DIGITAL KILLED THE LABELLING STAR: APPROACHING THE TERRITORY-
MUSEUM WITH MOBILE TECHNOLOGY

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Abstract

Visitors to historical locations in the United Kingdom step into what is, in essence, a virtual world of history and cultural heritage. Whether they realise this or not—and whether their experience at these sites is enriched by the recognition of the connections to other related objects and sites in the region—is determined in large part by the quality and coherence of the interpretative information available to them. This thesis focusses on how this interpretation is currently carried out at three sites, Hoddom, Ruthwell, and Bewcastle, and the possibilities for improvement based on the application of different media and technologies.

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They took the credit for your second symphony,
Rewritten by machine and new technology.
And now I understand the problems you can see.

–The Buggles, "Video Killed the Radio Star"

Oh let the sun beat down up on my face, stars to fill my dream.
I am a traveller of both time and space, to be where I have been.
To sit with elders of the gentle race, this world has seldom seen;
They talk of days for which they sit and wait and all will be revealed.

–Led Zeppelin, "Kashmir"

Introduction

In Simon Thurley's book, *Men from the Ministry*, the author's primary aim is to highlight the collective efforts of the men of the government (the architects, archaeologists, and historians) to conserve, restore, research, and present to the public the historical objects, artefacts, and places that make up Britain's national history (2013, 2).

In his discussion of the men of the government who were responsible for the creation of the national organisations for the conservation of historic monuments, buildings, and places, Thurley briefly discusses the history of the evolution of cultural heritage site preservation and interpretation. He describes the major role the expansion of the railway system across the English landscape had on the increase of tourist visits to rural sites (2013, 12) and how this increase in tourism brought the risk of destruction to these delicate areas. This destruction demanded intervention, which was provided at first by the local landowners (2013, 15). Eventually the government was organised enough to step in and intervene in an official capacity, creating lists of scheduled (protected) monuments, buildings, and places that became the cultural heritage sites we can visit today. In the preservation of these monuments, buildings, and locations, we see an authoritative shift from the indoor environments of the traditional museum (the static, four walled buildings that remove objects and artefacts from their intended context in order to place them under glass cases) to the field and countryside and back into the environments and context these objects and artefacts were originally meant to be experienced. This movement is largely influenced by technological innovations of the day, encouraged primarily by the expansion of the railway lines (Thurley 2013, 12-14; see also Sellars 1997; Runte 1997; Marsh and Hodgins 1998), shifting visitor interest

from the urban and city institutions to the countryside and rural heritage sites. These protected collections are now in the care of the three devolved, contemporary bodies – English Heritage, Cadw (in Wales), and Historic Scotland (Thurley 2013, 2).

This thesis is about the same divergent set of interests discussed in Thurley's book, but where Thurley argues that it was the Government that was the most successful in operating cultural heritage sites (despite the landowners' best efforts; 2013, 16), I argue the opposite, especially when it comes to unstaffed locations. We see historically that it was primarily the landowners (as amateur historians, whether they chose the role or not) who became the curators, opening the doors to visitors, providing interpretive information to tourists, and caring for the historical sites for the benefit of the society as a whole. While on my own trip to Ruthwell and the Dumfries and Galloway area in April of 2012, I saw that it is true that heritage interpretation is still handled best by the local communities.

While there, I visited three related Anglo-Saxon heritage sites: the Ruthwell church in Dumfries and Galloway, which is the site of the Ruthwell Cross, an eighth century Anglo-Saxon stone cross; Hoddom, also in Dumfries and Galloway, which is the location of a large Anglo-Saxon monastery (now gone) that saw its peak in the eighth century; and the Bewcastle Cross in Cumbria, England, which is also an eighth century Anglo-Saxon stone cross related closely to the Ruthwell Cross. These sites were specifically chosen because of their close proximity to one other but also because of their historical connections to each other. Although all three sites are under the care of governmental heritage conservation agencies (Ruthwell and Hoddom by Historic Scotland and Bewcastle by English Heritage), the best material is provided by the local

(and largely amateur) communities, acting as the curators of the (officially) unstaffed sites. In contrast, the official materials (provided by the conservation agencies and overseen by the bureaucrats[1]) are scarce and in some cases (specifically at Hoddom) are even incorrect. It is in this dichotomy in the history of heritage preservation in the UK that we see an ongoing conflict between the professionals and the amateurs to this day, a political tension that I saw still exists while visiting the area, and in part largely stems from the question of ownership. Although this question is not directly addressed in this thesis, it is inherent at the sites discussed in this paper and worth mentioning here, even briefly.

The tension I witnessed while visiting the Ruthwell site was primarily due to a dispute over who had the right to close the church while the *Visionary Cross Project* members were taking 3D scans of the Ruthwell Cross (the primary reason for the visit). Members of Historic Scotland had come to the church to prepare the cross for the erection of scaffolding and, while there, closed the site to the public by putting up signs that included a phone number to the Historic Scotland office if access was required (see Figure 1). Once they were gone however, the locals (those who maintain and care for the curch on a daily basis) removed the signs and made arrangements with the *Visionary Cross* members to allow visitors into the church while scanning continued. This dispute exemplifies the tensions between the official conservation agencies, in this case Historic Scotland, who are the "technical" owners of a historic site, and the local communities, those who maintain, care for, make access to, and live directly with the historic sites, and

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[1] It is important to distinguish here what I mean by "professional." When I refer to the professional works I primarily mean the government bodies. Although I later stress the importance of allowing input to interpretive material from all avenues (such as amateur and scholarly), I do not speak specifically of the current scholarly contribution at these rural sites since it does not necessarily directly influence the on-site interpretation plans themselves.

are therefore also owners. "Rural areas are characterised by a strong identity of people with place" (University of Aberdeen 2013) and individuals identify strongly with those places from which they come. In turn, people often identify with 'place' on a larger scale and often "feel their heritage is distinctive if often hard to define. They are proud of their past and also keen to capitalise on it, and thus tourist literature is full of reference to the heritage of the nation, of the region, of the city" (Gillman 2010, 1).[2] And so we see a claim to heritage on both local and national scales.

Figure 1: Sign on the Ruthwell churchyard gate left by Historic Scotland. Photograph by the author.

Additionally, while the *Visionary Cross* was scanning the monument, a couple of curators had come to scout the location while planning their guided tour. Seeing the signage indicated in Figure 1 and the scaffolding obscuring most of the cross, the curators were frustrated and angry thinking they had put so much work and planning into a trip to a location that would potentially be shut off to them, and without notice of the closure

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[2] For more discussion on the political and economic climates for heritage sites in other countries see Gillman 2010.

from Historic Scotland. The members of the team (and the gentleman who had removed the "Closed" signs) assured them they would have access and that the site and cross would be open for their tour group (the scanning was finished, and subsequently the scaffolding was gone, by the time the tour was scheduled to come through the area). The curators were understandably angry about the situation, and their reaction highlights another layer of tension between the curatorial/museological voices of authority and the bureaucratic voices of authority.

The Ruthwell Cross, which has been defined as the "most important Anglo-Saxon sculpture in Scotland" (Foster et al. 2006, 33) and is heralded by the local parish as "our amazing cross" (Moule qtd. in Ruthwell Kirk n.d.), is viewed as both a heritage object owned by the nation as well as a cultural object that, to some extent, defines the local community. My point here is to not place validity on one group over the other, but to recognise that the input from both parties is important (including the scholars and academics who study the Ruthwell Cross and other Anglo-Saxon monuments, as a third, more distanced party involved). The bureaucratic professionals have claimed ownership in order to guarantee preservation of cultural artefacts and to fund conservation efforts. But the local communities (the amateur curators) define themselves by the heritage and artefacts they live with and are surrounded by. It is due to their pride, enthusiasm, and desire to share these objects with visitors that the small, unstaffed (at least officially), rural locations are cared for and made available to the general public.

Chapter one of this thesis looks at the historical development of the museum (in line with what is discussed in Thurley's book), the different types of museums, and the definitions of each. It also looks at the differences between urban institutions and the

more rural and remote sites. It looks at how modern museums have been developed by and benefitted from technological innovations throughout their history and how they are currently experimenting successfully at an institutional level with mobile interpretation. It also looks at how technological developments have taken people out of the urban and placed them into the rural, and how contemporary technology is now directing people back into the urban environment.

While chapter one looks at the history of cultural heritage tourism and interpretation and its relationship with mobile technology, chapter two looks at the Dumfries and Galloway peninsula in Scotland in particular and how it can be understood as a territory-museum and how current interpretative efforts do and do not work in bringing out this aspect of the region. It looks in detail at the three aforementioned Anglo-Saxon sites in the region and how the local communities do a better job than the professionals in the quality and comprehensiveness of their interpretation. In particular, the amateur curators do a much better job in establishing the *context* for the sites they interpret. We will see how the communities deal with the information locally and operate out of enthusiasm, pride, and respect for their histories. In contrast, the professionals (the bureaucrats) work on a more global scale, connecting rural sites in smaller regions to urban landscapes hours away. The first two chapters, when taken together, demonstrate how the current interpretive plan fails to exploit the full potential of the peninsula.

Chapter three looks at how contemporary mobile technology could be used to improve the interpretive plan of the peninsula, and visitor experiences on a whole, focussing on the interpretation of the Ruthwell Cross and kirk. Ruthwell was chosen because it is a nice middle ground between the most complete interpretive plan at

Bewcastle and the least complete interpretive plan at Hoddom. Chapter three presents a demonstration of a virtual tour of the Ruthwell site and how it could be constructed in a way that would take advantage of the site's current strengths (including local engagement and a commitment to a comprehensive, *in situ* interpretation) but builds on them by taking advantage of the possibilities of contemporary and short-horizon mobile technology.

And finally, chapter four looks at the difficulties and technological issues with current mobile technology and how this can influence the implementation of a mobile tour at a rural, folk-run, cultural heritage site through experimentation with augmented reality applications (which is defined in more depth later in this thesis). It also looks at some potential difficulties with Ruthwell's unique visitor demographic in an introduction of a digital tour and some possible solutions for addressing these issues.

Keeping the inherent conflict between the professionals and local communities in mind, this thesis essentially looks at how mobile technology is being used successfully by urban museums to improve visitor experience and edification and looks at how these examples of mobile use can be employed to improve on heritage interpretation and visitor experiences in rural territory-museums. However, it also looks at the distinctions between urban museums and rural cultural heritage sites, how the two function in different ways even as they both hope to achieve similar goals, and how the technology would need to be modified to specifically work in a rural setting with no staff, no stable environment, and with technology that is still young. In order to achieve these goals, this thesis approaches three basic but important point when handling visitor interpretation in territory-museums: 1. Cultural heritage sites are driven by technology; 2. Rural cultural

heritage sites have been best served by amateurs; 3. Mobile technology can (and should) be looked at as a way of bridging the gap between the professionals and amateurs.

Chapter One: Museums and Technology

This chapter discusses the history of museums, museum studies, cultural heritage sites, and the development of the discipline of site interpretation by discussing the theory and literature of museums, both past and present. It also looks at the differences between urban and rural sites, the interpretive strategies for the different kinds of museums, and how these strategies and theories can be applied to the rural, folk-run, cultural heritage sites. It then discusses the affect that historical technological innovations have always had on the museum institution. We will see how mobile technology and cultural heritage sites, at least in the United Kingdom, have an almost symbiotic relationship. We will then turn to contemporary museums and how they are experimenting successfully at an institutional level with mobile interpretation.

History of the Museum

According to the *International Council of Museums* (ICOM), a museum is "a non-profit, permanent institution in the service of society and its development, open to the public, which acquires, conserves, researches, communicates and exhibits the tangible and intangible heritage of humanity and its environment for the purposes of education, study and enjoyment" (International Council of Museums 2012). This definition is accepted by the international community and was last revised in 2007 at the General Conference in Vienna, Austria (International Council of Museums 2012). The definition of a museum is constantly evolving, and often changes to reflect the attitudes, values, and environments of the current times, primarily evolving to suit the interests and desires of the museum's visitors. In other words, the museum, at its most basic, is a building that houses artefacts and objects of cultural and historical significance with the intention of

preserving, conserving, and interpreting them for the education and enjoyment of the general public.

The original concept of the museum evolved from the curio-cabinets and princely art collections of the eighteenth century that were opened to the public, primarily after the French Revolution, as a way of distributing the upper class's possessions (Duncan and Wallach 1980, 449; see also Bennett 1995). In order for the collections to become property of the public the presentation needed to change; specifically, the way visitors experienced and perceived them (Duncan and Wallach 1980, 449). The collections were no longer a privilege of the elite, but were on display for the enjoyment of the general public, and the visitor was no longer a passive observer in awe of the prince's collection, but "a citizen and therefore a shareholder in the state" (Duncan and Wallach 1980, 455). This change in the "way of viewing" a collection, and the building itself that housed the collection, is what became known as the Universal Survey Museum (which as we shall see is a type of Legislative museum) and is the traditionally accepted image of a museum. The Universal Survey Museum is epitomised in museums such as the Louvre, the National Galleries in London and Washington, and the Metropolitan Museum of New York (Duncan and Wallach 1980, 452). But ever since publicly open museums became popularly accepted in the eighteenth century, the definition of a museum has been in flux, mainly in response to changing times. Hooper-Greenhill argues that "Museums have always had to modify how they worked, and what they did, according to the context, the plays of power, and the social, economic, and political imperatives that surrounded them" (1992, 1). This argument is reflected in current museum practices. But despite the many changes museums have had to go through, they have always maintained the fundamental

role as "storehouses of knowledge" (Hooper-Greenhill 1992, 4). In this role, a museum can be anything: an art gallery, science centre, cultural heritage centre or interpretation centre, even a theme park, as long as it employs knowledge preservation and presentation that allows visitors to experience the institution's collection of objects and artefacts.

There are problems surrounding the musealisation of these significant artefacts and objects. The "Museum Effect" stipulates that the very act of removing an object from its original context and placing it on display within the walls of the museum, surrounded by glass cabinets, lighted, carefully labelled, is what gives the object its importance (Atkins 2009, n.p.; Casey 2003, 2; see also Bennett 1995; Alpers 2001; Malraux 1967; Kirshenblatt-Gimblett 1998). The curators of museums act as authorities on the objects and artefacts they care for, but in turn, they are given the authority to act as caretaker and interpreter by the general public (Cain 2008, 143). From this role, the curators choose how visitors are directed around the museums and determine how visitors will "read" the objects and interpret them. In many cases, the visitor becomes an observer and a witness to the historical recreation being presented by the curator and the exhibit. How the objects are displayed, and thereby interpreted, and how the visitor relates to these objects, are all dependant on the museum's institutional goals.

Museum practice has transitioned through many stages since its earliest days. Casey identifies two major typologies of museum practice. Traditionally, the "Legislating museum" was popular in the early nineteenth century and was essentially "a container for collections of objects" (2009, 4). It aimed to "create a venue for display not debate" and displayed objects without contextualising the information (Casey 2009, 5). The visitors were therefore dependant entirely on their own interpretation of what they were seeing,

with no guidance whatsoever from the museum's curator. The "Legislative Museum" then grew into the "Interpreting Museum" with the idea that the museum is responsible for the edification of the visitors. The Interpreting Museum is a contemporary style of museum and presents a "metaphorical shift" from

> the authoritative 'temple' to the contextualized 'forum' that contains multiple voices and presentations. Through label text, docent tours, and multimedia tools, the museum provides a framework for how objects should be viewed and understood. (Casey 2009, 6)

The visitor is then *told* what to see and how to read an object or artefact, and must trust the museum for the information he or she is being given. In both cases, the museum is the voice of authority and the visitor is the passive observer taking in the information from the outside, a position that has been criticised in recent history (see Cain 2008; Alpers 2001; Whitelaw 2000).

In response to this criticism, there has been a shift towards constructivist learning in the museum. Constructivism addresses the idea that museum visitors represent a wide range of individuals who each have his or her own way of learning. A Constructivist Museum is one that allows visitors to "draw their own conclusions about the meaning of the exhibition" (Hein 2008, 1-6). Hein states that by "considering both the epistemological bases for our organisation of exhibitions and the psychological basis for our theory of learning, we can develop museums that respond to the dispositions of our visitors and maximise the potential for learning" (2008, 6).

These museum practices can, and have been, extended into interpretation centres and cultural heritage sites. Indeed, the two types of museological settings are not mutually exclusive, although there are many differences between them. Similar issues are present at cultural heritage sites, and similar visitor interpretation strategies can be

employed at each to solve these problems. The HICIRA Project developed the 2005 *Hicira Handbook for Heritage Interpretation Centres* as a comprehensive guide to the management of interpretation centres. HICIRA is an international European project aimed at helping to facilitate the creation and management of interpretation centres, especially in rural Europe, and is internationally recognised. The Handbook describes four main types of interpretation settings (2005, 29-33):

- **Museums** are specialised settings for presenting items of historical cultural interest, exhibited in accordance with a museum's museological and museographical project, working within a museum's mission statement. They acquire (meaning, the object and/or artefact of interest is removed from its original setting), conserve, preserve, communicate, and exhibit, for the purpose of study. They tend to supply formal reading and interpretation to visitors.

- **Heritage** *in situ* is the opposite of a museum. Heritage *in situ* contextualises heritage artefacts that include archaeological and paleontological remains, monuments, historic buildings (such as churches, castles, etc.), and other unmovable features (such as walls, crossroads, etc.). These types of sites present heritage in its own context, usually with supplementary interpretive material (such as plaques). There are three main forms of presentation for heritage *in situ* sites:

    o *Basic*. The site is open for visitors, with or without interpretive sign postings.

    o *Supplementary permanent exhibition*. An exhibition is installed to explain and provide examples of research, restoration, or any other work that has been done on the site.

o *Musealisation*. This takes a museological approach that employs the use of an interpretation centre.

- **Interpretation centres** are found in the same natural and cultural heritage sites as those considered Heritage *in situ*, but the presentation strategy focuses on scenographic exhibition. The aim is for the visitor to explore and interact with heritage. This version differs from museums because interpretation centres do not collect, conserve, or necessarily study objects, but rather they attempt to enable visitors to gain a better appreciation of the site's natural and cultural values by providing the necessary information, within the context of the original site. These centres work to educate and raise awareness from the heritage site where they are located. The centres often include other services, such as tourist information services, tours with guides, bars and/or restaurants, etc.

- **Territory Museums** are relatively new models of interpretation centres, and therefore not many currently exist. The territory-museum is not located in a physically delimited single-use compound, but instead shares in the daily life of the area and its inhabitants. The term "territory-museum" is used to designate an area in which its coherence stems from historical and geographical links. It aims to enhance the welfare of the local community.

In this context, the Handbook defines "Interpretation" as:

> a working method which facilitates presentation and social use of heritage and serves to provide a reading and options for its active use by means of many presentation and animation resources. Interpretation is based on cultural and/or natural evidence, either material or immaterial, found in a given location, and seeks to promote these features in their original context. To this end, the aim is always *in situ* recovery and the greatest possible contextualisation of heritage

resources. The idea of the object as having value in itself in isolation from its function and setting, is rejected. (2005, 15)[3]

The important thing here is the idea that an object, in and of itself, as having value "in isolation from its function and setting" has been rejected in favour of an understanding of the object in its historical and geographic context, which is presented as the ideal. This is what differentiates interpretation centres and cultural heritage sites from traditional (Legislative) museums (although it is important to note that the "Interpreting Museum" discussed earlier does attempt to rectify this issue within the museum walls). An object or artefact that is treated as Heritage *in situ* through the addition of an interpretation centre, or as part of a territory-museum derives its importance and value from the evidence of its original function and context: it is the environment the object or artefact inhabits and its purpose for being created that gives it value and significance in a greater historical whole. In this model, the "Museum Effect" is being countered through *in situ* recovery.

André Malraux's concept of the *musée imaginaire* or "museum without walls" can also be applied to the territory-museum setting. Although Malraux's concept dealt with the proliferation of art to the public without the confines of a traditional museum setting (1967), the theory behind such a concept is easily applied to the tangible reality of a territory-museum, which is best realised and connected through the means of mobile technology.[4]

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[3] The idea that cultural objects and artefacts should be seen and interpreted in their original setting is still hotly debated, especially in war-torn areas of the world, partly due to political and economic reasons that will not be discussed in this paper. For further discussion on these issues see Gillman 2010.

[4] In an email to me on April 24, 2014, James Graham made an interesting observation about territory-museums: "The Territory Museum – consisting of interconnected elements that form a larger "site" – can be understood as functioning very much like hypermedia. The user and site administrator create or define pathways of physical, intellectual and historical connectedness, which is greater than the sum of its parts."

