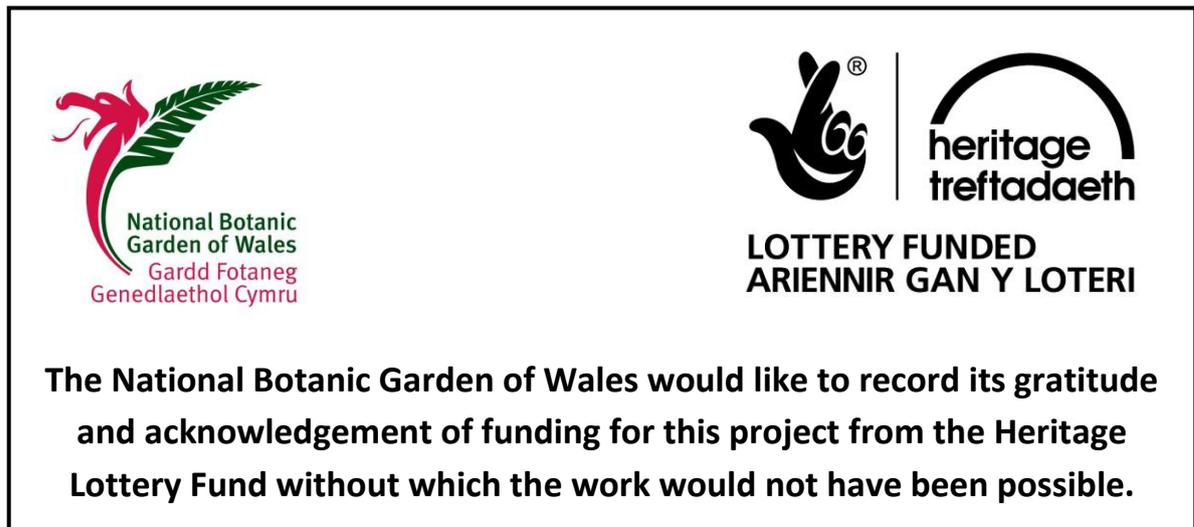


Middleton: A Paradise Lost

In search of a garden before the Garden

Report of a project conducted in 2011
Edited by Professor David Austin





Title Page Illustrations:

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Top: Catalogue no: PHI 00391. Morandi, Joannes Baptista, (fl. 1744). *Historia botanica practica, seu, Plantarum, quae ad usum medicinae pertinent, nomenclatura, descriptio, et virtutes, cum ab antiquis, tum a recentibus celebrium auctorum scriptis desumptae : opus equitis Joannis Baptistae Morandi Mediolanensis, botanici, galenici, pictoris*. Mediolani: Apud Joseph Galeatium, 1761.

First ed. published: Mediolani : Ex typographia Petri Francisci Malatestae, 1744. Engraved half title: *Historia botanico-practica stirpium, atque herbarum, quae ad usum medicinae pertinent / eques Joães Bãpta Morandi, inventor, delineator, et sculptor*. Book-plate: Ex libris Starrensteid. Label mounted on t.p.: Doctor Carl Alexand. v. Palkovics, Ord. Physicus zu Gran. Presented by Thomas Phillips, 1840.

Bottom Left: Catalogue no: PHI 00514: Jacquin, Nikolaus Joseph, Freiherr von, (1727-1817). *Nicolai Josephi Jacquin observationum botanicarum / iconibus ab auctore delineatis illustratarum. Pars I. [-IV et ultima]*. Vindobonae : ex officina Krausiana, 1764-71. Presented by Thomas Phillips, 1844

Bottom Right: Catalogue no: HPHI 014: Straet, Jan van der, (1523-1605). *Venationes ferarum, auium, piscium : pugnae bestiariorum & mutuae bestiarum*. Depictae a Ioanne Stradano : editae per Nicolaum Vischer ... [Antuerpiae : Apud Ioannem Gallaeum, 1630?]

Engravings signed by Ioan. Stradanus, Ioan. Collaert, Ioan. Galle, Carol. de Mallery, Corn. Galle, Theodorus Galle. A reissue of the preceding edition, with the name of Joannes Gallaeus substituted for that of Philippus Gallaeus on all the plates. Presented by Thomas Phillips, 1846

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Executive Summary

Results of the HLF-funded project:

1. Execution of a well-conceived and well-conducted survey and excavation programme on the original site of Middleton Hall and delivery of the originally envisaged project objectives to budget and on time.
2. The enhancement of our knowledge of the pre-Paxton, Middleton landscape with the confirmation through excavation of the site of the house, formal gardens and water systems. These have survived well in the archaeological record and can be dated back to the late 16th century.
3. The building of a strong volunteer History Research Team with a working relationship with the university partners.
4. Foundations laid for a strong cross-sectoral partnership to further the interests of the NBGW's history and cultural landscape in light of its strategic plans. This includes draft ideas and explicit intentions for the continuation of the historic landscape theme.
5. A good volunteer experience of archaeology with considerable interest from visitors and excellent media exposure.
6. The creation of an authoritative report on the history of NBGW's cultural landscape and its past occupants. It is intended as a first stage, a primary source, in the process of wider dissemination and publication to a range of audiences.
7. Provision of this comprehensive report.

Strategic recommendations:

1. Continuation of the research programme within a strategic partnership.
2. Research focus on the succession of landscapes, designed and agrarian, within the Garden and its locality as represented by the ancient lordships of Is-Cennen, Kidwelly and Carmarthen. An initial focus over the next five years would be the revelation of the first Middleton Hall and its designed landscape.

3. Research to encompass also the history of plants, planting and management within Middleton Park set within the context of the Garden's current research agenda.
4. Research to be linked closely with the development of services and benefits to the Garden's members and volunteers, to local and regional schools and to the surrounding communities.
5. The conscious development and evolution of a core text which would give an authoritative and coherent historic account of the Garden and its context. This would be built in the framework of the current report and would be regarded as an organic and ever-growing entity.
6. The promotion of a visitor experience centred on the historic succession of designed landscapes and their management.
7. Development of the historic landscape strand within the long-term strategy of the Garden to assist in the process of safeguarding the Garden's long-term sustainability and embedding its contributions as a National Asset (recognised in the Science Strategy for Wales 2012).

Foreword Rob Jolliffe (Chairman, National Botanic Garden of Wales)

I am delighted to say a few words to introduce this report. The Board of Trustees is particularly impressed with the work undertaken by this project team and is convinced of the benefits and added interest it will generate for everyone associated with the Garden – visitors, staff, volunteers and wider stakeholders. This work has underlined the importance of the Middleton Estate to the region’s history, added an exciting new dimension to the Garden as an attraction, and exposed the opportunities there still are to explain and interpret this legacy in greater depth.

We are committed to building the Garden’s contribution as a source of learning and inspiration for all. As part of that approach we strongly encourage the sort of participation by everyone, whatever their particular enthusiasms or capabilities that this project has demonstrated so well. Most of all this work has provided a means of drawing together different strands of information and contributors across the age-range and from many backgrounds to pursue knowledge and learn together about the importance of our natural world and the precious landscape and resources we have here in the Garden. The National Botanic Garden of Wales has a significant role to play in this, both by honouring and respecting the past and adding to that legacy of understanding for the benefit of future generations.

I know that the whole Trustee Board joins me in warmly endorsing the work done, and the contribution made by all members of the team in achieving this.



Rob Jolliffe

Chair of Trustees

Introduction *Rosie Plummer (Director, National Botanic Garden of Wales)*

Entering its twelfth year the Garden is maturing and, having spent its early years focussed on developing its planted collections, can now begin to consider how best to start exploring the hitherto relatively unknown, but clearly tremendous potential of its wider estate.

The Garden has now grown into a recognised National asset supporting Wales' conservation, education, science, and research agendas and it strongly promotes sustainability. It emphasises and explains the importance of plants and natural resources, shows the benefits of cultivation and growing, and supports the knowledge needed for industries to create products derived from these assets. It is also a significant contributor to the regional economy, a major tourism destination drawing visitors here for an engaging and rewarding experience closely linked with the culture and landscape of Wales. So many of these, it transpires, have repeating echoes in Middleton's past.

Most strikingly this report features archaeological and historical investigations and discoveries that have led us to the brink of an intriguing narrative which recounts unexpected insights and surprising connections in the early history of the Garden's landscape and occupants. In particular the work has provided us with an opportunity to recognise that, in its origin as a designed landscape, the Middleton Estate was founded using resources drawn from exactly the same sort of enterprise about the plants of the world at large that in many ways parallels the impetus of today's botanic garden. As a result it has shown too that the endeavours, risks, and challenges of bringing elements of the plant world to Carmarthenshire are, it seems, not new at all but are part of a long and fascinating tradition in this part of Wales. Even more intriguingly, at a time when plants for health are an important theme in present day Botanic Gardens, it turns out that the valuable commodities that generated income for the Middleton Estate long ago were also plants considered to have health benefits – nutmeg in particular together with mace, cloves, and pepper each valued as remedies for plague and pestilence.

This project has been made possible largely through the generosity of a Heritage Lottery Fund grant. From the outset it was intentionally designed and developed as a partnership project and its success has both entirely relied on and reflected this. The work has brought together individuals, organisations, and diverse stakeholders all contributing skills and perspectives in a tremendously positive collaboration. It has involved and included experts and novices, volunteers and employees from widely diverse backgrounds, each contributing in markedly different but equally important ways. A particularly core resource has been the volunteers, without whose efforts and inputs the achievements reported would not have been possible. Undoubtedly the experience of working in such a well-integrated team has been enriching for everyone and demonstrates, in exemplary fashion, the many benefits

of operating this way as well as the fun to be had from it. Predictably perhaps this has been so successful in what it has uncovered in terms of archaeology and history, and has achieved so much in terms of outcomes and potential impact, that it has without question underlined the enormous opportunity for extending studies on this theme yet further in the coming years.

1. Background to the Project *David Austin (Professor of Archaeology, University of Wales Trinity St David)*

When the National Botanic Garden of Wales was being conceived in the 1980s and 90s, the site of the former Middleton Hall and its historic designed landscape was in an advanced state of decay. However, the final decision to create the Garden here was in part predicated on its being inserted into a notable example of Picturesque landscape design, although its primary purpose was to host a public display of the botanic diversity of the world's plants and to undertake a range of scientific research. During the formation phase in the mid to later 1990s various studies were made of the historic aspects of the landscape, including both overviews (Gallagher n.d.; Ludlow 1996) and specific elements (Hood 1999). These built on previous historic accounts relating to the story of the families who once owned the Middleton estate and something of the development of the landscape.

One of the pieces of work undertaken in the 1990s by staff and students of the Archaeology Department of the University of Wales Lampeter, was a survey of an area of Middleton Park which lay to the east of the new Botanic Garden near the 1930s farm buildings of Waun Las (Baker 1999). This consisted of a preliminary survey and analysis of some earthworks which were interpreted as the archaeological remains of the original (pre-1795) Middleton Hall and its formal gardens. This study then formed the basis for a report by Professor David Austin which included recommendations for the development of a project to recover more information about the earlier garden and perhaps create another visitor attraction within the National Botanic Garden of Wales (Austin 1999).

This recommendation was not taken up at the time, but under a new director, Dr Rosie Plummer, the concept was re-visited and a project designed to test the archaeological potential and survival of the original house and its garden. The proposal was for further survey and trial excavation undertaken by volunteers of the National Botanic Garden, supported by professional expertise provided by the School of Archaeology, History and Anthropology of the University of Wales Trinity St David and the Department of Glaciology of the University of Swansea. The project, undertaken in July and August 2011 was generously funded by the Heritage Lottery Fund for Wales under its Community Heritage scheme. Leadership of volunteers and policy guidance was provided by the Director of the National Botanic Garden, Dr Rosie Plummer and key volunteers, notably Randall David, Sheila Smith and Susan Davies, formed a History Research Team. Overall academic direction for the archaeology was provided by Professor David Austin, while the excavations were directed by Jonathan Dollery supported by Rhian Williams and Edward Davies. Geophysics survey was provided under the general direction of Professor Tavi Murray by Dr Adam Booth, Dr Jemma Bezzant and Edward Davies, while topographic and aerial survey was undertaken by Louise Barker and Dr Toby Driver of the Royal

Commission for Ancient and Historical Monuments in Wales. Co-ordination and administration of the whole project was provided by Rob Thomas.

This report has been produced as a result of the work arising from the project in 2011. It has been structured to provide a full historic and topographic background to the archaeological work on the early Middleton Hall site. The background research for this is a continuing part of the programme and will in due course form part of a larger monograph on the historic landscapes, people and events of Middleton Hall. As such this report is a waymarker for a work in progress, indicating our current state of knowledge and identifying the agenda for future research and heritage activity within the Botanic Garden.

2. Location *David Austin and Jon Dollery*

General description

The landscape and former buildings of the Middleton Hall estate, as they came to be mapped first in the early 19th century by Horner (Figure 2) and by the first Ordnance Surveyors working in the area perhaps as early as c. 1810 (Figure 3), are dominated morphologically by the shape of its Park in a form we know at that time to have been re-fashioned by Sir William Paxton and his designers. As such it is to be found on the *Register of Historic Parks and Gardens* (Cadw 2001; 2002). Its approximately 500 acres, as shown on the first edition of the OS 6-inch map of 1891, lie at a height between 130 and 420 feet OD, and straddle a deep-cut stream valley (a southern branch of the Afon Gwynon) flowing generally northwards towards the Afon Tywi which it meets just north of the village and parochial centre of Llanarthney (Figure 4). Another stream just intrudes within the curtilage of the park on the south-eastern side and this flows southwards into the Afon Gwendraeth system. The park is thus on a water-shed zone within the incised plateau lands on the south side of the Afon Tywi in southern Carmarthenshire (Figure 1). Historically these were low upland border lands between the historic lordships of Cydweli and Is-Cennen (DAT n.d.Llangynwr – Llanarthne). Even today it lies on the ancient boundary of Llanarthne and Llanddarog parishes, although predominantly in the former.

The site under consideration (Figure 5) is likely to be the original 17th century and perhaps earlier, pre-Paxton Middleton Hall and the remains of its gardens. It lies geographically at the centre of Paxton's Park on the east side of the southern Afon Gwynon, and so the Park is likely to have been laid out originally as part of the designed landscape for this earlier complex of structures. Although no park is shown as such on Bowen's Carmarthenshire map of 1729, the gentry house is depicted as is a large fish pond to the north on the Afon Gwynon (Figure 6). This first Middleton Hall lay on the opposite side to where Paxton later built his mansion, outbuildings and formal gardens which have now in part been incorporated into the main elements of the National Botanic Garden. In Paxton's day the southern Afon Gwynon was modified by a series of seven artificial lakes that were created by landscape engineer James Grier as part of the re-design of the Park within the precepts of the Picturesque movement. In the first half of the 20th century a small tenant farm-house, Waun Las, was built on the southern edge of the earlier mansion site. Today the Park is a designated National Nature Reserve (NNR) under the management of the National Botanic Garden.

Geology

The solid geology beneath Middleton Park consists of Devonian Sandstone of the Raglan Marl Group, which is steeply inclined to the south. This bedrock is close to the surface where it underlies the house platform of the early mansion. Also within the

north-western area of the park there are outcrops of older Ordovician shales of the *Arenig* and *Llanvirn* series revealed as a result of a geological unconformity that runs south-west to north-east. The drift geology consists of varying depths of boulder clays throughout most of the parkland. This was deposited during the last glacial maximum around 10,000 years ago and forms the basis for the soils.



Figure 1: The location of the site



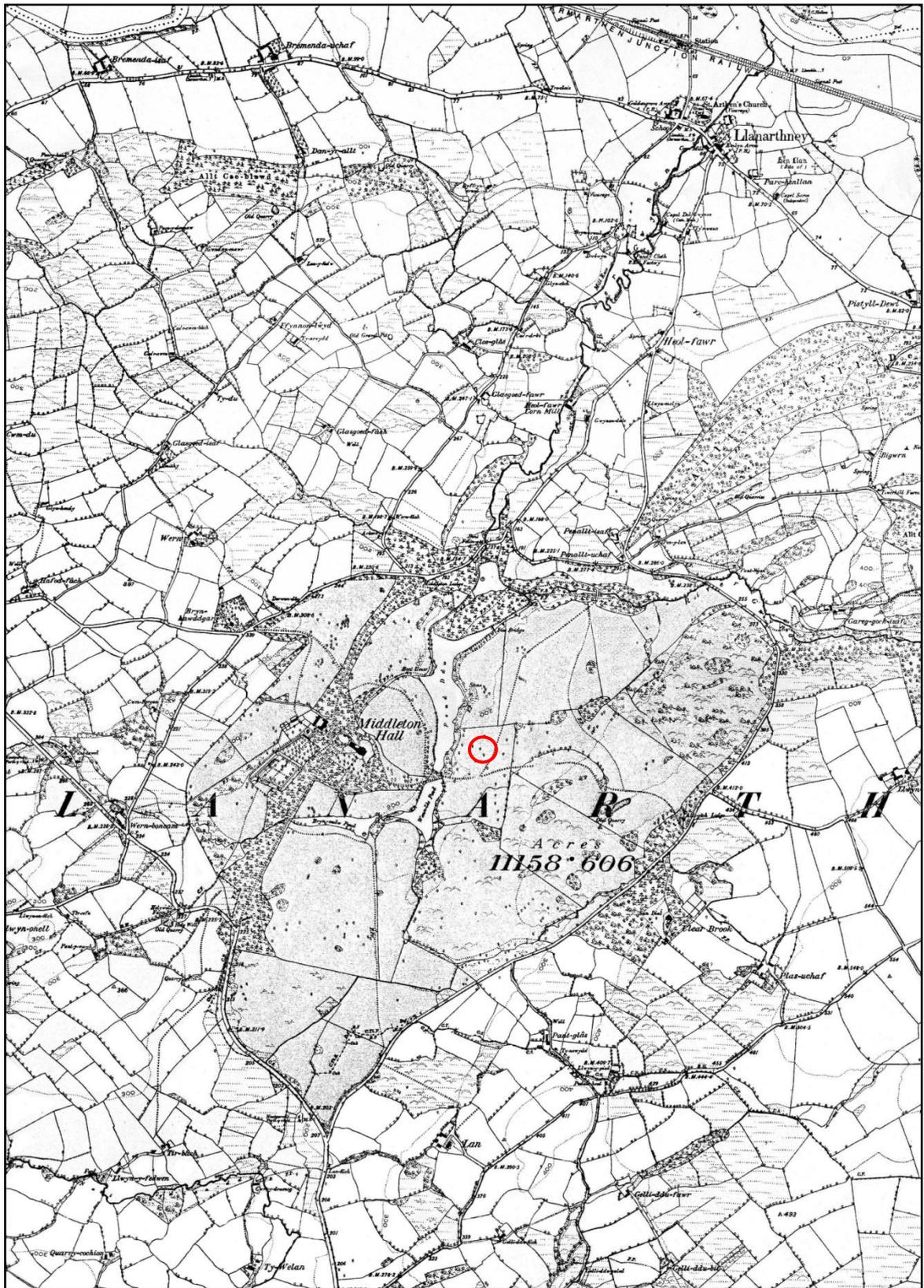


Figure 4: The first edition Ordnance Survey 6-inch to the mile map 1891. Earlier Middleton Hall and Garden location indicated by red open circle

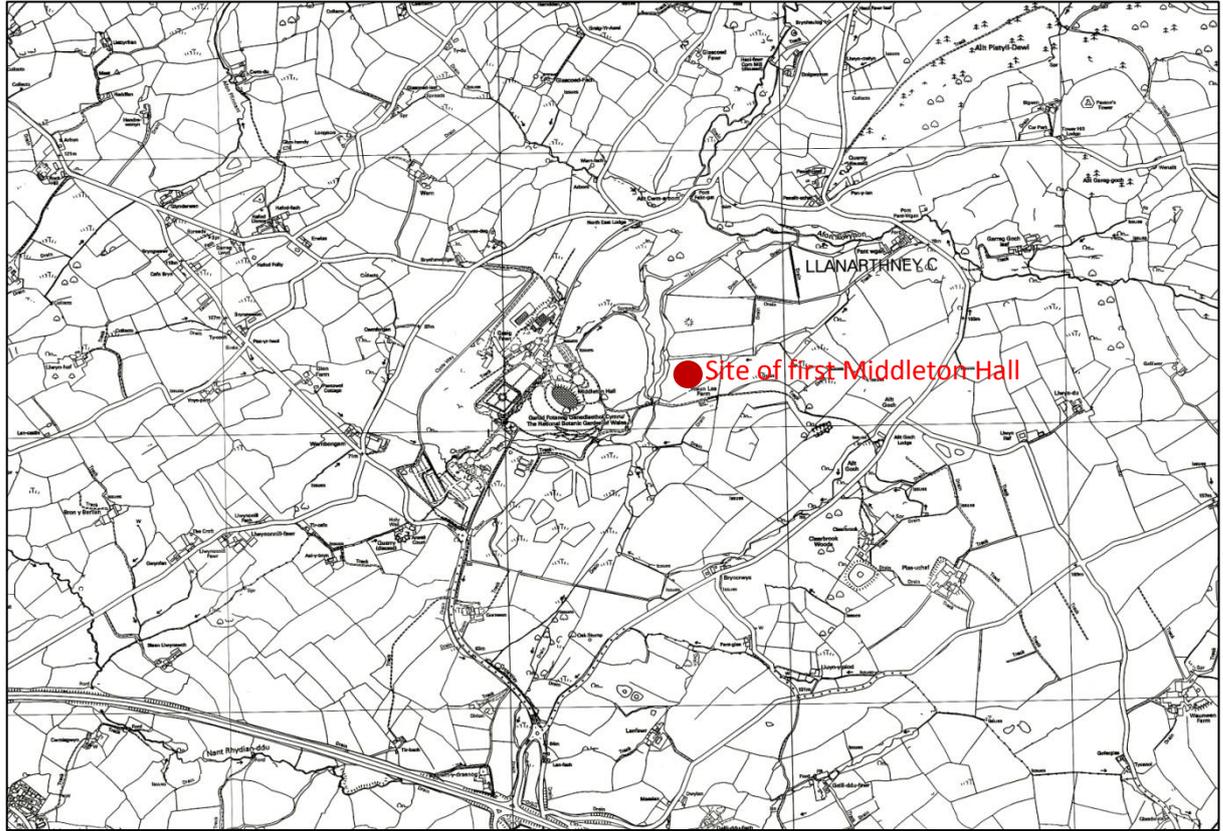


Figure 5: Site of first Middleton Hall (red circle) within the modern landscape of the National Botanic Garden (Published with the permission of the Director General of the Ordnance Survey)



Figure 6: Detail from the 1729 map of Carmarthenshire by Emanuel Bowen

Previous knowledge of the site

The location of the earlier Middleton Hall seems not to have become entirely lost to local memory despite the complex history of decay in more recent times, and certainly it has been noted in the formal record (Dyfed Archaeological Trust, Primary Record Number 31009). This was consolidated and supplemented by surveys undertaken prior to, and during, the early years of the establishment of the National Botanic Garden of Wales. The first is an undated consultancy report by Gallagher making an historic landscape assessment (Gallagher n.d.) and the second is a later archaeological impact assessment by Ludlow of the Dyfed Archaeological Trust (Ludlow 1996). Gallagher identified the 'Manor House (site of)' in a pasture field sloping gradually westwards away from the east side of the small gorge in which runs the southern branch of the Afon Gwynon and which was once filled with the lowest and largest of the Grier lakes, Pond Ddu. He identified some earthworks including a rectangular pond feature and a platform at the east end of the field with what appeared to be a later north-south track incised through it. Gallagher also located, further up slope to the east some features one of which he identified as a 'fish-pond'. Ludlow made a similar assessment of these features with only a few minor amendments, including a clearer pinpointing of the eastern platform as the site of the former mansion. (Ludlow 1996, 52). It was not until 1999 that the first detailed earthwork survey was undertaken by an MA student from the University of Wales, Lampeter, Edward Baker in conjunction with staff members David Austin, Quentin Drew and Mark Johnson (Baker 1999; Austin 1999). The survey analysis of the earthworks to the north of the Waun-Las farm house, re-drawn and further interpreted by Austin (Figure 7) confirmed the presence of extensive archaeological remains that were probably associated with the original Middleton Hall and its formal gardens.

