunliffe as a means of gaining a finer understanding of these sites (2006).

Landscape analysis – hillfort location

As shown above, positioning hillforts within a socio-economic hierarchy was prominent within hillfort studies in the 1960s and 1970s. However, in recent years the physical position and act of 'experiencing' hillforts within their landscapes have come to be more central in hillfort studies. This humanistic approach is primarily based upon movement and visibility, and investigates how these factors may have informed social relations within a landscape setting. An early example is Avery's analysis of the location of Cashel na Veen. Here he argues that its location afforded high visual accessibility both to and from the site (1991/1992).

Hamilton and Manley investigated the function of hillforts in south-east England by examining the correlation between their location and morphology (2001). This was chronologically contextualised through an examination of the sites within their landscape context (Ibid.). This chronological approach was used to investigate changes in ideology and argued that the construction of hillforts was an expression of social and cultural meaning (Ibid.). They found that the hillforts which dated from the late Bronze Age and into the early Iron Age were located on the edge of topographical land units, but had long distance views. This led them to argue that these sites were not central places, but served to connect people and landscapes (Ibid.). This was enhanced by analysis of the site morphologies, which showed that the sites of this period were simple, but with few morphological and locational similarities (Ibid. 2001) whereas Middle Iron Age sites were more elaborate and their interiors were visible from outside of the sites (Ibid.). Hamilton and Manley's study suggested that hillforts within south-east England were located to promote access to information (Ibid.). Initially they were placed to have maximum visual accessibility to the surrounding landscape, later they were positioned to be highly visible from the landscape itself (Ibid.).

Contextualised studies of hillfort location have moved beyond a chronological basis towards an assessment of material culture. For example, Driver investigated the directionality of movement within the landscape in relation to hillfort location and morphology by looking at the origin and distribution of material culture such as small finds (2005a). Chitty had also approached movement in a similar way in the Welsh Marches to answer questions of how and when people came into the area (1937). However, I would argue that the reliance upon interpreting object location and movement as the delineation of group areas and directions of movement is questionable. It is not known whether these objects came directly from the source to the hillforts, or if they had been curated and circulated for some time prior to their final deposition. If this was the case then Driver's and Chitty's directions of movement were not direct.

Driver also related his analysis of movement within the landscape to the visibility of hillfort interiors and the core components of their morphologies such as ramparts and entrances (2005a). This approach aided his investigation of image and function. The relationship between hillfort morphology, movement and topography had previously been examined by Mytum and Webster at Carn Alw (1989). Mytum also modelled the land before, during and after hillfort construction to assess variation in earthwork form and the changing view of the site on arrival and approach (1996).

Some of Driver's key observations and ideas were introduced earlier in this chapter. The first of which was the investigation of the physical relationship between hillfort location and morphology (2005a and 2013). The investigation and relevance of this relationship resonated throughout the remainder of Driver's key discussion, the second element of which was image (functional vs symbolic). This occurred when a hillfort portrayed an impression of strength and prowess (i.e. increased number of banks and ditches, elaborate entrance) within an area of high visibility or where there was a lot of passing traffic. This was defined as symbolic as opposed to functional because the physicality of the site's architectural components went above and beyond their functional need. The portrayal of an image was also seen as front/rear symbolism, where although superficially some hillforts appeared to be complete, they were not morphologically homogenous. They portrayed a public front and a private interior/rear, for example when one side of a site had a

greater number of banks and ditches than the others. In military functionalist terms the greatest number of banks and ditches may have been placed within an area where the hillfort was more susceptible to attack. It could be argued that this would be symbolic if the banks were most numerous where the land was steeply sloping and/or highly visible from neighbouring and contemporary hillforts.

Image was also discussed by Driver in relation to examples of 'a correct path of movement' (2013, 137). This was previously approached by Parker, Pearson and Richards at the Bronze Age enclosure of Springfield Lyons where a 'correct' path was found that kept refuse and cooking activities out of sight (1994). Driver found that in some cases, direct pathways into sites were obstructed by site morphologies, for example at Pen Dinas Elerch and Castell Grogwynion where bastions created such an obstruction. The act of obstructing direct access and routing people along particular pathways likely extended entry into these sites to enhance feelings of anticipation. In some cases, routing people in particular directions may have heightened their experience of coming across certain aspects of a site. These routeways may have been designed to both impress and conceal.

These earlier investigations of hillfort location and morphology are a fundamental influence on the approach that is adopted within this study. The following section details how past approaches will be enhanced and moved forward.