The History of Cultural Heritage

An interest in cultural heritage, and even cultural heritage preservation, at least as we know it as it is today, blossomed among the general public in the mid-nineteenth century. Museological practices had been observed since the princely curiosity cabinets, and a solid foundation of artefact interpretation had already been mostly established. What was different in the perspective of cultural heritage sites was the *context* of the artefacts and object. They were not being removed from their original setting, but being interpreted *in situ*; certainly because, in many cases, the objects were far too large to move (e.g. Stonehenge):

> Morales (2001) highlights the growing interest in the subject [of heritage interpretation] over recent years, which he attributes to a number of factors: the rise of environmental education; improvements in protected nature areas; a concern with and awareness of the need to present cultural and natural heritage, and the increasingly widespread interest in cultural and nature tourism. To all these factors, we could also add the rising interest and demand among the public, which increasingly seeks locations combining heritage with education and leisure. (qtd. in Izquierdo et al. 2005, 15-16)

The interest in cultural heritage sites seems to have gained traction around the same time in North America and the UK, showing that, to some extent at least, this interest in cultural heritage and the interpretation of such a history is not an isolated phenomenon. According to the Hicira *Handbook*, this interest began with the establishment of the first National Parks in the United States, primarily due to an increase in publicity for the parks around 1873 (when Yellowstone was established) and growing in strength as the rail systems were established (Izquierdo et al. 2005, 15). Thurley argues the interest in cultural heritage began much earlier in England due to a variety of factors (2013, 5-17); however, interest in cultural heritage and natural sites in Canada, the US, and the UK did not develop in isolation. The factors Thurley attributes to the growing

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interest in heritage sites include the rise in the number of fictional books placed in historic locations (specifically, Sir Walter Scott's historical novels, the first of which was published in 1814) and travel books published in the mid-nineteenth century (such as William and Mary Howitt's guidebook to ruined Abbeys, the first of its kind, published in 1862) (2013, 6, 8-13, 19), the establishment of archaeology as a discipline (2013, 36-37), and industrialisation and the development of the railway system, which made travel to remote locations easier, at least for the elite. Rail transport became even more popular with the Great Exhibition in 1851, since many more people travelled to London by rail than ever before (2013, 12-14). This development of the railway system directly influenced the development of the national parks in Canada and the US, and the development of the railway systems in Canada and the US were influenced by industrialisation in the UK (see Sellars 1997; Runte 1997). The history of the railway system is convoluted in both Canada and the US and will not be discussed in any detail in this paper, however it was primarily due to the westward movement of the rail systems in both countries that created an interest in and brought people to the natural parks. And, in turn, the railways exploited visitor interest in these sites through the promotion of tourism as a way to help fund the railway lines.

England was the first to develop a rail system (in the 1830s), with its biggest growth in the 1840s when it expanded to the smaller towns and villages in the English countryside (Thurley 2013, 12-14). In 1840, Canada saw the establishment of a number of railways in the eastern provinces, yet it was not until the 1880s that the longest railway in Canada was built, which connected the Post-Confederation provinces with British Columbia and the Pacific coast (Reichwein 1998, 160; see also Marsh and Hodgins 1998;

Sellars 1997; Runte 1997; Runte 2011). This is the system that really brought tourism to the unsettled areas of Western Canada. And as a result, a different type of entertainment was created.

The national parks and cultural heritage sites may seem different at first glance (the national parks being devoted to the natural world while cultural heritage sites focussed on human history), but the two are not mutually exclusive. As mentioned earlier, a museum can be anything that preserves and interprets its collection for the benefit of the general public. This is the same for the national parks, which preserve and interpret the natural world for the general public, and cultural and heritage sites (such as those in rural England), which are preserved and interpreted for the general public. The driving force of interest in the natural parks and cultural heritage sites were trains and promotional tourism. In turn, the increased interest in the national parks and cultural heritage sites drove the expansion of the railways and roads to make access to these areas more accessible. In short, it seems that technology (specifically, the state of the art technology of the day) and museological practices developed a somewhat symbiotic relationship.

Although the actual practice of heritage interpretation grew from the establishment of the national parks in the course of the nineteenth century, it was really not until 1957 when Tilden published *Interpreting Our Heritage* that the actual foundations of the discipline were established (Izquierdo et al. 2005, 15). Although the act of interpretation had really existed since the early days of the museum, Tilden is often credited as the "founding father" of interpretation (Craig 2007, intro to *Interpreting Our Heritage*, loc 349 and 350 of 3209). This was due mainly to his interest in the natural

heritage of the national parks. *Interpreting Our Heritage* was the first publication

interested in cultural and natural publication as a discipline (Craig 2007, Loc 102 of

3209). Until Tilden published his book in 1957, the discipline of cultural and natural

interpretation was largely the work of amateurs.

According to Tilden, "interpretive effort, whether written or oral or projected by

means of mechanical devices, if based upon these six principles, will be correctly direct.

There will inevitably be differences in excellence arising from varied techniques and

from the personality of the interpreter" (2007, Loc 585 of 3209). The six guiding

principles for interpretation, as defined by Tilden (2007, Loc 585-86 of 3209), are:

1. Any interpretation that does not somehow relate what is being displayed or
   described to something within the personality or experience of the visitor will be
   sterile.
2. Information, as such, is not interpretation. Interpretation is revelation based upon
   information. But they are entirely different things. However, all interpretation
   includes information.
3. Interpretation is an art, which combines many arts, whether the materials
   presented are scientific, historical, or architectural. Any art is in some degree
   teachable.
4. The chief aim of interpretation is not instruction, but provocation.
5. Interpretation should aim to present a whole rather than a part and must address
   itself to the whole man rather than any phrase.
6. Interpretation addressed to children (say, up to the age of twelve) should not be a
   dilution of the presentations to adults but should follow a fundamentally different
   approach. To be at its best it will require a separate program.

These six principles are still relevant and being used by managers of cultural heritage

interpretation centres today (see Izquierdo et al. 2005, 17).

Despite the numerous changes museums have had to go through in order to adapt,

the fact that these six principles are still relevant supports the idea that interpretive

strategies generally do not change from site to site or even from year to year. We will see

that the real innovation comes from the *medium* of interpretation rather than the *strategy*

of interpretation. In other words, principle four, "the chief aim of interpretation is not instruction, but provocation," is the driving factor for interpretation. How the general population is provoked is what changes from site to site and from year to year. This provocation and medium of interpretation is generally found through the changing forms of technology in museums and interpretation sites. As we saw earlier with the establishment of the rail systems in England, Canada, and the US as being in part responsible for the increase in tourism to natural and cultural heritage sites, technology is the driving force behind interest in these sites, which encourages the improvement and preservation of historic sites for the enjoyment of the general public. The railways exemplified the "ever increasing mobility" of the nineteenth century (Farman 2013, 3), which was the century that also saw the rise of personal mobile media.[5] Farman describes these changes in personal media as being a transformation of social space (2013, 3). This transformation is being exploited by the museological industry and, in fact, always has. This relationship is portrayed in the *method* in which museums disseminate information to the public, which is discussed in greater detail in the next section. Again, we will see a relationship between technology and museums, only on a smaller scale and within the museum walls.

The Visitor Experience and Mobile Technology

Although museums value the tactile and the authentic, it seems clear that museums also value the benefits of technology. Contemporary museums are using technology in order to "accomplish a number of institutional goals that extend and

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5 Farman uses the pocket watch as an example of personal mobile media in Mobile Interface Theory (2013, 3).

interpret the material collections" (Hazan 2007, 134). As early as 1952, museums

welcomed the use of hand-held technology within its walls:

> From its origin as an analog radio tour at the Stedelijk Museum, through its use by over three million North Americans as a Sony Walkman-style taped tour of the eight-stop "Treasures of Tutankhamun" exhibitions in the late 1970s, to its incorporation as a direct-access – also known as random access – digital guide to the Louvre's permanent collection in 1993, to its subsequent adoption by virtually every major museum by the end of the twentieth century, and to its establishment at the forefront of in-gallery interpretation innovation, handheld technology is today an established companion of the modern museum. (Tallon 2000, xiv)

These technologies are improving and building on the information, creating new ways of

popularising and distributing museum content. With mobile technology developing the

way it is, visitor interaction with the exhibits is changing; mobile technology is allowing

the museological world to enter into a new era of knowledge dissemination and

edification.

Museums, as well as cultural and natural heritage sites, are intended to be "open

doors" of knowledge, available to the general public as well as experts and scholars. They

are designed to create experiences and interactions:

> Even if it were possible to disentangle objects from information and from the classificatory process embedded in the museum enterprise, it could still be argued that museum objects never stand alone. The physical things in museums and galleries continue to comprise one element in a composite, but rather than being part of an object-information package they exist without an object-subject interaction. This is the interaction between inanimate, physical thing and conscious person, and constitutes the moments in which a material thing is perceived and sensorially experienced. It is only through this interaction that the thing becomes properly manifest to the viewer – in effect, it is only through the object-subject engagement that the material artefact or specimen becomes real at all. (Dudley 2010, 5)

Knowing how audiences react, interact, internalise, perceive, and communicate makes all

the difference in how a museum portrays an object. This idea is not only in compliance

with the idea of a "Constructivist museum," but also with new(er) ideas on how people

interact with space and place through the use of mobile technology. Farman, who builds

his theory of mobile interfaces around Edward Casey's idea of implacement,[6] states that,

in our current cultural shift from static to dynamic computing technologies, "it is less

about the devices and more about the activity" (2013, 1).[7] Barrett argues that

interpretation done while in a museum is something that should be undertaken by the

visitor and not provided for them by the curator (2008, 76). Hooper-Greenhill argues that

"the process of meaning making is the process of making sense of experience, of

explaining or interpreting the world to ourselves and others. In museum, meaning is

constructed from objects, and from the sites themselves" (qtd in Walker 2008, 110). This

emphasises that knowledge cannot stand alone, that visitors require *something* to interact

with in order to have a meaningful experience. It seems possible that new digital and

mobile technology will increase these types of meaningful interactions as visitors shift

once again from passive observers (reading tags on artefacts or listening to audio-guides)

to active participants as they navigate and embody the space they are in using mobile

technology.

　　　Museums are successfully using mobile technology for visitor experience and

artefact interpretation and the educative ability of museums of any kind is enhanced by

the use of this technology. Interactivity is a desirable trait of the modern museum since its

aim is to creatively engage the modern user. This idea is related to Hooper-Greenhill's

idea of the "post-museum" which is: "a site of mutuality, where knowledge is

constructed, rather than transmitted, through the account of multiple subjectivities and

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[6] *Implacement* is the interaction of the human body with and its environment as part of a "lived experience," which Casey states is "an ongoing cultural process with an experimental edge" (1993, 31).
[7] Farman also quotes Intel's 2000 announcement: "Computing, not computers, will characterize the next era of the computer age" (2013, 1), which, it seems, is certainly true now.

identities. In the post-museum the curator's voice is one voice among many others that are incorporated to create a constructive polyphony of views, experiences and values" (Arvanitis, 252).

Technology in Museums: Some Examples

In their article "Enhancing Visitor Interaction and Learning with Mobile Technologies" John Falk and Lynn Dierking explore the research done in order to understand visitors' "museum meaning-making" and how this understanding can benefit the development of mobile media for use in the museum (2008, 19). The outcome of the research proves that the experiences had by museum-goers are extremely complex and differ from person to person (Falk and Dierking 2008, 27). This seems painfully obvious in hindsight; however the research does offer "insights into why and in what ways digital media tools have the potential to enhance the meaning made of and from these experiences" (Falk and Dierking 2008, 27). The authors go on to argue, in conjunction with a Constructivist point of view on learning, that digital technologies have the capability to influence visitor learning and:

> When designed well, can have the potential to positively impact visitor meaning making by (1) enabling visitors to customize their experiences to meet their personal needs and interests; (2) extending the experience beyond the temporal and physical boundaries of the museum visit; and (3) layering multisensory elements within the experience, thereby enriching the quality of the physical context. (Falk and Dierking 2008, 27-28)

These technologies can take the shape of fixed electronic kiosks that are part of the permanent exhibition that are used during a museum visit, or any number of hand-held guides that can be permanent or temporary in the shape of personal digital assistants (PDA), the visitors' own iPods or mobile phones (Filippini-Fantoni and Bowen 2008, 79). These devices can be used to display text, video, and/or sound and can be used on

the visitors' own terms without "interfering in the aesthetics of the galleries" (Filippini-Fantoni and Bowen 2008, 79). In addition to these uses inside the museum, smartphone applications can be downloaded as native applications (that is, applications that run off the hard drive of the phone) and be used outside the museum, essentially creating a "museum without walls" (Arvanitis 2005, 251).

Because many museums are now taking advantage of how common it is that nearly every visitor will have some sort of mobile device with them (see Tallon 2008, xiii; also CHIN 2012a; Smithsonian Institution n.d.a.), museums are extending their walls beyond their physical ones and moving the museum exhibits into the "real world" through the use of smart-phone applications. These applications provide users with a new way of experiencing history and art and "have been developed to accomplish a number of institutional goals that extend and interpret the material collections" (Hazan 2007). Properly implemented, these technologies improve and build on visitor experiences and create new ways of popularising and distributing museum content.

Each institution classified as a museum has different intentions and different visitors with different needs. Uses of such technologies also differ from museum to museum. Many of the examples of new media technology in museums are found in Canadian museums, which are displayed enthusiastically in the "Techwatch" article on the website for the Canadian Heritage Information Network (CHIN 2012a). Some applications, such as the iPod and iPad apps offered by the Musée Bagotville and the Art Gallery of Ontario, offer simple, free, downloadable applications that display information like opening hours, activities, ticket prices, planned exhibitions, and news (CHIN 2012c). Other applications, such as ones offered by the Royal Ontario Museum

(ROM) and the Canadian Museum of History[8] go a bit further and offer interactive floor plans of the galleries, guided audio tours, and even treasure hunts, in addition to the usual information (CHIN 2012c).

The most significant shift we see in the use of technology and ways individuals interact with an environment is through augmented reality (AR) applications. AR applications use a smartphone or tablet's built-in camera to superimpose virtual objects upon the real world.[9] Therefore, "AR supplements reality, rather than completely replaces it. Ideally, it would appear to the user that the virtual and real objects coexisted in the same space" (Azuma 1997; see also Farman 2013). Many AR applications (such as Auramsa and Layar) operate through pattern recognition, which uses the natural texture and form of a physical object as the equivalent of a "Quick Response" (QR) code as a trigger that, when scanned, pulls up previously embedded information or actions.[10]

Although museums have used a number of different mobile technologies already (beginning, of course, with radios tours in the Stedelijk Museum in the 1950's) there is a significant increase in the use of AR applications by museums. As early as 2011, the British Museum ran a series of experiments with AR and its potential use for education in the museum and its affect on the visitor experience. Shelley Mannion, the museum's Digital Learning Programmes Manager, wrote an article about the series of experiments and the findings during the process (n.d.). In it, she lists the four main classifications of interactions AR technology is used for:

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[8] At the time the application was launched, the Canadian Museum of History was still the Canadian Museum of Civilisation/Musée de la Civilisation.

[9] AR is most often viewed through a hand-held device, like a smartphone or tablet, but can also be displayed through a head-mounted display (see Azuma 1997) or eyeglasses (like Google Glass). Additionally, iOptik is working on bionic contact lenses that, when used with specially made eyeglasses, are AR-capable (Statt 2014).

[10] QR codes are two-dimensional matrices that can embed complicated information, such as URLs, photographs, or videos (Simon 2011).

1. Outdoor guides and explorers
2. Interpretive mediation.
3. New media art and sculpture.
4. Virtual exhibitions.

Mannion states that, the more experimentation being done with AR in the museum, the more blurred the lines between categories became, and these varied uses of the technology are what create meaningful and engaging experiences for visitors. Most importantly, she states that "AR may have been overhyped to begin with, but we are entering a more serious phase during which its usefulness will become evident" (n.d.).[11] Similarly, Farman states that AR is a key technology that allows for the organisation and display of spatial data, which is highly significant to how locative media handles the convergence of material and virtual spaces (2013, 39). Farman and Mannion both state that AR technology is in its infancy, but this focus on AR shows that there is a great deal of expectation in the improvement and usability of the technology.

As recently as two years ago, the Canadian Heritage website boasted that "QR codes are one of the mobile technologies that are the hottest in the museum community right now" and offered a number of examples of them being used in museums around the world, such as the Powerhouse Museum in Australia and the Derby Museum and Art Gallery in the UK (CHIN 2012b). However the popularity of QR codes, especially in museums, has started to wane as more complicated technology, the software (smartphones applications) and hardware (smartphones and tablets), has started to improve (personal correspondence with James Graham February 2014). Indeed, many museums have begun employing the use of AR applications and other multimedia

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[11]It is clear that the British Museum has taken these findings, and Mannion's statements, seriously as they recently (December 2013) launched a new AR app called "A Gift for Athena" (Davis, 2013), the first in a series of apps funded by the museum's Discovery Centre and Samsung.

technologies useable on personal smartphones or tablets (Mannion n.d.). As we see

marketing strategies of major corporations incorporating the use of AR technology[12] and

Google launching Google Glass (http://www.google.com/glass/start/) as an every day,

wearable browser, it is clear that major funds and research are going into this technology

(see Farber 2013).

An early experiment with locational museum experiences is highlighted in the

conference paper "Museums Outside Walls: Mobile phones and the museum in the

everyday." The author argues that museums are not currently (in 2005 at least) utilising

mobile technology to its fullest extent and that the "museum without walls" should

extend beyond the museological experience and into the real world. Arvanitis argues that

mobile media not only allows museums "to create exceptional 'museum moments' in the

everyday, but attempt to disclose the largely inaccessible everyday knowledge, that

usually goes unnoticed" (Arvanitis 2005, 253). To discover the possibilities that mobile

technology can extend the museum experience, Arvanitis invited ten university students

in Thessaloniki, Greece, to use their camera phones and mobile messaging service

(MMS) to explore three archaeological monuments as part of the city's urban landscape

(Arvanitis 2005, 253). Camera phones were chosen because of their popularity among the

Greek population, their ease of use, and their personal portability (Arvanitis 2005, 253).

By participating in this study, the Greek students acknowledged the ancient surroundings

of their everyday lives that usually go unobserved. The practice of using camera phones

to discover the "everyday moments of archaeological monuments" extended the

museums walls, opening up the possibility for museum-quality experiences beyond the

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[12] For examples of the commercial use of AR technology, see Nissan's use of Layar
(http://static.layar.com/website/cases/casestudy-nissan.pdf) or Office Depot's use of Aurasma
(http://www.aurasma.com/news/aurasma-webcast-retail-is-evolving-office-depot-is-innovating/).

contextual walls the museum. Although the students did express some limitations with the technology (a 'sense of intrusion' on the user's behalf, poor image quality, and texts limited to 70 characters) further use and experimentation is needed to "contribute towards the understanding of the potential as well as the drawbacks of mobile media to connect museums and people through the context of everyday life" (Arvanitis 2005, 253).

Working within the same scope ("museum without walls"), we see more museums along with the British Museum developing AR applications that take visitors from within the institution and out to the streets. Many museums are developing AR applications that are *locational* and as such, have no requirement for pattern recognition. Locational AR applications use a phone's internal GPS and camera to juxtapose the museum's archival collections (like photographs) to show how areas of the cities looked in the past. But because they rely on a phone's GPS they cannot work indoors (Mannion n.d.), or really in any area where the GPS information is unreliable, such as in remote locations where cellular service is sketchy at best.

A Canadian example of this is the application called *MTL Urban Museum* (offered by the McCord Museum). This application, which is downloadable as a native app on a personal smartphone, allows users to superimpose up to 150 historic images from the Notman Photographic Archives over present-day views of various Montreal locations (CHIN 2012c). The application uses the phone's internal GPS to track the user's movements by using "pinned" photographs in conjunction with physical locational markers around the city to help visitors orient themselves so the photos overlay the real-world locations appropriately (Martineau 2012).

Similarly in the UK, the Museum of London offers an application called *StreetMuseum*. The native AR application is designed to guide users around the city of London to a number of specific spots where they can view a historical photograph superimposed over its modern-day location. The photographs are geotagged[13] to a specific location, so they are only functional in those exact spots. The application leads users to these various locations using the map or the phone's GPS. Once there, users are prompted to click on the "3D view" button, the application recognises the location based on the geotagged spot and the user's GPS location and overlays the historical image with the "live video feed of the real world," giving a brief glimpse into the past (Zhang 2010; Museum of London n.d.).

Another example of AR technology, but one that uses pattern recognition, was an application developed by the ROM as part of their temporary "Ultimate Dinos" exhibition (Royal Ontario Museum n.d. [now closed]). This was a two-part process, both parts relying on pattern recognition technology. The first was an ad campaign with posters set up around the city. The posters were bordered by a black box, which was actually the target image for the AR application. When scanned, a three-dimensional dinosaur head was called up, and the animated head popped out of the box, roaring (Mairin 2012). The actual exhibit, which was actually not a "true AR" experience, featured three specific kiosks of dinosaur skeletons (Mairin 2012). These displays were not designed to be used to visitors' personal mobile devices, but instead, iPad 3s were installed on swivelling mounts aimed at the skeletons. By using installed iPads instead of relying on visitors' own devices, the museum and application developers had full control

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[13] A geographical identification added to the metadata of an image (Wikipedia n.d.).

over the display. In this case, instead of pattern recognition, the iPad's internal compass and gyroscope was used to tell the iPad where the dinosaur animation should be displayed. "Looking through" the iPad, visitors were shown how the dinosaur would have looked like with skin and, when touched, the limbs would move and pop-up bubbles were displayed to show information about the species (Mairin 2012; Royal Ontario Museum n.d.). To make it seem like visitors were viewing the dinosaurs in the environment of the museum, images of the background taken from the exact vantage point of the installed iPads were stitched together and the three-dimensional dinosaur image was placed on top of it (Mairin 2012). In essence, this application is a complicated, three-dimensional image designed to be "AR-like."

Museums also use AR technology to create exciting, immersive, and entertaining experiences for their visitors. For example, the Smithsonian Institution in Washington D.C. has developed a number of Alternate Reality Games (ARG) meant to be played over a period of a few weeks, which utilise a number of different media technologies, such as AR. The latest ARG, "Capture the Pheon," was introduced in September of 2010 (Smithsonian American Art Museum 2010), but is no longer playable. It was designed to highlight the Smithsonian American Art Museum's collection and was aimed primarily at ages 11-14. It engaged the teens in the art collection by having them complete missions that revolved around a story. The off-site version was played through Twitter and Facebook while the on-site version was played by making an appointment with a museum employee and completing a multimedia scavenger hunt. At its core, "Capture the Pheon" was very much like a museum-based, multi-media game of "Capture the Flag."