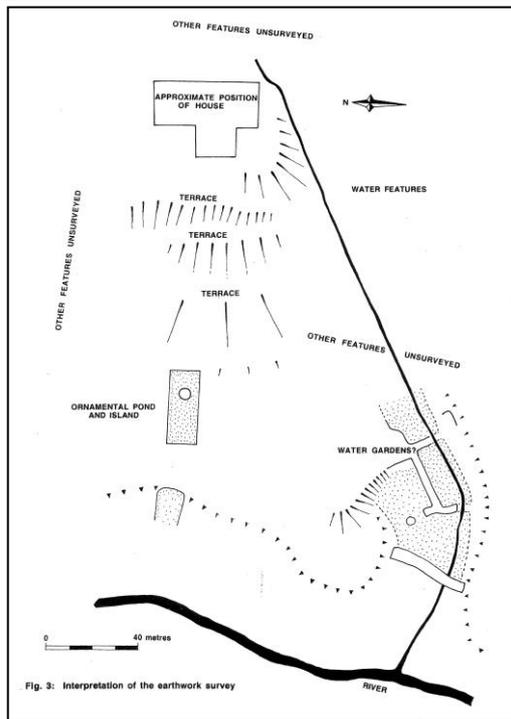
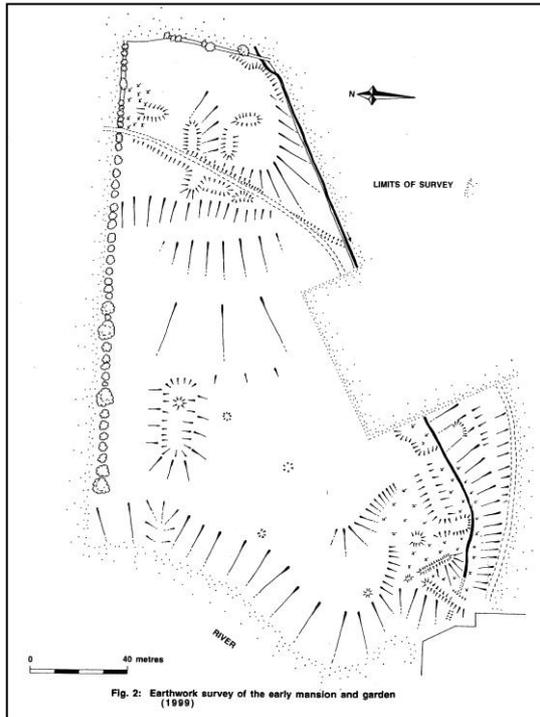


Figure 7: The survey and interpretation 1999 (D. Austin)

3. History and Context from the Later Middle Ages to the Present Day *David Austin*

The place that the National Botanic Garden of Wales occupies in the Welsh landscape was, from at least the 7th century, part of the Kingdom of Seisyllwg, with its shadowy sub-kingdoms such as Ystrad Tywi and Cetgueli, which, along with Dyfed, was the successor polity to the *pagus* controlled by the Roman town of Carmarthen. This may in its turn, at least in part, have been based on the pre-Roman tribal territory of the Demetae. We must be careful, however, not to ascribe to such concepts as kingdom, *pagus* and territory any sense that these areas were necessarily constantly unified. As later history shows there remained a tendency to fragmentation and realignment, through the complex processes of inheritance, conquest and political manoeuvring. It was only in the fourteenth century that the imposed coherence of the English state made a unity of it in the form of the shire of Carmarthen, and even then this would not have been felt to be irreversible until after the Glyndwr revolt at the beginning of the fifteenth century and perhaps even as late as the Act of Union in 1536.

What we must take account of is the existence, within the larger frameworks of power and territory, of smaller units of land and authority. These are localities, often associated with their own, local centres of power, such as hill-forts, *llysoedd*, monasteries, bishop-houses, and, later, castles, parish churches, *plasau* and manor-houses. The units of land at this scale are much more closely related to their real management in terms of agriculture and other ways of winning the means of life than the larger polities which access wealth through tribute renders, labour services, rent, levy and taxation as well as personal demesnes and home farms.

The land units themselves emerge, rather hazily at first, from the murk of early documents into the fuller light of day in the twelfth and thirteenth century written records (Richards 1969; Owen 1989). The units themselves exist at a number of scales, some of which are to be found in the first codifications of the Welsh Laws. Perhaps the largest, and perhaps the latest to emerge in native Wales, is the *cantref* which is cognate with the English Hundred, at first designed as a means of mustering a regional fighting force to face external aggression. This may not have been the motivation in Wales and its appearance here, in its late documented form, may have been largely administrative, especially for judicial and taxation purposes, and imposed by aspirants to Welsh statehood mimicking the success of the House of Wessex in its creation of an English state in the 10th century. However, there is a view that the *cantref* in south-west Wales was actually created from much older units based on the authority of local kings on the Irish model (Charles-Edwards 1970-2).

Ostensibly the next scale down, the *cwmwd* (commote) was seen in the law codes as the sub-division of the *cantref*, but there is some reason to think that these also

are actually much older units, local sub-tribal or clan entities, which were formally compounded within the later *cantrefau*. At this scale of resolution we can begin to feel, perhaps, that we have an early expression of true local power and resilient units of social identity and cohesion.

At the level of *cantref* and *cwmmwd* there is also the parallel organisation of territory which is the church. Again this emerges hazily in the records and it is very difficult to know, before the early twelfth century, exactly what this meant in terms of spheres of influence and administration. At the first, in the late Roman period, the bishopric seems to have been largely the same as the tribal pagus administered by the Empire from central administrative towns such as Carmarthen. From the later 5th and 6th centuries, in a period of dynamic change both politically and spiritually, the spatial connection of the church to the land of Wales becomes much more closely related to the nature of tribal power and regional hegemonies which create the bewildering tapestry of Welsh history at this time. We know that land was granted to the church and the church organisation seems to be centred on powerful monasteries (*clasau*) and their satellites usually associated with the cults of founder saints, such as Teilo or Dewi. However, much of the temporal authority of these monasteries came not from direct ownership of land and wealth, but from intimate, even direct familial connection with ruling clans within the various levels of tribal power controlling life in the landscape. Many of the heads of these larger monasteries were bishops with dioceses which we can no longer identify as territories, but some idea of scale is given by the knowledge that Dyfed had seven bishop-houses, perhaps one each for its seven *cantrefi*. It was not really until the Norman Conquest and the imposition of much more effective and direct control from Canterbury, backed by the Anglo-Norman state and the Papacy, that stable territorial dioceses began to emerge on a much larger scale than previously. At this time the powerful *clas* monasteries were suppressed, being converted into parish or collegiate churches. Indeed it is from the later eleventh century that we can begin to see the formation of the parish system as we can see it on early maps and the structure of administration within the dioceses such as deaneries and archdeaconries, although these also may have had some form of existence earlier than this.

Below the level of the *cwmmwd* were a variety of units, carefully and rigidly annunciated as formulae or models in the Law Codes, but in reality often quite variable from place to place. These units were related to the legal systems controlling rights of access to, and tenure of, the land and its resources. These were essentially both hierarchical, that is linked to structures of tribal authority and status, and kin-based through the customs of inheritance and seniority. The most significant of these units was the *maenor* (cognate with, but essentially different from, the English manor) within which existed other smaller units such as the *dref* (township) and the *tyddyn* (homestead). The evidence and debate about these units in the landscape is complex and bedevilled by the paucity of precise evidence in the

native Welsh areas. Usually landscape historians are forced to understand and map these units from much later evidence which is often overlaid by other forms of spatial organisation and tenure or even from the simple occurrence of place-names containing these elements.

Of these later forms, the most important to grasp in the area in which the Botanic Garden sits is the series of territorial concepts grafted on through Anglo-Norman Marcher administration or the direct intervention of the English state. This began from the first moment that Anglo-Norman barons began to seize and hold land once controlled by native Kings and Princes. In this area this is in the 1090s. These territorial concepts include: *fees*, land granted by kings to vassal barons who give military and other services in return; *sub-fees*, land granted on by the barons to knights and lesser lords who themselves give military and other services to their feudal lord; *castleries*, areas under the jurisdiction of Marcher lords from castles (often the same as fees); *boroughs*, legal trading and administrative centres; *manors*, land held by lords and their vassals, servants, free tenants and bondsmen from which they drew income and resource; and *Welshry* and *Englishry* (or *Foreignry*), land held by Anglo-Norman lords but divided into those areas whose tenants were governed either by local indigenous Welsh or by colonial English custom.

In the 11th century, prior to the first annexations of South Pembrokeshire and Cydweli by the Anglo-Normans in the 1090s, a powerful regional Kingdom of Deheubarth had emerged, combining Dyfed, Seisyllwg (which itself included Ceredigion) and Brycheiniog. This was reduced to a rump, centred on the Tywi valley, following the invasions and the status of its ruler was downgraded from king to prince. For the next couple of centuries until the final conquest in 1272-3 there was a relatively clear boundary between Marchia Wallia under Anglo-Norman control and Pura Wallia, the territory of the Welsh Princes. The part of the lower Tywi valley in which the Botanic Garden sits today was, for this period, nominally in Pura Wallia at the south-western corner of Deheubarth whose centre lay at Dinefwr. It lay within Cantref Bychan and its southern *cwmwd* of Is-Cennen, both of whose centre perhaps was on the site later occupied by the castle of Carreg Cennen. In this border land, however, territory changed hands on several occasions during the next two centuries, largely in the circumstances of internal dynastic struggle following the demise of Rhys ap Gruffydd, Prince of Deheubarth at the end of the 12th century but also under pressure from the Fee of Kidwelly held by the de Londres and then the Chaworth families. Indeed, one of the problems of studying the Botanic Garden area is that in this boundary zone we cannot be certain about who is controlling what at which time. We are even unsure about exactly where the boundary lay. The first time we can really put it on the map (Figure 6) is when the landholdings of this area are surveyed, with their bounds, by the Duchy of Lancaster in 1609, at which time it held the territory of both Kidwelly and Is-Cennen together with their castles. In this same document we have a listing of the freeholding tenants who owe some form of obligation or rent to the Duchy. Two of the land units identified are Maenor Vouwen

and Maenor Gryngar which are said to lie within the parishes of Llanddarog and Llanarthne.

Following the annexation of former Welsh royal holdings under the Statute of Rhuddlan in 1284, the castle and commote of Is-Cennen were held in chief of the Crown and eventually absorbed within a single marcher lordship together with Kidwelly and Carnwylion. As a marcher lordship it lay outside the administration of the new shire of Carmarthen, albeit still owing suit of court and certain services there, at least for a while.

In the sixty years following the Statute of Rhuddlan, the commote passed through various hands. The first beneficiary was John Giffard from whom his son John inherited in 1299, although during his minority (until 1308) the fee was administered by the Justice and Chamberlain of Carmarthen. John rebelled against Edward II and in 1322 was executed with the land being granted to Hugh Despenser, then Earl of Glamorgan and already holder of the lands and castles of Cantref Mawr on the north side of the Tywi. Is-Cennen seems to have been held locally by Rhys ap Gruffydd on Despenser's behalf. In 1326, however, Despenser and Edward II were overthrown by Queen Isabella and Roger Mortimer, Lord of Wigmore. By 1327, Edward II was dead, killed under uncertain circumstances in Berkeley Castle and a very young Edward III was crowned king under the nominal guardianship of his uncle Henry Earl of Leicester and Derby (later Duke of Lancaster), but under the effective control of Isabella and Mortimer. The commote was held in royal hands until 1330 when it was granted to John Mautravers who, however, was attainted for treason the following year and the land again passed back to the Crown who farmed it out to Maurice de Berkely. After a brief period, in 1337, Maurice surrendered the holding to the Crown to enable Edward III to grant it to Ralph de Wylington and his heirs. Then in 1340 it was again surrendered this time for it to 'enfeoff Henry de Lancastre, Earl of Derby with the castle and commote said to be held in chief'. The lordship was incorporated into the Shire of Carmarthen under the Act of Union in 1536. Little is known of the administration of the lordship between these 1340 and 1536, but it is likely that the steady conversion of renders and community dues continued, such as *commorth* (tribute of cattle for pasture), *ceisad* (support of the serjeant responsible for law and order), milling and military service (*leyrwite*). By 1609 when the lands were surveyed for the Duchy of Lancaster (Rees 1953 and see below), they were all money rents and by this time too, there were no servile tenancies since all held their land by freehold, albeit some were very small and there remained a landless, labouring underclass.

4. History of Middleton Hall *Randall David, Sheila Smith and Susan Davies*

Pre-Middleton

There is, as yet, no clear historical evidence for what existed on the Middleton estate prior to c.1600. It is likely that whatever land holding existed before the Middleton association began, there was a change of name when this family acquired the freehold. The later medieval and Tudor name is, for the time being, lost to us. The morphology of fields and settlements in the immediate area around the Park strongly suggests, however, that the land of the Park was once part of an agrarian landscape which had probably been farmed for at least two thousand years before the Middletons acquired it. With greater research of the landscape of the estate it may be possible to extend the historical narrative to earlier dates.

The Middletons and Middleton Hall

Historically there have been two different houses known as Middleton Hall, built on different sites within the grounds. Little is known of the first mansion, built in the decades before 1634, except that it was one of the larger houses in the area. Records from the Hearth Tax of 1676, show that this would have been the only substantial dwelling in Llanarthne at the time, as there was only one property listed with more than 10 hearths (Anon, n.d. A). It is suggested that it was in fact one of the larger mansions in the county with 17 hearths (Jones 2002, 282).

The freehold on which it was built was perhaps acquired first by Christopher Middleton who was appointed as vicar of Llanarthne in 1584 by Bishop Marmaduke Middleton (CCED, ID 104251) and recorded again in this post in 1596 (Evans n.d., f.128). Christopher Middleton is also listed as a freeholder of the Duchy of Lancaster's lordship of Is-Cennen within the parish of Llanarthne in 1609 (Rees 1953, 293). His annual rent of 5s.9d. places him as one of four major freeholders in the parish, who were outranked only by Sir John Vaughan (of Golden Grove) who held a substantial estate of tenant farms in Llanarthne, rendering 20s. p.a. to the Duchy. This rent paid by Middleton, if it is the 'Chief Rent' or annual payment by which the land was held of the Duchy, can be calculated as representing 34.5 *cyfars* or sharelands which was equivalent to either 276 arable acres, if 8 *cyfars* to the acre, or 414 acres, if 12 (Rees 1953, xxxv). However, we must exercise some caution as it may also have included other rents such as commorth compounded within the one payment. Nevertheless it is a strong indicator of the general size of the Middleton estate and it is likely that this arable land also had attached to it other, pasture lands and maybe even the opportunity for encroachment on adjacent hilly land. This would begin to approximate to the 568 acres of the Parkland purchased by Paxton as the core of his estate. It is notable also that, in 1609, Christopher Middleton's is almost the only English name among 50 listed tenants in the parish, all of whom were part of a long tradition of farming and landholding within a Welsh area.

The first evidence of a Middleton in Carmarthenshire was Edward Middleton who resided in Sain Pedr, Carmarthen. Edward's grandfather and Christopher's great-grandfather were brothers, another brother being the grandfather of Sir Thomas Myddelton of Chirk Castle.

Edward went on to become a Bailiff of Carmarthen in 1575 and then Mayor in 1583 before his death in 1587 (Evans, n.d., f.126). Edward seems to have been a distant cousin of Christopher (see Figure 9), and it is possible that the connection played some part in Christopher's move to the area.

It is likely that he was an outsider, perhaps arriving as a result of his tenure of a living given to him in 1584 by an English Bishop of St Davids (Marmaduke Middleton) and who then decided to buy into the area. Records from the Clergy Database do contain references to a Christopher Middleton, residing in the Chester diocese, being ordained as a deacon in Chester Cathedral on 28th May 1580 and as a priest on 20th May 1582, and list his qualifications as an M.A. This would certainly fit with the information available about the Middleton Family prior to their arrival in Wales and would suggest an approximate year of birth of 1558 (Anon, n.d. C). Christopher was uncle to Henry Middleton of Chester who may have been his heir. Henry's father/Christopher's brother David was a Captain on the early voyages of the East India Company, as were his two uncles Captain John and Sir Henry Middleton (Anon, n.d. D), and thus may have had no established family seat. It is possible that Christopher Middleton purchased an already-existing and fairly substantial landholding at the end of the Tudor period, probably with a pre-existing house on it, possibly as a result in part of the wealth achieved by the Middleton brothers from their voyages. He may have enhanced it as appropriate to his status, but it may be that it was the East India wealth of Henry, with financial assistance from his wife's family the Vaughans, which allowed its full elevation to a *plas* (mansion) with a designed landscape (see chapter 5 below for a fuller exploration of the Middleton dealings). In 1611, Bishop Rudd appointed a successor to Christopher Middleton at Llanarthney, Nicholas Lounds (CCED, ID 185896), and we may assume therefore that Christopher had either died or, more likely, retired to his new estate or, indeed, to his portion of it at Gorsddu (q.v). It is certainly a possibility that Christopher was essentially a 'caretaker' of the family estate until Henry came of age. He may have resided in Gors Ddu, possibly leaving the property to his nephew Christopher. Certainly this second Christopher later left the property to his own grandson Christopher, possibly continuing a family tradition (Evans n.d. f.129).

The date of Henry's birth is unclear but we do know from surviving records that he was an adult by 1624, and was both married and living in Middleton Hall before 1635 (Anon. n.d. B). He later inherited lands in Blagdon, Somerset upon the death of his mother and stepfather (Evans, n.d., f.128). Henry became well connected in the area, becoming High Sheriff of Carmarthen in 1644. His wife, Mary Vaughan, was the daughter of Walter Vaughan of Golden Grove and granddaughter of Mary Rice of

Dinefwr. Middleton Hall remained the home of the Middleton family for six generations, but by 1776 debts had risen to such a level that the estate had to be sold (Jones et al 2002, 283).

Post – Middleton

It seems that for a period of time the estate was overseen by John Gawler, an attorney, but no record has been found regarding ownership between 1776 and 1787/9, when it was bought by William Paxton. It is certainly possible that John Gawler owned it during this time. Further research is needed into this period.

The Paxton purchase and the new landscape

William Paxton was born in Scotland in 1744 and moved to London when he was three years old. He left Britain as a captain's boy aged twelve and, after eight years in the navy, he set out for India. He returned in 1785 with a sizeable fortune.

He bought the Middleton Hall Estate between 1787 and 1789 knowing that his wealth would allow him to build the more modern mansion that he desired and to create his vision for the estate as a whole (Kuiters 1992). The first clear indication we have of the extent of the estate is from the Sale Catalogue of 1824 (NLW, CSC 518), but further research will be required to discover whether this was the same as the original Middleton landholding or whether Paxton added to it or, indeed, sold or exchanged parts of it (Figure 8). Paxton's income was not dependent on the revenue of his estate. The centrepiece of Paxton's park was the new mansion. Built between 1793 and 1795, it was a large quadrangular house with strong Neo-classical features. 'The mansion was certainly unique in Carmarthenshire and yielded to few others in West Wales'(Kuiters 1992, 34-5). The new house was fitted with a lead cistern on its rooftop, and pipes to supply the various water-closets of the house with running water.

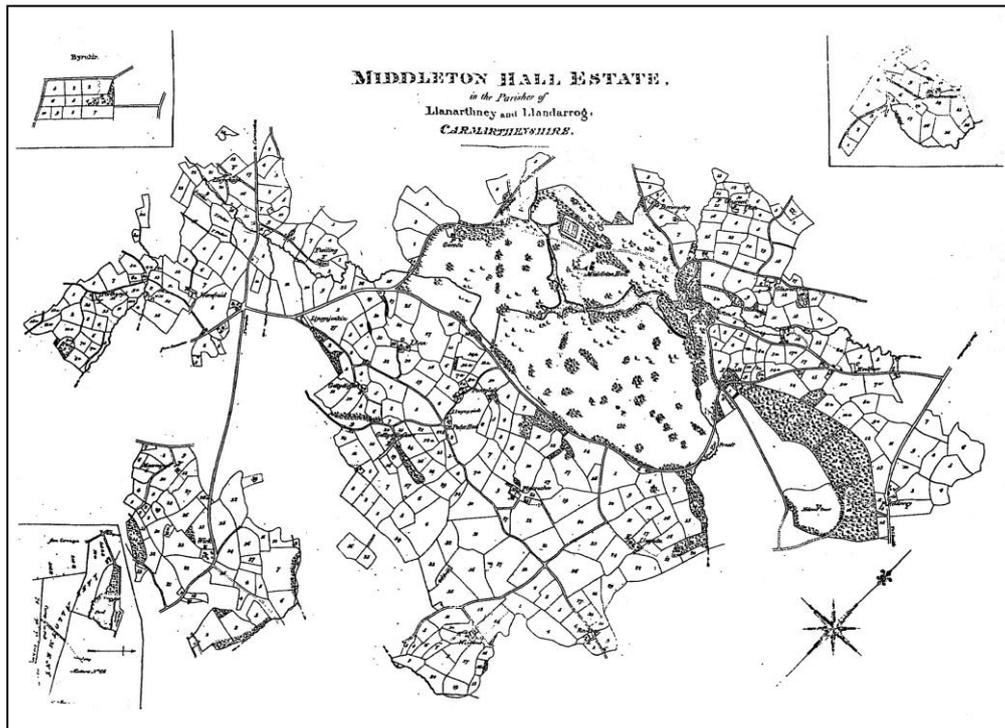


Figure 8: Map in the sale catalogue for the Middleton Hall Estate in 1824

Paxton employed three key men to assist him in developing the site:

James Grier managed the estate. Paxton had a keen interest in technical innovation and up-to-date water management and together with James Grier, he set out to create the many water features that marked his park. Dams, bridges, sluices and cascades were built as part of the elaborate system of lakes, ponds and streams around the estate (Kuiters 1992, 30). When Paxton discovered chalybeate springs in his park he built two bath-houses on the site, complete with furnace rooms (Kuiters 1992, 33).

Samuel Pepys Cockerell was the architect invited to contribute to the plans for Middleton Hall. He may also have contributed to the laying out of the park as he was recognised as one of the most notable garden architects of the day (Kuiters 1992, 30-31).

Samuel Lapidge had been one of 'Capability' Brown's surveyors and it is likely that the planting of trees and the arrangement of the flowerbeds were his work, together with the idea of a double-walled garden (Kuiters 1992, 31),

Paxton's Tower was designed by Cockerell and was built between 1806 and 1809. It was probably built to wine and dine the visitors to Paxton's Estate and provide panoramic views. Paxton dedicated the tower to Admiral Nelson and originally the tower was named Nelson's Tower (Kuiters 1992, 58-9).