The enhancement of earlier approaches to hillforts within the landscape

As discussed, recent studies have investigated the morphology and location of hillforts to tackle issues relating to social organisation and identity. Hillforts are not a uniform entity that can be explained through typologies (Driver 2005a; Driver 2007; Driver 2013). The current focus of questioning hillfort typologies is primarily based upon non-GIS, topographical and fieldwork analysis that are generally applied to individual areas. To develop upon this approach, and to concur with the extent of the Atlas of Hillforts in Britain and Ireland project, this study examines a series of areas which are spread across the project area. The large scale of this work meant that the interpretation of the data is on multiple levels, beginning with individual sites, then moving on to test areas; these are then compared and contrasted across regions of Britain and Ireland. The multi-scale analysis and interpretation of this study enables a broader understanding of hillforts which has never been possible before due to the constraints of small study areas and the barriers of modern administrative boundaries.

The large scale of this work is enhanced and enabled by its predominantly GIS-based approach as this effectively analyses large volumes of data. Since the early 1990's, GIS has been used within archaeology. GIS is a 'data management tool and . . . a methodology in its own right' (Chapman 2006, 9). It was slow to diffuse within archaeology in the UK (Harris and Lock 1990). However, archaeologists who were closely associated with the planning process came to be increasingly aware of GIS applications used by planning authorities (Ibid.,36). GIS permits 'much greater flexibility . . . [in] structuring . . . raw data and . . . [enables] both map-based and quantitative approaches' (Ibid., 47). It allows one to display and analyse large quantities of both spatial and thematic data (Ibid.,47).

As GIS came to be increasingly adopted by archaeologists, it began to be integrated within quantitative analyses. In particular it was frequently used in predictive modelling (Wescott and Brandon 2000; Connolly and Lake 2006, 34-35). It was also used to model movement and visibility within landscapes in relation to archaeological sites (Connolly and Lake 2006).

This work harnesses GIS' ability to store, display and analyse multiple types of data, to encourage the further interrogation of the data and results in the future. It also encourages the application of similar studies to other regions to enhance our understanding of the hillforts in Britain and Ireland. This study will create a body of data that will continue to increase over time and as new methodologies are developed they can be applied to an existing dataset. This would not have been as possible with the earlier non-GIS-based studies of visibility such as Renfrew's analysis of visibility from tombs on Orkney (1979). The reliability of this work was based upon the drawing and mapping capabilities of Renfrew, and as Fleming highlighted, such studies are often very difficult to go back to and investigate due to human drawing error (1999).

To avoid issues of human drawing error and to manage large quantities of data, this study's analysis is primarily GIS-based. However, the results from this analysis are qualitatively enhanced by field visits and site photography. This demonstrates how the visual and physical prominence of each site is affected by movement and distance by taking photographs of the hillforts from varying distances and directions. The combination of GIS-based analysis and fieldwork has been applied to other landscape projects, for example, Arbour used GIS-based analysis both pre- and post-fieldwork to test the reliability of the field work and the accuracy of viewshed calculations (2011). Similarly, within the Lismore Landscape Project a combination of photography and viewshed analysis was used to investigate the visibility from a site (Redhouse, Anderson et al. 2002). This creates a realistic visualisation and basis for analysis and interpretation because these photographs are taken within a real environment with real weather and real vegetation which can all effect visibility.

Hamilton and Manley assessed visibility both to and from hillforts, unlike many visibility studies, they explored directions of visibility and depicted it in pie-charts (2001). This depiction is not as clear as it would be by using GIS such as ArcGIS viewshed analysis. Pie-charts

do not inform the reader of the extent of visibility, neither can they determine which areas are visible, for example if a particular hill is visible or not. This is all possible when using GIS-based techniques such as Viewshed Analysis which is now often reported (Field and Smith 2008; Dorling and Wigley 2012). However, the use of Viewshed Analysis within these papers is based upon binary viewsheds which simply depict whether something is visible or not. As it will be shown later in this book, visibility is not definitive and it is affected by distance, atmospheric and environmental conditions.

Moves in this direction have been made by Ruestes as she believed that visibility and distance affected and informed socio-economic relations (2008). Instead of relying upon the limitations of a binary viewshed, bands of visibility as defined by the effect of distance upon visual clarity were applied to the results of the viewshed analysis (Ibid.). The viewshed analysis results were then investigated to examine how the site's ability to have visual control varied although she failed to clarify how one could gain such control (Ibid.).