As we can see, museums have not shied away from the use of mobile technology, inside or outside the physical walls. Although the examples above are interesting, and although the shift from item tags to QR codes to AR applications may not seem revolutionary in terms of the technology, what is most revolutionary here is in *how* visitors engage with the information, how they experience the exhibitions, how they perceive the objects, artefacts, and locations, and how (as Farman would put it) visitors embody the space. Indeed, "while AR interfaces may not do anything revolutionary in regards to historicizing a place... the major shift here is the implication of the user in the act of defining the site" (Farman 2013, 44).

In this chapter, we looked at the history of museums, cultural heritage sites, and some differences between these different institution types and how they handle visitor experiences and interpretation. We also saw how contemporary museums are experimenting successfully with new forms of mobile technology and we saw how this method of interpretation changes a visitor's experience in a significant way (how they *embody* the space) while not necessarily changing the strategy of interpretation.

In the next chapter, we will look at the Dumfries and Galloway peninsula in Scotland and how it can be understood as a territory-museum, the methods of interpretation at a selection of small cultural heritage sites in the region and how they function within the definitions set in chapter one, the implications of the methods of preservation at each site, how each site reflects those who work to preserve and interpret them (i.e. folk vs. professional interpretations), how cultural heritage sites and interpretation have been handled historically, and what this means in the greater context.

Chapter Two: Dumfries and Galloway as Territory-Museum

In chapter one, we looked at how modern museums have been developed by and benefitted from technological innovations throughout their history and, currently, are experimenting successfully at an institutional level with mobile interpretation. We also looked at the different types of museums and noted some of the differences that distinguish urban institutions from more rural and remote sites.

In this chapter, we will look at how the Dumfries and Galloway peninsula can be understood as a territory-museum, how current interpretive efforts function within the definition of this museum type, how each site reflects those who work to preserve and interpret them (i.e. folk vs. professional interpretations), how cultural heritage sites and interpretation have been handled historically, and what this means in the greater context. We then do a close reading of three separate but related cultural heritage sites in the region (Hoddom, Ruthwell, and Bewcastle) to see how interpretation is handled at each, as each site represents a different level of involvement.

The Historical Region

The Dumfries and Galloway peninsula is a historic region in the south west area of Scotland and is bordered to the west by the Irish Sea and to the south by the Solway Firth and the county of Cumbria in England. The peninsula can be considered a *de facto* territory museum under the HICIRA definition discussed in chapter one.
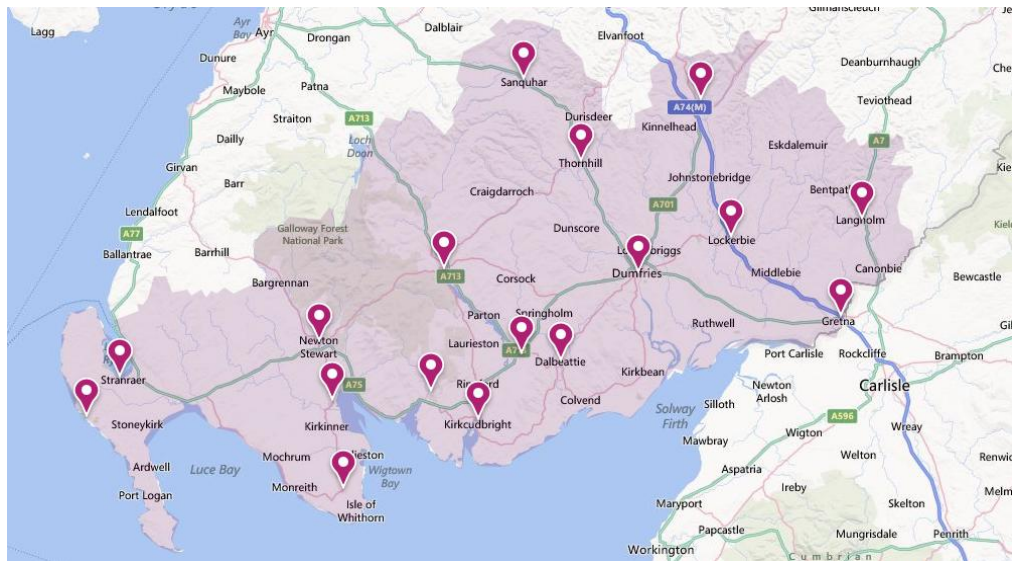
Figure 2: Map showing some important historical locations around Dumfries & Galloway. Courtesy of Visit Scotland: http://www.visitscotland.com/en-ca/destinations-maps/full-screen-map?region=dumfries

The Dumfries and Galloway region is a historical one, with sites dating as early as the Roman period (second century) and includes many major periods and characters from subsequent Medieval, Renaissance, and Modern Scottish and English history. No site in the Dumfries and Galloway region stands in isolation; each site is connected historically in some way to another.

The Ruthwell Cross is located within a specially built apse in the Ruthwell kirk—a late medieval church in the Dumfries and Galloway region of Southern Scotland. The church is found at the apex of a roughly equilateral triangle connecting the nearby villages of Ruthwell and Clarencefield (see http://goo.gl/maps/lxdpb). The Ruthwell site sits on the coast of the Solway Firth and at the very west end of Hadrian's Wall (built in AD 122). It is one of many sites associated with a series of points along Hadrian's Wall that may have served as beacons for those arriving from Ireland from the Solway Firth (see Farrell and Karkov 35). The site of Ruthwell is itself built on a Roman outpost of

Hadrian's Wall (as is common of many other Anglo-Saxon sites in the area), and in this case, is dedicated mainly to iron working (Crowe 1987, 46).

The nearby Roman site of Birrens was a fort and garrison originally built in timber in AD 79. It was rebuilt in stone in AD 122, or soon after, but most of the visible fort and outer buildings actually date from AD 142 (Lowe 2006, 122). It is this supply of carved Roman stones that would be harvested by the Anglo-Saxon monastery builders of the Hoddom complex in the seventh century (Lowe 2006, 122).

The site at Hoddom, which will be discussed in more detail later (albeit, museologically as opposed to historically), was the site of an Anglo-Saxon monastery. In its early days it was relatively unimportant, but it reached its peak in the eighth and early ninth centuries, becoming a central monastery to the surrounding areas (Lowe 2006, 191). The more significant buildings at Hoddom were built in part using stones harvested from Birrens (Lowe 2006, 191).

The Bewcastle Cross (which will also be discussed in more detail in conjunction with Hoddom and Ruthwell) is a late eighth century Northumbrian cross located in the churchyard of St. Cuthbert's church in Cumbria, near Carlisle, England. The Bewcastle Cross bears a number of similarities to the Ruthwell Cross, including date of manufacture. In addition to the cross, the site of Bewcastle contains a number of historical layers: The site itself is located within the ruins of a Roman fort that was built in AD 122 as an outlaying fort for Hadrian's Wall (Farrell and Karkov 1992, 45; Crowe 1987, 47); within the ruins of the fort but outside the churchyard, are the ruins of the fourteenth century castle Bewcastle; the current church, St. Cuthbert's, was the last

iteration of churches that occupied that space, and was re-built in AD 1792; the site also shares space with a modern-day working farm.

In addition to these cultural heritage sites, nearby places of historical interest include the later medieval castle at Caerlaverock (also built on the ruins of a Roman fort), the historic city of Dumfries, which is connected closely with both Robert the Bruce, who began his ascent to the Scottish throne there, and the poet Robert Burns, who lived the last five years of his life in the city and is buried in St. Michael's churchyard, [14] the town of Lockerbie that is well known due to the bombing of Pan Am flight 103, which landed in the town in 1988, and the town of Gretna Green, a popular wedding destination.

Many of these sites are under the official care of Historic Scotland, including Ruthwell and Hoddom, or English Heritage, as in the case of Bewcastle. However, as we will see, many English and Scottish cultural heritage sites have been best served by amateurs, past and present.

A *De Facto* Territory-Museum

Returning for a moment to the HICIRA typology for museums and interpretation centres, a territory-museum is "not located in a physically delimited single-use compound, but instead shares in the daily life of the area and its inhabitants. The term 'territory-museum' is used to designate an area in which its coherence stems from historical and geographical links. It aims to enhance the welfare of the local community" (2005, 15). The important elements of what constitutes a "territory-museum" are actually quite simple and relatively vague, meaning that an area does not need to be "officially

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[14] Burns himself has a connection to Ruthwell: he visited the Ruthwell manse shortly before his death—an event documented in a well-known painting by Duncan McKellar (BBC-Your paintings); the friend Burns was visiting at Ruthwell, Agnes Craig, was the wife of Henry Duncan, who led the reconstruction efforts that resulted in the Cross's installation in its current location (Dinwiddie 1999, 32-36, 51).

designated" as a territory-museum in order to function as one; indeed, the concept of the "territory-museum" has always existed, but it is only recently that it has been given a name. However, in order for a space to be successful in its operation as a territory-museum there needs to be recognition of the area's historical significance and an attempt to provide visitors with the necessary interpretive tools (see HICIRA 2005, 32). This approach emphasises Tilden's fifth guiding principle of interpretation: "Interpretation should aim to present a whole rather than a part and must address itself to the whole man rather than any phrase" (2007, Loc 586 of 3209). In this context, the region of Dumfries and Galloway can be approached as a *de facto* territory museum when explored as a cohesive whole. The "tools" are successfully supplied by Visit Scotland, the official national tourism organisation (see http://www.visitscotland.com/en-ca/), as a selection of "touring trails" that includes the Galloway Touring Route (which starts in Gretna Green), the Burns Heritage Trail (which focuses on Burns landmarks), and the Solway Coast Heritage Trail (which runs along the coast of the Solway Firth and through locations such as Gretna Green and Dumfries and includes locations from a variety of different historical periods).

These touring routes serve as a way for visitors to explore the region as an interconnected whole and in turn unite all the cultural heritage sites with a common element: the historical interest of the region. This fits with the scope designated by HICIRA, which stipulates that the heritage ensemble "facilitates perception of the territory as a cultural product, an open, inhabited museum, in continuous transformation. The visitor can gain a first-hand view of the territory, selecting the aspects which are of most personal interest" (2005, 33). This still functions within the HICIRA definition of

interpretation in that it recognises that an object has great or greater value when *not* taken "in isolation from its function and setting." The primary purpose for the trails is to recognise that the environment the object or artefact inhabits is valuable and significant in a greater historical whole (2005, 15).

These touring trails have both a physical and digital component. Tourists can look up itineraries online before visiting the area—or on their mobile devices while on the road—or by following heritage markers along the regional roads. Essentially, the territory-museum has always existed, but it is through the use of digital technology that the space as a whole is accessed.[15] However, despite this idea that the area is (and always has been) a territory-museum, the officials involved in its maintenance do not view it as such. This is primarily a museological problem: the area is not viewed as a connected whole or as a series of interrelated sites, but rather as a series of popular or entertaining stops within the region. The Visit Scotland website does a relatively good job at describing each site it lists on its itinerary, but that is all it does; it provides a brief history of only a few stops along the trail. It provides the minimum of information and it actually misses listing some historically important sites, ones that could easily be missed while physically driving the routes.

In the late seventeenth century, travel to remote cultural heritage sites was made by carriage, foot, or boat, and were generally seen as "nice days out" for the English elite (Thurley 2013, 11-12). By the early eighteenth century, antiquarianism (the precursor to the careful archaeology we have to today) and interest in studying the past had started to gain popularity. A trend was created when the upper class had started to gain an

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[15] Again, see Farman (2013) for the theory of embodied space and implacement as a way of giving context to digital information.

appreciation for the particular aesthetic of the ruins found scattered over the English countryside and an "appreciation of landscape and the picturesque encouraged people to see medieval ruins as beautiful and evocative" (Thurley 2013, 6). Landscape art began to rise in popularity and the desire for the pleasing aesthetic of ruined abbeys and medieval monuments was incorporated into parks and fake ruins and were castles built when there were none. The late eighteenth century saw a revival of the Gothic style of country homes on a cosmetic level, placing an increased value on medieval architecture.

However, it wasn't until the nineteenth century and the development of the railway systems that a boost in tourism was seen, with people venturing away from their homes and their created landscapes and parks to the countryside and rural cultural heritage sites (as discussed in the previous chapter; Thurley 2013, 12). With the influx of visitors to these delicate areas, there was a need for intervention by official parties to prevent damage. In England, the need for preservation of historic sites and monuments was introduced in the 1740s, when antiquarians voiced outrage against landowners defacing ancient monuments on their property, such as Stonehenge (Thurley 2013, 36). But the movement did not really begin to take traction until the late nineteenth century with the development of archaeology as a discipline and the notice of the destruction of historically significant artefacts: industrial development and the extension of land meant megaliths and monuments were being "repurposed" for roads and turnpikes (Thurley 2013, 36). Although the Society of Antiquaries had existed since 1707 (Thurley 2013, 6), they were primarily concerned with Medieval and Renaissance art and architecture and had little or nothing to do with prehistoric, Roman, or Anglo-Saxon heritage in the UK (Thurley 2013, 37). The organisation of a protection act for these earlier artefacts was

thanks mainly to a man named John Lubbock. In 1870, Lubbock was elected as MP for

Maidstone, a position he planned to use to aid in the preservation of Danish

archaeological sites (Thurley 2013, 37). However, Lubbock received a number of

requests to aid in the preservation of several historically important English landmarks,

and so changed his focus to the legal preservation of prehistoric British monuments

(Thurley 2013, 38). In 1871, Lubbock proposed a bill to establish a National Monuments

Commission that would acquire the rights to of a number of archaeological sites and

would intervene if one of them looked to be in danger of mutilation or damage (however

owners were given the right to appeal against the purchase of the monument) (Thurley

2013, 38). Lubbock's bill was largely opposed and, consequently, voting was consistently

delayed.[16] After nine years, and earning the satirical nickname "The Monumentally

Ancient Act," the Office of Works intervened and Lubbock's bill was abandoned

(Thurley 2013, 40).

These interventions lead directly to the creation of the Ancient Monuments Act of

1882,[17] proposed by George Lefevre, First Commissioner of Works. The new bill "was a

permissive measure that allowed an owner to place his monument under the protection of

the State, which would then take care of it on their behalf... Anyone convicted of

damaging a monument was to be fined £5" (Thurley 2013, 41; see also O'Neill 2005; Ó

Carragáin 2005). The Act had included a list of sixty four monuments for scheduling.

Scheduling, as defined by English Heritage is "shorthand for the process through which

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[16] For an account of the reasons see Thurley 2013.

17 This is the very act that eventually protected the Ruthwell Cross when it was added to the list of
protected monuments in 1882. This inclusion eventually led to the addition of the apse to the Ruthwell Kirk
in 1887, which was specially constructed to protect the Cross from the elements. Until the Ancient
Monuments Act of 1882 passed, the Ruthwell Cross stood in the garden since it was still considered an
"Idolatrous monument" under "Act anent the demolishing of Idolatrous Monuments" that passed in 1642.
The Act had not yet been rescinded by the General Assembly in 1823, and so Rev. Duncan felt it was
unsafe re-erecting it inside the Kirk itself; see Dinwiddie1999; O'Neill 2005; Ó Carragáin 2005.

nationally important sites and monuments are given legal protection by being placed on a

list" (n.d.). When first proposed, Scheduling was described as the "necessary first step in

any scheme for the care and protection of monuments" (Browne qtd. in Thurley 2013,

62). The current legislation in England is the Ancient Monuments and Archaeological

Areas Act of 1979, and the protection of heritage sites are overseen by English Heritage

and it continues to use (and add to) the list of scheduled monuments first created in

1882.[18] In Scotland, the equivalent (yet separate) organisation, Historic Scotland, also

maintains a Schedule of Monuments based on the original list from 1882 and operates

under the Scottish Historic Environment Policy, last updated in 2011 (Historic Scotland

n.d.).

Despite the intervention of the Office of Works, historically speaking, cultural

heritage sites in the UK have been long served by amateurs. In the liminal state between

the time when tourist interest began to grow and the railways began to bring more people

to rural areas, but before there was an official government intervention in terms of

protection and interpretation, the private owners of many cultural heritage sites (as many

archaeological sites were located on private land) took it upon themselves to organise

tourism parties, charge (or not charge) entrance fees,[19] hire caretakers, and provide

tourists with visitor guides (Thurley 2013, 13-14). The ruins of the Norman priory in

Norfolk, Cleeve Abbey in Somerset, Kenilworth Castle in Warwickshire, and a number

of country houses across the rural landscape of England are all examples of the various

tourist attractions owned, operated, and cared for by amateurs (Thurley 2013, 16).

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18 See the English Heritage website for more information on scheduling at http://www.english-heritage.org.uk/caring/listing/scheduled-monuments/

[19] Entrance fees were primarily charged as a way to control visitor volumes. Many of the fees collected by owners of heritage sites donated the money they made to charities. See Thurley 2013, 16.

Although Thurley argues that the owners did their best with what they had and that it was the Government that was the most successful in operating cultural heritage sites (2013, 16), in the present day this is certainly not always true (as we shall see in the examples of Ruthwell, Bewcastle, and Hoddom discussed later in this chapter). It was primarily the owners (and by proxy, amateur historians whether they chose the role or not) who became cultural heritage site curators, opening the doors to visitors, caring for the historical sites for the benefit of the society, and providing interpretive information for tourists. In essence, these sites were then built "from the ground up." They started small, mostly in response to the increased tourist interest in such sites and the need for *something* on-site, and increased in efficacy as they became more established as heritage sites, until the government eventually stepped in to take over the official duties. Even so, the more remote heritage sites are still, to this day, mostly cared for by the local communities (the "amateur" curators), and often quite successfully. Of the "more successful historic visitor attractions" run by national institutions that Thurley provides as examples, the majority of them are within the limits of large cities, such as Westminster Abbey, St Paul's Cathedral, and the Tower of London, which are all in London (2013, 16) and do not provide a fair comparison to the smaller, more remote, cultural heritage sites.

We can see this best through the interpretation for the sites of Ruthwell, Bewcastle, and Hoddom, which are all official cultural heritage sites under the care of the government conservation agencies. Ruthwell is on the touring trails in the Dumfries and Galloway region (the Solway Coast Heritage Trail, specifically) but is not listed as a stop on the official itinerary on the Visit Scotland website. There is, however, signage

directing visitors to the church and cross from the regional highway (a broader search of the tourism site will uncover information about Ruthwell, though not in connection to the Solway Coast Heritage Trail). The nearby and related sites at Hoddom and Bewcastle are not part of any of the regional trails nor mentioned on the relevant websites: it is unclear why Hoddom is missing, since there is Historic Scotland signage on-site; in the case of Bewcastle it is missing from Visit Scotland because it is across the border in England and so falls the jurisdiction of English Heritage. English Heritage's official website does list the Bewcastle site in its entirety (St. Cuthbert's Church, the Bewcastle Cross, Bewcastle Castle, and the Roman fort) under its list of scheduled monuments and listed buildings; however it is relatively hard to find it on the website even when using the search function. The official tourist site for English Heritage (and the equivalent of Visit Scotland), Visit England, does not even list Bewcastle as a site of interest—searching "Bewcastle" returns '0' results.

These omissions are important to visitors' experience of the region and their understanding of its history. The Solway Coast Heritage Trail, like the other itineraries provided by Visit Scotland and the regional tourism authorities, represents an entrance into a virtual historical geography. But the world these trails introduce is incomplete and, even for the parts that are included, are relatively haphazardly put together. The failure to exploit and display the interconnectivity of these sites is a museological problem that significantly affects public understanding of the region's history. Although Bewcastle and Ruthwell have objects that are likely to be of interest to casual visitors, and as my visitor surveys show, are often specifically sought out, visitor experience at both locations would be considerably improved by interpretative material that improved the sense of

connection between them and to other, nearby, sites.[20] In the case of Hoddom, where very few physical markers of the monastic settlement remain, such contextual information would seem to be essential. As we shall see, the failure to include such information at this last site considerably distorts the visitor experience.

A Museological Reading of Ruthwell, Hoddom, and Bewcastle

Although the entire Dumfries and Galloway region can be understood as a territory-museum, it is easiest to examine and improve the individual components of the region on a site-by-site basis. In order to learn what the sites do well and what could use improvement, it is important to examine each site within the context of the museological typology discussed in the previous chapter. For the sake of my project, I have focussed on the three Anglo-Saxon sites discussed above: Ruthwell, Bewcastle, and Hoddom.

All three sites are under the care of the government-sanctioned preservation departments (Ruthwell and Hoddom under Historic Scotland, and Bewcastle under English Heritage) and all three sites fall under one or both of the HICIRA definitions of "Heritage *in situ*" and (particularly at Bewcastle) "Interpretation Centre," although, taken together, the sites represent what can be considered a *de facto* "territory-museum" within the greater context of the entire region. Of the three, Bewcastle, has perhaps the most museologically complete interpretation, with Ruthwell a close second. Hoddom, which verges between 'basic' and 'supplementary' Heritage *in situ*, supplies the visitor with by far the poorest interpretative aid, even though it is the only one that has been supplied by professionals alone. There is much to learn from all three sites, and the close examination of the interpretive materials supplied by each site discloses an interesting dichotomy

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[20] And, as we will see in the forthcoming chapter, visitors have indicated that finding the connection between Ruthwell and Bewcastle is interesting enough to visit both locations.

between material provided by the professional orgaisations and the material provided by the local community.

Hoddom

Hoddom was once the site of what archaeological evidence suggests was a major Anglo-Saxon Monastic settlement (see Lowe 2006). Activity at the site reached its peak in the eighth and early-ninth centuries (Lowe 2006, 191). The settlement appears to have been quite large, with evidence of a stone-built church and many large service buildings, suggesting that it may have been a "mother monastery" responsible for overseeing and supplying a large part of the surrounding region including, perhaps, the church at nearby Ruthwell (Lowe 2006, 191).