Post Paxton

Shortly after the death of Paxton in 1824 the estate was sold to Edward Hamlin Adams (Davies 2002, 37). Adams was born in Kingston, Jamaica into a Royalist family that had emigrated to the West Indies and the North American Colonies after the Civil War. They owned large sugar plantations in Barbados. He was educated in England before returning to the West Indies as a young man. Despite some setbacks, he amassed a very large fortune and met and married his Philadelphian wife Amelia whilst involved in trade between North America and the West Indies. This was the era following the American War of Independence and trade may well have included contraband in contravention of English Law (Davies 2002, 37). Settling his family at Middleton Hall he pursued his ambitions to establish them in society, becoming High Sheriff of Carmarthenshire, then a Member of Parliament (Davies 2002, 40). The estate deteriorated rapidly during his ownership and by 1841 Paxton's pleasure park and the farms were in a serious state of neglect (Davies 2002, 40). On his death in 1842, the estate passed to his son Edward Abadam who adopted the Welsh form of the family name (Davies 2002, 42). Thereafter succession to the estate was complicated. Edward Abadam had 3 sons and 4 daughters. All three sons predeceased their father and Abadam could not leave the estate to his eldest and favourite daughter Lucy as she was illegitimate. Consequently, when Edward Abadam died in 1875 the estate passed via his second daughter Adah to her son, Major William Hughes (Davies 2002, 50). However the 1881 census shows Adah living at Llanfair, Llandovery, and Lucy and her husband Rev. R G Lawrence living at Middleton Hall. Lucy had been gifted the estate by Adah on condition that if Lucy died without children the estate would revert to Adah (Davies 2012, 43). In 1919 the estate was sold by Major Hughes to Ammanford industrialist Lt Col William N Jones. His military title was granted when he was put in charge of the Ammanford Home Guard during the First World War (Norman 2011). By 1931 he was not in residence on the estate and on 31 October 1931, a fire which started in the caretaker's accommodation destroyed the Hall (Carmarthen Journal 1931). At some point in the 1930's Carmarthenshire County Council acquired the Estate and divided it into farming starter units for lease (Lloyd-Fern n. d.: 3). In 1935 the driveway through the estate was made a public highway. The road was closed in 1997 to enable development of the National Botanic Garden.

National Botanic Garden of Wales

In 1974 the estate, which consisted of seven tenant farms, passed from Carmarthen County Council to the newly formed Dyfed County Council (D.C.C.). In 1978 the Estates Department of D.C.C, in conjunction with the Manpower Services Commission, started a restoration and public access programme for the Middleton Estate which involved rebuilding the original Paxton water features and improving the pathways (Lloyd-Fern n.d., 3). In 1987 the site was visited by Miss Rose Powell who mentioned her visit to her nephew William Wilkins of Carreg Cennen, and

described the interesting structures that had survived for nearly two hundred years (Sclater 2000, 35).

William Wilkins visited the site and immediately realised the potential of the landscape and its surviving buildings. He then began to think of practical ways in which the landscape could be restored to its former glory and also maintained as a viable enterprise. He recruited a number of influential supporters and formed the Welsh Historic Gardens Trust in 1989 as a forum for the promotion of the Middleton Estate and the eventual creation of a botanic garden. Dyfed County Council were approached and provided enthusiastic support at this very early stage.

Detailed planning began in 1990 with the production of four feasibility reports, and in 1991 a meeting was held in Brecon, chaired by Professor Prance of Kew, for leading botanists to discuss the possibility of establishing a National Botanic Garden at Middleton (Sclater 2000, 38). A Steering Group was set up chaired by David Bown the Director of planning for D.C.C., and William Wilkins was appointed as Project Director to take the scheme forward and seek sources of capital funding. In 1994 a charitable trust was established to oversee the project, and trustees were chosen to form the first Board under the chairmanship of Brian Thomas.

At this stage the project appeared to be proceeding smoothly – William Wilkins had approached the Secretary of State, David Hunt, to seek approval for the title ‘National’ and had received an encouraging response, but in the autumn of 1994 his replacement, John Redwood, called for a study to examine the need for a Welsh botanic garden, and whether Middleton would be the ideal choice (Sclater 2000, 40). A number of sites were examined in Swansea, Cardiff and Gwent, but the study revealed Middleton as the most suitable, and the one which had completed the detailed planning and gathered the most support.

This report coincided with the formation of the Millennium Commission which was seeking new projects to be completed for the start of the new millennium in 2000. The support of the Commission would mean that William Wilkin’s original vision of a twenty year project could be completed in less than half that time. Fortunately the detailed planning and organisation of support which had already been carried out by the project team meant that Middleton was the only contender in a position to submit an application to the Commission in 1995. Ambitious targets were set by the Commission for the project – the total capital value was raised to £43 million which meant that £21.5 million had to be raised from other sources and, as the grant would only cover capital expenditure, the running costs would have to be generated mainly from visitor numbers.

There followed a period of intense effort in the preparation of the application and in the numerous reviews by the Millennium Commission of fundraising progress, costings, public support, and land acquisition. The application was formally submitted in October 1995, but in December the application was deferred pending

further investigations into concerns over fundraising. Frantic negotiations then followed and it was agreed that the project would be split into two phases of equal value to ease the fundraising load. On the 1st March 1996 the Millennium Commission grant of £21.7 million to the National Botanic Garden of Wales was officially announced to the public.

In September 1996 the Trustees appointed Professor Charles Stirton as the first Director of the Garden and work began on site in spring 1997. The funding targets and major construction goals for Phase 1 were achieved in 1998 and further commitments were secured from the Millennium Commission for the funding to take the project forward. Under the patronage of HRH the Prince of Wales, the Garden opened in May 2000 and has since established itself as a major visitor attraction, and a centre for environmental education and scientific research.

5. Wider historical connections *Rob Thomas and David Austin*

One of the most frequently asked questions is why the National Botanic Garden of Wales was created in the rural setting of Middleton Hall, Llanarthne in Carmarthenshire? The results of this project have given this question at least part of the answer and one which is rooted in the history of its historic landscape. A story has emerged which justifies the choice and which gives a greater significance to its unique location in a rural setting at the heart of a designed parkland which is now a National Nature Reserve. It is a story that takes us back to the sixteenth and early seventeenth centuries as we have seen and connects us to a wider history of early empire, capitalism, globalisation and the part that was played by plants in the harvest of the world's natural resources that this dawn of the modern world brought with it.

The story must begin with the Middleton family (Figure 8). As discussed above (Chapter 4), the earliest record of their presence in this particular part of Carmarthenshire is 24th February 1584 when Christopher, one of four brothers, was appointed vicar of Llanarthne by Bishop Marmaduke Middleton (CCED, ID 104251). It is the brothers' connections and deeds which expand this story into the wider world.

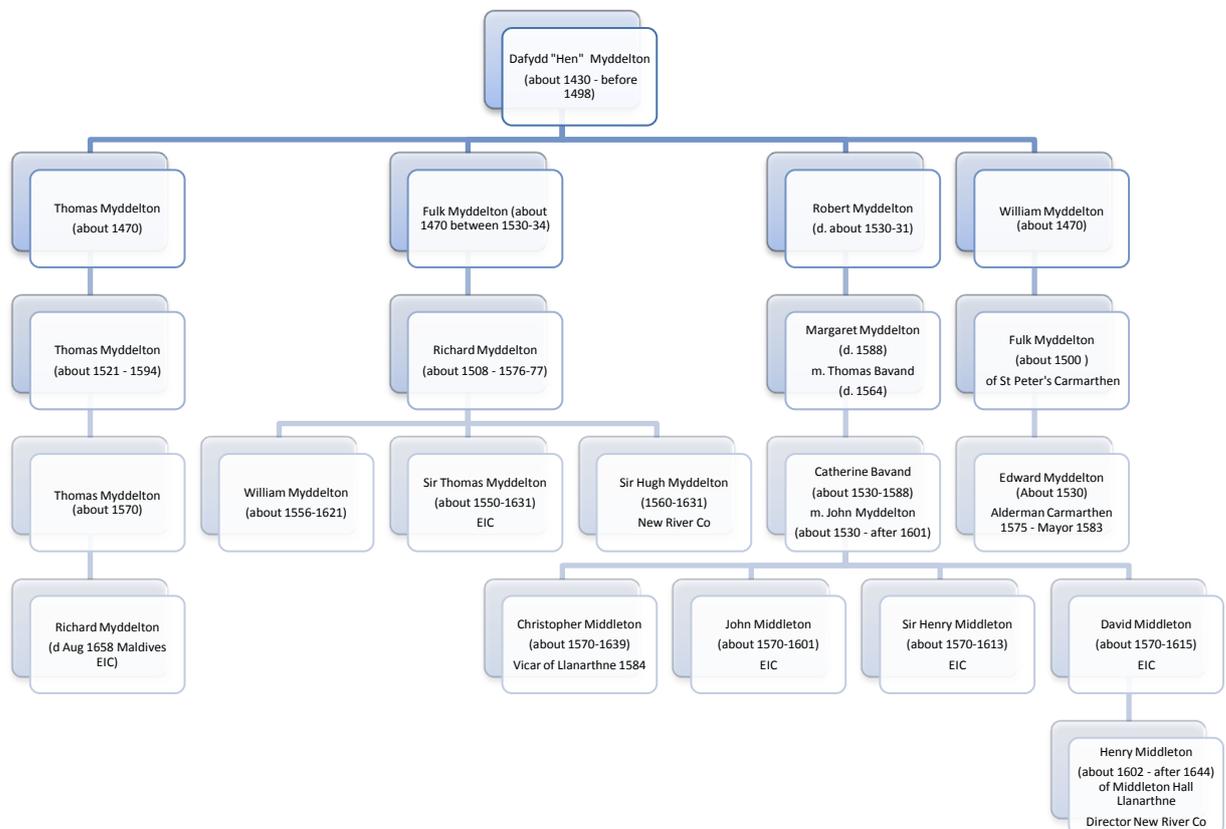


Figure 9: A summary Middleton Family tree (Rob Thomas): EIC – East India Company

The Middletons of North Wales

There are two contemporary 16th-century and related branches of the Middleton family, one of Denbigh and one (Christopher's) of Chester (Myddelton 1910), who as cousins could trace their Welsh lineage as far back as Rhirid Flaidd, Lord of Penllyn in the 13th century (Bourne 1856; Williams n.d.). Both achieved fame in the burgeoning commerce of Tudor England and came to style themselves "gentlemen of London" (NA, Prob. 11/123; NA, Prob. 11/131).

Most famous of these today are the Middletons of Denbigh and the names that are principally remembered from this period are Sir Thomas, Sir Hugh and William. Sir Thomas developed many and various London business interests. In 1603 he was made alderman and sheriff of the City of London, was knighted and by 1613 was Lord Mayor. He later represented the city in the three parliaments of 1624-6 (Bourne 1856; Williams n.d.). His brother Sir Hugh was also an entrepreneur who is known today for his New River Company which vastly improved London's water supply. The project created an artificial river from Amwell and Chadwell in Hertfordshire which ran to Islington, a distance of 38 miles, the undertaking being financed principally out of his profits as a city goldsmith. Sir Hugh supplied jewellery to Queen Elizabeth and was at one point goldsmith to James I. He was made a baronet in 1622. His other business interests included the development of extensive lead and silver mining in Cardiganshire (Gough 1964). The third prominent Middleton of Denbigh was William, seafarer, poet, scholar of Welsh prosody and writer of a metrical version in Welsh of the Psalms. William was a contemporary and crony of Sir Walter Raleigh and was often to be seen smoking tobacco in his company at brother Hugh's goldsmith's establishment in Basinghall Street (Bourne 1856; Williams n.d.). William's chef d'oeuvre "Psalmae Brenhinnol Brophwyd Dafydd" was said to have been finished while under sail in the West Indies.

The Middletons of Chester, although not quite as well-founded as their cousins, were nonetheless key players and two of Christopher's brothers, David and Sir Henry, featured in Thomas Fuller's famed "Worthies of England" as the celebrated "Seamen of Chester" (Fuller 1662). A third, John was also a seaman and all three were key players in the creation of the East India Company as captains in what were among the first British expeditions to the Spice Islands in search of the immeasurable profits to be made in the trade of nutmeg and pepper. It is this profit which, we believe, was the source of wealth which created the Middleton estate. As we have established, it is Christopher, the vicar, who is known to have acquired a substantial estate in the parish of Llanarthne by 1609 when he is recorded as a major freeholder in the Duchy of Lancaster Lordship of Is-Cennen (Rees 1953, 293). Although we have yet to document this, it would appear that he died without issue and that the estate passed to his nephew Henry, who was son of his brother David. Henry also inherited the wealth of his other uncle Sir Henry who similarly died without issue (NA, Prob. 11/123). This wealth was based on money from a volatile and extremely risky trade

and needed investment in more permanent capital. Although we cannot be sure, it is likely that Christopher, whose own income as a vicar would have been insufficient, was given the resources by one or all of his brothers to make the land purchase of the Middleton Hall estate somewhere between 1584 and 1609 as a joint family undertaking. This may all have been by design as a joint family undertaking while the seafaring brothers were about their risky enterprises and the eventual inheritance of the nephew may have been structured as part of the deal. Even if this was not the intent, it was certainly the result as the brothers all met their end in the spice trade, and by 1635 a “gentleman” named Henry Middleton is living in Llanarthne and his home is called Middleton Hall (Anon. n.d. B). He is married to Mary, the daughter of Walter Vaughan and sister of Sir John (later first Earl of Carbery) and is, therefore, clearly of some standing. In 1624 as a young man in his early twenties he was in London, sponsored by Sir John Vaughan, on a very personal quest for restitution and justice for his family (Anon. n.d. B), a quest which connects us directly to the wider world and the Middleton wealth.

The origins of the East India Company and the role of the Middletons

On the evening of 24th September 1599, eighty men gathered in Founders Hall in Lothbury Street London. They were by and large burghers, merchants, aldermen, freemen of the London guilds, three previous and one future Lord Mayor of London, Sir Thomas Middleton of Denbigh. Mingling with this band of worthies was a very motley crew of venturing soldiers and sailors, their number including members of Drake’s crew, cronies of Raleigh (including perhaps William Middleton), William Baffin, James Lancaster and others who had sailed with Cavendish and Hawkins. Certainly among the group were the three Middleton brothers of Chester – John, Henry and David. The men resolved to petition the Queen for her assent to grant a charter “intended for the honour of our native country and for the advancement of trade of merchandise within this realm of England” (Milton 1999). With this was born the Honourable East India Company and a new era of enterprise and opportunity ushered in for merchants and adventurers. The Middletons of Denbigh and Chester were at the forefront. Sir Thomas was one of the principal petitioners and among the first directors and stakeholders (Bourne 1856), and his cousins John, Henry and David were primary participants in the Company’s early years of seafaring and prospecting (Milton 1999).

The destination of the adventurers was the so-called Spice Islands or Moluccas where the natural resources were hotly contested by Portuguese, Dutch and British alike. Individual islands such as Bantam, Neira, Run, Ternate and Amboyna were rich sources of cloves, nutmeg and mace. Until this time, few had known the sources of these fabled spices. London merchants had bought them from Venice and Venetian traders had in turn come by them through Constantinople. Their origins much further east had been a closely guarded secret. Now, however, the race was on for European countries to secure their own primary sources, as by the late 16th and early

17th centuries, nutmeg, in particular, had become not simply a culinary luxury but a vital necessity.

Elizabethan physicians had begun to make claims as to its efficacy against the plague or “pestiferous pestilance” that routinely visited itself on the nation’s capital, and the price went through the roof. In the last decade of the 16th century ten pounds of nutmeg could change hands for less than one English penny in the Banda Islands. In London that same quantity would command a price of £2.10s, which represented a mark-up of 60,000 per cent. It was not nutmeg alone, however. In around 1610 for example David Middleton, captaining the *Consent*, landed a cargo of cloves traded in the East for £3,000 which sold on the London market for £36,000 (Milton 1999). This might well have provided the sort of sudden cash windfall that could have been sent to his brother Christopher to purchase the estate in Llanarthne.

The enterprise was hazardous in the extreme. Not only did captains such John, David and Sir Henry Middleton have to steer their ships through such “greevous stormes” that one in three was lost, they also had to contend with the threats of scurvy, dysentery, the “bloody flux” and tropical diseases which more than decimated crews and led to the scuppering of many vessels through the inability to man them (Corney 1855). The dangers did not end there and David’s first-hand account of his escape from the cannibals of Ceram and its crocodile infested rivers exists to this day (Makepeace 2004a), as does the account of Sir Henry’s capture and imprisonment in Arabia. He became the first Briton to visit the interior of the country albeit with “a great paire of fetters clapt upon my legges” and having witnessed the slaughter of several of his crew (Bourne 1856; Makepeace 2004b; Milton 1999).

Such were the perils of the merchant adventurers, and the ventures engaged every risk to life. It required great skill, great courage and great determination in equal measure, all fired by greed and hope of fabulous riches. Both David and Sir Henry Middleton were variously described as impetuous, hot headed, stubborn and intractable, but they were skilful leaders too, diplomats and tacticians. But pay the ultimate price they did, and early too. Elder brother John had been lost on the East India Company’s first voyage in 1601 (Milton 1999). Despite reaching Bantam, where Sir Henry was later to establish the Company’s first trading post or factory, having sailed there in the patriotically named *Red Dragon*, John fell sick aboard his vessel the *Hector* and eventually succumbed to the fever. Sir Henry was ultimately to fare no better and he, along with most of his crew aboard the Company’s first bespoke vessel, the 1,000 ton *Trades Encrease*, was struck down in the East Indies in 1613 (Makepeace 2004b). This was discovered by David on his next voyage in 1615 and he was returning home with the news when his ship *Samaritan*, laden with pepper, foundered off Madagascar and he drowned (Makepeace, M. 2004). David’s will of 1614, written shortly before his last voyage, poignantly refers to his “well belov’d brother” Sir Henry and a re-apportioning of his share of the estate if it “chance that he should die before coming home from sea, God forbid” (NA, Prob. 11/131).

Equally, David insists that his will should be opened only “upon certaine news of my death”. The adventurers were well aware of the dangers they faced and the power of rumour and falsehood in the circumstances of such great distances in unknown lands and seas.

Legacies and Litigation

It is these trials, tribulations, tragedies and disasters that led some nine years later to the younger Henry petitioning the East India Company with the support of Sir John Vaughan (Anon. n.d. B). Henry had, by this time, already been a director of the New River Company for five years (Gough 1964) and, as well as being one of the principal beneficiaries of his father’s will, he was residual beneficiary of that of his namesake and uncle (NA, Prob. 11/123). Eleven years after his death, however, probate had still not been granted in relation to Sir Henry’s will, and the younger Henry and Sir John were pursuing the East India Company for compensation in relation to David’s death too. The value of both estates was in the region of £2,500 (Makepeace 2004a; 2004b).

Figure 10: *Portrait of Sir Henry Middleton circa 1610 oil on board (reproduced with kind permission of the National Portrait Gallery)*



There is some evidence that this dispute had been underway since shortly after the deaths of the brothers and it is perhaps unsurprising to learn that the East India Company was not especially sympathetic to Henry's case. It was not inclined to be generous, arguing that the loss of the *Samaritan* and its valuable cargo cancelled out any claim based on David's earlier, successful and highly profitable voyages (Makepeace 2004a).

The fortunes of both branches of the Middleton family burned brightest during the first half of the 17th century but gradually that flame began to gutter and die. For a while the family were able also to maintain themselves as one of a growing breed of gentry who had bought their way into land and status on the back of a sudden influx of money. Henry was variously described as a "gentleman", was High Sheriff of Carmarthenshire in 1644 (Jones et al 2002, 283) and seems to have had various local business interests as did his successors. After this, however, there was slow decline.

The Middletons – Relevant Today?

Documentary research, as well as last summer's archaeological investigations, have shown that in the first quarter of the 17th century the estate was graced with a substantial hall and extensive formal, ornamental gardens, the locations of which are now better known. This indicates, at least, that there is a tradition of formal and designed planting and growing in the Botanic Garden of today that extends back for more than 400 years. The Garden has often proclaimed itself to be the youngest national botanic garden in the world and that may well be true, but its situation has a pedigree that far exceeds its 12 year existence.

As important as understanding the Garden's cultural inheritance, though, is an appreciation of how these discoveries inform and add value to its core mission and the messages it communicates, as well as the stories that are told to visitors. The Garden plays for Wales on a world stage, as did the Middletons in all their incarnations, and worldwide connections have always, it seems, been fundamental. It is curious to think that barely a quarter of a mile from the home that David Middleton created for his family can be found plants that would have been familiar to him from his voyages – dragon palms and *Strelitzias* from the Canary Islands, *Banksias* and *Proteas* from South Africa, both of which were routine refuelling stops for the East India Company pioneers (Milton 1999).

Compelling too, is the fact that the development of the entire estate was dependent for 200 years or more almost entirely upon the fortunes of the East India Company, the rise of the merchant classes, the growth of empire and the complex networks and practices of international trade.

Most significant though for the Garden today is the acknowledgement that the very existence of its 568 acres owes everything to the nature of that earliest trade. It has quite literally been created out of the profits derived from plants for health. What

we now consider the humble nutmeg is responsible for all the wealth that Henry Middleton inherited from his father and uncle and, of course, plants for health are a cornerstone of the Garden's research, interpretation and conservation missions. Who knows, it could even be that the warm air of the Tropical House will one day be heavy with the scent of spices that David sailed half way round the world to experience.

Even now, the international networks created by the Middletons proliferate. The grocers, goldsmiths, skimmers and haberdashers that sprang modestly from Galch Hill in Denbigh did not only look east to increase their wealth, but also became increasingly interested in the New World markets. From the earliest times Sir Thomas had been active in the Virginia Company and William, as we know, had travelled to the West Indies. And there exists today, in South Carolina, Middleton Place which is the site of the oldest formal gardens in the USA. Middleton Place bears an uncanny resemblance to how it is thought Middleton Hall may have looked in its heyday, but researching that connection still has some distance to go.

6. The Topographic and Landscape History of the Botanic Garden Area *David Austin*

a. The Later Middle Ages (Figure 6)

The historic landscapes of the lower Towy valley have not been the subject of much sustained study and the perhaps the best account of the later medieval landscape was given by Sir John Lloyd in volume one of his magisterial *A History of Carmarthenshire* (Lloyd 1935). It is an important, if ill-referenced narrative focussing much, as his generation of historians did, on forms of tenure and agrarian renders. His work seems to draw on at least one *Inquisition Post Mortem* from the reign of Edward III, some Minister's Accounts and a Kidwelly Court Roll of 1523. All of these and any others, especially from the archives of the Duchy of Lancaster as well as Golden Grove will need to be examined during the life of this research project. However, it is possible to give an initial overview of elements of the late medieval and Tudor landscape (Figure 10).