Whilst this study uses GIS-based analysis to question the archaeological record, it also questions the effectiveness of using this software as a tool to answer these questions. The questions under consideration are Driver's key conclusions of the relationship between topography and morphology, image and correct pathways (2005a and 2013). The first of which is assessed with the analysis of LiDAR imagery, aerial photographs, site plans and DTMs. This analysis helps to examine the physical relationship between the topography and the morphology of the hillforts, to assess how the latter adheres to the former. The degree to which the form of the land is utilised within the construction of the hillfort is also examined to identify whether or not the form of the landscape in conjunction to the morphology of the hillfort was used to manipulate images of the hillfort.

The concept of image is developed further within this study, just as within Driver's work, the idea of utilitarian vs symbolic is tackled. In particular, the spatial allocation of resources such as material, time and people in relation to the hillfort morphology is investigated. In some cases, emphasis has been put upon one side, for example the side which faces an area of a large degree of human traffic or where it is highly visible from the surrounding landscape. This element of hillfort morphology is assessed through a combination of cost surface, viewshed and fieldwork analyses. This enables the examination of the access to and visual qualities of the hillfort alongside an analysis of morphology.

Movement is also a key feature within Driver's third element, which is 'correct pathways' (2005a and 2013). Here, entrance morphology and the positioning of other features such as outworks or bastions affected movement to and through the hillfort. Although Driver based his correct pathways upon hillfort morphology, they could also be based on a least cost pathway. This study aims to investigate whether correct pathways, as defined by both slope and visibility, existed at these sites and whether they correlate with entrance-ways or other particular morphological components such as the most extensively enclosed area.

The analytical process within the investigation of 'correct pathways' is a two-stage process and is explained in more detail in the next chapter. However, firstly, the methodology is applied to a group of hillforts within Driver's study area to examine how effective his non-GIS-based conclusions were compared to those reached from this GIS-based analysis. This also aims to question Driver's concept of a correct pathway. For example, it investigates whether the non-extant pathways (slope-based or visual pathways) correlated with a hillfort's entrances or earthworks. This approach was inspired by the work of Lee and Stucky, and Lock and colleagues who saw visibility as a highly influential factor in pathways (Lee and Stucky 1998; Lock et al. 2014). This was undertaken by integrating visibility with movement through Cost Surface Analysis. This approach has not been applied to hillforts and it shows great potential for the investigation of movement and visibility in relation to hillfort morphology, at a scale that has never been used before, i.e. the human scale.

Individually, visibility and access analysis have been factored into site analysis to varying degrees for some time. For example, as described above, Hamilton and Manley argued that through analysing the chronological variation of the visibility of hillforts one could understand their changing role (1997; 2001). However, they failed to take into consideration that with distance visual clarity decays. The work presented here incorporates visual decay through distance by using bands of visibility. Such banded visibility was used within Ruestes' analyses of Iberian hillforts (2008), as described above. The difference here is that the visibility of the hillforts from the bands as well as the visibility from the hillforts is used to achieve a fuller understanding of visual variability within the wider landscape context.

This analysis of visibility enables one to question the degree to which the hillforts were integrated into the wider landscape, for example how a site 'affords' the act of being seen (Gibson 1979; Wheatley and Gillings 2000). This is manifested through 'strategies of visibility' such as monument construction' (Wheatley and Gillings 2000) and it is these which are under investigation within this book. Strategies of visibility bring hillforts into being within a person's world (Ingold 2000, 21). However, by integrating movement with visibility through Cost Surface Analysis, this study acknowledges the importance of movement within peoples' engagement with the landscape (Ingold 2000, 55; Ingold 2011).

People 'know as they go, as they journey through the world along paths of travel' (Ingold 2011, 154). Consequently, by investigating the visual qualities of pathways this study has the opportunity to identify areas where the landscape

afforded people the opportunity to obtain visual information about their surroundings. The process by which this study investigates both the strategies of visibility, and knowledge acquisition through wayfaring (Ingold 2011) is explained in detail within Chapter 2. However, as Barrett suggested, events and activities such as site construction all occur as a result of peoples' ability to interpret situations with their understanding of the past and the present (1999, 24). Consequently, this study assesses the evidence for hillfort morphology and location through a contextualised assessment of their wider landscape context, the method by which this is undertaken is also detailed in Chapter 2.

Chapter 1 highlighted the theoretical underpinnings and influences to the approach within this book which set the scene for the study. Chapter 2 subsequently develops upon this introduction to introduce the methodology used as well as highlighting the fundamental research questions asked and how the methodology is used to answer them.