Very little evidence of this activity has survived through to the present day. The site continued to play a role in the ecclesiastical life of the region (albeit on a much reduced scale) until 1609 when the parishes of Hoddom, Ecclefechan, and Luce were combined

and a new church was built at the nearby location of Hoddom Cross (Lowe 2006, 5). With the demolition of the medieval church on the site sometime around 1772 (Lowe 2006, 5) and the eventual return of almost all the surrounding land to agricultural use, the only landmark suggesting something of historical interest is the remains of a small graveyard (in use through the early modern period) by the River Annan, which is some several hundred yards across an actively farmed field. Although there is an official Historic Scotland interpretative plaque in the graveyard itself, there are no road signs pointing to the site (in contrast to Hoddom Castle, a later medieval and early-modern site on the other side of the river that now hosts a campground, caravan park, and golf course). The Anglo-Saxon monastery is overlooked entirely on the Visit Scotland website. A walking path along the nearby River Annan has signs that describe the local flora and fauna, but nothing referring to the historic site the path leads to.

To get to the graveyard, visitors must follow a walking path from the road (the secondary highway, B723) through the field. At the graveyard, visitors can enter through a gate and proceed to an interpretive plaque supplied by Historic Scotland.

Figure 4: Plaque inside the Hoddom graveyard. Photograph by the author.[21]

As Figure 4 illustrates, the plaque focusses primarily on the (perhaps spurious; see Lowe

2006, 2) association between Hoddom and St. Kentigern (Mungo), the Patron Saint of

Glasgow, who is said to have built a church on the site and lived at Hoddom as Bishop

until he was exiled to the Kingdom of Rheged in the seventh century. The plaque mainly

discusses his work in Glasgow, where, as it notes, he was the "founder of a monastery."

The final paragraph provides suggestions for further information and visits to related

sites, "if you are interested in the history of St. Kentigern/Mungo": i.e. the website for

Historic Glasgow, Culross Abbey near Edinburgh (160 kilometers to the north) and

Glasgow Cathedral (130 kilometers north by north west).

The rest of the plaque discusses the graveyard the visitor is standing in, the many

finds of Anglo-Saxon stone fragments that have turned up over the years (including

"numerous carved Anglian [Nothumbrian] stone crosses" much like the nearby, still-

standing, but unmentioned, Ruthwell and Bewcastle crosses), and a description of the

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[21] See Appendix B for a transcription of the plaque.

ecclesiastical connection to the Glaswegian diocese. There is a brief description of "the monastery," but this reference, since it follows immediately after a mention of the monastery St. Kentigern founded in Glasgow, does not refer to any landmarks in the area, and is not differentiated from the monastery in Glasgow, is easily (and almost certainly) misunderstood by many visitors as a reference to the Glaswegian institution rather than the Anglo-Saxon one whose former location they are visiting.

In other words, the problem with this plaque is that it misdirects. It downplays the details, history, and local connections of the once important, but now obscure site, visitors are actually looking at in order to concentrate on the better-known, but partially fanciful, connections to the area's largest city. It directs visitors virtually and physically to more tenuously connected locations far outside the site's actual geographic and historic context while ignoring the potential to enrich the visitor experience by explaining the connection to local sites and artefacts as close as a ten minute drive away—including both a standing example of the type of crosses they note are often ploughed up in the surrounding field and the Roman site at Birrens from which the building material used in Hoddom's construction were taken. While Hoddom has been the focus of several recent digs (in 1915, 1952, and 1991), nothing is mentioned of the results of this archaeological work (although the plaque is undated, the reference to the www.historicglasgow.com website, which was first indexed in March of 2004, suggests it long post-dates the major 1991 dig described in Lowe 2006). And perhaps more problematically, a number of the few details it does discuss of the actual site are wrong: its discussion of the post-medieval history of the Hoddom church, for example, appears to mistakenly conflate Hoddom and the nearby Hoddom Cross. The church that the plaque describes as having

been abandoned in 1815 was not the church that stood on this site, but actually its replacement at Hoddom Cross. As mentioned above, the medieval church at Hoddom itself was abandoned in 1609 when Hoddom Cross was established, and pulled down in 1772 (see Lowe 2006, 5).

One of the most intriguing oversights, however, is the plaque's orientation: it is situated in such a way that visitors who stop to read it are looking towards the south wall of the graveyard and the River Annan in the background. The actual monastic site was in fact located over the readers' right shoulder, along a wooded low ridge that runs east-west about 180 meters to the north west. In addition to reporting almost nothing that is actually known about the historical site and its local connections, the interpretive plaque ends up literally disorienting them by causing them to stand looking in the wrong direction (Figure 5).
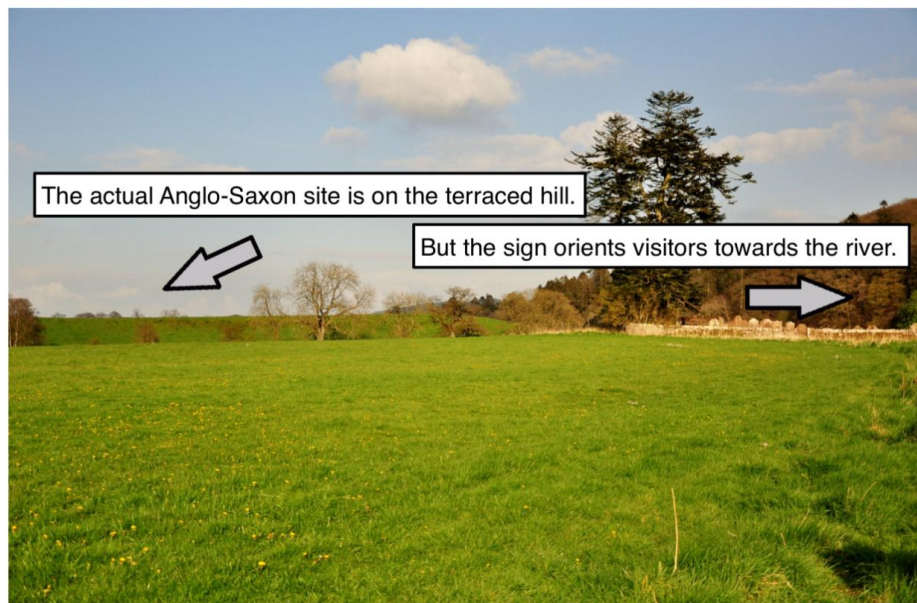
Figure 5: Hoddom, looking east. Photograph by the author.

The decision to orient the sign in this direction and focus on St. Kentigern and the connection to Glasgow may have as much or more to do with aesthetics and commercial

interests than historical or museological interpretation. The emphasis on Glasgow is

presumably associated with the fact that tourists to the Solway region commonly come

from the Glasgow area, the largest tourist destination in the region and the site of the

nearest international airport. The location and orientation of the plaque is presumably the

way it is because the graveyard in which it is found is the only obvious sign of non-

agricultural human activity in the area and because the attractive river to the south is a far

more visually interesting feature than the wooded ridge to the north west (the massive

1991 dig has long since been recovered, leaving no trace of the original architecture; see

Figure 6).
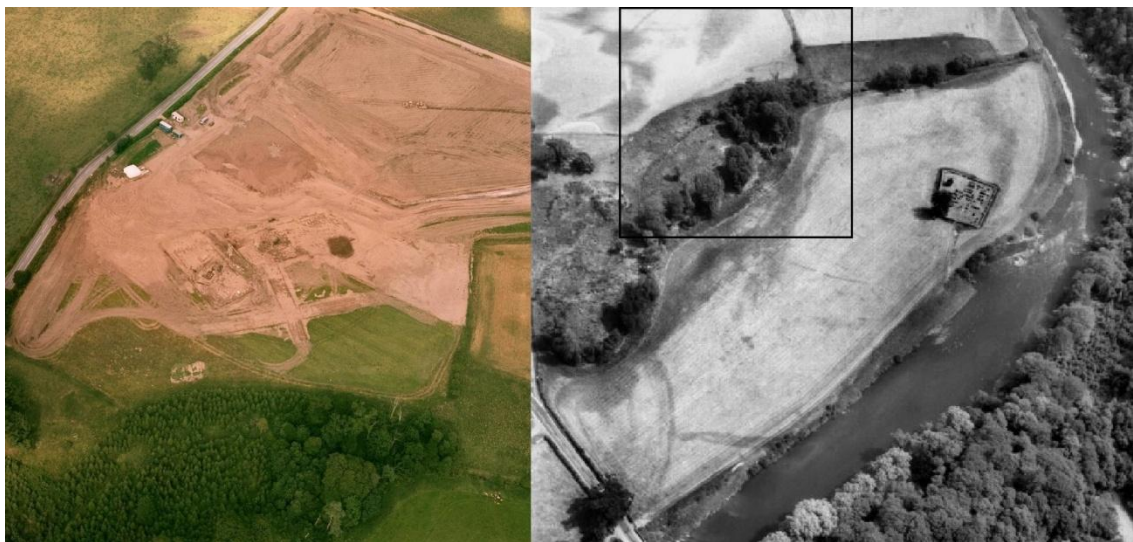
Figure 6: The left image is an aerial view of the 1991 dig site, and (roughly) represents the section in the black square on the right image, which is an aerial view of the Hoddom graveyard. Both photographs courtesy of Canmore Mapping and RCAHMS. See http://canmore.rcahms.gov.uk.

But the decision also has museological implications. By focussing on what is not

there (the spurious connection to St. Kentigern) and turning the visitor away

(intellectually and physically) from what could potentially be learned from the site itself

and the surrounding region, the interpretative plaque leaves visitors with a skewed

understanding of Hoddom and its relationship to local history: an understanding that

connects the site to a semi-mythical figure and the (relatively) far away city of Glasgow

in place of the better documented (and much closer) history of the local peninsula and

sites at Birrens, Ruthwell, and Bewcastle.

Ruthwell

Figure 7: The front door to the Ruthwell kirk, just inside the churchyard gate, looking south west. Photograph by the author.

The Ruthwell site does much a better job at creating a meaningful visitor

experience than Hoddom, although it has its own share of problems. Even though the site

is not prominent on the online guide from Visit Scotland there are plenty of physical

signs in the area to direct visitors from the highway (the B724) to the church. Once

visitors arrive at the church, there is a small parking lot (while visitors to Hoddom have to

park at the side of a relatively dangerous stretch of road) with a sign providing orienting

information about the church and its connection to the nearby Ruthwell village. As the

visitor stands looking at the church and this orientation sign, the old Manse (Figure 9),

depicted in McKellar's painting of Burns,[22] lies behind and slightly to the right.

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[22] http://www.bbc.co.uk/arts/yourpaintings/paintings/burns-at-ruthwell-manse-207835

Figure 8: Ruthwell kirk from the road, looking north. Historic Scotland site sign directs visitors to the parking lot. Photograph by the author.

Figure 9: The old manse at Ruthwell, as seen from the visitor parking lot of the site. Photograph by the author.

As mentioned before, the Ruthwell kirk is a renovated late medieval church that

forms the apex of a triangle connecting the villages of Ruthwell and Clarencefield. The

kirk and churchyard are found inside the remains of a circular Roman outpost (see Crowe

1987), the edge of which, if the light is right, can been seen looking towards the north and

west from inside the churchyard. The church is open to visitors from early in the morning

through the late afternoon and maintained carefully by the local parishioners. The Anglo-Saxon cross is located inside the church in a specially built apse along the north wall, immediately behind the (modern) communion table. The Ruthwell Cross is by far the largest object in the building and forms the visual centrepiece of the church. Directly across from the cross is an aisle, Murray's Quire (Figure 10), which was a funerary chapel for the Murray family. This was separated from the church by an interior wall until the church was renovated in 1772 and it became part of the overall church (O'Neill 2005, 20). It now contains pews and historic photographs and architectural and engineering drawings pertaining to the reconstruction of the cross and the construction of the apse in the nineteenth century.[23]

Figure 10: Murray's Quire. Photograph by the author.

There are a number of interpretive signs located around the church and churchyard. Visitors with the time and patience to explore the church itself, as well as the churchyard and garden by the parking lot, will more than likely stumble upon a number

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[23] for discussions of the position of the Cross in the church and the various locations of its fragments after it was pulled down, see Ó Carragáin 2005; Dinwiddie 1995; O'Neill 2005; Farrell and Karkov 1992

of these. As at Hoddom, the locations and content of the signs appear to be dictated largely by aesthetics and convenience. While the material is more informative than at Hoddom, and more directly connected to the local context and artefacts at which visitors are actually looking, it lacks a cohesive rhetoric. Connections between resources are, for the most part, unstated or incompletely explained.

A tour of Ruthwell begins in the parking lot. When visitors first arrive, the first thing they see is the church gate with a sign beside it describing the "Ruthwell Connection" (Figure11). Although the cross is the main tourist attraction in the area and the primary reason for visits to the church by non-congregants,[24] the "connection" described on this sign is not what you might expect—i.e. between the Ruthwell Cross and related Anglo-Saxon sites at Bewcastle and Hoddom, or between the underlying Roman site at Ruthwell and the Roman remains at nearby Birrens and Bewcastle. Instead, it is to the Ruthwell Savings Bank, now a museum, in the nearby village of Ruthwell, and the "connection" extends through Henry Duncan, the nineteenth century minister who, among many achievements, was responsible for both the reconstruction of the cross and the establishment of the first savings bank.

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[24] This information was collected through site surveys collected for me by the Sessions Clerk, Susan Broatch over in the summer of 2013.

Figure 11: The "Ruthwell Connection" sign, looking south west. Photograph by the author.

Inside the church is a selection of tourist materials for sale. One that is especially interesting (and worth buying) is the visitor's pamphlet. It contains quite a detailed and enjoyable history of the cross, the church, the Savings Banks Museum, and mentions some of the ministers that had served the parish over the years. It was written by Rev. J.L. Dinwiddie (himself a minister of the church) and was first published in 1927. It is currently in its ninth edition, last published in 2009, but has had very little in the way of revisions since the 1920s. The new forward (Figure 12) alerts the reader in general terms to the fact that the book is outdated and that thoughts on the cross and its history have since changed, but no detailed list of errata or corrections is supplied.
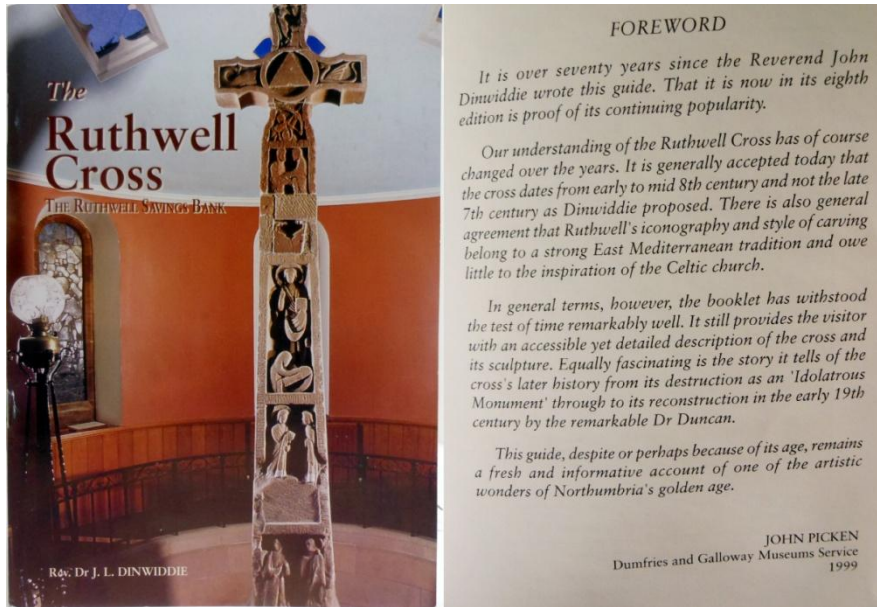
Figure 12: Front cover and forward of the visitor pamphlet available for sale in the church. Photograph by the author.

Although most of the interpretative material on-site was supplied by members of

the parish, additional material in the form of paddles (Figure 13), with a more detailed

description of the cross's history on one side and a panel-by-panel interpretation of the

cross on the other, has been supplied by Historic Scotland. These panels, which are

provided in a number of different languages, are intended to be held up by visitors as they

look at the cross, allowing them to receive an interpretation of the individual panels. The

religious interpretation that these panels offer is relatively superficial: they do not, for

example, translate the Latin inscriptions or offer an explanation as to the origin of the

damage on the cross itself. There is also only the briefest explanation about the side

panels of the cross, which hold the Old English runic carvings.

The cross itself towers over the visitor. Its base is in a pit surrounded by an iron railing and extends to within a few feet of the ceiling. The pit walls and the railing also contain a couple of smaller medieval stone pieces: a fragment from a carved lintel (Figure 14) and, on the railing, a piece that is thought to come from a crosspiece (Figure 15), and may even be the missing crosspiece of the Ruthwell Cross itself (the crosspiece that currently tops the cross is a nineteenth century reconstruction, commissioned by Henry Duncan).

Information about these pieces is sparse or non-existent. The piece of rock attached to wall of the pit is unlabelled, and a reference in the visitors' guide to it as a piece of another cross is almost certainly incorrect. The small piece attached to the railing in an iron cage is identified by a small sign as "the only surviving remnant of the original crossbeam," a claim that is at least probably correct in as much as its appearance is not inconsistent with such a function (see Cramp 1978).

Figure 14: The piece of lintel fixed to the inside of the Ruthwell pit. Photograph by the author.

But while this piece is correctly labelled, the relationship of the object to its label is almost as problematic as the orientation of the interpretive sign at Hoddom. Visitors looking at the fragment while standing at the railing are almost certainly going to assume that the most interesting part of the stone is the bit that is facing them (the piece that is visible between the iron bands that hold it in place). In actual fact however, the evidence that the stone is part of a crosspiece, and the only visually or historically interesting feature of the fragment itself, is the carved figure found on the side of the piece—that is to say, the bit that is oriented parallel, rather than at right angles, to the railing and visitor (compare figures 15 and 16). This is difficult to see unless the lighting is right, and the visitor is given no instructions as to what they are supposed see; it seems very likely that few visitors understand what they are looking at.

Figure 15: The broken interior that is presented to visitors. Photograph by the author.

Figure 16: The carved side that faces away from visitors. Photograph by the author.

Finally, a small locational plague in a grassy island in the church parking lot indicates where the cross stood in the Manse garden after it was reassembled by Henry Duncan but before it was moved into the church in 1887 (Figure 17). The sign itself is low, beside a tree stump, and very easy to miss: members of the *Visionary Cross* team overlooked it on several site visits in the run-up to our scanning expedition in the spring

of 2012 (personal correspondence with Daniel O'Donnell 2012). Apart from a reference in the caption to a photograph of the cross in the garden reproduced in Dinwiddie's pamphlet (Dinwiddie 2009, 33), no other sign, paddle, or guidebook suggests that the location of the cross in the garden is marked in any way. Just as importantly, the environment has clearly changed since the original photograph was taken (the grassy field by the parking lot is not clearly defined as once being the manse garden—indeed, it is not even within the bounds of the old Manse property line). The caption in Dinwiddie's pamphlet indicates that a Californian Oak was planted in the place where the cross stood. This is presumably the stump that now partially obscures the sign. Beyond this, the surrounding area looks nothing like the original photograph and the orientation of the cross is now lost.

Figure 17: A confusing comparison between the original location of the cross and the location of the plaque at the base of the tree stump. Right photograph by the author. Left image is a vintage photograph courtesy of RCAHMS http://canmore.rcahms.gov.uk/en/de

Clearly the Ruthwell Cross is source of local pride, as parishioners past and present have sought to preserve, acknowledge, and teach its history. And especially in comparison to the official efforts at Hoddom, these largely amateur efforts do a very good job. The interpretation is far more comprehensive and focussed on what the visitor has come to see. And while only a few attempts have been made to connect either the different interpretive tools to each other or the site itself to the surrounding area, the beginnings of such a network are clearly present. The raw material for a comprehensive *in situ* interpretation is in place, and the weaknesses of the current representation are due less to a lack of interest in the site than technological issues, access to resources, and the lack of professional oversight. The current interpretive materials use pre-digital media and are bound by their limits. But as we shall see in comparison to Bewcastle, the real museological issues are organisational. The pieces are in place; what is missing is a comprehensive visitor plan that allows them to work together to form a coherent overview of the site and its connections to other objects and locations.

Bewcastle

Figure 18: Bewcastle Cross (centre background), looking east. Photograph by the author.

As mentioned before, the Bewcastle Cross is an Anglo-Saxon stone cross that stands approximately 4.5 metres tall in the graveyard of St. Cuthbert's church, in Bewcastle, Cumbria. Like Ruthwell, the cross and church are found within the confines of a Roman fort, which was built in AD 122 as an outlying fort for Hadrian's Wall (Farrell and Karkov 1992, 45; Crowe 1987, 47). Unlike the Ruthwell Cross, however, the Bewcastle Cross still stands outside, exposed to the elements in its original location. In addition, and within the confines of the Roman fort, there are the (easily accessible) ruins of Bewcastle Castle. The Roman fort, St. Cuthbert's Church, the Bewcastle Cross, and the castle, are all listed as scheduled monuments under the care of English Heritage.

The Roman fort is itself quite interesting. Excavations in 1932 unearthed an unusual six-sided fort with three gates, road system, barracks, a shrine to the god Cocidius, and a bath house. The bath house, which is now just a collection of grassy mounds, can be seen over the high churchyard fence if you know where to look. From an

aerial view, however, it is quite noticeable (the remains of the bath can be seen to the east of the churchyard in the satellite view of Google maps: http://goo.gl/maps/LgVif). Beside the churchyard, and still within the ruins of the Roman fort, are the ruins of a fourteenth century castle (Figure 20), which can be seen from the churchyard in the field of a working farm.[25]

The Bewcastle Cross dates to approximately the same time as the Ruthwell Cross (Ó Carragáin 2005, 36; see also Breeze 2003; O'Neil 2005), and stylistically, it is associated with the Ruthwell Cross and cross fragments found at Hoddom (Lowe 2006, 131). However, one of the most the interesting and (useful) aspects about the Bewcastle monument is that it still stands in its original position—one of the few remaining Anglo-Saxon sculptures that does (Farrell and Karkov 1992, 45; Ó Carragáin 2005, 36).[26]

Figure 19: Close-up of the sundial on the south face of the Bewcastle Cross. Photograph by the author.