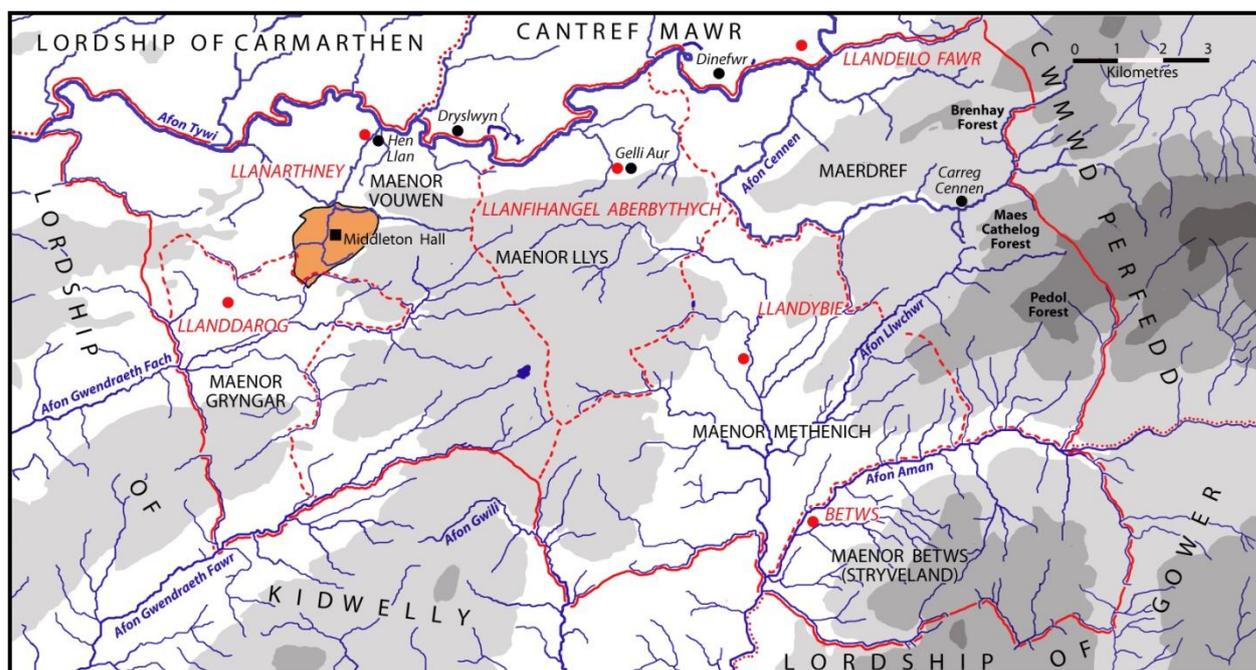


Figure 11: The landscape of Is-Cennen (D. Austin)

What Lloyd describes for the 14th century and later is a well-farmed landscape, part lowland and part upland, with an exclusively Welsh tenantry farming and making renders of produce and services according to Welsh custom and practice, with many already commuted to money rents and in the process of becoming effective freeholds (Rees 1953, xxi-xxii). There was a large *maenor*, called Maerdrof (the name for a lordship estate), farmed by bond (unfree) tenants of the lord, situated around the castle of Carreg Cennen. To the east of these farmlands on the eastern boundary

of the commote lay the forest or waste land of Pedol, probably an extensive upland common of open rough grazing with some woodland where rights of pannage (grazing pigs) and the collection of honey from woodland bees added to the lord's revenues. There were also two other smaller forests, Brenhay, north of Maerdref, and Maes Cathelog in the south-east. We must remember that the medieval term 'forest' related primarily to legal rights of access and jurisdiction (largely favouring the lord) and not principally to extensive areas of woodland. Forests were first conceived as reserved hunting areas for the nobility and very often, especially in upland regions like this, included large tracts of open unenclosed moorland and rough pasture.

The rest of the commote to west and south was divided into other maenors. According to Lloyd, the two maenors on the east side of the commote, Vouwen and Gryngar 'corresponded roughly to the ancient parishes of Llanarthne and Llanddarog', although we cannot assume that there is a straightforward one-on-one correlation in territory and boundary. Between these two and the maerdref lay the maenors of Llys and Methenich which Lloyd identifies as the parishes of Llanfihangel Aberbythych and Llandybie while to the south beyond the Afon Amman lay the maenor of Betws (also called Stryveland). These are areas occupied largely by Welsh freemen paying the *gwestfa* or food render made to the lord of Cennen as well as other ancient tributes of cattle or *cymmorth* and oats or *dofraeth* (originally a render to provide accommodation for the lord's retainers visiting on circuit) along with service at courts and mills. Lloyd also noted two annual fairs, one at Maes Cennen (Ffairfach just south of Llandeilo) and Llandybie and the fact that coal was being mined in the commote from the time of the earliest records.

The landscape fleetingly revealed in these documents was a busy one, occupied by dispersed freehold farms, cottages of bondsmen (*eilltion*) and labourers, small hamlets around mills, churches and the lord's land, buildings and lands of free notables (*uchelwyr*) and lordship officials such as the reeve (*maer*), the court beadle (*rhingyll*) and the constable of Carreg Cennen castle. The core of these holdings were on the arable lowlands where some were enclosed fields and some divided into strips; as part of the holdings there were also customary rights of access to, and use of, tracts of upland pasture as well as to other areas of land especially hay meadows and small tracts of woodland. The rapid upland rivers and streams were ideal for water-mills, but only those strictly controlled by the lord's reeve. We can also imagine a deal of craft production such as mining, cloth, building stone, wood and ceramics which, by the sixteenth century was ready to become more technically advanced and industrialised.

By the early sixteenth century these landscapes would have changed little. However the later sixteenth and seventeenth centuries saw great change beginning. The dynamic came from the aggressive practices of major landowners and freeholders who were freed by the Act of Union in 1536 and other post-feudal legislation from

many of the constraints of the Middle Ages, and new concepts of property introduced a powerful land market and a sweeping away of ancient rights and customs, not always strictly within the letter of the law. The Act of Union also discouraged the system of gavelkind (equal inheritance among all male heirs) and encouraged the consolidation of previously fragmented holdings by enclosure. This process may already have been in progress on the Towy valley floor in Llanarthne where recent historic landscape characterisation suggests that 'the field pattern is one of small, irregular enclosures, possibly late Medieval in origin - as encroachments onto fairly marginal, north-facing land' (DAT n.d.).

In the 1609 Survey, there is also much reference to recent 'incroachment' (by enclosure) on waste and former common pastures by prominent local freeholders to the south on Mynnydd Cyforth in the adjacent lordship of Kidwelly (Rees 1953, 243-4). Elsewhere there is also the purchase of freeholds often to be found in the estate records of major families such as the Vaughans of Gelli Aur and, we suspect, in the less well recorded estates of local gentry and ambitious freehold farmers (Lloyd 1939. 279-80). It was this pattern of enclosure, consolidation and the opening up of a land market that provided the opportunity and context for the Middleton purchase at the end of the sixteenth century. In terms of the landscape we must see all this encroachment as the time when the mountain pastures began to vanish and enclosed fields became the norm of good and 'progressive' agricultural practice.

Along with these new, improving agrarian practices came increasing cultural influences from England and Europe. The architectures and designed gardens of the elite would have shown clear signs of the Renaissance and parklands served both a new aesthetic and advanced techniques of pastoral farming. Another powerful element of this dynamic was the introduction of new technologies which drew first on innovation in hydraulic power and advanced mine engineering. This was the period of major industrial growth, in this region beginning to transform landscapes as landowners exploited more extensively the abundant mineral resources such as coal, iron and heavy metals. There was also a strong growth in the woollen cloth industry, although this was undertaken largely by small individual craft operations. Most of this change was from the top down as medieval elites bound by custom and exchange became capitalist landowners bound by laws of property and the market. By the end of the seventeenth and during the eighteenth this change was filtering down to the tenancy and new standards of building and land use began to be universally practiced. However, the basic pattern of settlement and land use which is still visible today contains extensive signs of the pre-seventeenth century landscape as the recent Historic Landscape Characterisation demonstrates (DAT, n.d.).

b. The Park

The park of Middleton Hall, as identified on even the earliest maps we have (Figure 2), is a relic of conscious design by the elite and grafted onto this basic agrarian landscape. For the landscape historian and archaeologist it is full of traces from at least two phases of design. The most obvious is the latest, the 568-acre Paxton park which, with some minor changes, is what can be seen (Figure 3) on the first edition 6-inch to the mile Ordnance Survey map of 1891 (surveyed in 1886). This has been described in full in previous landscape analyses by consultants, notably Gallagher (n.d.) and Banks (2000) and need not be repeated here. The primary elements include an encircling stone wall with lodges to north and south at either end of the main drive which approaches and passes Paxton's new mansion, formal gardens and service buildings. These lay to the west of the southern Afon Gwynon, an area also rich in woodland plantations through which the drive was designed to run thus giving the signature picturesque views of the landscape and the house. The rest of the park, especially to the west, was largely open, perhaps originally unenclosed, pastureland with small stands of trees dotted around, very much in view from the south-west facing facade of the mansion. In the foreground of this view were three large ponds giving the Claudian pastoral perspective across a pretend broad Tuscan river.

What, if anything, of this park existed before Paxton? The concept of the park in Britain appears to originate in the hunting obsessions of feudal aristocracy. Until recently it has been assumed that this began during the Norman era when enclosed parks began as reserves for deer, especially some of the smaller introduced breeds, as quarry for the hunt. More recent work has clearly demonstrated that this concept can certainly be found in late Anglo-Saxon England and it may even be that the park was first introduced by the Romans as aesthetic as well as hunting elements of some of their very large *villae rusticae* in regions like the Cotswolds. In Wales there are only a few clear examples of medieval hunting parks with the nearest perhaps being at Dinefwr. However, by the end of the Middle Ages, in the later 15th and 16th centuries the Anglo-Welsh aristocracy and gentry were certainly beginning to use the park concept, closely linked with the formal garden, as a way of expressing status in an expanding world, redefining leisure and courtly or polite behaviour in accordance with Renaissance European practice and introducing new systems of agrarian management with new breeds of animal and species of plants.

At the moment we can only propose that elements of the Paxton Park may have originated in the Middleton era. It has already been noted that the site of the earlier Middleton Hall is actually much more central to the Park than Paxton's mansion. Aerial photography and ground survey has shown a complex early system of water management to the east of, and around, the hall site, which includes quite substantial ponds. There may also be traces of early woodland management as well as a variety of earthworks which cannot be explained in terms of the Paxton

landscape. Much more, systematic work needs to be done on the Park landscape before its full history can be written.

One of the key areas where work will need to be done, and which will integrate with the other research undertaken by the National Botanic Garden of Wales, is in the historical ecology and land management history of the Park as it now survives. It would be a mistake to think of the Park, even in Paxton's day, as something created solely for the aesthetic and pleasure purposes of the proprietor and his guests. It had to pay its way, as indeed it must still do today. Parkland was essentially a pastoral reserve. As an enclosed and secure piece of the landscape, it provided scope for the management of fauna on an extensive scale and sometimes in an experimental and innovative way. Classic parkland animals were the white cattle and fallow deer still to be seen in Dinefwr Park, although these tended to be the perquisites of the aristocracy and those aspiring to such status. Nonetheless the Park as 'chase', the location of genteel hunting would have engaged the introduction and management of lesser beasts, especially game birds, and the destruction of their predators. The partner of the game bird, the rabbit and the hare were the fish, particularly in the lakes, perhaps only enlarged by Paxton as part of the Picturesque landscape. Hunting and fishing would not have paid the park workers' wages, however and the pastoral would have seen herds of domestic grazing cattle and flocks of sheep with landowners particularly interested in the new breeding lines which were improving their profit margins. There was no better place than a park, with its closed, tightly controlled and often well-resourced management systems, for conducting experiments and trying out the new where the interest of the landowner could be directly engaged. In a park also the endeavours of landowners to improve could be the source of admiration and praise from their peers and their tenants alike who would be encouraged to make better returns to the benefit of their masters.

Alongside the management of fauna came the management of flora. In part this was again aesthetic and subject to the vagaries of fashion. Here a key motor for change was the idea of landowner as progressive improver and, just as new breeds of stock were presented to view, so too were new plants increasingly being planted, brought from the expanding British Empire and selectively bred under the eye of a bright new science of botany emerging out of the more humanistic natural history. This also engaged the improvement and designed planting of native species, especially woodland. In part, the design concept for planting was aesthetic, but there was also much practical return in terms of sustainable woodland management for fuel, manufacture and building and Middleton Park has a rich legacy of such planting, some of which stretches back beyond the time of Paxton.

The natural legacy of Middleton Park and its wider landscape is a rich source of biodiversity acknowledged as a major strategic objective of the National Botanic Garden of Wales. There is much, however, still to be learned and gained from extended research with the potential for detailed plant recording on an historical basis, of

archaeobotany, and of the re-construction of past landscapes, both in virtual and real space. The Park is clearly a potential resource for understanding and learning the histories and contemporary trajectory of sustainability as a long-term and embedded part of our environmental heritage. This would sit well alongside the techniques, discoveries and objectives of modern science which the National Botanic Garden also seeks to promote. The Park, after all, was always a place of experiment and innovation for the public to see and admire.

7. Field Survey and Propection *David Austin, Quentin Drew and Edward Baker*

a. Initial field survey

In 1999, the site of the earlier Middleton Hall was surveyed by staff and students of the University of Wales Lampeter (Baker 1999; Austin 1999). The earthwork survey and its interpretation (Figure 5) identified a large square house platform (approximately 650m²) at the east end of a field sloping away from the shallow gorge of the Afon Gwynon and the former Pond Ddu. A soil pit dug in the same year had revealed substantial building and domestic remains together with some dating evidence of the later sixteenth to early eighteenth centuries. The western edge of the platform appeared to have been designed as a terrace looking down on the lower part of the field where there were traces of one and perhaps two other terraces. Beyond these were the very clearly delineated earthworks of a very substantial rectangular depression. This had a mound in the middle and was interpreted (as Gallagher and Ludlow had done previously) as an ornamental pond. To the south in a former stream bed the survey also identified a series of banks which suggested the outlines of a flight of small ponds as part of a possible water garden. All of this was interpreted as the remains of the first Middleton Hall and its formal gardens to be dated to the 17th and early 18th centuries. The survey also noted that there were other features which time and resource had not allowed us to record, especially to the south and east of the main site.

b. Aerial Photography

David Austin and Toby Driver (Royal Commission on Ancient and Historical Monuments in Wales)

We were fortunate in finding that, in 2010 oblique air photographs had already been taken in near perfect conditions by Toby Driver of the Royal Commission on Ancient and Historical Monuments in Wales. A light dusting of snow and frost filled even the slightest hollow and emphasised low banks and a set of images was produced which will stand the project in good stead for several years to come (Figures 11 and 12). An initial interpretation of this photograph informed the strategy for fieldwork in 2011.

All this has shown that on the house platform there were the fainter earthworks of a large building of some complexity, aligned broadly north-south and facing westwards down the slope as envisaged in the 1999 interpretation (A). It is also clear that there are features, including what may be another small pond, on the terrace in front of the house (B). The Garden area itself below the house platform could now be seen as another broadly square area with a number of faint features running on north-south lines parallel to the house (C). Just outside this was the large ornamental pond on a slightly different alignment to the rest (D) and possibly inside a similarly aligned

enclosure (E). The water garden features originally identified to the south (F) could now be seen to be part of a larger complex of features (G) including yet another formal pond (H). To the east of this and just below the house platform



Figure 12: 2010 Air photograph of the study area with key features annotated (Toby Driver: RCAHMW: AP 2010 4768).



Figure 13: 2010 Air photograph: wider view of the study area (Toby Driver: RCAHMW: AP 2010 4769).

on its south side is another square enclosure on the same orientation as the house (J). To the east of this again, just intruding into the surveyed field but extending beyond this into the rough pasture field to the east, was a set of features which are very clear, but hard as yet to explain. It consists of a large rectangular raised platform with a large bank on its down-slope (western) edge (K). Cut into the top of the platform is a rectilinear network of ditches forming eight square 'islands' on either side of spinal ditch running from back to front (east to west) of the platform. That the ditches were intended to hold water, whether standing or running, is clear from the presence of reeds which give the dark colouration on the air photograph. At the centre of the 'islands' there are small depressions which appear also to have been water-filled (e.g. L). Up the slope to east of all these features, but off the edge of the air photograph, there is also an extensive complex of leats and ponds which have yet to be surveyed, but which clearly provided the capacity for a complex pattern of water use for domestic as well as garden purposes. There also appear to be features (M & N) under and to the south of the Waun Las farm complex which was built on the south side of the site in the 1930s and is now abandoned.

c. RCAHMW field survey

Louise Barker (Royal Commission on Ancient and Historical Monuments in Wales)

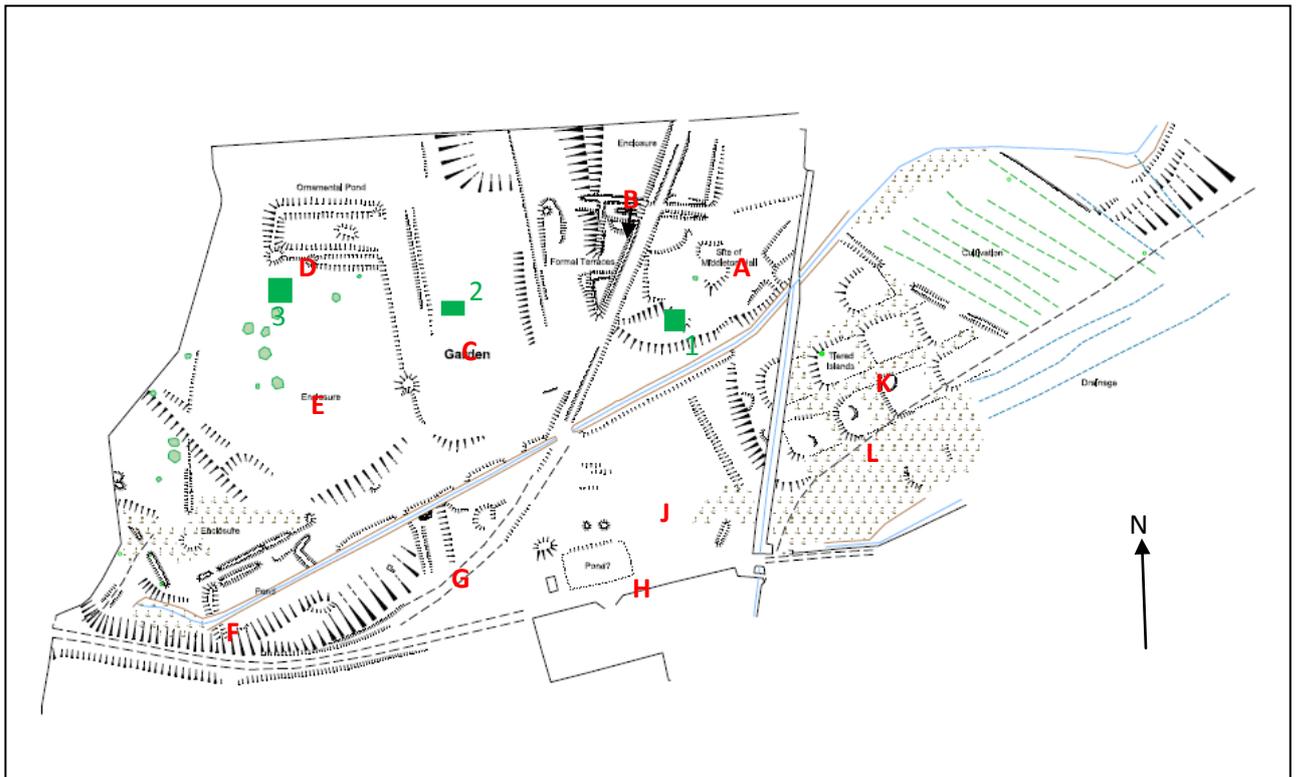


Figure 14: 2012 Survey of earthwork features with elements lettered as in Figure 12 and 2011 excavation trenches marked in green (Louise Barker: RCAHMW)

In February and March 2012, Louise Barker conducted detailed topographic survey on the site of the early Middleton Hall. The preliminary results are shown in Figure 13 and accord reasonably well with the results seen in the air photographs (the letter codes for the various elements identified on the air photograph are replicated on the earthwork survey). The survey, however, is incomplete on the eastern and southern sides and the whole needs full ground-truthing. This will be completed during the 2012 season. At that point also all the survey results, including the geophysics which follow, will be correlated and an overall interpretation offered.

d. Geophysical survey 1

Dr Adam Booth (Glaciology Group, College of Science, Swansea University)

Introduction

Geophysical surveys were conducted in the Waun Las field, to image target features identified in the field survey and aerial photographic record. The main survey grid focussed on imaging subsurface archaeological remains beneath features A, B and D (see Figure 14), and smaller datasets were acquired over features H and J.

Basic Theory

Three geophysical methods contributed to *Geophysical Survey 1*, specifically ground-penetrating radar (GPR), electromagnetics (EM) and global positioning satellite (GPS) techniques. Some background theory to each method is provided although, for more detail, the reader is directed towards the many research articles published in "Archaeological Prospection" journal, or the *Society of Exploration Geophysics* textbook "Near Surface Geophysics (Butler (ed.), 2005).

i. Ground Penetrating Radar (GPR). GPR can be thought of as 'an X-ray for the subsurface', and offers the highest-resolution (i.e., highest detail) imaging of all geophysical techniques. Pulses of radar energy are transmitted into the ground from a surface antenna and can be reflected back to the surface by buried archaeology, where they are recorded at a receiving antenna. By measuring the time taken for the radar energy to return to the receiver, the depth of a target can be estimated. Archaeological GPR data are usefully shown as a 'time-slice', allowing the responses to be visualised in map-view.

ii. Electromagnetics (EM). EM methods provide a measure of the electrical conductivity of the subsurface. The high conductivity of metals is therefore associated with a high EM response, although the technique also responds to subsurface water. Groundwater usually has a small electrical conductivity, and high concentrations of water within the ground (e.g., located within buried post-holes, ditches, etc) are detected by the EM equipment. Variations in water-content can therefore be used to diagnose archaeological structures within the ground.

iii. *Global Positioning Satellite (GPS)*. GPS surveys are well-known for their capability to measure the position of a target on the earth's surface. They are useful within an archaeological context for measuring the size of earthworks and correlating them with anomalies identified in other geophysical records.

Surveys at Waun Las

GPR: Two GPR systems were used during data acquisition. Grids in Figures 11-13 were acquired with a Sensors and Software *PulseEKKO PRO* system, whereas those in Figure 15 were acquired with a GSSI SIR-3000 system. Both systems used antennas of 500 MHz centre-frequency, and the spatial resolution of all grids was 5 x 50 cm (i.e., the GPR samples every 5 cm along a survey line, before the survey line is incremented 50 cm along the grid).

EM: EM data were acquired with a Geonics EM31-3 system, equipped with a data logger. This system has an effective sampling depth down to ~ 1.5 m. The spatial resolution of the EM grid is 10 x 50 cm (i.e., EM survey lines are separated by 50 cm, and sampled every 10 cm along a line).

GPS: The GPS is a *Trimble* system, used here in a differential mode. This allows centimetre positional accuracy, including in elevation (which is usually the least-precise dimension in a GPS survey). The GPS base station was established close to Waun Las farm house (near to feature H in Figure 14), and was operative during the grids in Figure 14-13; unfortunately, no GPS information is available for Figure 14.

Geophysical data

Figure 14 shows an overview of geophysical data grids over features A, B and D (see figure 8); Figures 12 and 13 show equivalent enlargements over features A and D, respectively.

The location of each acquisition is shown in *a*; blue boxes are GPR acquisitions, the green outline shows the extent of the EM grid, and the red line shows the GPS track from which the elevation model is derived. That elevation model is shown in *b*; topography varies by ~ 8 m across the site, with the hall platform (A) some 6-7 m higher than the ornamental pond (D) further west. EM data, in *c*, show the highest electrical conductivities in the extreme north of the grid but this is due to the proximity of a wire fence; the next highest conductivities are over the ornamental pond (D). Panel *d* shows GPR time-slices over features A and D.

Figure 15 shows an enlargement of acquisitions over the hall platform. Note that the colour scales of these plots have been changed with respect to Figure 9, to emphasise local contrasts. Local elevation is shown in *a*, and EM responses are shown in *b*. These generally increase from south to north across the grid. Two GPR time-slices are shown, from ~0.4 m (*c*) and ~0.7 m (*d*) beneath the ground surface. The brackets in the shallower time-slice indicates a region of 'chaotic' GPR responses, which disappears further north; in this northern region, there is evidence

of a subtle linear feature (at Y = 40 m, and between X = 120 and 140 m, and Y = 40 m). The deeper time-slice appears much 'quieter' (i.e., fewer responses), expect for a distinctly rectangular zone of subtle reflectivity in the south-western corner of the grid. The chaotic region of GPR responses is possibly indicative of building debris related to the hall construction, with the rectangular reflectivity potentially indicating intact construction (i.e., an intact floor). The elevated electrical conductivity to the north, and the lineation in the GPR anomaly, may be associated with managed gardens to the immediate north of the building platform.

Figure 16 shows an enlargement of acquisitions over the ornamental pond, feature D (again, colour scales are modified to emphasise local contrasts). The pond is associated with clear topographic (a) and electrical conductivity (b) anomalies; the earthworks stand proud of their surroundings by 10-20 cm, and the centre of the feature is associated with a strong positive electrical conductivity anomaly. Within the earthworks, there are some GPR responses but these are located some metres west of the highest EM responses. These response show clearly that there are buried features associated with feature D; however, the high EM responses are probably not sufficiently high to indicate metal and are instead more indicative of a groundwater pool (i.e. a buried excavation in the centre of the pond). The GPR responses could indicate decorative features of the pond, or simple debris fill washed to lower elevations from the hall platform.