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[25] The castle, unlike the cross, church, or Roman fort, has an official interpretative sign provided by English Heritage; this is concerned with the post Anglo-Saxon history of the site and is not discussed further in this paper.
[26] We know the orientation of the Bewcastle Cross is correct because the sundial on the south face of the monument (Figure 19) is only functional if that side faces to the south. See Ó Carragáin 2005, 36.

Figure 20: Bewcastle Castle, looking east. Photograph by the author.

The Bewcastle Cross, even missing its top-piece,[27] is one of the first things you see when you enter the churchyard, although it appears quite small next to the church.[28] The current church, which was rebuilt in 1792 (Visit Cumbria 2014), is open to visitors and a selection of tourist items is available for sale just inside the porch in a fashion similar to Ruthwell. The real innovation however, is the 1980s interpretive exhibit built inside a repurposed shed or storeroom attached to the old rectory to the south of the church. Although not officially organised by English Heritage, this exhibit means that Bewcastle is the only site of the three that technically has a "visitor interpretation centre."

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[27] The cross piece has been missing since at least 1607. In *Conversion of the Heptarchy: Seven Lectures*, Browne mentions a note found by Gough in William Camden's personal copy of *Britannia* (1607) that read: "I received this morning a ston from my Lord Arundel, sent him from my Lord William. It was the head of a cross at Bucastle" (1896, 190). Browne clarifies that "Lord William was Lord William Howard, and that Lord Arundel was the first Baron of Wardour (1896, 190). Browne also briefly states that the cross piece was blown from its socket in a gale wind and that it had "letters across that Camden could not read" and that Camden's "drawing of them shews us that they were runes" (1896, 190).

[28] The earliest recording of a church on the site is from 1277, but the current church was rebuilt in 1792 (http://www.bewcastle.com/church.htm).

Figure 21: St. Cuthbert's Church, the Bewcastle Cross, and the Bewcastle interpretive centre, looking east. Photograph by the author.

Despite being established nearly thirty years ago and put together by students from a local art school, the exhibition centre is very well done, with comprehensive and relatively up-to-date information that is easily readable on large posters hung around the walls of the converted storeroom. Stray finds from the site, including a selection of grave-slabs from the tenth, eleventh, and fourteenth centuries, a stone baptismal font, and a stone socket that was probably for a Roman altar, are located throughout the centre. A plaque on the wall just inside the door gives an explanation as to where the information came from and who designed the exhibition.
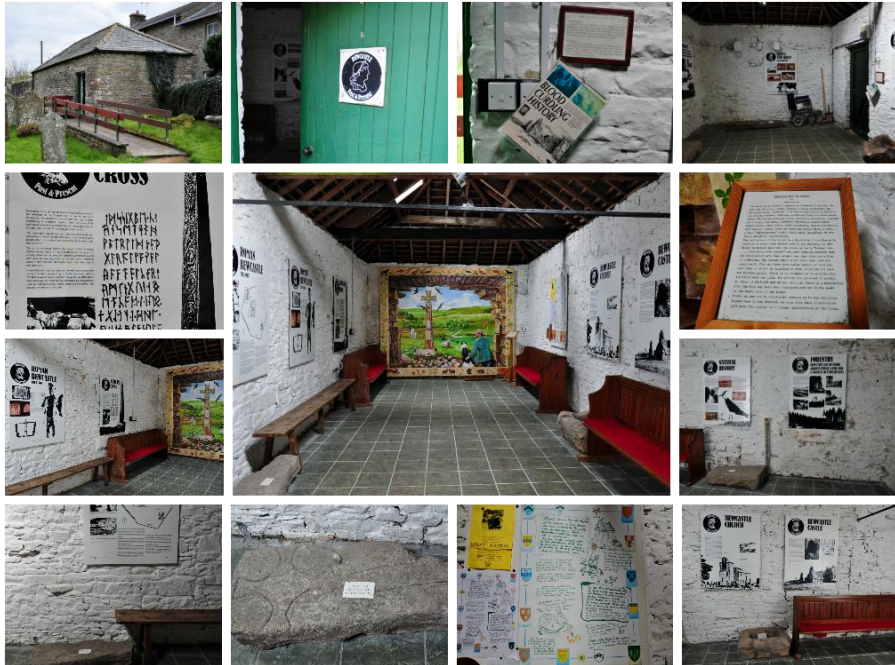
Figure 22: The Bewcastle Exhibition Centre. The order of the images here follows a clockwise path around the room. Photographs by the author.

Figure 22 shows details of the interpretation centre, starting outside the building and, once inside, proceeding clockwise around the exhibit. The north wall is devoted to the cultural history of the area, with dedicated boards for the Roman fort, the Bewcastle Cross, Bewcastle Castle, and St. Cuthbert's church. The other walls cover a variety of different subjects, including information on the local flora and fauna and natural history, as well information on local forestry and agriculture.

The poster devoted to the Bewcastle Cross talks about its interesting history, albeit in frustratingly little detail (Figure 23). It relays some interesting tidbits—such as how the runic engraving cannot now be translated with any certainty thanks to "ntiquarians altering it in previous centuries—and its stylistic relation to the Ruthwell Cross. Unique among the three sites we have discussed, the centre at Bewcastle connects its subject to other Anglo-Saxon objects in the area, mentioning the association with the

Ruthwell Cross as well as, less pertinently, Bede's monastery at Jarrow—a connection

that, at best, is cultural rather than direct.
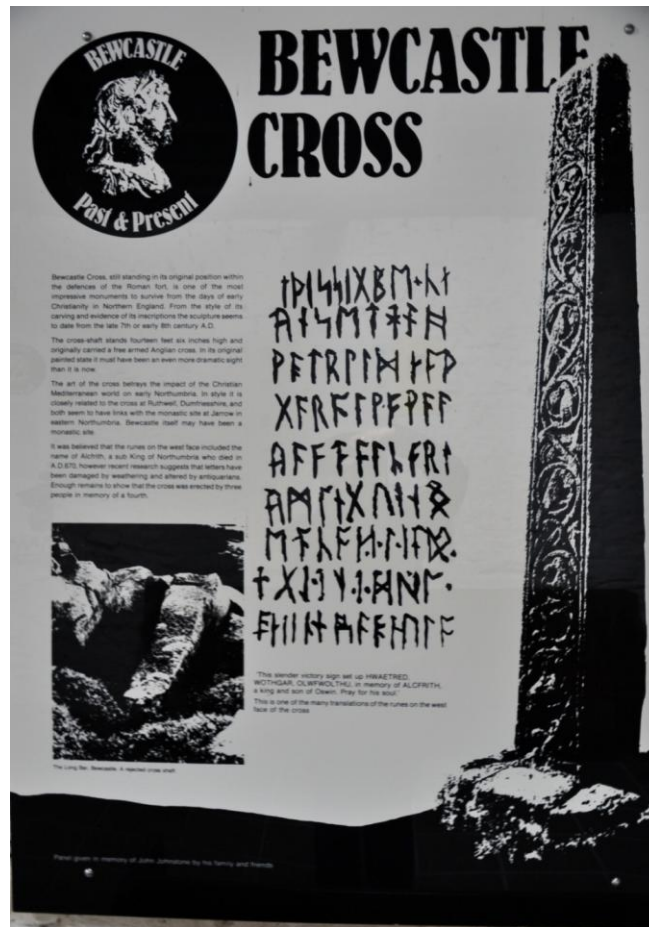
Figure 23: Image of the poster board of the Bewcastle Cross inside the Bewcastle interpretive centre. Photograph by the author.

Despite the efforts of the students responsible for the centre, some of the

informational boards raise more questions than they answer. One photo, for example,

shows what the caption describes as a "rejected cross shaft" at Long Bar (Figure 24), but

provides no other information. As it turns out, few local people appear to know where

this piece was found; it took many hours of work and a misdirection to "the Long Bar"

pub in Newcastle (not far, indeed, from Jarrow), before I was able to track down the

actual referent to this photo, English Heritage Monument No. 13113. It is "on the summit

of Long Bar 580 metres north east of Todcrag Loch" some 6.6 kilometres to the north east of St. Cuthbert's church (Pastscape, n.d.).

The Long Bar, Bewcastle. A rejected cross shaft

Figure 24: Close-up image of "The Long Bar" image on the poster. Photograph by the author.

The interpretative centre at Bewcastle is by far the most complete and coherently designed of all the sites we have examined. It provides more detail and a better organised portrait of the site in question and, uniquely, points to other sites in the region that are associated with the objects it contains. Although its content is almost thirty years old and apparently assembled by amateur historians, it has withstood the passage of time relatively well. Apart from a few original mistakes and the lack of a detailed reference to the cross shaft at Long Bar, the interpretation of the site still agrees by-and-large with the views of contemporary researchers.

The only real weakness at Bewcastle has to do with the limits of the technology it uses: visitors to the cross must step out of the environment they have come to see in order to access the interpretative material that contextualises their visit. While the Bewcastle interpretation centre provides a comprehensive overview of the site, it does not provide an immersive one: visitors have to remove themselves from the context of the site and step away from the terrain in order to learn about the objects and buildings it contains. And when they step back out of the centre, they find themselves on the periphery of the churchyard without a clear view of anything they have been reading about except the Anglo-Saxon cross and the south wall of the church. Although it is the most effective and complete of the interpretive installations we have examined, the centre at Bewcastle still isolates visitors from the very objects they came to see.

Figure 25: View from the door of the visitors' centre, looking north. Photograph by the author.

These omissions are important to visitors' experience of the region and their understanding of its history. The Solway Coast Heritage Trail, like the other itineraries provided by Visit Scotland and the regional tourism authorities, represents an entrance into a virtual historical geography. But the world these trails introduce is incomplete and, even for the parts that are included, are relatively unevenly put together. The failure to exploit and display the interconnectivity of these sites is a museological problem that significantly affects public understanding of the region's history. Although Bewcastle and Ruthwell have objects that are likely to be of intrinsic interest to casual visitors, visitor experience at both locations would be considerably improved by interpretative material that shows the sense of connection between them and to other, nearby sites.[29] In the case of Hoddom, where very few physical markers of the monastic settlement remain, such contextual information would seem to be essential. The failure to include such information at this last site considerably distorts the visitor experience.

In the next chapter, we will see how the potential of contemporary technology could improve on the current materials at folk heritage sites by making them updatable as well as creating a cohesive interpretive plan. It discusses the current forms of technology and their potential uses in rural, folk-run cultural heritage sites. It then demonstrates how a digital tour using AR technology and pattern recognition would look if employed at the site of Ruthwell by overlaying the successful pieces of Ruthwell's *in situ* material with the successful presentation of Bewcastle's interpretation centre.

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[29] And, as we will see in the forthcoming chapter, visitors have indicated that finding the connection between Ruthwell and Bewcastle as interesting enough to visit both locations.

Chapter Three: Digital Interpretation

In chapter one, we looked at how modern museums have been developed by and benefitted from technological innovations throughout their history and, currently, are experimenting successfully at an institutional level with mobile interpretation. We also looked at the different types of museums and noted some of the differences that distinguish urban institutions from more rural and remote sites.

In chapter two, we looked at how the Dumfries and Galloway peninsula can be understood as a territory-museum and how current interpretative efforts do and do not work in bringing out this aspect of the region. We looked in detail at three related Anglo-Saxon sites in the region and discovered that local amateurs have, on the whole, done a far better job than the professionals in the quality and comprehensiveness of their interpretation. In particular, the amateurs do a much better job than the professionals in establishing the *context* for the sites they interpret. In Bewcastle, the 1980s interpretation centre both comprehensively explains the different aspects of its own location and ties this location to at least some of the surrounding, related, locations. In Ruthwell, the strata of (primarily amateur) signage and documentation provides both a wealth of information about the cross and church but also some sense of the (at times unexpected) connections between the Anglo-Saxon cross and other aspects of the region's history and personalities.

Taken together, however, the two chapters also demonstrate the extent to which the current interpretation on the Peninsula fails to exploit its full potential. The official archaeological and tourist websites do not integrate well with the existing on-site interpretative material, even when this material is officially supplied. The amateur

interpretive efforts, while generally of higher quality and broader interest, are limited by the nature of the physical media they employ: visitors to Bewcastle must leave the site in order to learn about it; and while Ruthwell has better signage *in situ*, this signage both lacks an overall plan, can be difficult to follow, and, as we shall see, is subject to scarcity.

This chapter looks at how contemporary mobile technology could be used to improve upon the visitor experience on the peninsula, focussing on the interpretation of the Ruthwell Cross and kirk. It demonstrates a virtual tour of the site and how it could be constructed in a way that would take advantage of the site's current interpretative strengths (including local engagement and a commitment to a comprehensive, *in situ* interpretation) but builds on them by taking advantage of the possibilities of contemporary and short-horizon mobile technology.

An Interpretive Strategy for Implementing a Digital Tour of Cultural Heritage Sites

In order for a digital interpretation programme to be successful at a rural cultural heritage site, it needs to address three specific points: 1. It needs to be discoverable; 2. It needs to recognise the greater context 9that it is part of a larger region and therefore part of a territory-museum); 3. And, it needs to recognise that the local community can do a better job at interpretation than the professionals, and consequently it requires opportunities for local as well as scholarly input.

Digital Interpretation Plan for the Site of Ruthwell

One way of improving on the current Ruthwell interpretation programme is an AR tour that would function through individual visitors' personal mobile devices. An example of how this would work is detailed in this chapter.

Although the ideal would be to have a unified virtual Anglo-Saxon network that spans the region, the best strategy is to start small and move outwards. From the site readings in the previous chapter, it is clear that the local communities have done an excellent job at preserving and disseminating the history of the local region to their visitors (at Ruthwell and Bewcastle, specifically). We have seen how the local passion, interest, and enthusiasm in the history of the area is a source of local pride. The residents want visitors to come and they want visitors to value their experiences and share what they have learned. The interpretive material at Hoddom provided by Historic Scotland is an example of how the professionals think globally and not locally, and as a consequence do a poorer job at site interpretation. The strengths of the amateur interpretation and the weaknesses of the national is a good reason to start small and eventually build to the national level.

However, as mentioned before, although the raw material for a comprehensive interpretive programme is in place, the main weaknesses in the current representation of information are due mainly to a lack of professional oversight, a limited access to resources, and limitations of physical media, and as a result, the current interpretive material is bound by those mediums. However, what else is clear is that the overall interpretive material at the site, although well done and focussed on the object visitors came to see, is lacking an overall cohesive rhetoric: the issues, aside from those mentioned above, are organisational. An updated, digital interpretive plan can remedy these organisational issues by allowing all the unconnected pieces on-site to work together to form a coherent overview of the site and its connections to neighbouring objects and locations in Dumfries and Galloway.

A digital interpretive tour using AR and pattern recognition technology would not only improve on-site visitor experience and engagement, it would also address three main points: 1. Discoverability; 2. Connection to the region and territory-museum; 3. Allowance for local as well as scholarly input.

There are two main options for implementation of a digital tour at Ruthwell. One is by using tags or codes linked to an external, mobile compatible website. The second is by using pattern recognition to display the information directly on a visitor's smartphone.

An Interpretation Plan using QR Codes

Figure 26: By scanning this QR code, you will be taken to the website www.everythingruthwell.org

QR codes have been around since 1994 and were developed by the automotive industry in Japan, but only started to experience widespread use in North America in the 2000's (Strout 2013), including inside the museum walls (Simon 2011). There are a number of online articles and blog posts on the success (or lack thereof) of QR code use in a variety of contexts (see Simon 2011; Wheeler 2011; Strout 2013; Anderson 2013). In the museum world specifically, there is a definite rift between those who believe in using QR codes and those who do not.[30] Despite the Canadian Heritage website boasting that "QR codes are one of the mobile technologies that are the hottest in the museum

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[30] Wheeler (2011) strongly advocates for the use of QR codes while Simon (2011) urges caution and careful strategy when employing the use of QR codes. However, the Smithsonian Web and Media Strategy (n.d.) on "Using QR Codes" suggests moving from QR to pattern recognition.

community right now" (CHIN 2012b), QR code popularity is beginning to decline just as we are seeing a rise in AR technology in the museum environment (e.g. "Ultimate Dinos," "StreetMuseum," "Capture the Pheon"). However, despite this, QR codes are still "usable" in that the technology still exists, is free and downloadable, and QR code readers are still available for every mobile platform. And so, if not "ideal," QR codes are still a solution for the implementation of a digital strategy at a site like Ruthwell.

Strategically placed QR codes could link to a dedicated website connected to those of Visit Scotland, Historic Scotland, and the Ruthwell kirk while still allowing for the input of scholars and the local community. Pointing a device at these codes pulls up information about the relevant objects that is part of the larger website. A set of individual QR codes can thus be used for each of panel of the cross, allowing visitors to call up information about each panel individually—a method similar to that employed by the current paddles but that allows easier updating.

One glaring downside is the actual physical addition of QR codes to a building that is still a functioning church. QR codes are not exactly an attractive addition and as such disrupt the natural aesthetic of any environment. This could be partially solved by placing the QR codes on movable pillars, sticks, or podiums that could be removed during a service or only placed out when the church is open to visitors. This option requires an infrastructure (the addition of such sticks or podiums) and consequently becomes bulky. There is also a chance for error (unless the codes are clearly marked) as a QR code could be placed in the wrong location. For locations outside the church building, the QR codes would have to be made permanent and protected in some way as to make

them immune to the weather but still readable (anything with a glare, like glass or plastic, makes it difficult to scan a code successfully).

In addition to the technical issues, QR codes must be *value-added* to the current interpretive material: they must offer more than a digitised version of the current material on-site to be worthwhile for the time and energy it takes to download a reader and scan the code. Furthermore, the proper context for the QR code needs to be presented to the visitor—visitors need to know *why* they should scan the code and *what* they get out of doing so. As one author states: "QR codes without context are appealing to two audiences: museum geeks and technology geeks" (Simon 2011). What we want to do is appeal to everyone.

An Interpretation Plan using NFC Tags

If the major concern with QR codes is the aesthetic appearance of them, an alternative to using QR codes are near field communication (NFC) tags, which function similarly to QR codes but are more visually inconspicuous. NFC is a "wireless technology that allows for the transfer of data between two NFC enabled devices, such as smartphones" (Rapid NFC n.d.a). For example, the technology that allows for the transfer of data between two smartphones when "bumped" is due to NFC microchips in those smartphones. NFC tags are small, unpowered microchips with aerials that can store simple data that can be transferred to NFC enabled devices when such devices are within ten centimeters of the tag (see Rapid NFC n.d.a; Casabona 2013; Chandler 2012). NFC tags are programmable with simple data such as text, numbers, URLs, contact information, and simple applications (Rapid NFC n.d.b.; see also Casabona 2013; Chandler 2012). They are most popular for advertising and making payments (the "tap-

to-pay" options on many credit cards use NFC technology, as does Google Wallet and the PayPal app, among others; see Casabona 2013; Rapid NFC n.d.a). NFC tags are small and cheap enough that they can be used in items such as wristbands, posters, and business cards, are easily programmable by anyone with an NFC enabled smartphone and a suitable application, and are rewritable and fully lockable, meaning the data can be changed until the tag is locked so no one else can overwrite it (however, once a tag is "locked" it is not reprogrammable; see Rapid NFC n.d.a.; Rapid NFC n.d.b.; Casabona 2013; Chandler 2012). They do not require a power source of their own because they draw from the power of the device reading them (so no batteries) nor do they require a specially designed application to read them (like a QR code reader). Many smartphones currently on the market are fitted with NFC technology, which is important to note, because NFC technology requires NFC enabled phones in order to be read or written. In order to write to an NFC tag, the enabled phone needs a specialised application that is capable of writing data to the tag (Rapid NFC n.d.a.; Rapid NFC n.d.b.; Casabona 2013). Although the tags themselves cost, the writers are generally free.

In the case of Ruthwell, anywhere a QR code would be positioned could be replaced by the less intrusive NFC tag. The NFC tags could be programmed to direct visitors to the same specially designed website the QR codes would direct them, and be placed around the church and churchyard in the same manner as the QR codes. An additional pro is the ability to code NFC tags with small amounts of text; the tags could actually be programmed with the artefact description itself to be transferred directly to the phone "tapped," essentially bypassing the need for an internet connection (a clear benefit over the functionality of QR codes). However, the comprehensiveness of the text would

depend on the amount of data the NFC tag can hold (they are available in difference sizes).

Additionally, because of their small size NFC tags would not require as heavy an infrastructure as QR codes would—they can even be ordered as stickers and placed anywhere. What's more, and as mentioned before, NFC tags are compatible with NFC enabled phones and as such do not require the need for a downloadable application (like a QR code reader) in order to read them. Visitors to the site with these smartphones would only need to hold their phones within ten centimeters of the tag in order to participate in an NFC tour.

However there are some cons with these tags. If they were used to store and transfer simple text to a user's phone it would mean less of an equal opportunity for scholars and the local community to include their input in the interpretive material because the information would need to be planned and curated ahead of time. Because it is not possible to place a sticker right on the Ruthwell Cross itself, they would still require *some sort* of an infrastructure, like a plaque or a poster. Additionally, if the tag is locked, it would need to be replaced with a new tag if the data stored on it ever changed. The cost is not all that much and so is not a huge factor, but it does mean that the tags are *not* updatable from anywhere, which is the primary benefit of QR codes.

The biggest concern with NFC tags is device compatibility. Although many smartphones are equipped with NFC technology and are compatible with NFC tags, many users may not be aware of this aspect of their devices since it is not a feature that is often advertised (Nosowitz 2013). And even though many phones are NFC enabled (primarily

Windows and Android phones), not all are[31]—my own phone, a Samsung Galaxy Infuse (Android), is not NFC enabled (albeit, it is over two years old). Additionally, Apple has decided not to include NFC technology in its phones or tablets despite the fact that Windows and Android are (Nosowitz 2013; see also Casabona).[32] As one author puts it, "Apple also, as the company with the most promotional power in the entire industry, has the ability to singlehandedly change things. If Apple had included NFC in the iPhone 5S, and really pushed it, who knows what could change?" (Nosowitz 2013). It is hard at this point in time to know what the future is for NFC tags; because they are popular among retailers and advertisers they will remain a viable technology, but because Apple has decided not to include them in their devices, they are not available to all platform users.

Looking at the pros and cons of NFC tags in comparison to QR codes, they do not seem like a feasible replacement for QR codes. However, there is no reason they could not be used in *conjunction* with QR codes, and may even make a digital tour using QR codes more robust and accessible. Indeed, it is generally felt that "QR Codes and NFC tags sit alongside each other and both have their advantages and disadvantages" (Rapid NFC n.d.b.). An NFC tag could be included in any medium the QR code is printed on— for instance, an NFC tag could be *inside* a poster on which a QR code is printed—making the tour more accessible to a larger audience than a tour involving only one or the other would be.

This tour would need to (again) be *value-added* to the current interpretive tour and it would require more careful updating than the current material does. The QR codes and the NFC tags would need to be maintained simultaneously to make sure one would not

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[31] You can find a detailed list of NFC enabled smartphones and tablets at Wikipedia: http://en.wikipedia.org/wiki/List_of_NFC-enabled_mobile_devices; see also Rapid NFC n.d.c.
[32] See Figure 55 for a graph on the types of smartphones and tablets visitors to Ruthwell carry.

become outdated while the other one is up-to-date, and they must always relay the same information if they are intended to supplement one another. Additionally, the installation of such a tour should remain temporary and updatable, meaning it could be relatively easily replaced by a more technologically up-to-date system, such as one that functions on pattern recognition.

An Interpretation Plan using Pattern Recognition

Figure 27: Example of AR in the Streetmuseum application by the London Museum. Image courtesy of Zhang (2010). http://petapixel.com/2010/05/24/museum-of-london-releases-augmented-reality-app-for-historical-photos.

As pattern recognition technology improves, the applications that use it (such as the AR applications Aurasma and Layar) are becoming more popular. They have the distinct advantage over QR codes in that they would require no additional infrastructure like podiums or sticks, do not disrupt the natural aesthetic of the environment, and create an immersive and engaging environment for visitors. However, like QR code readers, AR applications would require the initial download of the application before visitors are able to participate, but "the payoff is immediate and allows for a much richer experience" (Strout 2013). The only required visible indication of a digital tour at any site would be a

poster or sign alerting visitors that a digital tour exists with a guide on how to get started. This information can also be made available as a (reusable) brochure or pamphlet.

The primary benefit for AR technology that utilises pattern recognition is the immersive environment it creates. Visitors are free to explore and navigate the area for themselves and are not tied to any specific room. For example, visitors could view each distinctly carved panel on the Ruthwell Cross in the suggested order, out of order, or view the cross as a whole. They could move out to the churchyard and surrounding environment, such as around the building of the church, the graveyard, or the street. One way of exploring a tour such as this could begin inside the church, expanding outward from the cross, to the inside structure of the church, then out to the churchyard, and then finally to include any off-site points of interest, such as the Roman enclosure and the old Ruthwell manse. Visitors have the freedom to explore the entirety of the site if they so choose, free to move around without constraint, or they could focus entirely on the cross itself and ignore any of the other points. The site would become a user-controlled, immersive environment, introducing visitors to the historical layers of the site (Roman, medieval, and modern), drawing them into the history. This mobility that results from pattern recognition and AR applications is also a major benefit when compared to the less mobile QR codes and NFC tags. Although QR codes and NFC tags can be placed nearly anywhere, there are certainly locations where they are less convenient or are relatively useless (like highways; see Anderson 2013 for more examples).

As we have seen, many museums have begun employing the use of AR applications or other multimedia technology (Mannion n.d.; see again "Ultimate Dinos," "StreetMuseum," "Capture the Pheon"). Additionally, there is also an increase in the use

of AR applications in the advertising strategies of major corporations and Google's

Google Glass is becoming more popular.[33] Looking at the versatile use of AR and pattern

recognition by different types of industries, it is clear that major funds and research are

going into this technology (see Farber 2013).[34] As the focus turns away from QR codes

and to pattern recognition and AR, it makes sense to dedicate resources to implementing

an AR focussed interpretive tour instead of a tour based on tags or codes. Essentially,

there is no sense in investing in a technology that will be defunct in five years or so.

Therefore, if a tour were to be implemented at Ruthwell, it should focus resources on one

that uses pattern recognition, or is at least one that is updatable for future technology that

utilises pattern recognition.

Discoverability, connection to the regional territory-museum, and allowance for

local and scholarly input can all be done through the use of the above technologies. The

first and, to a lesser extent, the second points can easily be solved by linking a dedicated

site about the Ruthwell Cross and kirk to the official websites for Visit Scotland and

Historic Scotland. By highlighting the interpretive programme at Ruthwell through these

official spaces, it not only makes the physical site more discoverable physically (visitors

are directed on how to get the location), but by notifying visitors of a digital interpretative

tour that requires a personal smartphone or tablet makes the site discoverable

intellectually as well. The current page for the Ruthwell Cross and kirk on the Visit

Scotland site would also need to be updated to reflect their connections to the greater

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[33] See Google Glass http://www.google.com/glass/start/. Also, see how Nissan uses Layar (http://static.layar.com/website/cases/casestudy-nissan.pdf), or how Office Depot uses Aurasma (http://www.aurasma.com/news/aurasma-webcast-retail-is-evolving-office-depot-is-innovating/), for commercial uses of AR applications.
[34] We are also seeing the decline of advertisers using QR codes at this time. See Strout 2013 and Anderson 2013.

region. Most of all, Visit Scotland needs to include Ruthwell as a stop in its online

itinerary, not only on the physical route. Similarly, the inclusion of Ruthwell as a "point

of interest" heritage site on the Historic Scotland website is imperative for directing

visitors to the area and alerting them of a digital interpretive tour in order to give them the

opportunity to participate in such a tour. Within this context, connecting the sites in the

Ruthwell area (the cross, church, and village) with nearby related sites online would

encourage visitors to take advantage of their opportunities to visit these sites while in the

area, not just discover them by chance (or perhaps not at all).

In addition to the heritage site being included on the Visit Scotland and Historic

Scotland websites in greater detail than it is now, the church's own website

(http://www.ruthwellkirk.org.uk/), which already highlights the local and historical

importance of the Ruthwell Cross, could also advertise any new interpretive programme.

While essentially achieving the same results as the Visit Scotland or Historic Scotland

sites in terms of directing visitors to the physical location and encouraging them to bring

mobile technology along, linking to the church's official website also allows for the

potential of including local knowledge and input in the overall interpretive tour; a digital

tour could also link to individual pages on the church's website where the information is

collected and managed by those who manage the site.

It is also extremely important to allow for scholarly input as well as local input.

As we saw from the site reading at Ruthwell, one of the major weaknesses for the current

interpretation programme is that the existing material is outdated. Scholarship ages, and

in order for the information to stay up-to-date it will need to be updated by those

interested in, and with access to, the current research. Scholarship can be updated by

giving professional scholars and academics access to where the information is held, be it on the church's website, or the dedicated space for the site on the Visit Scotland or Historic Scotland websites, or a dedicated web-space to the cross and church, independent of, but linked to the previously mentioned websites.

An effective mobile tour should take the interpretive *in situ* pieces already at Ruthwell (with the ability to expand on it) and overlay them with the successful cohesion of the Bewcastle interpretation centre. It would take the presentation method from Bewcastle (the posters) and display them in context of the entire site: visitors will be able to receive the information for what they are currently looking at without being removed from the direct environment. The primary improvement here would be the method of tying the interpretive material to the environment itself. A digital tour such as this is not meant to focus on the technology and the novelty of the new technology, but should simply be designed as a robust and effective dissemination of knowledge to an interested visitor base. Again, the point is not to change the strategy of interpretation but merely to improve on the medium of interpretation by making it more cohesive, robust, sustainable, and of course (as Tilden would put it), provoke interest. The most effective way of achieving this is through the implementation of a tour using pattern recognition and AR technology.

We will see in chapter four that the visitors to Ruthwell are interested in the cross and church and spend a fair amount of time on-site; however, they are not heavy technology users. Although more than half the visitors in most demographics (the exception being visitors from England) have some technology with them on their visit, experience suggests that they will not use this technology unless given a good reason to

do so.[35] Because of these factors, visitors need a good reason to participate in a digital tour, which would require additional steps to the current interpretive material (such as downloading an AR application and possibly subscribing to a channel where the tour is hosted).

   To begin strategising the overall interpretive plan, I created the map in Figure 28, which displays an aerial view of the Ruthwell site.[36] The physical copy of the map is customisable by using moveable cell phone icons to indicate where points of interest are. The cell phone icons can be placed to indicate where there are currently marked points of interest (e.g. the Ruthwell Cross, the marker in the garden, and the "Ruthwell Connections" sign), or indicate where points of interest are not currently marked but may be discoverable through other means, such as online research (e.g. the old manse, the Roman enclosure), or indicate where there should be a marked point of interest but there is none (e.g. a specific reference to the connection with the nearby sites of Bewcastle and Hoddom).

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[35] This is seen in the visitor survey cards collected at Ruthwell in 2012. Although the survey was available online as well, no visitor to Ruthwell chose to fill out the digital copy—in large part because it simply repeated what was already available on-site in a physical medium

[36] This map is hand-drawn and is based largely on the archaeological drawings by Chris Crowe (1987), the ordnance survey map of the Ruthwell area from Canmore mapping, and two aerial photographs of the Ruthwell site - licence obtained from RCHMS.
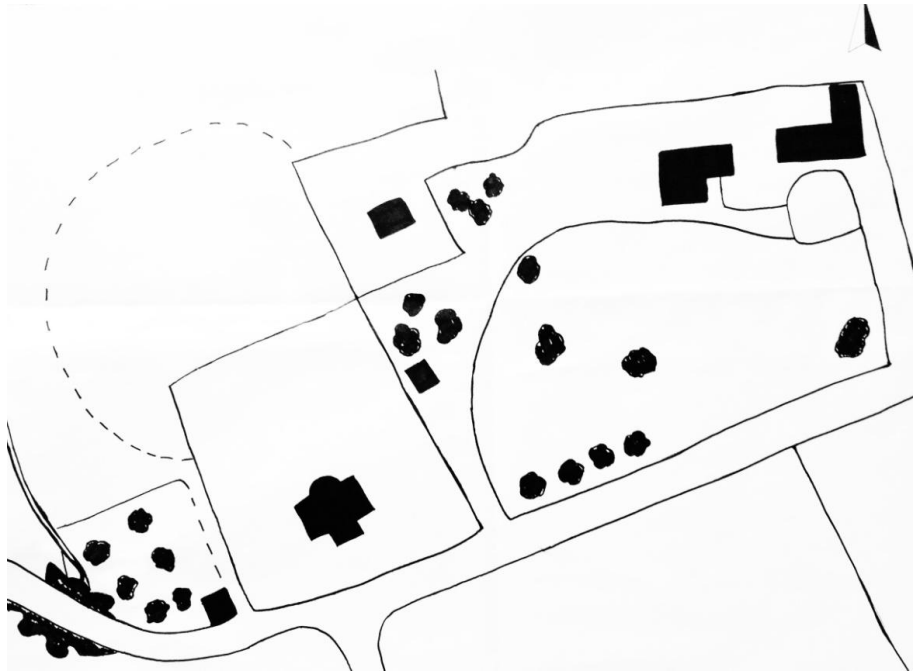
Figure 28: Map of the Ruthwell site drawn by the author.

Using the map, I plotted a series of points that that were highlighted in the visitor

surveys as missing or interesting and important: the Ruthwell Cross as a whole, as well as

an individual panel on the Ruthwell Cross; Murray's Quire (aisle), which would include

an overview of the history of the kirk itself; the garden plaque where the cross was re-

erected by Henry Duncan; a stop on the B724 highway showing how the kirk looked

prior to its 1906 renovations; a stop along the maintenance road by the Roman enclosure;

and the old manse. Below is a proposed example of what an AR implemented tour would

look like, including a small selection of stops that both represent locations already

included but could use some improvement or are not currently represented on-site.

1. **Introducing visitors to the Ruthwell interpretive tour and the Ruthwell**

   connection sign

   Ideally, visitors will come to the site already knowing there is a digital tour and

have the application downloaded on their mobile devices. For those who do not (e.g.

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those who visit spontaneously) there will need to be a sign indicating the new tour with instructions on how to participate.

As mentioned in chapter two, the first point of interpretation is the "Ruthwell Connection" sign on the wall next to the entrance gate by the visitor parking lot. The sign points to the connection between the Ruthwell Cross and church to the village of Ruthwell and the Savings Bank Museum through Rev. Henry Duncan. It also directs visitors interested in the museum on how to get there. Because this sign is obvious to visitors just arriving, this is the ideal location for an introductory sign for the interpretive tour. Once visitors have the application downloaded, where they start the tour would be entirely up to them, but it is possible to provide a selection of starting places as suggestions to help visitors start the tour, including the Ruthwell Connections sign itself.

Figure 29: The Ruthwell Connections sign on the fence of the Ruthwell churchyard. Photograph by the author.

Digitally, the current connections presented on the sign can be expanded upon. For example, this can be done by creating a Google Map with directions to other nearby and related Anglo-Saxon, Roman, or modern sites in the region, such as Bewcastle, Hoddom, Birrens, or Dumfries. A sign can be placed on the inside of the churchyard wall as well, reminding visitors to scan the Ruthwell connection sign before they leave for a customised Google map[37] with directions on how to find related sites in the area.
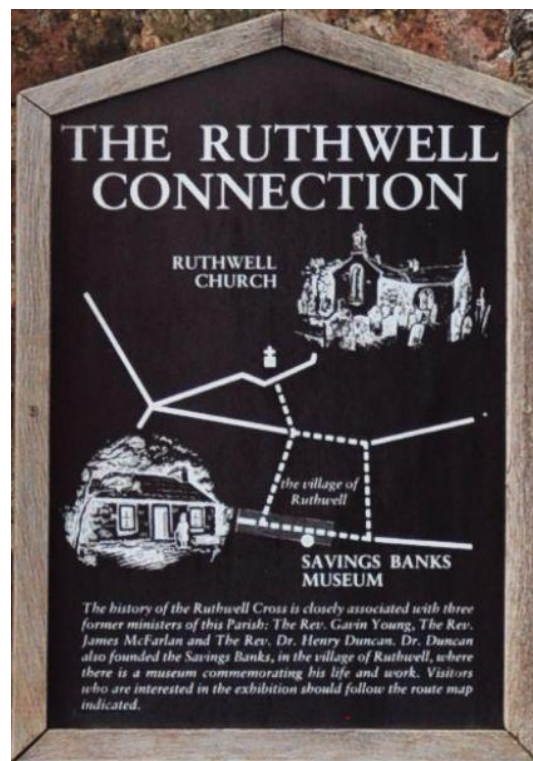
Figure 30: This image is Aurasma enabled, meaning, it can be scanned using the Aurasma application on your smartphone or tablet and will pull up the Aura associated with it. Photograph by the author.

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[37] I have created a custom Google map to showcase the network of related sites in the Dumfries and Galloway region. The map can be viewed here: https://www.google.ca/maps/@55.022235,-3.0446184,11z/data=!3m1!4b1!4m2!6m1!1szi7I_rYw8bV8.kBHbpOQ7LJqQ?hl=en

Figure 31: The Ruthwell connections sing overlaid with an Aura as seen in Aurasma on an iPad. Photograph by the author.

Figure 32: A custom Google map with stops of interest and directions displayed in the Aurasma application after the image is tapped. Photograph by the author.

2. The Ruthwell Cross and the Mary Magdalene panel

Figure 33: The Christ and Magdalene panel on the Ruthwell Cross. Aurasma enabled. Photograph by the author.
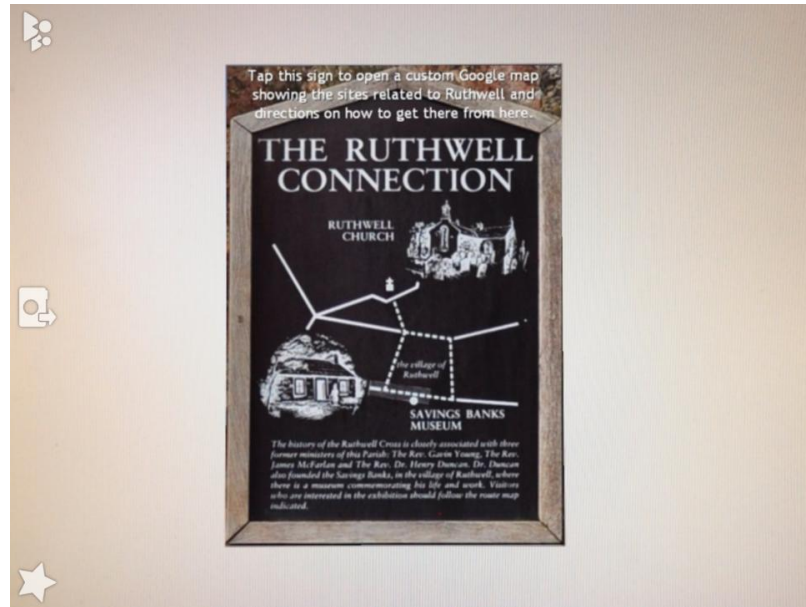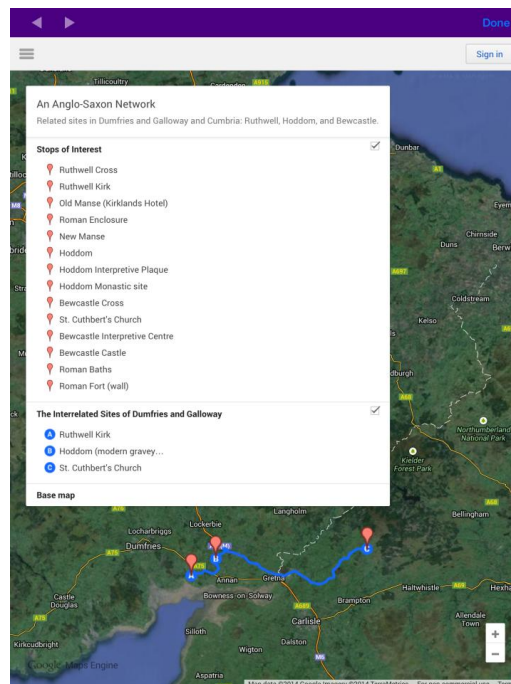
The majority of people visit specifically to see the Ruthwell Cross,[38] so it is most likely the first object a visitor would look at. The second stop would focus on the cross as a whole (which is not illustrated here), and give visitors the option of drilling down on the specific panels of the cross separately. The current interpretive information on the cross, as discussed in detail in the second chapter, is found in the visitor pamphlet and on the wooden paddles. The visitor pamphlet can be read while on-site, but a number of visitors indicated they bought it as a souvenir to take home with them. The wooden paddles have an overview of the history of the cross on one side, and a panel-by-panel description on the other side. The paddle is intended to be held up by visitors as they look at the cross, allowing them to receive an interpretation of the individual panels.

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[38] As evidenced by the visitor surveys collected over the summer of 2013. See Chapter Four for a detailed breakdown of the survey.

A digital stop on this tour would do essentially the same thing as the wooden panels do now –visitors will be instructed to look at the cross "through" their mobile devices to receive more information on the cross—but the main difference being that visitors will know exactly what information goes with which panel specifically (as it is now, visitors have to deduce which panel is which while looking at the paddle since panels are not specifically labelled). In addition to this, and primarily for visual interest, the panels could be overlaid with a number of reconstructed representations of the cross and its panels. The *Christ and Magdalene* panel has been used as an example of how this could be done. It has been overlaid with an image of the painted plaster cast of the Ruthwell Cross (which used to be in the Manchester Museum and is now in pieces at the University of Leeds). Tapping on the image would take visitors to the Wikipedia entry[39] on the cross or individual panel if the visitor were interested in learning more.
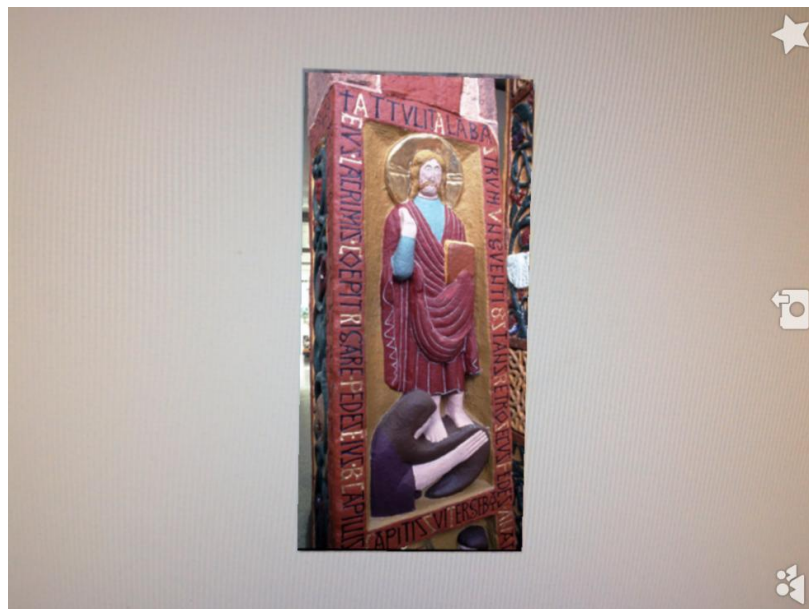
Figure 34: The painted plaster cast overlaid on the Christ and Magdalene panel displayed on an iPad inside the Aurasma application. Photograph by the author.