Figure 14 shows additional GPR time-slices acquired over features H, J and B.

Feature H (green grid) is a similar earthwork to D, hence was tentatively identified as a second ornamental pond. Similar to Figure 16c, there are isolated GPR anomalies at the centre of the feature, potentially related either to buried structure or debris.

Feature J (red grid) is a large earthwork, trending obliquely to the hedgerow at the eastern edge of the Waun Las field. There are some very strong GPR anomalies associated with this, and possible structure buried beneath (at a depth not less than 30 cm); furthermore, this structure may align with the orientation of earthworks that form features L and K.

Feature B is a further earthwork, west and down-slope of the hall platform, A. The earthwork is quite large and, in light of this, the absence of GPR responses in this grid is somewhat surprising. There is a subtle response at the centre of this grid, and a subtle linear feature trending east-west (this latter anomaly appears to align with a narrow, long earthwork). However, this earthwork was not associated with any large electrical conductivity anomalies in the EM31-3 record in Figure 15b.

Given their distinct geophysical anomalies, coupled with their clear earthworks, invasive excavation should therefore be prioritised over features A and D (the hall platform and ornamental pond). Of the grids in Figure 17, feature H could indeed correspond to a second pond, and earthwork J certainly merits further investigation.

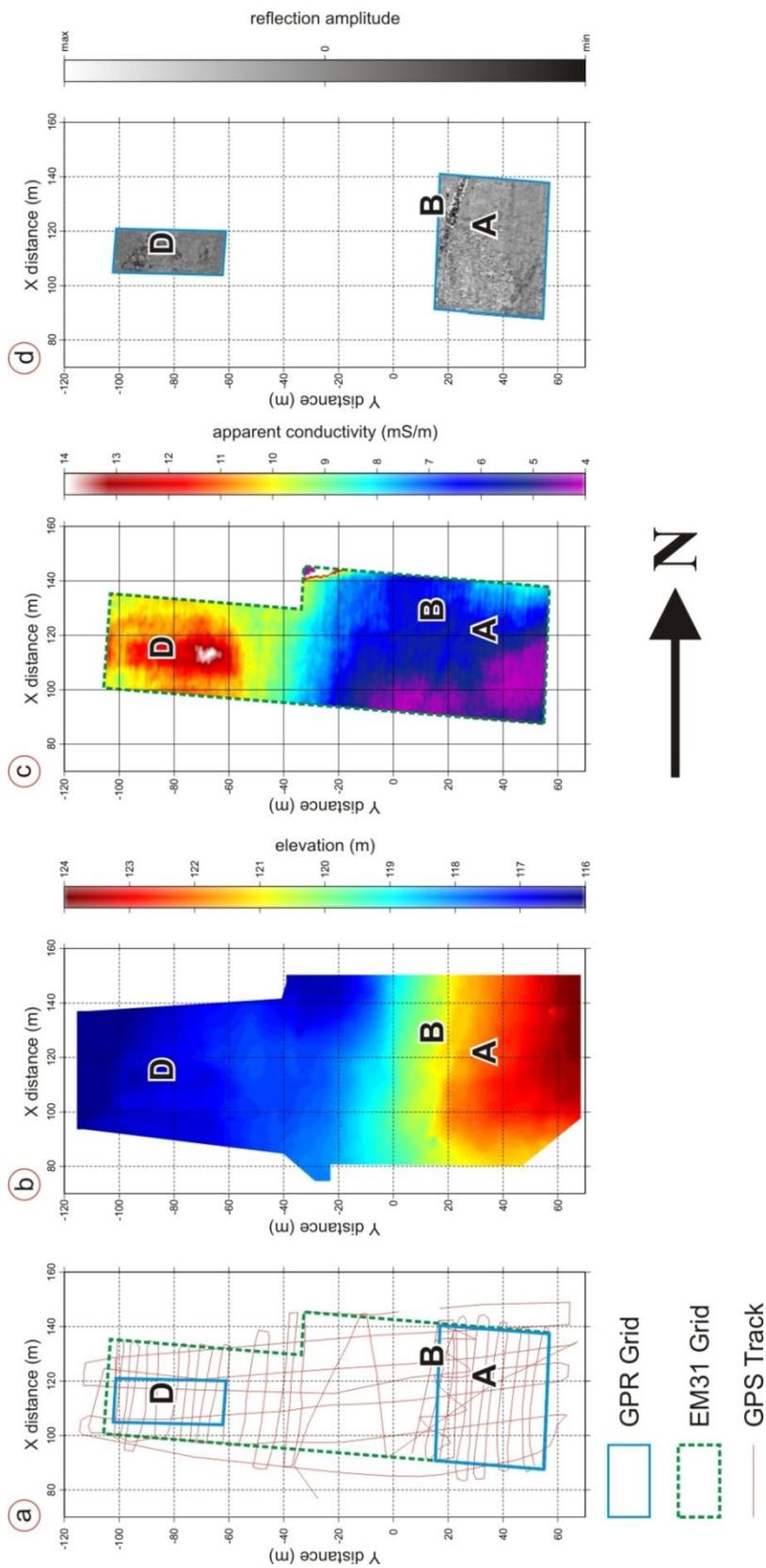


Figure 15: Overview of geophysical acquisitions over the northern half of the Waun Las field. Annotations A, B and D correspond to equivalent annotations in Figure 13. a) Survey location map. b) Elevation data from GPS surveys. c) Electrical conductivity from EM31-3 acquisitions. d) Locations of GPR grids, over features A and D.(Adam Booth)

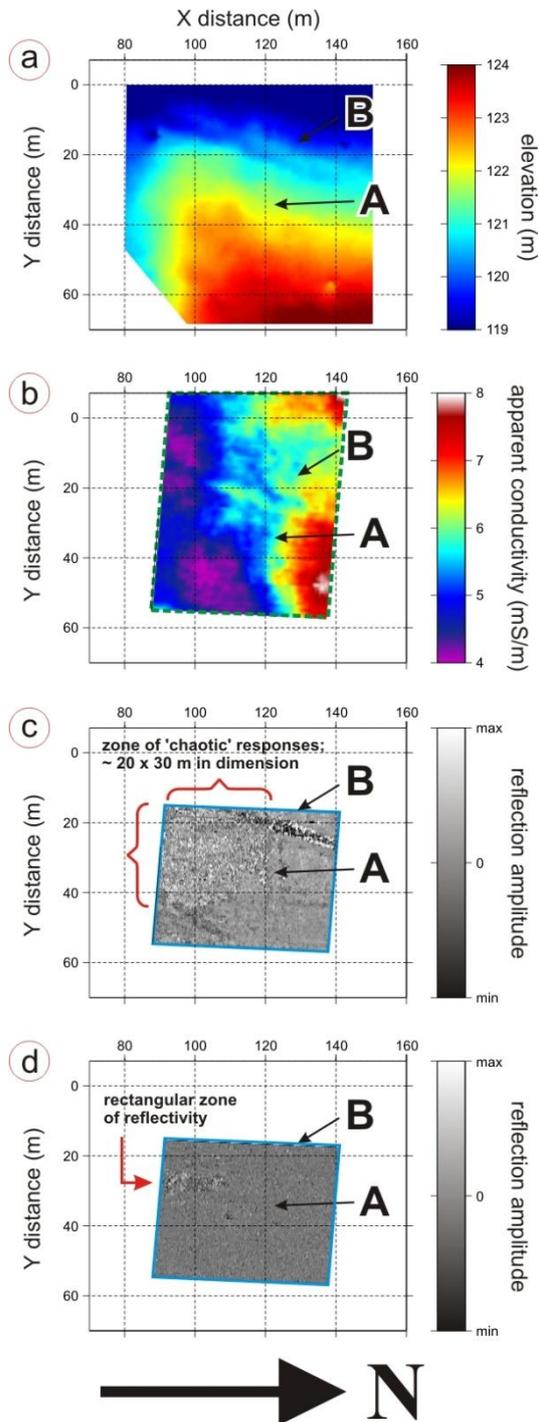


Figure 16: Enlargement of acquisitions performed over the hall platform (feature A), in the north-eastern corner of the Waun Las field. a) Elevation data. b) Electrical conductivity. c) GPR time-slice, corresponding to a depth of ~ 40 cm in the ground. d) GPR time-slice, corresponding to a depth of ~ 70 cm in the ground. (Adam Booth)

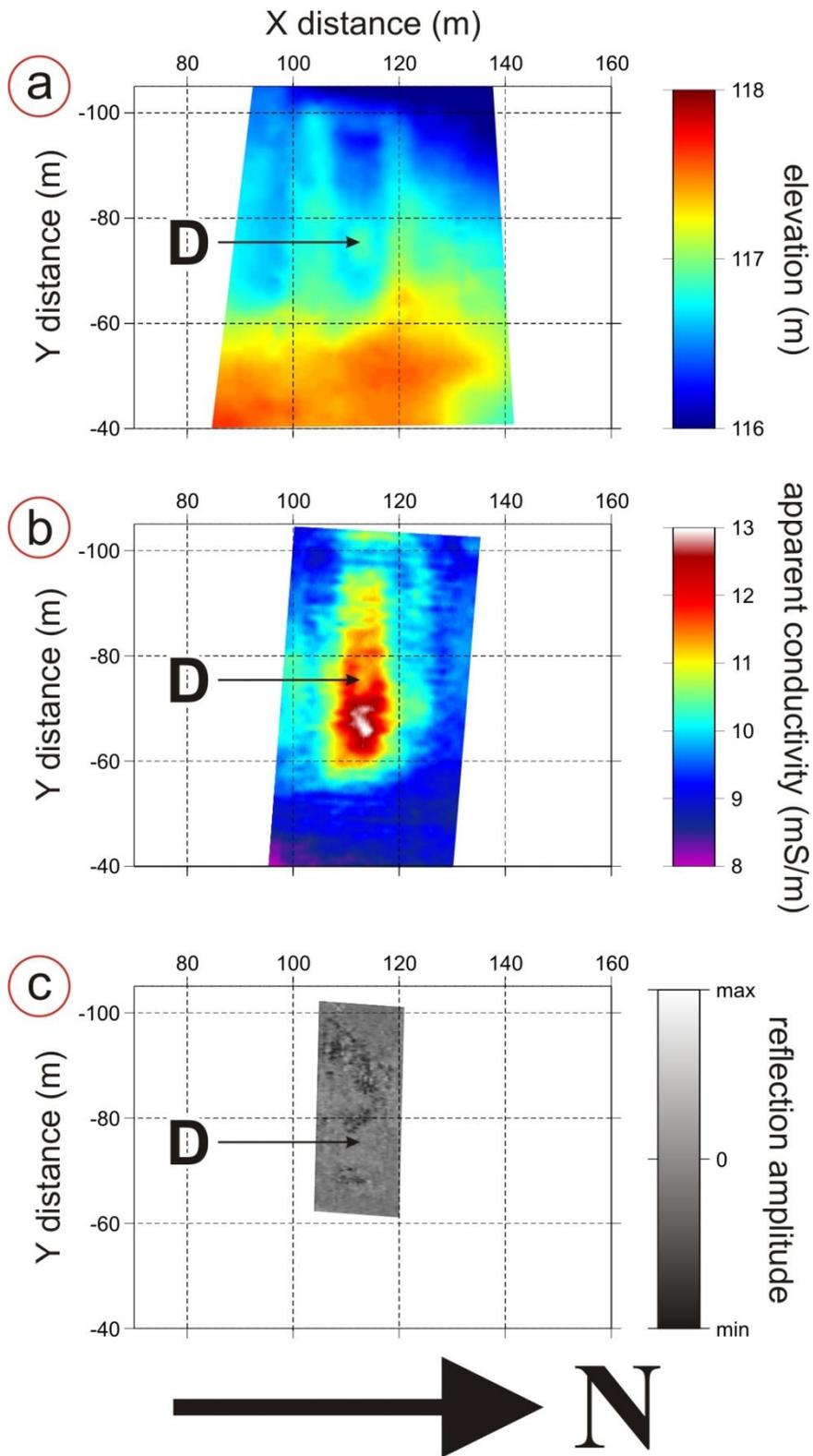


Figure 17: Enlargement of acquisitions performed over the ornamental pond (feature D), in the north-western corner of the Waun Las field. a) Elevation data. b) Electrical conductivity. c) GPR time-slice, corresponding to a depth of ~ 40 cm in the ground. (Adam Booth)

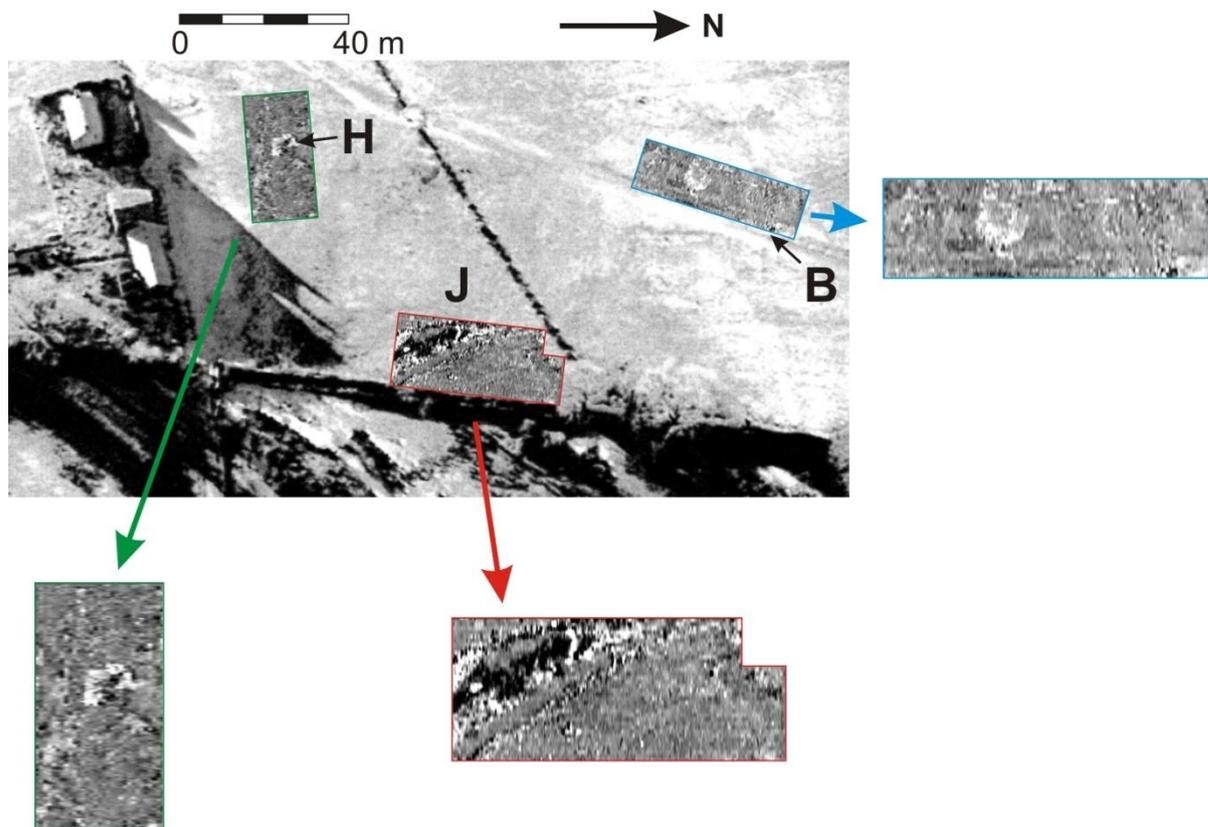


Figure 18: GPR time-slices from elsewhere in the Waun Las field, made over features H, J, and B (green, red and blue grids, respectively). Feature H shows similar radar responses to the ornamental pond in D (Figure 14c). Feature J shows strong GPR responses over its prominent earthwork. Feature B is not associated with significant GPR responses. (Adam Booth)

e. Geophysical survey 2

Dr Jemma Bezant (School of Archaeology, History and Anthropology, University of Wales Trinity St David)

Part 1: Survey 2011

Aims

The aim was to test the technique (magnetic gradiometry) on the target area. Following aerial photography by RCAHMW in late 2010, a number of linear earthwork features were confirmed. The geophysical survey was targeted partially on this area.

Method

The survey was conducted using a Bartington Grad 601/2 in the dual configuration. This gradiometer is useful for rapid shallow prospection where typically 'noisy' features are expected, i.e. subsurface features such as ditches, paths and occupation.

30x30m grids were laid out and surveyed in zig-zag fashion with a NE start direction (originating from bottom left). Traverses were 1m apart with a sampling frequency of 25cm.

Results

Results were good – clear magnetic signals were received (Figure 19). The survey ‘clipped’ the eastern end of the rectangular ‘pond’ feature which can be clearly seen. This can be clearly seen in the survey. A number of parallel features running perpendicular to this may relate to a formal garden layout although excavation alone can prove this. There is a level of ‘noise’ overlying the survey that may be localised burning and/or iron-rich objects from occupation or agricultural debris. The results were superimposed on the air photograph (Figure 20) and the general relationship between the linear features shown on the geophysics and the orientation of the garden as a whole can be clearly seen.

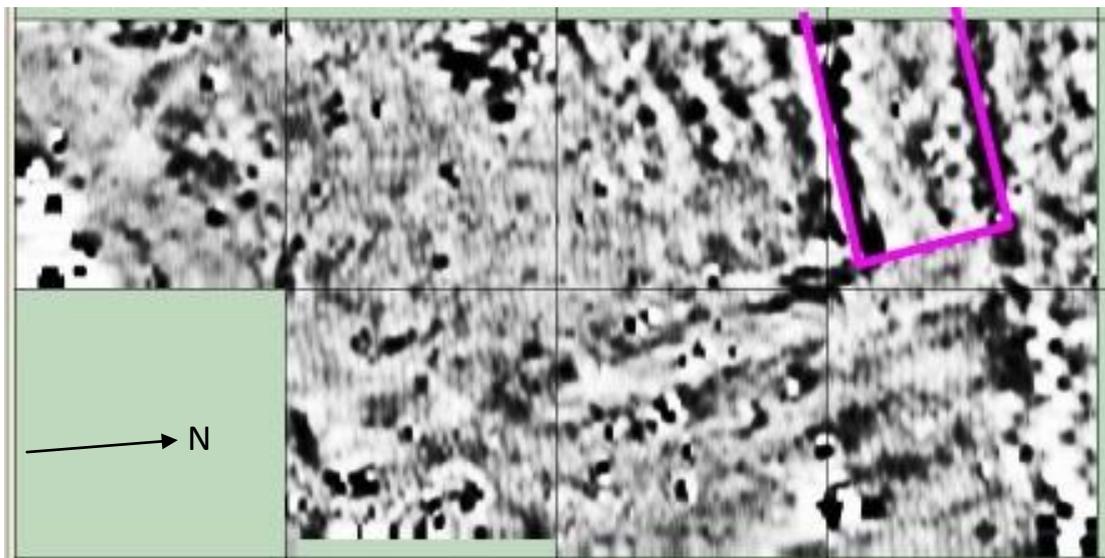


Figure 19: 2011 magnetometry results for the garden area and pond (J. Bezzant)



Figure 20: 2011 magnetometry results overlaid on the Air Photograph (J. Bezzant)

Dr Jemma Bezant and Edward Davies (University of Wales Trinity St David)

Part 2: Survey 2012

In February 2012, we returned to the site of the early Middleton Hall as discussed in this report and carried out a much more extensive geophysical survey of the major earth work area to the north of Waun Las farm.

As in 2011, the survey was carried out using a Bartington magnetic gradiometer 601-2 in the dual configuration to allow for rapid and accurate survey. This technique is ideal for the prospection of 'noisy' archaeological areas that might contain built structures with both domestic occupation and industrial activity. It is also capable of detecting more subtle features such as ditches and former river channels.

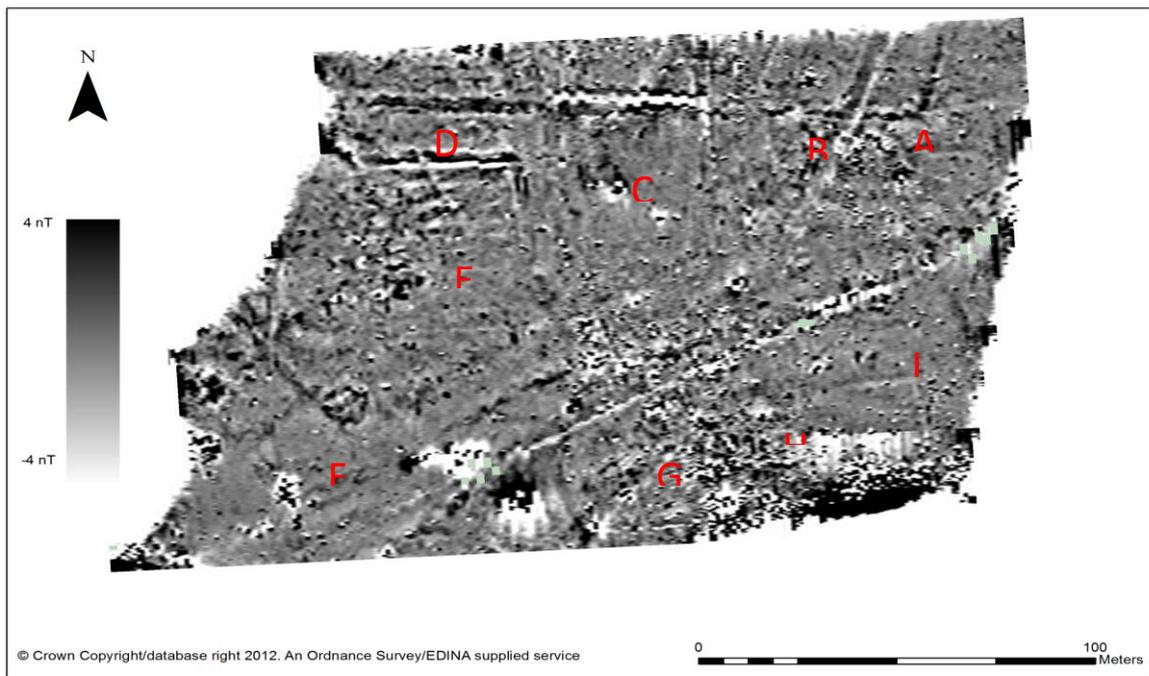


Figure 21: 2012 magnetometry survey with letter codes as in Figure 12 (Dr Jemma Bezant and Edward Davies)



Figure 22: 2012 magnetometry survey 2012 overlaid on topographical survey (Dr Jemma Bezzant and Edward Davies)

Each 30m grid was surveyed at a traverse interval of 1m with a sampling interval of 4 readings per metre in a zig-zag format in order to give high resolution results (see survey metadata below). The data were downloaded and processed using Archeosurveyor LT v. 2.5.10.4. The data were subsequently adjusted to reduce striping (an artefact of the survey process) and are reproduced as greyscale bitmaps of readings clipped to a range of ± 4 nT (nanotesla). This is represented by a palette bar where positive magnetic anomalies (for instance, pits ditches or furrows) are represented as dark grey and negative anomalies (for instance, paving, tracks or walls) as light grey. The subsequent data were 'smoothed' by a process known as interpolation that increases the number of data points in the survey. In this case the number of points were doubled along the x and y axes. 'Speckling' across the survey that shows as discrete white/black points are dipolar in nature and are likely to represent highly fired material deposits within the topsoil (such as brick fragments) or ferrous items (such as iron nails or horseshoes). This type of 'background noise' is common to land that has been used for agriculture and sites containing demolition activity; both of which are known to have occurred in the survey area. We can say there was a demolition at least due to the findings from the excavation and agriculture is supported by historic sources.

Survey Metadata

Instrument Type:	Bartington (Gradiometer)
Units:	nT
Assembled on	22/02/2012
Direction of 1st Traverse:	South
Collection Method:	ZigZag
Sensors:	2 @ 1.00 m spacing.
Dummy Value:	32000

Dimensions

Composite Size (readings):	600 x 240
Survey Size (meters):	150 m x 240 m
Grid Size:	30 m x 30 m
X Interval:	0.25 m
Y Interval:	1 m

Stats

Max:	4.00
Min:	-4.00
Std Dev:	1.92
Mean:	0.01
Median:	0.00
Composite Area:	3.6 ha
Surveyed Area:	2.9232 ha

Conclusions

The character of the subsurface features has lent itself well to magnetic gradiometry and linear positive and negative features suggest an area of intense activity. The geophysical survey has revealed an area of activity likely to have been associated with the earlier Middleton Hall mansion and gardens and supports current interpretations of the earthworks (see elsewhere in this report). The linear and geometric nature of the results suggests a formal garden layout with a rectangular feature likely to have been an ornamental pond or canal garden, both popular during the 16th – 18th centuries. Negative linear features could be wall or path foundations whilst positive magnetic anomalies could be pits or ditches. It should be stressed that geophysical survey has limitations and not all archaeological features present may provide a suitable signal. Responses can be masked by background ‘noise’ or the magnetic differential in quite different features may not be sufficient to provide a signal. The conditions also were very wet and it is clear that the water retention qualities of the ground led to some subtle but interesting differences in results. Perhaps the most noteworthy is the garden area C where the very clear striations visible in 2011, which excavations have shown to be the remains of gravel paths,

were almost indistinguishable in 2012. Other major features, however, notably a very prominent east-west ditch to the north of A, B and D are not very prominent on the earthwork survey or the air photographs. It is customary to proceed with caution therefore with any interpretations based upon geophysical survey alone.

With these results and the need for completing and extending the topographical survey, there is clearly now a need to return to this area, correlate all survey results and probably repeat parts of the geophysics work. It is, however, already clear that the site has great complexity and is likely to have more than one phase of design and use.

8. The Excavation Jonathan Dollery and David Austin (School of Archaeology, History and Anthropology, University of Wales Trinity St David)

Strategy and method

The excavations at Waun-Las National Nature Reserve were undertaken over a period of 10 days between 18th July 2011 and the 1st August 2011. During this period three trenches were excavated to assess the interpretations produced from the fieldwork described earlier in this report and the potential for surviving archaeology. The excavations were undertaken by students from the University of Wales Trinity Saint David's and volunteers of the National Botanic Garden of Wales. This work was overseen by Jonathan Dollery and assisted by Rhian Williams (Trench 1), Edward Davies (Trench 2) and Kit Hughes (Trench 3).

Aims and objectives.

- To explore the potential of surviving archaeology that can be recovered from *Waun Las* nature reserve.
- To look for archaeological evidence associated with Middleton Hall.
- To look for evidence of previous garden features that pre-date the Paxton designed landscape.

All works were undertaken in accordance with the Institute for Archaeologists (IFA) *Standards and guidance: for archaeological excavations* and current Health and Safety legislation. To ensure safe working on the site a risk assessment was created and all volunteers were fully briefed by excavation staff on how to conduct themselves on site before being allowed to participate.

Methodology

1. Archaeological Evaluation.

To assess the potential for surviving archaeology it was agreed that three trenches would be excavated. All the trenches had been positioned over different areas of the site to target specific archaeology (for locations see Figure 13; Figure 22). Trench 1 was intended to look for evidence of the early house of Middleton Hall. Trench 2 was designed to look for any evidence of surviving garden features at the west of the site between the water feature and the lower terrace. Trench 3 was to target the southern and western bank of the water feature and also to investigate the fill of this large feature.

All excavation was done by hand as the depth of the archaeology was not known. Archaeological contexts were recorded and then removed using a variety of techniques, primarily mattocking and troweling depending on how large or sensitive the deposits were.

2. Recording the Archaeology

Great care was taken to ensure that the archaeology was sufficiently recorded. A basic hand-written recording system was employed and later transferred to an electronic archive. This

was done to assist in the process of inducting novice volunteers into the methods of archaeological recording. The following specific records were created:

Context Record: The single context recording system used, which means that every archaeological entity or feature discovered on site was assigned a unique number through which the stratigraphic relationships could be expressed in the form of a matrix. To avoid confusion and duplication each trench had a different numerical system. Trench 1 started from 1001, while Trench 2 began numbering contexts from 2001 and Trench 3 from 3001. Each context was then recorded thoroughly by pro-forma context sheet.

Photographic Record: Photographs were taken of all three trenches using an 8.0 megapixel Nikon Coolpix 8400, producing colour digital photographs. Photographs were taken at various stages of the excavation to document the changes of archaeological deposits that accrued within each trench. The full photographic record is retained as a separate archive. Elevated photography was also taken of each trench at the end of the excavation to give a good overview of the archaeology that was uncovered.

Drawn Record: Site drawings were produced for each context during the excavation. All plans were drawn on permatrace and have subsequently been converted to digital format. The scales that were used on site were 1:20 for trench plans and 1:10 for section drawings. All plans were drawn by excavation staff with the aid of volunteers and have been checked for accuracy by Jonathan Dollery.

Survey Record: Before the excavation began a site grid was established on site using a temporary point of origin which was given the value of Eastings 500.00m and Northings 500.00m. This gave one system for horizontal recording. Due to the nature of the topography of the site, two temporary bench marks (TBM) were used for the record of levels. TBM A was located on a concrete plinth close to the farm of Waun Las. TBM B was located on a buried stone close to an access gate to the north-east corner of the field. As the sea level datum was not known at the time, both TBM's were given a value of 500.00m Above Ordnance Datum (AOD). The grid and TBMs, since the finish of the excavation have been surveyed and geospatially recorded by Louise Barker of the RCAHMW and their respective Ordnance Survey co-ordinates have been updated.

a. Trench 1 (Figures 23-26)

Trench 1 was excavated in order to identify the potential of surviving archaeology associated with the structure of Middleton Hall. It was agreed that the trench would be 4.00m square with the possibility of it being extended by 1.00m depending on the type of deposits and archaeology that was found. It was decided that the trench would be placed over the radar anomaly that was identified by Dr Adam Booth's survey of the house platform. The readings for this anomaly indicated a rectilinear feature 15.00m in length and 5.00m in width at a depth of 1.00m. This large feature, due to the nature of its depth, may have been a cellar



Figure 23: View of Excavations in progress with Trench 1 in the foreground looking west towards Trenches 2 and 3 with the site of Paxton's Hall visible in the background (Jonathan Dollery).

associated with the house platform. It was decided that the best place to determine the nature of archaeology that survived within this area would be to investigate this rectilinear feature as its depth could have protected the archaeology from later disturbance such as ploughing.

The turf was removed to a depth of 0.10m and it became immediately apparent that there were significant occupation and building deposits. Directly below the turf and topsoil [1001]ⁱ were two rubble deposits [1005] and [1007], the first spreading from the east of the trench edge to the centre where it dissipated and the second being located from the centre of the trench to its western edge. Once the turf was removed the trench was cleaned by trowel to expose both the rubble deposits. These rubble deposits confirmed the presence of a large structure within the local vicinity of the site.

Once the trench was cleaned, it became apparent that there was a ditch-like feature [1011] running north-south through the centre of the trench (Figures 23 & 24). The fill of this feature was easily recognisable as it contained a clean light brown soil without rubble or occupation material [1002] and it had been cut through both rubble deposits. This upper fill of the

ⁱ Numbers in square brackets denote the recorded context numbers to be found in the site recording and the Appendices to this report.

feature was recorded and removed. Directly below [1002] was a deposit of sub rounded gravel contained within a yellow clayey soil matrix [1003]. While cleaning this deposit, pottery and iron objects such as nails were found as well as an area of burnt material including coal, charcoal and burnt stone within a dark brown soil matrix [1004] at the north end of the trench. This deposit was found to be on top of [1003] and removed.

Once [1004] was recorded and removed a decision was made to investigate the two rubble deposits located to the east and west of the trench. The reason for doing this was that it was thought that surviving structure would hopefully lie directly below these deposits. Although we had answered our primary question of identifying archaeology the next step was to ascertain whether any structure relating to Middleton Hall survived.

With this new objective both rubble deposits were excavated in spits, that is to say 0.10m of material was removed by mattock and then trowelled to remove the uppermost part of the context; the process was then repeated until a new context was discovered. Once the first 0.10m of material was removed from the rubble deposit in the west of the trench there was a recognisable change. The rubble deposit [1005] became more compacted, the majority being consolidated with lime mortar and it seemed possible that this feature was structural. The other rubble deposit to the east of the trench [1007] also started to produce a large amount of lime mortar with much larger stones, but was less compact than [1005]. While excavating [1005] a small isolated area of concentrated burning was identified [1006] towards the centre of the deposit. This feature was located within [1005] and through further investigation it was found that it had been cut by the ditch feature.

Identifying the nature of the rubble and potentially discovering structural remains the decision was taken to extend the trench 1.00 m. to the west to identify a western edge to the possible structural feature [1005]. It was established very quickly that there was no such facing edge and it became apparent that this was not structural but simply a concentration of building rubble. While investigating [1005] it was identified that the rubble deposit was sitting above a reddish-brown loose soil [1008]. It also became very clear that both rubble deposits did not contain any high status stone of a kind that might have been used for openings and decoration. The only stone contained within both deposits had most likely been sourced from local sandstone quarries.

As [1005] had been identified as structural debris rather than structure in-situ the next step was to resume the investigation of the ditch feature in the centre of the trench. [1003] was producing a large amount of archaeological and architectural refuse and the decision was made to remove this context to identify the bottom of the cut. Whilst removing [1003], it was apparent at the time that the area of concentrated burning [1006] seemed to be the fill of a pit feature. As this feature was apparently more recent stratigraphically, it was removed to explore what was situated below it. Once the fill had been removed, its cut [1009] was exposed. It was then possible to identify the sequence of this feature and its relationship with the surrounding archaeology. It was apparent that [1009] cut into the ditch fill of [1003] and

below it a new context [1013] was discovered consisting of dark brown soil and rubble. The fill [1006] and cut [1009] have been interpreted as being part of the demolition phase of the old hall, perhaps evidence of the burning of debris and detritus when the hall was being demolished.

Once the cut [1009] had been recorded the removal of ditch fill [1003] continued. Underneath [1003] a deposit of rubble suspended in a matrix of reddish brown soil and mortar [1010] was identified. The cut of the ditch feature was also now more visible and was given a context number [1011]. Due to time constraints, excavation of this feature was suspended. However from the evidence that had been collected the identification of this feature was now positive. [1011] was a trench created to rob the faced and worked stones from the walls of the hall. The depth of this feature probably reaches down to foundation level and may account for why no structural remains survive due to the hall being picked clean of any reusable material during the Paxton era of the site. Although structural features such as walls may not survive, the identification of these robber trenches will still permit the reconstruction of a floor plan of the building and its development.

While cleaning the reddish brown loose soil [1008] a series of compacted stones were uncovered. The stones appeared to have been deliberately placed and upon further examination it was established that these stones were in fact a cobbled floor surface [1012] which ran underneath the rubble deposit [1005]. The last act of excavation in Trench 1 was to remove the rubble deposit [1005] and the reddish brown soil [1008] which lay underneath to expose the cobbled surface [1012]. It was discovered that the cobbled surface [1012] ran up to, and was cut by, the robber trench [1011]. It was also apparent that the cobbles had been arranged around circular features that had subsequently been in-filled by later rubble and deposits such as [1005] and [1008]. These features may have been footings for architectural features such as a colonnade. The significance of finding the cobbled surface has established the exterior of the building as it is likely that these cobbles belong to a portico, but at the same time also established the depth of occupation levels for the site (Figures 25 & 26).

From the excavation of Trench 1 a clear narrative has been uncovered. When the building was demolished by William Paxton in the 1790's, a deliberate attempt was made to reuse material, especially high status stone. It is apparent from looking at both rubble deposits [1005] and [1007] that the rubble was deliberately sorted and that the material that has been left behind is the un-useable detritus of the building. The ditch feature [1011], interpreted now as a robber trench for a structural wall of the building, also shows clear evidence of this activity. The interesting thing about this feature is that it had not been back-filled using any rubble. Further investigation of this feature would allow for more concise answers and the identification of similar features across the site could lead towards the development of the building's floor plan. The cobbled surface [1012] and associated footings for architectural features clearly demonstrates the significance of the building. Although no physical architectural remains have been discovered of the old hall, this feature gives some indication of the former grandeur of the building.

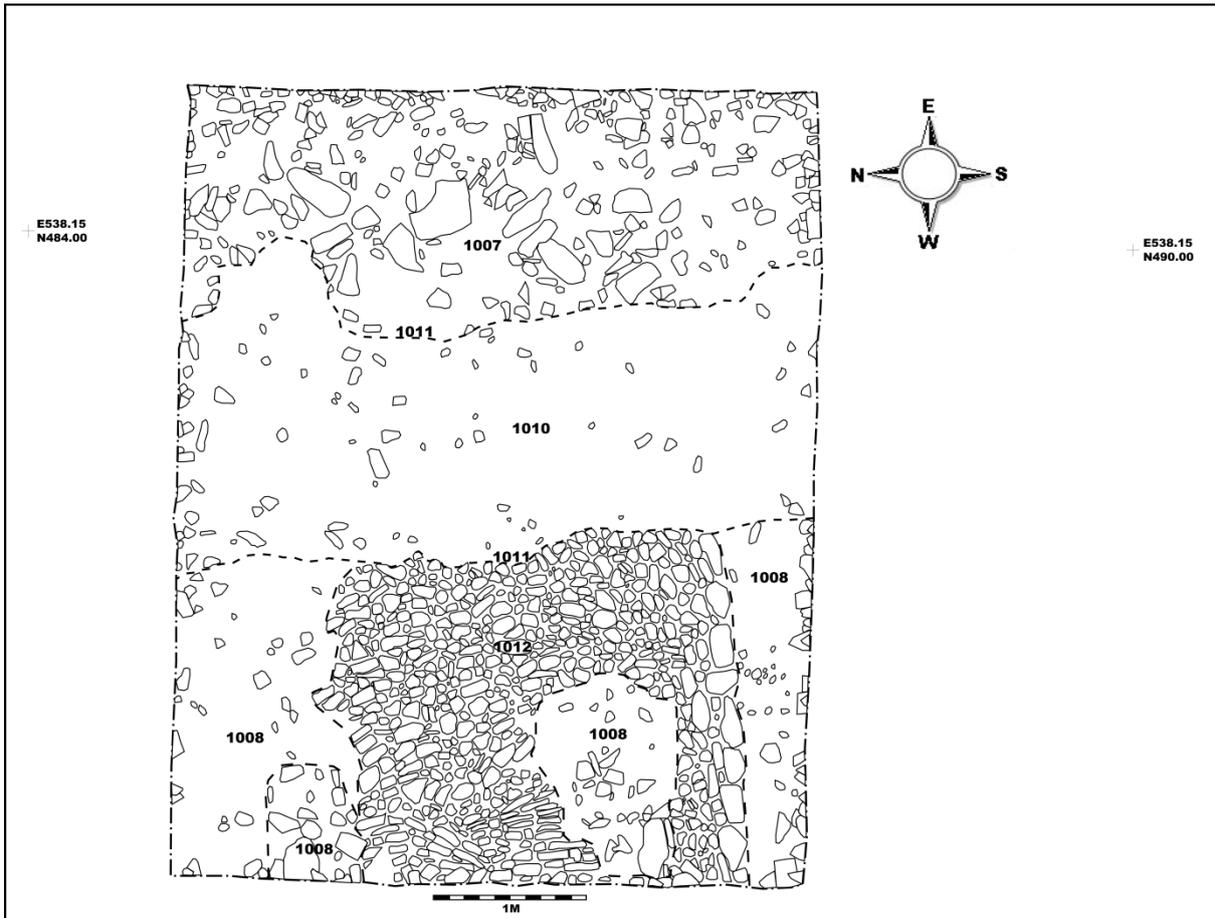


Figure 24: Trench 1 plan of features visible by the end of the excavation. (Jonathan Dollery and Rhian Williams)

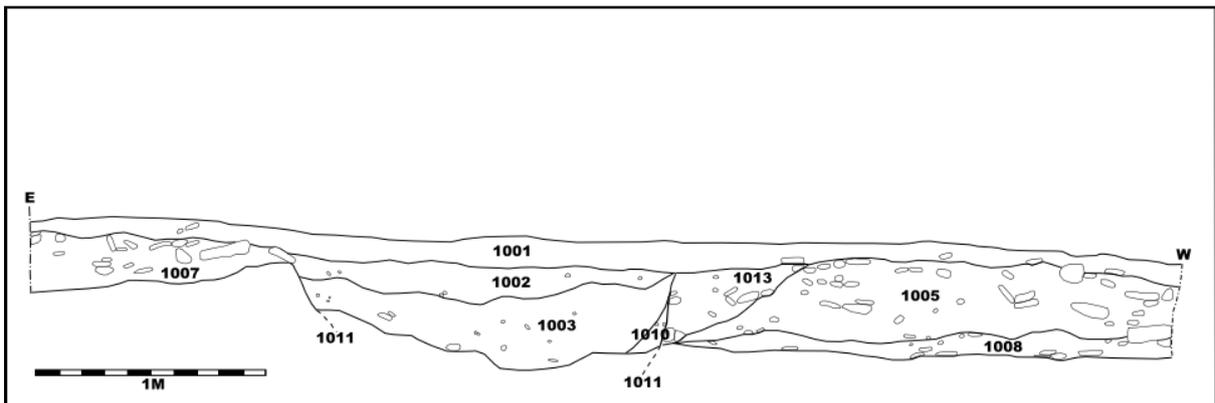


Figure 25: Trench 1 north facing section (Jonathan Dollery and Rhian Williams).

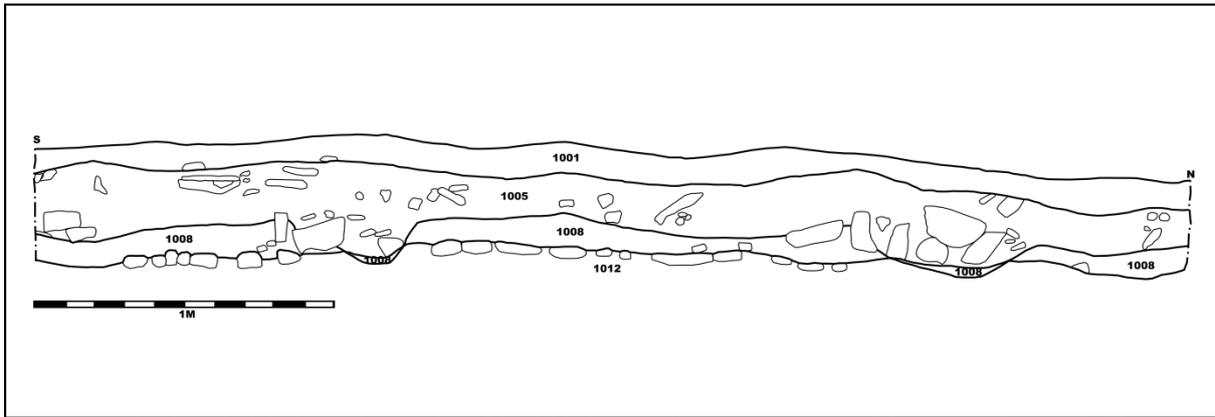


Figure 26: Trench 1 east-facing section (Jonathan Dollery and Rhian Williams).



Figure 27: Trench 1 Final photograph (Jonathan Dollery).

b. Trench 2 (Figures 27-30)

The purpose of Trench 2 was to identify the potential for surviving archaeology associated with the garden of Middleton Hall. A trench 6.00m from east to west by 4.00m was laid out in order to investigate the potential deposits and placed over the regular, linear anomalies which were picked up by the magnetometer survey of the area (see above). It was thought that these features were associated with garden features possibly equating to gravel paths.

Once the turf and topsoil [2001] had been removed the trench was given a thorough clean using a trowel to identify any archaeological features (Figure 27). Underneath [2001] three main features were apparent: at the west end of the trench there was a pink/brown clayish soil matrix with a mixture of stone; in the middle there was a high concentration of compacted gravel suspended within and orange/brown soil matrix [2003] running north-south across the width of the trench; and at the east end there was an orange/brown clayish soil [2004] with fewer stones than [2003] and [2004].

Once these contexts had been cleaned by trowel it was apparent that within [2004] there was a circular area of darker soil containing a concentration of coal [2005]. This area appeared to be the fill of a negative feature and a half section was excavated to identify its cut. The cut was identified quite clearly and the half section was recorded before the rest of the fill [2005] was removed. Pottery was also recovered from the fill [2005]. The cut had near vertical sides [2006] and created a linear feature 0.65 m wide with a curved western end, but which ran out beyond the eastern trench edge. As the sides to this feature were well preserved the conclusion has been drawn that the feature was in-filled almost as soon as it was created and has thus been interpreted as a garden feature, possibly a planting trench.

Once this feature had been excavated, attention was drawn to the centre of the trench. The high concentration of compact gravel [2003], it was thought, could relate to a gravel path. It was decided that the best way to positively identify this feature would be to define its edge both on the west and east side. In the west of the trench, the pinkish/brown soil [2002] was removed. Underneath this context it was found that there were two distinct areas: in the south west corner of the trench an orange/brown soil with a concentration of mixed stone [2007]; and in the north east another high concentration of compact gravel suspended in a dark brown soil matrix [2008]. Although the gravel [2008] was different in colour to that of [2003] it was interpreted as another gravel path joining [2003] and running west of the feature at a 90° angle. This feature also runs on an alignment which, if projected, would lie parallel to that of the southern bank of the water feature investigated in Trench 3 where a similar area of gravel was identified.

While investigating the gravel path [2003] and defining its edges to the east and west, it was discovered that a series of features had been cut into it. The first feature to be identified was roughly oval c. 0.26 long by 0.12 m. wide with an orange clay fill [2009] located in the centre of the trench. This feature was half sectioned and recorded before being totally excavated to identify the shape of the cut [2010] which, with sharp edges and a depth of 0.15 m., was interpreted as a stake-hole. Three more stake-hole cuts were found cut into the gravel; [2014] close to the south edge of the trench, [2016] and [2018] both being located to the south of [2010]. The alignment of these stake-holes suggest that they may have been part of a lightweight such as a hurdle fence and it may be significant that the distance between [2010] and [2014] is exactly 6ft. Since the features are on the same alignment as the gravel path [2003], it is reasonable to suggest that they were created at a time when the path was still visible and in use. The irregular feature [2012] (0.28m. long by 0.21m. wide and 0.14m. deep) was also found cut into the gravel, although its purpose is not clear. It was filled with

orange clay [2011] and it is possible that this fill could indicate repairs to the gravel path, suggesting a long period of use.

To work out the stratigraphic relationships between [2003], [2004] and [2007] a sondageⁱⁱ 0.5m wide and running along the southern edge of the trench was excavated (Figure 28). Four new contexts were eventually discovered during the excavation of the sondage. Directly below the gravel path [2003] was a deposit of yellow brown silty clay [2021] that contained some large compacted stones which has been interpreted as the base of the path. Underlying [2004], [2007], [2003] and [2021] was a deposit of light brown silty clay [2022] that ran the full length of the trench. It is likely that this context is the old soil level onto which the gravel paths were laid. At the bottom of the sondage and beneath [2022] two more contexts were discovered. The first, in the west and centre of the sondage, was a dark brown silty clay with some sub-rounded stone [2020], containing one piece of pottery that has been identified as brown glazed earthenware of the late 16th and early 17th centuries. The discovery of this feature is very important as it can now be confirmed that there are dateable sealed deposits which appear to pre-date the Middleton garden. The second, at the eastern end of the sondage, was a deposit of yellow/grey clay containing frequent rounded stones and gravel [2019]. There is a clear edge between these two deposits and they appear to be two separate features. The decision was made to stop the excavation at this level as complicated archaeology was beginning to surface and the size of the sondage would have been inadequate to explore both of these contexts.