[39] Linking to Wikipedia is a potential solution to the question of sustainability and will be discussed in more depth in the next chapter.
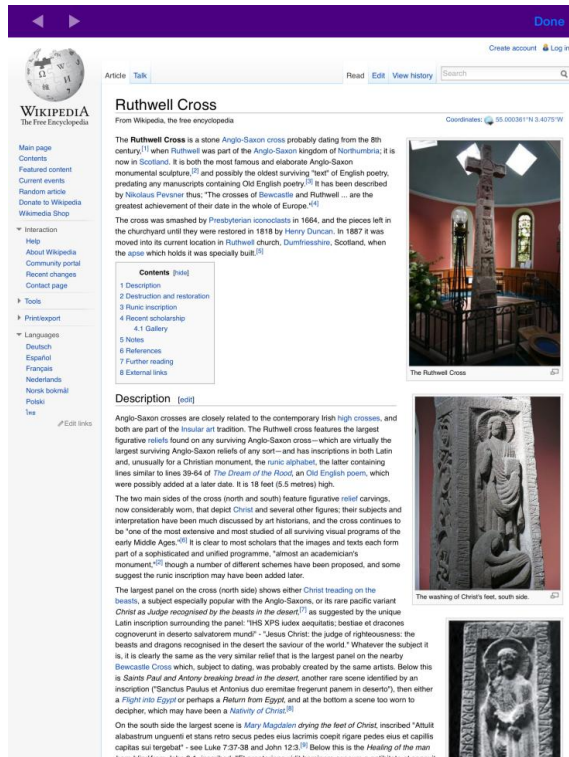
Figure 35: The Wikipedia entry on the Ruthwell Cross displayed inside the Aurasma application after the image was tapped. Photograph by the author.

3. Murray's Quire

Figure 36: Murray's Quire looking south. Aurasma enabled. Photograph by the author.

Murray's Quire (Aisle) has an interesting story in the history of the church

building and also plays a role in the history of the Ruthwell Cross. A selection of

photographs and documents from the history of the church and cross are presently

displayed on the walls in Murray's Quire. Although some of the documents in the frames on the wall deal with the renovations of the aisle, the history of the aisle itself and the role it played in the history of the cross is not displayed in the church nor is it talked about in the current interpretive material provided on-site.

For visitors interested in the history of the church building and those looking for more information on the interesting memorial insignia and windows, a stop on the digital tour could focus directly on Murray's Quire, adding additional information to the current interpretive material.
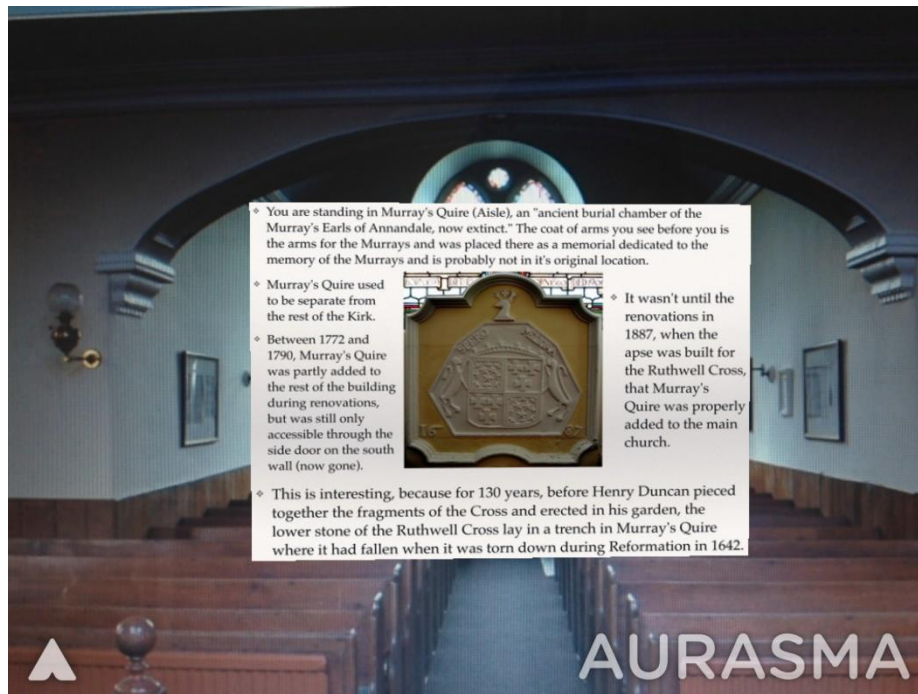
Figure 37: Overlay for Murray's Quire displaying the role it played in the Aurasma app on an iPad. Photograph by the author.

4. **The current apse**

On the wall of the Murray's Quire is a picture of the proposed plans for the new apse. Although it is interesting, visitors may not see the significance of the plans, even if

they venture outside to view the current apse—the plans are actually quite different than the apse that was actually built.

Including this stop in a digital tour would be doing something different than the traditional interpretive material does: it would move visitors from inside the church to the outside, "extending the walls of the museum" while taking advantage of a heritage *in situ* site. Visitors may choose to explore this area of the site, or they may not. With the tour directing visitors outwards and showing them how the apse may have looked had these plans been finalised, they become even more immersed in the environment than they would by just looking at the images on the church walls.

Figure 38: Image of the Ruthwell apse. Aurasma enabled. Photo by the author.
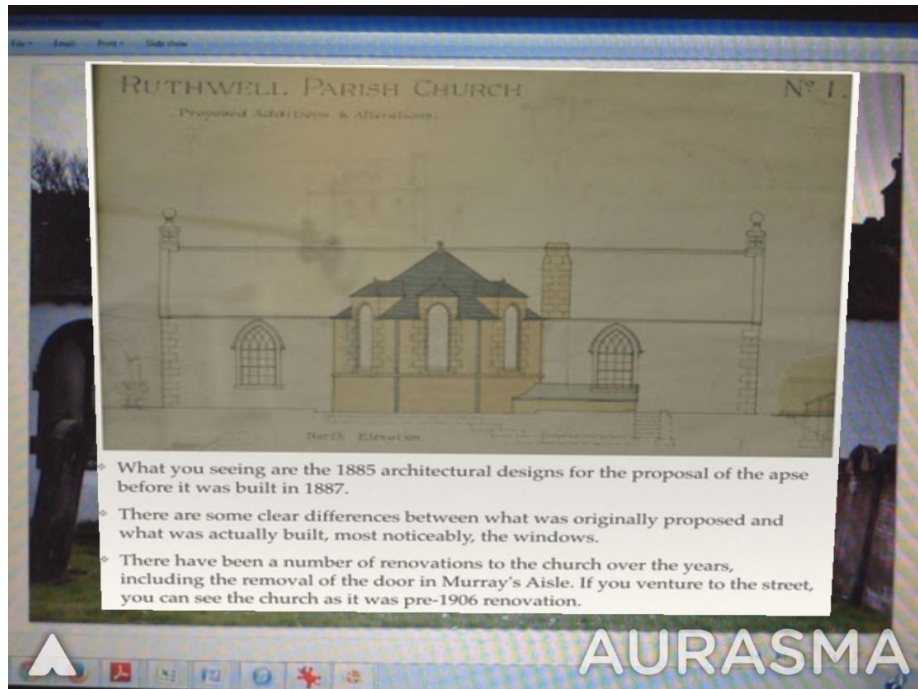
Figure 39: The apse plans overlaid on the apse displayed in the Aurasma application on an iPad. Photograph by the author.

5. The garden marker indicating where the Ruthwell Cross used to stand

Directing visitors further away from the church, this time outside the churchyard and into what used to be the old manse garden (and is now a green space in the parking lot), visitors can find a small metal sign indicating where the cross was re-erected by Henry Duncan in 1823. The garden marker is placed near the stump of a California Oak and is easily overlooked.[40]

On a digital tour, this stop can be added without difficulty and has the added bonus of taking visitors even further from the church, meaning visitors have a more complete experience of the site as a whole. Visitors will have a greater chance of finding this location since it will be part of the cohesive rhetoric. In addition to this, the overlaid image can be of the actual cross as it stood in the garden between the years of 1823 and 1887, giving visitors a lens to the past.

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[40] One visitor even specifically stated on the survey that he/she would have liked to have seen where the cross used to stand outside.

Figure 40: The garden marker indicating where the Ruthwell Cross stood between 1823-1887. Aurasma enabled. Photograph by the author.

> This stump of a California Oak marks where the Ruthwell Cross used to stand in the manse garden when it was first re-erected by Henry Duncan in 1823.

> The image of the Cross as it stood in the garden was taken by J. Rutherford (J.R) in 1883, four short years before it was moved into the specially built apse in the Kirk, where it still stands.
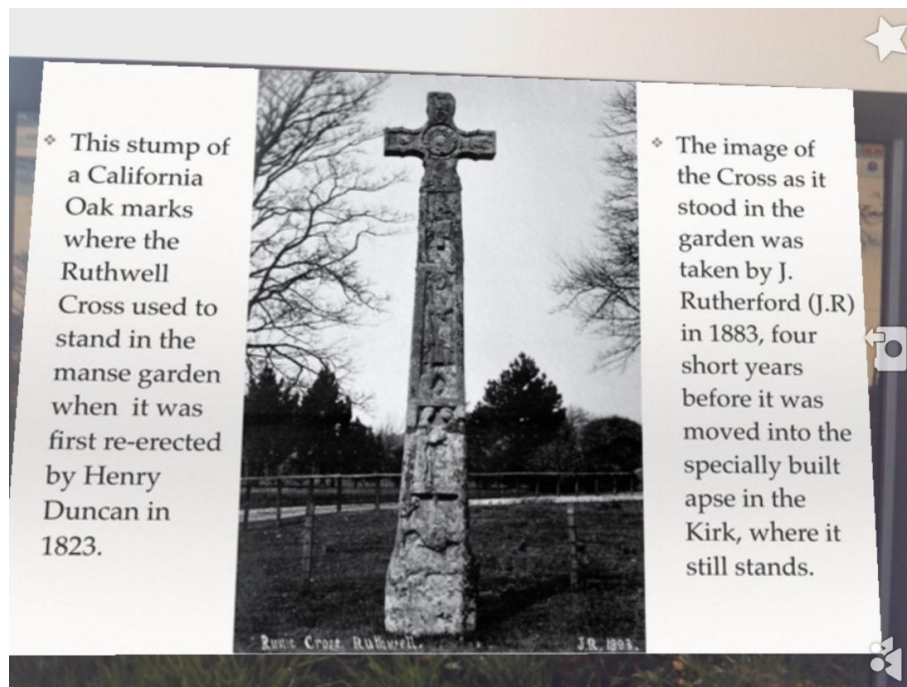
Figure 41: The Aura of the Ruthwell Cross in the garden dispalyed in the Aurasma application on an iPad. Photograph by the author.

6. The old manse

As visitors stand in what used to be the manse garden, they can see the old manse

house in the distance. Pictures of the old manse can be seen in the visitor's pamphlet and

is referenced more than once in discussions of the past parish ministers and the poet, Robert Burns.

Adding this stop on the tour expands the visitor's perspective of the site once again beyond its normal scope. Visitors would be directed to hold their phones up to a building in the distance. It would make for a particularly interesting stop to include, placing the building in the context of the recent history and its tie to Burns, which would also connect the site to the nearby city of Dumfries, Burns' last place of residence.

Figure 42: A photograph of the old manse looking north east. Aurasma enabled. Photograph by the author.
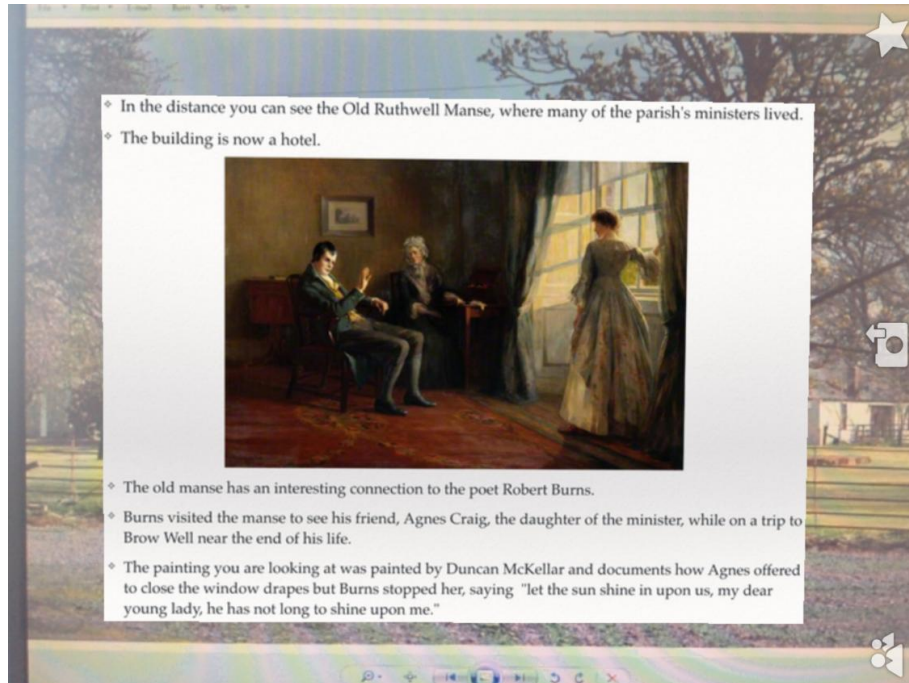
Figure 43: McKeller's painting of Burns at Ruthwell overlaid on the Ruthwell manse. Displayed on an iPad inside the Aurasma application. Photograph by the author.

7. Ruthwell Kirk Prior to 1906 Renovations

A photograph of the Ruthwell kirk prior to the renovations done in 1887 and the final renovations in 1906 is displayed on the wall of Murray's Quire in an attempt to showcase how many renovations the current church has undergone to look as it does now. However, it is taken from a location many visitors may not view the church, and so they may not truly understand how different the church now looks.

A stop on the digital tour could direct visitors to the B724 highway to approximately the same vantage point the photograph on the wall in Murray's Quire was taken. By looking through their mobile devices, they will be able to see this photograph overlaid with the current building, being granted another view of Ruthwell's past, much like the stop focussed on the apse.

Figure 44: The Ruthwell kirk from the B724 looking north. Aurasma enabled.

Figure 45: Image of the Ruthwell kirk prior to the 1906 renovations overlaid on the present day image of the kirk in the Aurasma application on an iPad. Photograph by the author.

Summary

This proposed tour for the Ruthwell site is relatively conservative. It essentially
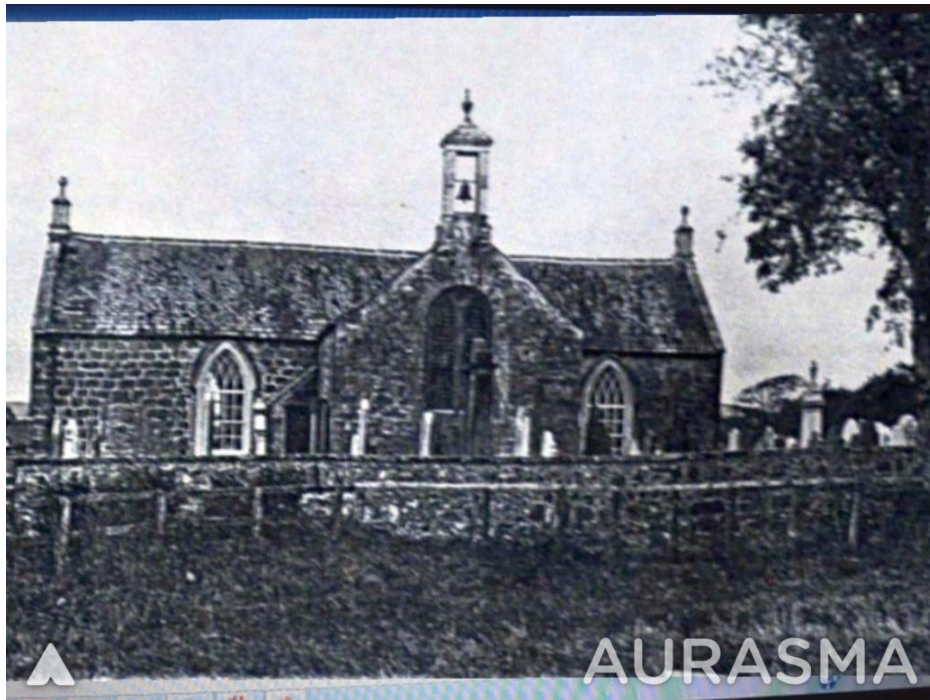
just takes what is already on-site and joins the pieces together through the use of digital

technology, displaying the information to visitors by way of an AR application. It also connects the Ruthwell site to other interesting, related sites in the region through mentioning them on individual stops (e.g. Dumfries and Burns on the manse stop and Bewcastle on the Ruthwell Cross stop) and expands on the local area with an inclusion of a linked Google map that directs visitors to greater region.

The visitors to Ruthwell are not only older on average than visitors to urban museums, they are also not heavy technology users (as we'll see in chapter four). Because this slightly older demographic will not use technology without a reason, the point is not to "wow" them with what digital technology itself can do, but to take the local enthusiasm and build on what is already great about the current interpretive material. By including a digital tour at Ruthwell, the overall material on-site is improved by becoming updatable, while presenting a cohesive narrative in an environment that is fully discoverable and immersive and *in situ*, all while remaining unobtrusive. In turn, the information becomes more sustainable digitally and, when tied to the official tourist materials provided by Historic Scotland and Visit Scotland, is discoverable in new ways.

This tour represents how an AR enabled tour would work under ideal conditions with technology that works perfectly. It takes the *in situ* interpretive material from Ruthwell and overlays it with the professional-looking interpretive display at Bewcastle, essentially taking the best of both (amateur organised) sites.

However, the next chapter focuses on the technological issues discovered during experimentation and seeks possible solutions for them. It also discusses the results from the visitor surveys collected during the summer and fall months of 2013, which point out

Ruthwell's specific visitor-base and how this unique group of people may affect future

digital installations on-site.

Chapter Four: Implementation and Larger Problems

In chapter one, we saw how the idea of the museum has been driven by technological innovations and how urban museums have been experimenting successfully with AR applications. We have also seen a marked difference between how urban museums and rural heritage sites operate, primarily how rural cultural heritage sites have best been served by amateurs. In chapter two, we saw how three of these cultural heritage sites deal with visitor experience and interpretation, both successfully and unsuccessfully. Most importantly, we saw how the professional organisation failed the site of Hoddom, while the folk-run sites of Ruthwell and Bewcastle presented a far more comprehensive overview of their histories (even if outdated). In chapter three, we saw how mobile technology could be used to improve on the visitor experience at the Ruthwell kirk, and in turn, of the Dumfries and Galloway peninsula through the demonstration of a virtual tour that harnesses the strengths of Ruthwell's *in situ* approach and Bewcastle's in-depth interpretation.

This chapter looks at the difficulties and technological issues with contemporary mobile technology and how this can affect the implementation of a mobile tour at a rural, folk-run, cultural heritage site through experimentation with AR applications. We also see some potential difficulties with Ruthwell's unique visitor demographic in an introduction of a digital tour and some possible solutions for addressing these issues.

A Technological Option for a Digital Tour

Primarily, the difficulties again come down to the environment. As we have seen previously, what can be done successfully in an urban museum does not work for a rural, folk-run, heritage *in situ* site. We know now that AR technology is becoming more

popular and that corporations are turning to it for their marketing strategies. In turn, museums such as the Smithsonian Institute, the British Museum, and the Museum of London offer a variety of AR-based applications in order to improve on visitor engagement and experience. However, a scavenger hunt-like game like "Capture the Pheon" offered by the Smithsonian Institute is not appropriate for a sacred space such as Ruthwell, and locational AR applications (which feature geotagged images and are designed to function based on a user's physical location in the world) rely on GPS positioning and cannot work indoors (see Mannion n.d.). AR applications reliant on tags or codes, such as the 3D exhibit at the ROM ("Ultimate Dinos"), while not ideal, are possible at a site like Ruthwell, aside from the obvious disadvantages discussed in the previous chapter. An AR application dependant entirely on pattern recognition, like the newest application offered by the British Museum called "A Gift for Athena" (Goula, 2013), is ideal, but the technology behind pattern recognition is not robust or reliable enough to function properly in an outdoor environment or an environment with changing light and angles. However successful they are in a controlled indoor environment where lighting is static and angles can be controlled, like at the British Museum, they ultimately fail once tested in an environment where the light is constantly changing, like outdoors, or in the apse of the Ruthwell church with its skylights.[41]

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[41] During the 3D scanning of the Ruthwell Cross in April of 2012, the Visionary Cross Project team experienced the difficult lighting directly. While scanning, Callieri and Dellepiane (Visual Computing Lab, see http://vcg.isti.cnr.it) had to cover the skylights with cloth in order to get a proper image.

Figure 46: Members of VCL covering the skylight in order to scan the cross. Notice the sunlight cast on the actual cross-head. Photograph by the author.

In order to test the feasibility of AR applications, I experimented with Aurasma (a free, multi-platform AR application) in a two-part experimentation to test how pattern recognition handles in different environments. In addition to these experiments, I instituted a visitor survey on-site at Ruthwell with the help of the church session's clerk, Susan Broatch, over the summer and the fall of 2013 and winter of 2014. The results from the surveys helped us to better understand who visits the Ruthwell site, what they expect from their visit, and their interaction with the site itself.