During the final day of excavation the trench was thoroughly cleaned by trowel for photographs. Whilst cleaning the trench it was discovered that there was also another patch of gravel [2023] running off the east edge of the gravel path [2003]. The angle at which this was running was entirely different to that of the north-south orientation of [2003] and the east-west alignment of [2008]. Instead this feature ran south-west to north-east starting from the east edge of [2003]. It is possible that this feature could be the start of another gravel path heading off to the north-east of the site, leading to the conclusion that the trench could have picked up on a cross roads of the formal garden. However only further excavation in this area would confirm if this feature is another gravel path and in what direction it is heading.

The excavation of Trench 2 has provided much information on the extent of survival of the garden associated with Middleton Hall. Firstly, a clear archaeology has been identified that is well preserved and also has the potential for dating specific sealed contexts. Secondly, a garden archaeology has been well established within this trench and already answers to some of the broader questions such as what did the garden look like are beginning to be answered. The most obvious element is the highly formal and rectilinear nature of the garden with features that relate directly to the array of earthworks identified on the air photograph. The excavation also validates the interpretation of the geophysics results and provides a solid basis for interpreting the whole garden area. It can now be said for certain that it contained gravel paths that would have been used as the main thoroughfares through the formal garden. It has also been identified that there are deliberate features that reflect some form of

ⁱⁱ A sondage (from the French 'sounding') is a small trial trench to test the nature of features at a lower level.

formal planting on the site. Finally there are also suggestions for some longevity in the garden use with traces of repair and adaptation.

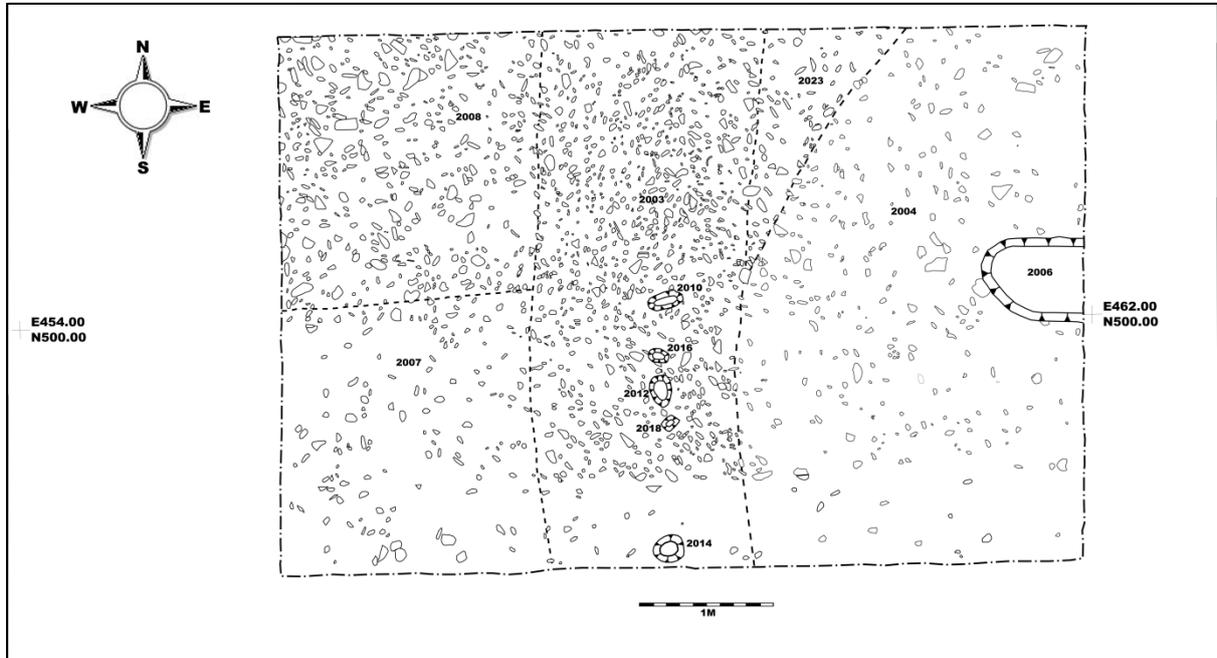


Figure 28: Trench 2 plan of features below topsoil (Jonathan Dollery and Edward Davies)

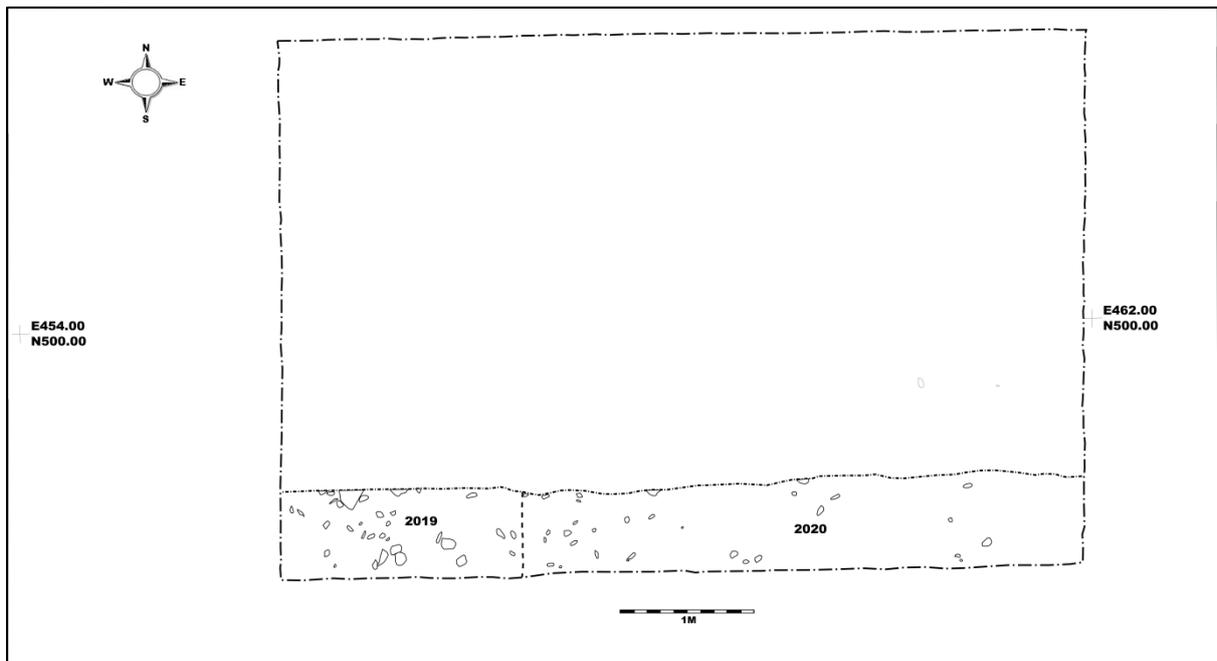


Figure 29: Trench 2 plan of sondage (Jonathan Dollery and Edward Davies)

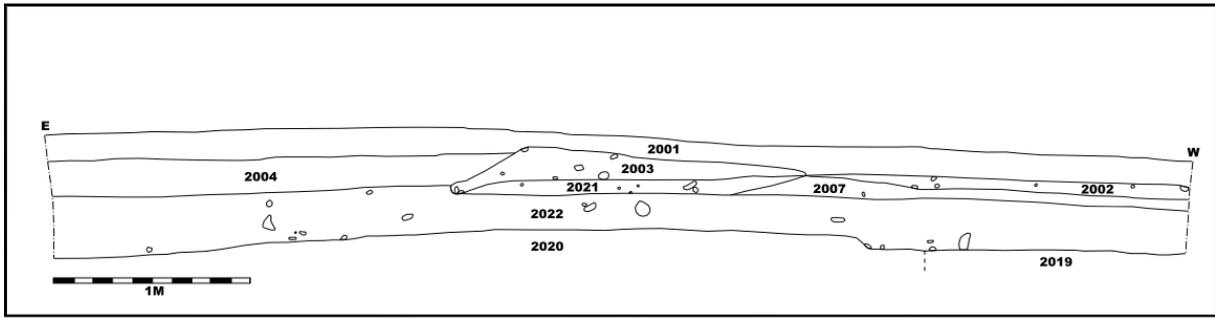


Figure 30: Trench 2 north-facing section (Jonathan Dollery and Edward Davies)



Figure 31: Trench 2 final photograph from the north (Jonathan Dollery)

c. Trench 3 (Figures 31-34)

The excavation of Trench 3 commenced after Trench 1 and Trench 2 had both been well established. The reason for excavating Trench 3 was to investigate the nature and state of survival of the large water feature which lies at some distance to the west of the house platform. The target was the south-west corner where the feature's two defining banks met and a 4.00m square trench was laid out over the junction and extending into the bottom of the earthwork.

Once the turf and topsoil [3001] had been removed, the trench was given a thorough clean using a trowel to identify any discernable archaeological features. Contexts were immediately

visible (Figure 31). At the top of the southern bank a deposit of light brown clay contained a large concentration of compacted gravel [3002] similar to that found in Trench 2 [2008]. This feature ran the length of the southern side of the trench and sloped slightly down to the north. In the north-west corner of the trench a similar context could be seen [3003], which ran from the west trench edge and sloped down to the east. These features, as they were strikingly similar to that found in Trench 2, were interpreted as gravel paths running along the edge of the water feature.

In the centre of the trench, at the base of the depression there was a deposit of light brown silty clay [3005]. This contained occasional charcoal and burnt building material. In the north-east corner of the trench, still at the base of the depression there was also a deposit of dark soil and burnt material [3004]. This deposit contained a high amount of charcoal and coal along with a high concentration of archaeology such as iron, glass and pottery. Both of these deposits, due to their high content of archaeology and burnt building material are indicative of dumped deposits, although the relationship between the two could not be established due to the lack of time for their excavation. It is highly likely that when the hall was demolished by Paxton, the water feature was in-filled with domestic rubbish. Nevertheless the hollow left behind still held and accumulated water and a shallow trench 0.62m wide and 0.21m deep [3010] had been cut through the western bank to drain off surface water. Due to time constraints this feature was not fully investigated, and only the surface of this feature was defined and recorded.

Once this sequence of events was established, the main objective of the trench had been achieved. Archaeology had clearly been identified and the narrative of water feature had begun to present itself. It was decided that to get the most information from this trench with the limited time available, a sondage would be excavated to explore the southern bank of the water feature to detect potential structure (Figure 32). The sondage was cut into the bank at the south-east corner of the trench, the dimensions of which were approximately 2.00m in length by 1.00m in width. The depth at which the sondage was taken to was flush with the bottom of the trench at the north east corner. While excavating this area two phases of bank construction became visible and could clearly be seen in the section. Below the gravel path [3002] was a high concentration of red clay [3006] which contained a mixture of sub-rounded stones. Below [3006] there was a clear division where the red clay stopped and grey clay [3007] began. The grey clay contained a mixture of rounded stones of various sizes and it has been interpreted that this context could be the natural boulder clay that caps the solid geology of the area. In short the water feature was dug into this grey clay that was probably re-deposited to make the core of the bank while the red clay was used for building up the bank and also to help retain the water.

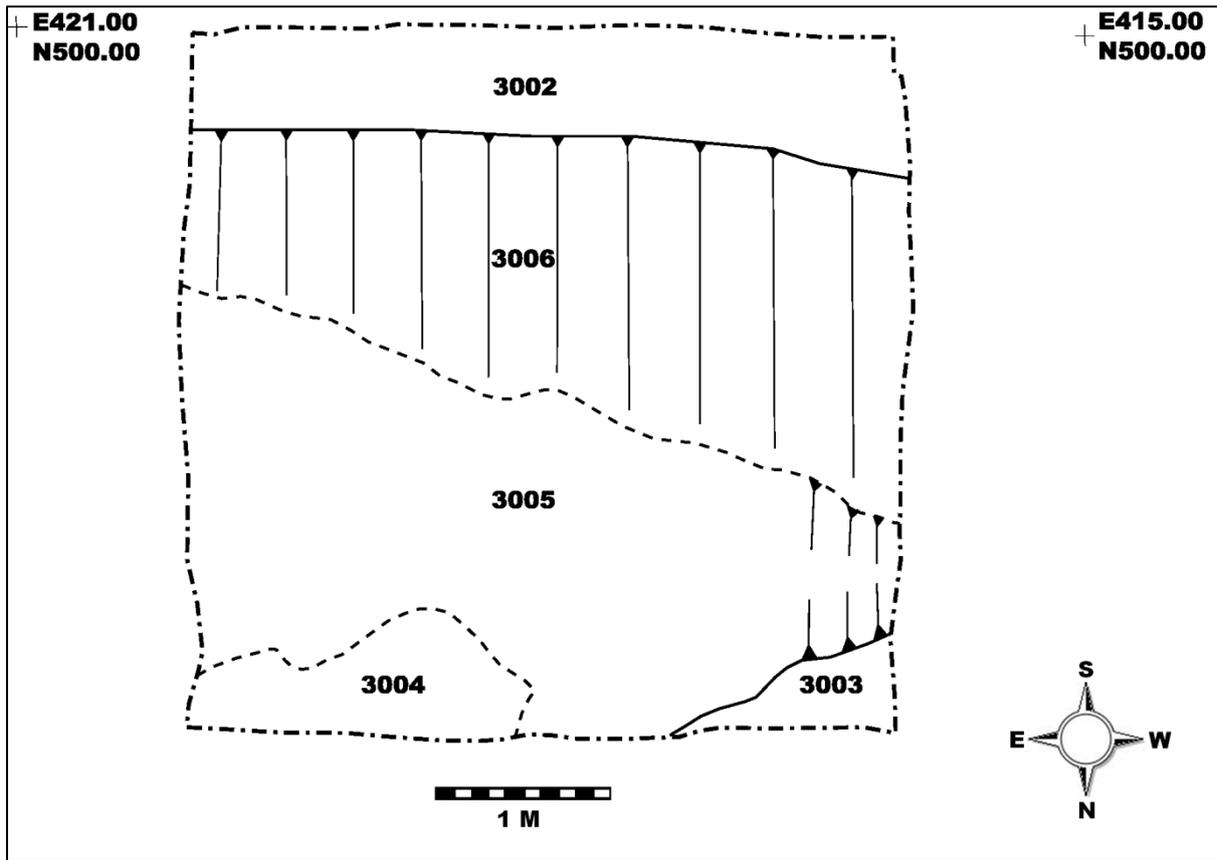


Figure 32: Trench 3 plan of features below topsoil (Jonathan Dollery and Kit Hughes)

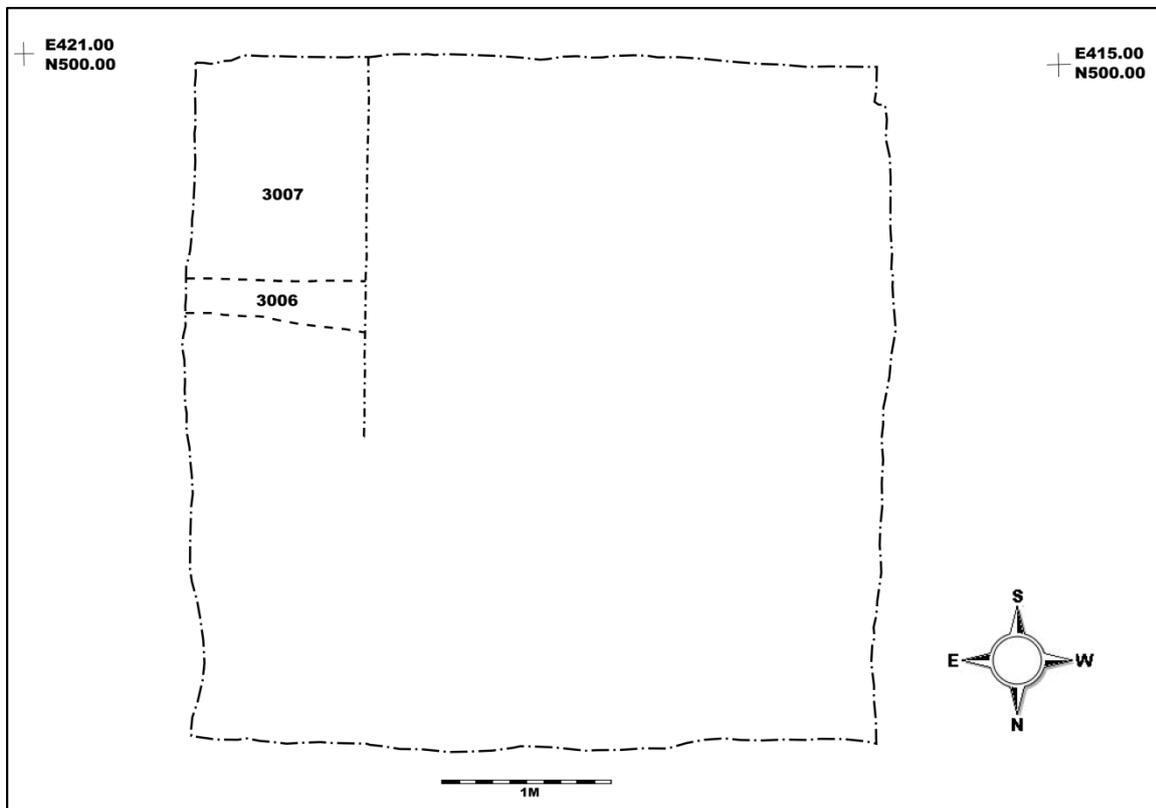


Figure 33: Trench 3 plan of sondage (Jonathan Dollery and Kit Hughes)

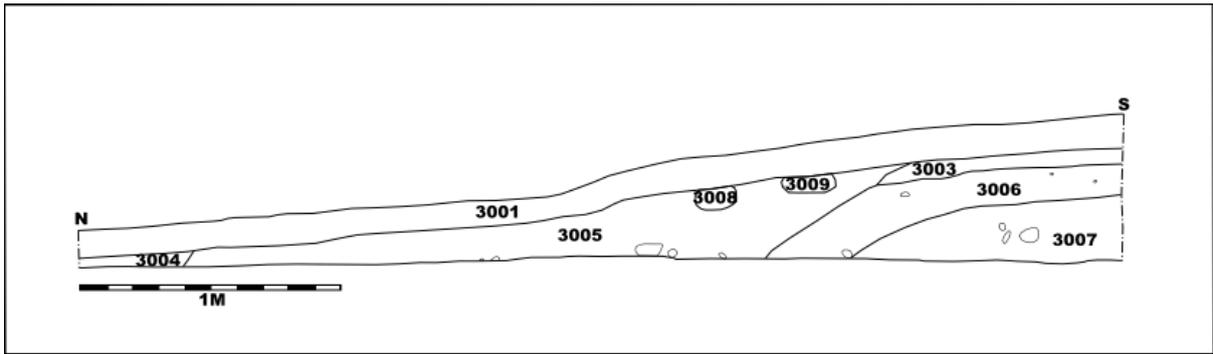


Figure 34: Trench 3 North-facing section (Jonathan Dollery and Kit Hughes)



Figure 35: Trench 3 final photograph from west (Jonathan Dollery)

9. The Finds: an interim overview *Marie Woods and Dee Williams*

The finds from the excavations in 2011 have been subjected to initial analysis reported here but they will form part of a more extensive consideration as a BA dissertation by Marie Woods (UWTSD).

Trench 1

All of the deposits excavated in Trench 1 represent various elements of the destruction of the first Middleton Hall in the 1790's during the creation of the Paxton house and landscape, and the finds reflect this. The ceramics appear to be remnants from most of the documented occupation phases of the Plas, but include also a very small quantity of late medieval material, predominantly several fragments of ridge tile. The preponderance of pottery, however, as might be expected in this limited excavation of destruction deposits, date to the eighteenth and early nineteenth centuries and are largely good quality, polite wares especially creamwares. Only subsequent analysis will be able to establish whether any of this material truly extends into the nineteenth century and thus beyond the date of the documented destruction. There is little in the way of utilitarian domestic wares and this reflects perhaps the position of the excavation at the front of the mansion. There is also good quality seventeenth century ware including a Bristol or Staffordshire beaker fragment. Reflecting this theme of quality are the few pieces of fine glass vessel and a fair amount of very good window glass, this latter suggesting perhaps some degree of dereliction in the building such that windows were broken and the glass unrecoverable. However, there were a goodly number of hand-blown dark green bottle fragments, mostly body fragments, and they suggest a date range again of the seventeenth to mid eighteenth centuries. Amongst the debris also was a large amount of burnt material, particularly stone, which probably came from a domestic hearth and chimney. There was one large piece of tap slag perhaps used as building material.

Trench 2

The garden produced, as might be expected, relatively little material and the majority heavily abraded, apart from two conjoining sherds of high-quality Frechen stoneware of the earlier seventeenth century. Similarly conjoining were three sherds from the base of a small splash-glazed jug or cup which may be of medieval date. There were several sherds of tin-glazed earthenware of the seventeenth to mid eighteenth centuries and a piece of nineteenth century transfer-printed glazed bowl.

Trench 3

Given the relatively small scale intervention in the pond, the finds were limited to material thrown into the earthwork depression, but did include, amongst the shotgun cartridges and other rural remains a large sherd of Westerwald stoneware from the Rhineland that was hand decorated and had both cobalt and magnesium glazing.

Summary

In general the finds conform to our expectations of the quality and nature to be found at a gentry establishment of the status of Middleton Hall. In this respect they are similar to the assemblage found in the excavations at Aberglasney (Blockley et al 2002).

10. The Visitor and Volunteer Experience *Rob Thomas*

The National Botanic Garden of Wales relies routinely on the support of its cohort of some 175 volunteers and these and indeed other, new volunteers were crucial both in meeting the requirements for the funding of the project and its delivery. During the course of the twelve days of the excavation itself and in the preceding and subsequent months 86 days of input by 28 volunteers were formally recorded. Work to progress our understanding of the history of the Middleton family and the estate in its wider historical landscape has continued and is now embedded as a discrete programme within the Garden's volunteer framework. This programme already numbers some further hundreds of volunteer days.

The project volunteers ranged in age from 16 to their mid 70s and were engaged in a wide variety of activities that were both central to the dig itself and peripheral inasmuch as these latter were geared towards either underpinning the historical perspective that informed the excavation or assisted in interpreting findings and progress for leisure and learning visitors. Volunteers were thus employed:

- Excavating under supervision
- Cleaning finds and assisting to collate and record
- Removal of spoil
- Supporting recording of data
- Creating interpretation materials for visitors
- Conducting twice daily tours of the excavation site
- Undertaking library and archive research
- Sourcing genealogical material

As a result of this project a number of volunteers have increased their commitment to the Garden's programme of activities, have gained new and valuable experiences and skills, and have enriched the resources at the Garden's disposal. In addition to this, visitors to the excavation site have expressed considerable interest and enthusiasm, and provided the Garden with their contact details in order that they can become involved in any future, similar projects in a volunteering capacity.

The core mission of the Garden is to conserve, to inspire and to educate, and the increased understanding and appreciation of the estate's cultural and historical importance and legacy have become established as key features of the formal and informal visitor experience. During the fortnight of the excavation proper, more than 400 visitors accessed the Waun Las site to observe archaeology in action and to gain first-hand information and interpretation relating to the dig. The Waun Las site lies outside the formal, planted garden and is, for this reason, a route less well trodden by the typical, leisure visitor. The project occasioned the opportunity to explain to visitors the wider extent of the estate and its core conservation context, the greater knowledge that was being acquired as to its history and the unique position that Garden occupies, encompassing within its 568 acres botanical planting, National Nature Reserve and organic farm.

The wider understanding of the site's history and the importance of the Middleton family have resonances that will persist long after the lifetime of the project and these are particularly relevant to visitor experience and developing the heritage tourism offer that the Garden can make. These are especially evidenced by new developments and activities which include:

- A programme of joint presentations detailing the project's findings delivered to visitors, members and trustees alike. These have been delivered by Professor David Austin and Rob Thomas and are set to continue and expand as knowledge and discoveries increase.
- The creation of a fun / educational, "productive play", period costume Garden trail for children entitled "Pirates, Plague and Plants for Health", which is undertaken during school holidays and at other times by arrangement. This was delivered initially by Chance Encounters Theatre Group which has since trained seven Garden volunteers to continue performances in the future. This historical "role play" represents an added and novel volunteer opportunity, as well as the acquisition of confidence enhancing experiences.
- An early stage proposal to re-configure the Garden's Tropical House to incorporate specimen plantings of "East Indies" spices such as nutmeg, cloves and pepper. This may, for example, entail re-naming the feature the "East India House", thereby underpinning both the Garden's core, botanical mission and its historical linkages as well as the important context of global economic botany.
- The inclusion of the Middleton story in the Garden's "Medicines in May" calendar of events, which provides a wide variety of workshops, tutorials, discussions and other learning opportunities associated with its plants for health credentials.
- The extrapolation of elements of this report to create a new "historical" visitor guide and other potential publications. The project's findings have already been the subject of one of the issues of the Garden's members' magazine (widely applauded as the best ever) and there is scope to bring this material to a wider audience.
- The establishment of ongoing relationships with the India Office of the British Library, the National Portrait Gallery, the Goldsmith's Guild, Middleton Place USA and other UK and international institutions and ongoing discussions as to areas of possible collaboration, education, outreach and joint venture.
- The development and delivery of project and placement opportunities for students, two of which are already in train and are complementary. One Masters student is actively collating, researching and interpreting elements of the Middleton and later Paxton park layout to understand original planting and water features, which will inform recommendations and actions that correspond to targets and outcomes in the strategic

plan. The other is engaged in interpreting and developing the historical narrative of incoming families (Middleton, Paxton, Adams etc) that have made substantial local contributions and had significant impact, but have wealth derived through influence of empire and international trade. This narrative will help to fashion heritage tourism messages that will be rolled out across various media. The proposal to incorporate and mainstream much of the newly discovered, historical material into the Garden's ambitious "Digital Tourism" plan will increase audience and enhance the actual and virtual visitor experience.

- High level (governmental, institutional and public) recognition and acknowledgement of the importance of the Garden's heritage and legacy through specific outcomes targeted in its new strategic ten year plan. These include increased understanding of the history of the landscape, enhanced interpretation for visitors, greater accessibility to the Garden's wider estate and the commitment and ambition to restore key features of its Regency splendour. Fully reflecting the Garden's history will enhance its reputation, prove an additional draw to the heritage tourist, provide new opportunities for volunteering and engagement, and perhaps provide wider scope for external, commercial funding, sponsorship and partnership.

11. Overall Interpretation *David Austin*

As a result of the project undertaken in 2011, certain interpretations have become clear. There is little doubt that the site investigated is most likely to be the early Middleton Hall: it is of the right date (c.1600 to later 18th century) and the substantial architectural remains belong to a building which is of sufficient size and quality to be fitting for a family of the Middletons' gentry status. There is little doubt also that there are the extensive remains of a contemporary formal garden, in a reasonably good state of archaeological survival to offer stimulating and exciting potential for future excavation, prospection and survey. The elements of the garden, paths, beds, water features, all appear to be very rectilinear and strictly aligned on the house. The garden appears to consist of more than one enclosure and there is perhaps at least one other orientation added at the western end. Associated with all this, and lying upslope to the east, is a large water management system related to a modest, but complex water garden on the south side of the site.

Topographical and historical research has also shown that the Park where it survives on the east side, although largely still in the form created by William Paxton's designers, was also an element in the Middleton designed landscape. It is difficult without further research to understand the nature and extent of this parkland, but there seem to be, from preliminary fieldwork, sufficient surviving traces in the archaeology and historical ecology to lead us to believe that at least a partial reconstruction may be achievable.

Research from both primary and secondary documentary sources has also begun the process of sorting out the history of the poorly-documented Middleton family and probably identified Christopher Middleton, perhaps with the financial assistance of his three merchant-venturer brothers, as the creator of the gentry estate at the end of the Tudor period. We can also begin to put the historic landscape into a wider frame of environmental and social history in the lower Tywi valley.

The Garden will itself be funding another, modest programme of work in the summer of 2012, with a little more excavation and the correlation and ground-truthing of all survey results.

12. Future Programmes *All Partners:* Good research informs and enables the creation of good amenities and services, enhancing the visitor experience, sustaining the long-term future of the Garden.

Good Research

There is opportunity and need here for a carefully-targeted programme of research which will, of itself, generate interest amongst the wider public and provide important and coherent narratives about the Garden's past which can be used to enhance its identity and provide a resource for a range of economically viable activities. The principal areas identified as a result of this project are:

1. Research to reconstruct the story and images of how the regional landscapes developed. This would engage us in the medieval and early modern cultural landscape of Is-Cennen to the east and the Lordships of Carmarthen and Kidwelly to the west with all their connection to the sea. It would explore the fact that the Garden is on an important cultural and political boundary between Pura Wallia and Marchia Wallia, between Anglo-Norman and native Welsh, as well as its place on the environmental and ecological boundary between the maritime and the mountain. These wider landscapes will provide the context and setting for the Middleton landscape development. ***Specific actions:*** documentary research in public archives, notably the Duchy of Lancaster; field surveys, aerial photography, remote sensing and geophysics to build a map of the medieval and earlier landscape and identify sites for further investigation; limited excavation to determine date and nature of key sites, e.g. Hen Llan at Llanarthne and Gors Ddu on the southern edge of Middleton Park.
2. Research to create a narrative and visualisation of the Middleton landscape, both designed and agrarian. This would be coupled with continued work on the Middleton family, both those directly associated with Middleton Hall and those in the broader arc of the genealogy. Here there are connections to a wider set of international events, people and landscapes, all of which can help the National Botanic Garden of Wales increase the scope of its networks and enhance the story of the Middleton social, cultural and economic milieu. ***Specific action:*** continued documentary research in public archives exploring probate, taxation, court and other records; major excavation of the first Middleton Hall and its garden, including the water management features; surveys and other prospection within the Park to discover pre-Paxton features; field surveys on the soils and historical plant ecology.
3. Research to assist in the reconstruction of the Paxton landscape especially the aspirations towards authentically re-creating the Picturesque as a viewscape looking outwards (eastwards) from the Paxton Mansion terrace. This would involve detailed recording and analytical work on the historical ecology. It would include research to establish the linkages between the Paxton milieu, including his family and circle of designers and peers,

and the wider international world. ***Specific action:*** collation of all the previous research on the Paxton landscape; identification and conduction of research needed on documents in the public archive; surveys and other prospection within the Park to discover unknown Paxton features; field surveys on the soils and historical plant ecology to establish the Paxton planting regimes and management systems.

4. Research to create an in-depth account of the NBGW landscape in terms of a continually-evolving ecology and processes of land management. This would draw out the long-term history of how communities and societies sustained bio-diverse environments at the same time as winning the means of life. This account would bring the story of design, change and adaptability up to the present day. ***Specific action:*** continued documentary research in public and private archives and in oral memory to establish the sequence of events in the maintenance and dereliction of the Paxton landscape; field surveys and recording in the Park landscapes of post-Paxton features and changes within the context of the adjacent landscapes in the Tywi Valley.
5. Research that complements and enhances the active plant science conservation research programme of NBGW. The biodiversity of the Waun Las site has been actively recorded since the late 1990s providing NBGW with data by which to monitor biodiversity and habitat change brought about by environmentally sensitive land management, most notably NBGW's organic and traditional approach to farming. The greater the understanding of current biodiversity, the greater the potential is for NBGW generated scientific initiatives such as DNA barcoding, rhos pasture translocation, tree dating, waxcap fungi conservation, meadow restoration and Glastir Welsh woodland creation. ***Specific action:*** developing and maintaining a biodiversity database; working in partnership with CCW and other local biodiversity agencies to set and achieve biodiversity goals that are complementary to other interventions; working in partnership with other academic institutions, students and volunteers to gather and analyse current and historic biodiversity data; investigating the origin and management of non-native species, such as hornbeam, which may provide clues as to the site's former uses. This approach would bring the story of cultivation, design, change and adaptability up to the present day and will inform future planting schemes and conservation initiatives.

Good Amenities and Services

The intention from the start of this project has been that both the knowledge derived from research and the processes of gaining that knowledge should serve the strategic aims of the NBGW in providing a series of amenities and services to support the economic and social life of the nation, the region and the community. There are a series of potential initiatives which are intended to enhance what the NBGW already does, offering additionality to its existing environmental and natural history branding through the provision of a coherent and related historical product. Some of these may be:

1. The continued development of a cohort of volunteers working on the history of Middleton Park. One of the great successes of the HLF-funded project has been the consolidation of what has become the NBGW History Research Team. This has strong leadership and has produced a robust strategic sense of research and intended outcomes. The Research Team has linked well with the professional outside researchers and there is a lot to be gained from the continued interaction of the volunteer and university-based personnel. Further opportunities for skills training exist both for new recruits and those already more experienced. A short programme of lectures and field days is already underway and scheduled to continue and develop.

Specific action: consolidation of the cohort of volunteers. This can be achieved by a programme of workshops and information exchange at the Garden as a means of both reinforcing activities of the skilled group and rolling out the skills and knowledge to new recruits. The programme of talks and guided walks can also be extended to wider community groups in the locality to draw in a more diverse range of volunteers.

2. A schools-based education programme meshed into the National Curriculum in particular the history and local studies strands. This would need to involve the engagement of a specific number of targeted schools to act as a development test-bed for teacher training, teaching materials and NBGW staff induction. Considerable thought will need to be given to how the Park experience can be enlivened to gain the attention of children and engage them. One avenue is certainly historic role-playing; another is active participation in archaeological excavation. There are others which can be drawn from a considerable international experience in such engagement. One idea that would be fruitful to follow is the Eco-Museum movement. It should be borne in mind that many elements of such formal delivery can also be used for informal holiday-time activity for children – a pattern widely used by NBGW.

Specific action: a plan for schools delivery of heritage, within the Garden's overall education strategy, could be developed which will then require an implementation proposal. An initial step would be the creation of a pilot programme for the next academic year with a small group of local primary schools. This will enable practical measures to be tested and logistical and cost implications to be explored.

3. Further development of a strong community connection in the region, deploying concepts such as regeneration through heritage, enhancement of social identity and coherence through shared history and landscape, eco-museums, civic society and well-being. Techniques developed within the Garden can be taken beyond its strict curtilage and be used to assist community organisations in applying heritage and tourism to the current needs of their economies.

Specific action: some of these concepts could be discussed with local communities, perhaps drawing in already existing amenity groups and local community organisations. This could be done within a day-school. There could also be liaison with other operations in the area, notably initiatives at Dinefwr, Llanelli, Carmarthenshire Heritage Regeneration Trust and Adfer Ban a Chwm.

4. Creation of an authoritative core text with high-quality graphics on the historic landscapes of the NBGW from which a wide variety of visitor material can be generated. It is recommended that the NBGW, its History Research Team and partners seek to develop this text as a central asset by adding syntheses of relevant previous research and undertaking new research within an agreed programme. Publication at a number of levels and for different audiences including web-pages should be considered.

Specific action: the present report itself represents a stage in this development. Further consideration could be given to the range of publications that might be drawn from the present work. An article for the academic journal, *Landscapes*, is planned for the autumn. The work and report provide the foundation for other published outputs.

Visitor Experience

It is believed that the development of the historic environment and cultural landscape strand can bring benefits in terms of additional visitors since it is aimed at a different area of interest. Visitor footfall is a vital component of NBGW's operational model and therefore business success – imperative considerations for charities in the prevailing economic climate. There needs to be further evaluation of the 2011 project from this perspective and the NBGW management and marketing team will need to review this further, but the following suggestions can be offered in the first instance:

1. The trial work in July 2011, although hurried in its initiation following the award of the HLF grant, in the end generated a lot of visitor interest and the guided tours run by the team of NBGW volunteers were highly successful (see section 10 of this report). It is clear that with a longer period of preparation and proper marketing the performance of an excavation each year, slowly revealing the secrets of the Garden's past could be a major attraction, especially if TV were engaged in a serious way. It could offer a venue for both spectators and those who might wish to be directly involved. Interest and engagement could be supported and sustained year round by interactive digital media.

Specific action: discussions with an independent TV company with a proven track record in this area would be an important first step. It is hoped that some modest, smaller scale excavation can be undertaken during 2012. A full appraisal of the ways forward will be undertaken by all involved following this season's work.

2. The historic story of the landscape could be deployed as part of the visitor information packages both for the main Garden and the Waun Las NNR. This could take the form of leaflets, pamphlets and minor publications, a glossy booklet and perhaps the construction of formal heritage trails within the NNR. This can be enhanced by the creation of digital, augmented reality applications drawing on the Horner landscape paintings of 1815 and artist's reconstructions.

Specific action: there are wide opportunities for this to be drawn formally into the Garden's publicity and marketing strategies. Ways in which this can be most effectively achieved warrant further consideration.

3. Events, summer schools and other activities could be built around visitor interests related to archaeology, local history, historical ecology and plant history, garden history, historic buildings, and artefacts and antiques.

Specific action: although heavily constrained by resources, the intention is for there to be repetition of some activity around the proposed 2012 excavation. Again, however, there will could be an internal discussion on how this will be executed. One activity that may be feasible is a programme of small exhibitions centred on the current outcomes of the project: e.g. the Spice Trade; the first Middletons; the Paxton Landscape; the people of the Gardens and their wider historical connections. Other future activities may include the invitation of sculptural, musical and poetic responses from the Welsh arts community and school holiday, family activities incorporating the pomander and braid making sessions that were successfully trialled during the Easter 2012 holidays.

Sustaining the Garden

The historical strand which has been developed as a result of the HLF project may offer a series of opportunities within the existing strategy and structure of management of NBGW to develop new strands and mutually beneficial partnerships. Some of the thoughts on this subject are:

1. As we have discovered over the last year the subject area that this strand represents exists in a funding area which can draw resources towards the Garden which it would be otherwise unable to exploit. This can be extended through the diversity of the partnership.
2. It might be possible to consider housing a Welsh Centre for the Historic Landscape, an idea first proposed by William Wilkins in the 1990s and the subject of a consultancy appraisal.
3. There may be mileage in branding the concept as the 'Heritage of Sustainability' and borrow practices and ethos from the international Eco-Museum and Transition movements. This would centre around the Park landscape as exemplar of designed sustainability and adaptation (see section 6 in this report).
4. There are a number of opportunities for broadening the international connections of the NBGW through historical relationship of events, places and people (see section 5 in this report).

1-4 Specific action: There could be opportunities for further funding related to this which can be explored and will be set against in the context of the Garden's core mission and strategic plans for next ten years. The key is its potential role in relation to the Garden's broader landscape and regeneration scheme. Partnership discussions with selected regional interest groups which can offer synergy should be taken forward as soon as possible.

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Appendix 1: Context Summary

Trench 1

Context Number	Description	
1001	Turf and Topsoil	
1002	Light brown soil (fill of 1011)	
1003	Sub rounded gravel (fill of 1011)	
1004	Dark gravelly rubble	
1005	Rubble with dark soil matrix in the south west of trench	
1006	Dark burning deposit (fill of [1009])	
1007	Rubble with dark soil matrix in the east of the trench	
1008	Reddish-brown loose soil in west of trench.	
1009	Cut into [1003]	
1010	Deposit of red soil mixed with lime mortar (fill of [1011])	
1011	Cut into [1005] & [1007] (Possible robber trench)	
1012	Cobbled surface in west of trench	
1013	Dark brown soil with rubble	

Trench 2

Context Number	Description	
2001	Turf and Topsoil	
2002	Pinkish-brown soil spread to west of trench	
2003	Compacted gravel (possible gravel path)	
2004	Orangey brown soil spread to east of trench	
2005	Dark brown soil with coal fragments (fill of [2006])	
2006	Cut of pit in east of trench (cut into [2004])	
2007	Orangey brown soil containing small stones in south west of trench	
2008	Dark brown soil containing	

	large quantity of stone in north west of trench	
2009	Orangey brown clayish soil (fill of [2010])	
2010	Cut of stake-hole in centre of trench (has been cut into [2003])	
2011	Dark orangey brown silty clay (fill of [2012])	
2012	Cut of irregular feature (has been cut into [2003])	
2013	Reddish brown silty clay (fill of [2014])	
2014	Cut of stake-hole in south of trench (has been cut into [2003])	
2015	Orangey brown silty clay (fill of [2016])	
2016	Cut of irregular stake-hole in north of trench (has been cut into [2003])	
2017	Reddish brown silty clay (fill of [2018])	
2018	Cut of irregular stake-hole in south of trench (has been cut into [2003])	
2019	Yellow silty clay deposit with rounded stone at bottom of sondage located in the west of trench	
2020	Yellow silty clay deposit at bottom of sondage in east end of trench	
2021	Yellowish brown silty clay (located below gravel path [2003])	
2022	Light brown silty clay (located beneath [2021])	
2023	Gravelly spread at north east of trench (possible gravel path?)	

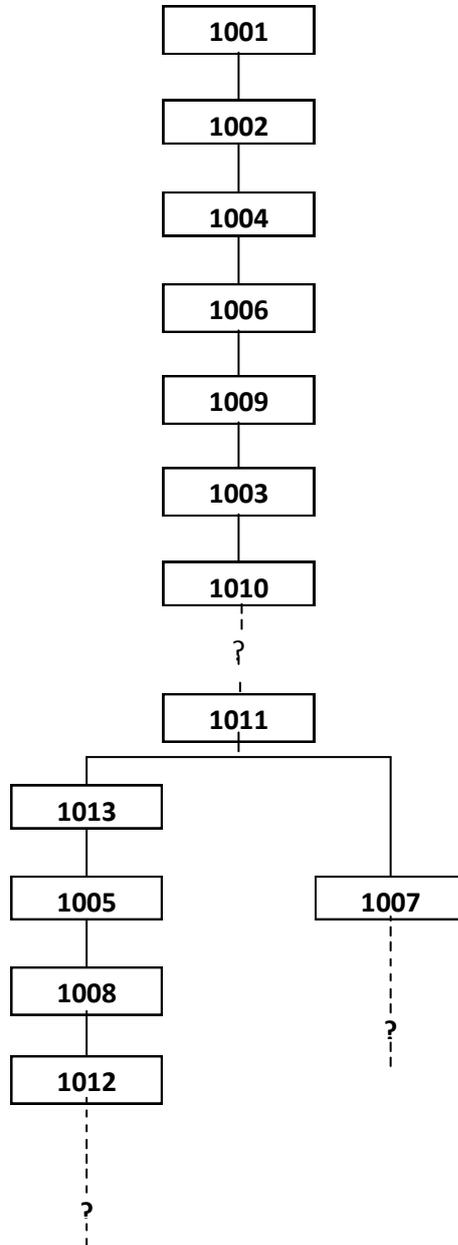
Trench 3

Context Number	Description	
3001	Turf and Topsoil	

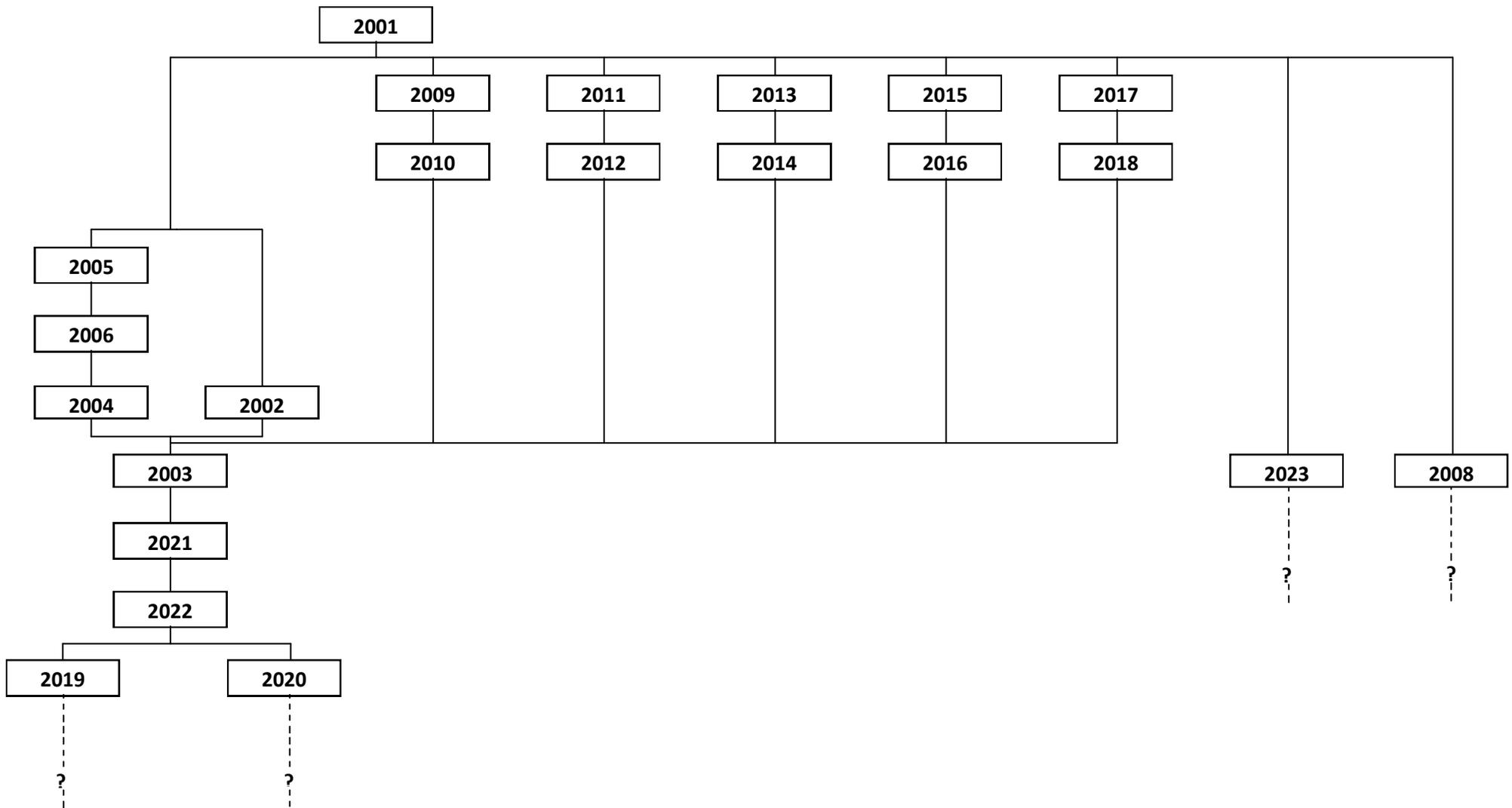
3002	Gravel bank / path located along southern edge of trench	
3003	Gravel bank / path located in north west corner of trench	
3004	Area of burnt material located to the north east of trench	
3005	Light brown silty clay (fill of water feature)	
3006	Red clay in bank (underneath [3002])	
3007	Grey clay in bank (underneath [3003] & [3006])	
3008	Lens of Gravel above [3005]	
3009	Lens of Gravel above [3005]	

Appendix 2: Harris Matrices

Trench 1 Matrix



Trench 2



Trench 3 Matrix