Experimentation with AR Applications for a Feasibility Study

At this time, there are a number of options when it comes to AR developers, such as Layar (https://www.layar.com/), Aurasma (http://www.aurasma.com/), and Wikitude (http://www.wikitude.com/). I ultimately decided to experiment with Aurasma primarily due to its ease of use and focus on a general audience.[42] Aurasma uses the natural texture

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[42] Layar is more focussed towards a commercial use and Wikitude required much more time to build and use than Aurasma.

and form of a physical object as a trigger that, when scanned, pulls up previously embedded information or actions. The technology functions by using pattern recognition, meaning that any unique pattern can be used as a target image, including maps, photographs, and specific buildings, etc. (see Mannion n.d.). Designers can use Aurasma Studio to develop complex sets of such embedded information (known as "Auras"), which are then assigned to "channels" that registered users can subscribe to. Once users subscribe to a channel, they can search for specific Auras or are proactively notified when a pre-set Aura is nearby. An added feature of the software allows users themselves to add simple Auras to their environment—making it theoretically possible, for example, for visitors to a site to "attach" notes or other material to surfaces that interest them.

To test the ease and function of the Aurasma application, I experimented with it in two steps: 1. Using a series of still photographs, I experimented with how Aurasma's Auras handled still overlays, videos, and URLs in a static, unchanging environment; 2. I experimented with Aurasma on my mobile phone in the dynamic, changing environment of Canmore, Alberta's historic cemetery. The reason behind the two separate experiments was to test the reliability of the application in different environments to see how it handled. Essentially, if Aurasma functioned as expected indoors as well as outdoors, it should work in the Ruthwell kirk and on the individual panels of the Ruthwell Cross, making it the perfect medium for a new interpretive programme at Ruthwell. The two primary experiments are detailed below.

Experiment 1

The first experiment was a series of AR examples I had prepared for a class on the digital humanities I was a teaching assistant for in the fall semester of 2012. I used the

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images to create the Auras using Aurasma Studio and entered the target images into a

PowerPoint presentation to project the images on the wall so students – if they had the

application downloaded to their phones or tablets – could grab the image from anywhere

in the room. The most successful Aura was built using static image as a target image

(Figure 47) with an overlay image of similar size and shape. Moreover, when the image is

tapped, the user will be taken to a Wikipedia page on human evolution.[43] The Aura

worked as expected, easily and successfully (Figure 48). The figures below were taken by

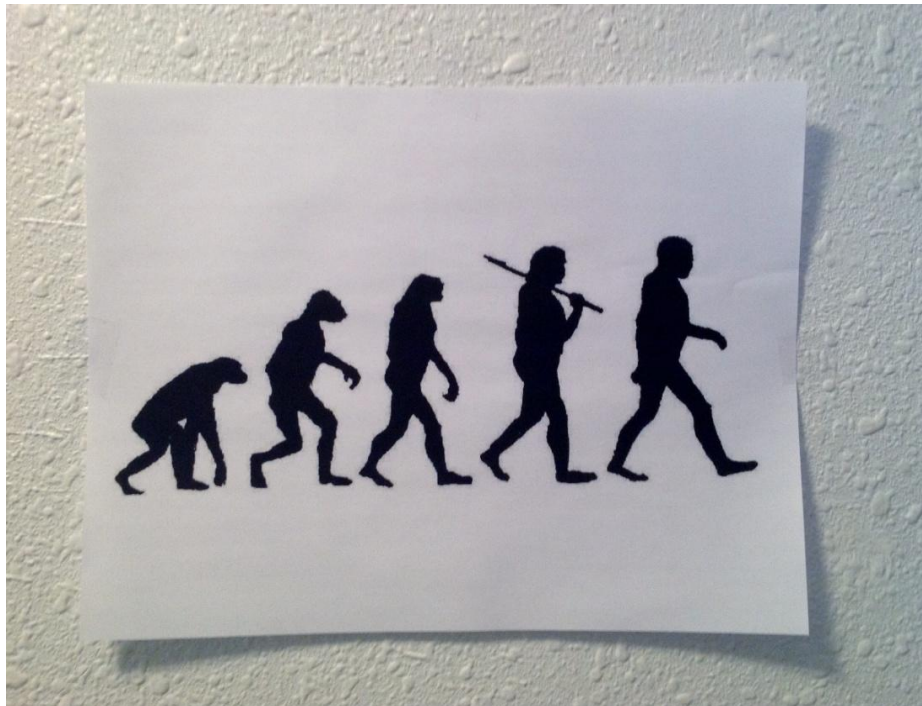me in November 2014 to see if the Aura still functioned.

Figure 47: The trigger image printed on a piece of paper and taped to a wall. Alternatively, the application also worked when used on a PowerPoint slide projected on a screen. Aurasma enabled. Photograph by the author.

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[43] When users are directed to an external URL by tapping an Aura the link opens inside the Aurasma application.

Figure 48: Screen capture taken of the Aurasma application overlay image on an iPad. Photograph by the author.

This particular Aura is stable. As long as users are still subscribed to my channel and as long as I have not deleted or altered the Aura in Aurasma Studio, the Aura is consistently called up when the target image is pointed at within the Aurasma application.

Experiment 2

The next step in experimentation was to change the environment by moving outdoors. Although the Ruthwell Cross is indoors, the apse in which it sits has a series of skylights that let in changing light depending on the time of day, time of year, and weather. The outdoor experiment in a cemetery with late nineteenth century and early twentieth century gravestones was meant to emulate the conditions in the Ruthwell kirk with its subjection to changing light patterns on the sandstone panels of the cross.

Because Canmore is about a three hour drive from Lethbridge, I decided to build Auras using both methods: on the Aurasma application downloaded on my cell phone and overlaying photographs taken at the museum that day using gravestones in the cemetery

as target images; and creating Auras on my laptop using Aurasma Studio and a series of better quality photographs taken with my Nikon D5000 using photos of gravestones as target images.

While on-site, I used a picture of a nineteenth century coal mining outfit acquired at the local Canmore museum to overlay one of the graves in the cemetery. Although I was able to initially recall the overlay image by pointing my device at the relevant marker, it became increasingly more difficult to find the right angle to bring the image back into view on subsequent passes. This could be due to changing angles, changing light as it got later in the day, or issues with my smartphone's connection to a data signal.

Figure 49: Gravestone in the Canmore Historic Cemetery. Used as a target image. Photograph by the author.

At a later date, I built three Auras using Aurasma Studio and photographs I took while at the cemetery, but on return to Canmore I was not able to retrieve any of them,

even knowing the approximate spot of the original target image. It seemed then that the exact angle of the target image would be needed, as well as lighting that was close to the original lighting at the time the target image was taken—which would mean that the Aura could only be activated at a specific time of day, or that a series of Auras built on target images taken at every time of day (and season) would be required to build anything reliable, which is just not realistic as a solution.

Figure 50: Image taken at the Canmore Museum. Used as an overlay image for the grave marker in Figure 48. Photograph by the author.

Discussion

Because of my difficulties, I contacted a representative at Aurasma and received a response within a couple of days. [44] The representative confirmed what I had already experienced with both experiments: that the most reliable results are (and were) achieved with flat surfaces and neutral light or extremely large and easily distinguishable surfaces

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[44] As an alternative, I had also contacted a representative at Layar who gave me a similar response to that from Aurasma—flat surfaces with neutral lighting make the most reliable target images.

without reflection.[45] These conditions are difficult enough to achieve in relatively sunny

and dry Southern Alberta—but next to impossible to find at a cultural heritage site in

south east Scotland. As my experiments with the Canmore gravestones demonstrated

moreover, the requirement that physical objects be large and highly distinctive in shape

suggests that the individual cross panels would be too similar to each other to serve as

reliable triggers for interpretative Auras, despite their greatly differentiated details.

These experiments and conversation with the developers of Aurasma and Layar

show that current AR applications and pattern recognition are not reliable or robust

enough to support a digitised interpretive tour at Ruthwell at the present time. However,

the successful first experiment and the initial success with the first half of the second

experiment shows that this kind of tour will be more realistic as the technology improves

and becomes more popular.

Wikipedia and Sustainability

I had mentioned quite briefly in the previous chapter about using Wikipedia for

sustainability. Sustainability has been a pertinent question from the beginning, and it

seems that Wikipedia is a reasonable (and possibly popular) solution. Essentially,

information collected for a digital tour can be linked to Wikipedia entries, and as such,

ensures the information is always there, is updatable, and is accurate. Links to Wikipedia

will not corrupt or become stale since they are automatically re-directed if the article

moves or if articles are merged. Because Wikipedia is accessible by anyone, the article

can be continually updated ensuring the information found there is recent. One major

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[45] Such as the Eiffel tower, for example.

concern is the reliability of information found on Wikipedia,[46] which stems from its open

access (and is the primary reason for the hesitance by professionals in using it in the first

place). New pages have to be checked and approved by Wikipedia's administration, and

may be flagged or even taken down if incorrect. Although small changes and updates to a

site can be done immediately, this issue can be solved by asking volunteers to

occasionally check the page to protect from vandalism.[47] If there is a particular user (or IP

address) making inappropriate changes, a request can be placed to block that individual

from making any more changes to the page.

Just as companies and museums turn to AR and pattern recognition, more

professionals are turning their attention toward Wikipedia as a solution for their projects

(Jisc 2013). For example, the Museum of Modern Art in New York (MoMA) has

discussed the possibility of linking their artist biographies to Wikipedia entries (Hobma

2013). The recent digital humanities project, "The Social Edition of the Devonshire

Manuscript," is specifically published in Wikibooks with the aim "to explore new

dissemination venues that bring the best of academic scholarly practice, including peer

review, to the online spaces and tools that currently house and enable the circulation of

public knowledge" (Crompton n.d.).

I had experimented with creating a Wikipedia entry on the *Christ and Magdalene*

panel while building the examples spots along the proposed tour in chapter three to see

what it would take to link to an article in Wikipedia directly. I intended to create it as a

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[46] Wikimedia, the charity that runs Wikipedia, is working with museums, academics, libraries, and other institutions to improve Wikimedia projects (Wikipedia, Wikibooks, etc.) to benefit everyone (Jisc 2013). Wikipedia also offers a selection of academic career positions for the same reason – improving the overall content of Wikimedia projects.
[47] An alternative solution would be to make the article semi-protected, meaning it would require a user to have a Wikipedia account in order to make changes to the page.

child article for the Ruthwell Cross article (meaning it is a smaller, linked article in relation to a longer, more complete article), yet it was rejected based on formatting and context. The recommendations for changes looked fairly straightforward if not a bit time consuming, so I am in the process of making the changes to meet their stylistic requests. There is evidence that a submission like this would be accepted by the Wikipedia administration, but it needs to be organised and coordinated. On a larger scale, this page and project would greatly benefit from the use of crowd sourcing. I recently led a tutorial session for the University of Lethbridge Women's Scholars Wiki-edit-a-thon during International Women's Week.[48] It is possible to organise a similar event with the intention on overhauling the Ruthwell Cross article and including subpages dedicated to the individual cross panels, the interesting locations around the site, and including links to the related sites of interest in the Dumfries and Galloway territory-museum. This would require significant planning and coordination, but would be an interesting way of harnessing the enthusiasm of the local community in conjunction with the academic knowledge of Ruthwell scholars, giving both groups a place to contribute.

The Visitor Survey as Part of the Feasibility Study

The survey was based on a variety of visitor surveys taken at other museums (such as the ROM in Toronto, Ontario and the Smithsonian Institute in Washington, DC).[49] It began with general visitor questions and then asked more specific questions pertaining to the site and the visitors' expectations.[50] The survey was offered in English, French, and German. Visitors had the option of filling out the provided paper copy or

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[48]The workshop information can be found here: http://www.uleth.ca/notice/display.html?b=302&s=20569
[49] Recommendations on what to include in the survey were offered by Daniel O'Donnell and Susan Broatch.
[50] A copy of the survey can be found in Appendix A.

scanning the QR code on the survey to fill out an electronic version. The survey questions included place of residence, age, reason for the visit, satisfaction with the visit, research done prior to the visit, whether travelling with a smartphone or tablet (and what type), additional cultural heritage sites on the visitor's agenda, whether the visitor used any interpretive material provided by the church, and whether the visitor would like to see any improvements to the current programme. 108 hardcopies of the visitor surveys were completed and mailed to me by Susan Broatch over the course of ten months (April to February); no electronic versions were completed.

The tour discussed in chapter three really represents an incremental and conservative change from the current interpretive material due to the data collected from the visitor surveys, which are discussed below.

Visitor Satisfaction

Every single individual indicated that they were satisfied with their visit to Ruthwell. In addition to satisfaction, visitors were asked what they would have liked to have seen or learned that they did not during their visit. Very few had any suggestions or comments in this regard; however, those who did had interesting requests. Several people noted that the guide book (offered for £5 with proceeds going to the church) was missing or was sold out, and as such asked for alternative methods of information (one asked for a postcard with the inscription translations). In one case, the directional indicators for the sides of the cross were problematic (north face, south face, for example) since the sun was not out and they could not tell direction inside the church. A number of visitors had asked for more information on the history of the location (such as the church itself, the medieval history of the site, and the connection of Ruthwell to other stone crosses, such

as Bewcastle). A couple had wondered how the restoration design was chosen and if there were plans for replacing the nineteenth century transom to one more closely related to the lost one. More than one had asked for the original location of the Ruthwell Cross in its outdoor garden location[51] as well as more road signs along the A724/5. And two visitors had asked for translations for the inscriptions (runic and Latin, respectively), indicating how the wood panels are missing any mention of the runes. Although, it is important to note that the provided pamphlet des include translations of the inscriptions, but does little to help when it is sold out or missing. Of the 108 cards filled out, seven checked that they did not use any of the interpretive material provided on-site, although did not specify why.

Demographics: places of residences

Figure 51: Graph showing the places of residences of visitors to Ruthwell.
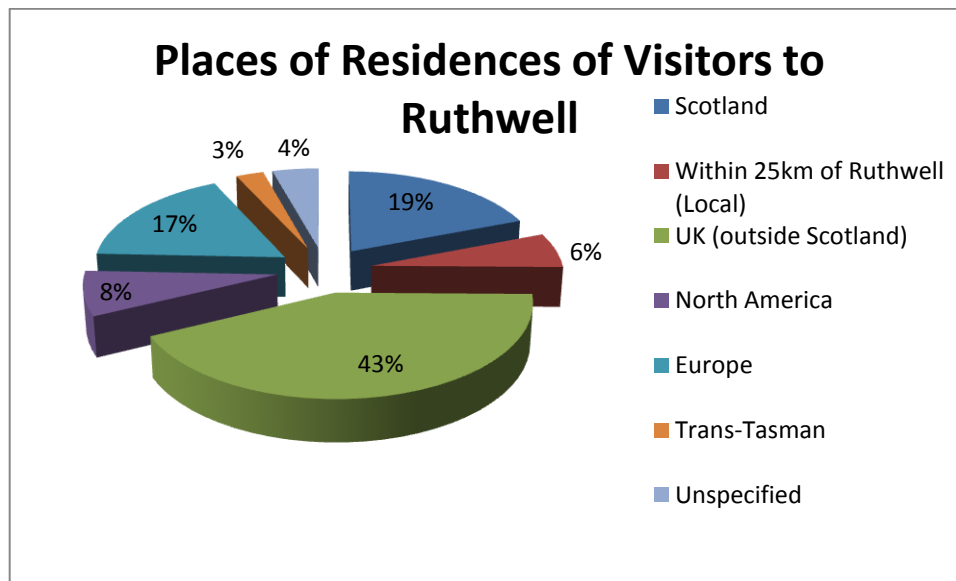

The majority of visitors (43%) were from the UK but lived outside Scotland. The visitors that travelled the furthest were Trans-Tasman (3%) – two from Australia and one

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[51] As mentioned in previous chapters, there is, in fact, a marker for where the Cross used to be when Henry Duncan first re-erected it, and is easily missed.

from New Zealand. Roughly the same number of visitors travelled from other areas of Scotland as there were visitors from Europe (specifically, Ireland, France, Germany, Austria, Belgium, Czech Republic, and Denmark) making up 36% of the total visitors to Ruthwell. Nine of the visitors had travelled from North America (8%), with the majority of them from the United States. Seven visitors had indicated that they lived within twenty five kilometres of Ruthwell (6%), with one indicating that they also lived outside of Scotland.[52] Five visitors had marked that they travelled from outside the UK but did not specify where they were from (4%).

Time spent at Ruthwell

Figure 52: Graph portraying the amount of time visitors spent on-site at Ruthwell.
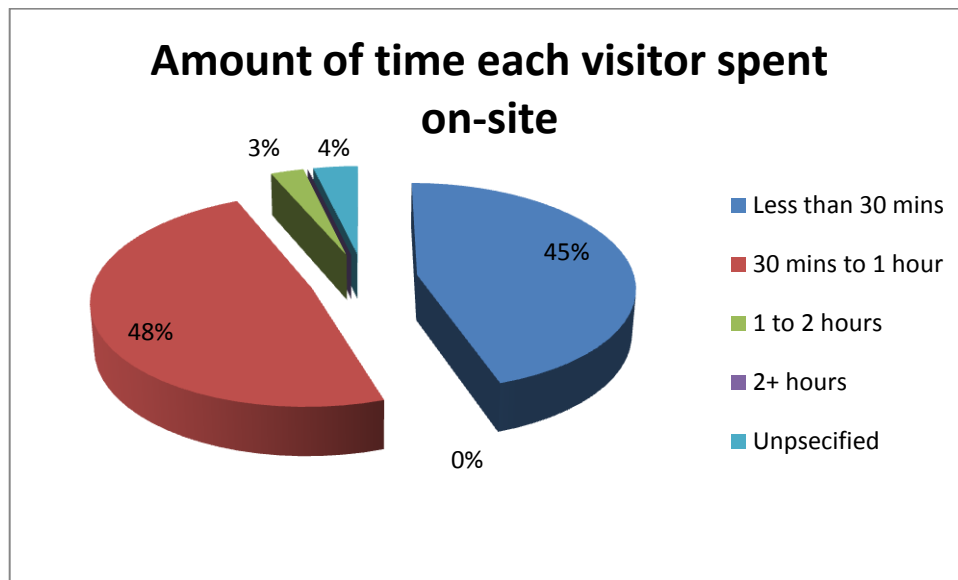
45% of the visitors spent less than thirty minutes at Ruthwell. Slightly more and just under half (48%) stayed for thirty minutes to one hour (one visitor had indicated they stayed for thirty minutes exactly). Three visitors (3%) stayed for one to two hours and

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[52] It is safe to assume that this visitor travelled from England since Ruthwell is very close to the Scottish-English border.

four visitors (4%) did not specify how long they stayed. No visitors stayed longer than two hours.

It seems then that nearly half of the visitors are spending a great deal of time on-site, indicating that they are taking time to explore, learn, or enjoy the environment. The visitors who stayed less than thirty minutes may stay longer with the proper implementation of a digital tour that engages them with the site, encouraging them to explore the entirety of the area.

Demographics: ages of visitors

Figure 53: Age groups of visitors to Ruthwell.
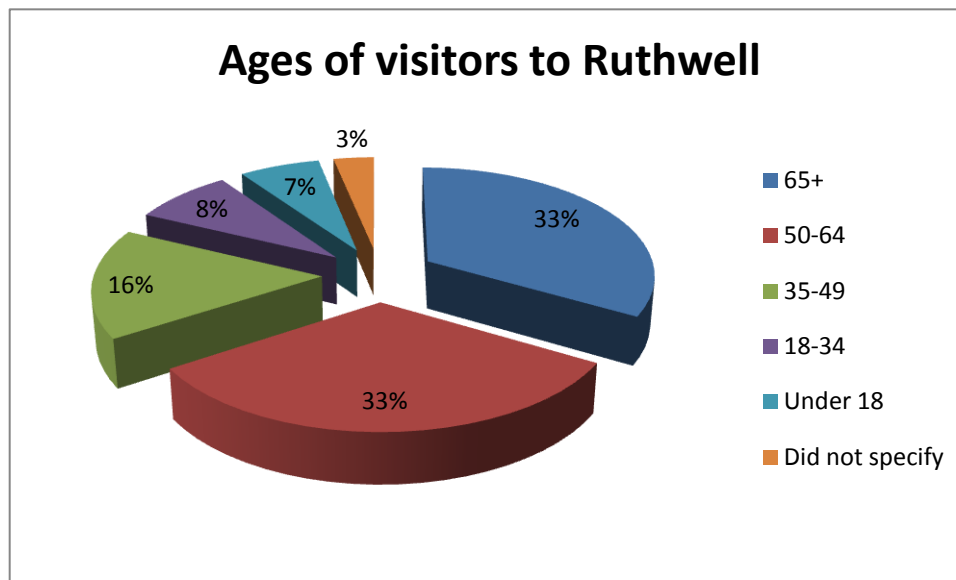
Seven of the visitor cards filled out had multiple age ranges marked, indicating the visitor who filled out the card was travelling with a group. Thus, instead of having data for the ages of 108 individual visitors, we have data for the ages of 129 visitors. Three of the cards had the "Under 18" box marked (with one stating "three people altogether"), which may suggest family visits. The other surveys had multiple boxes checked indicating an older group of visitors (34-49; 50-64; 65+).

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The site was least visited by those under 18 (7%) and in the age range of 18-34 (8%).16% of visitors were 35-49 years of age and four visitors (3%) did not specify their age. The age-groups of 50-64 (33%) and 65+ (33%) were equal in numbers and by far make up the majority of visitors to Ruthwell (66% of the total visitors).
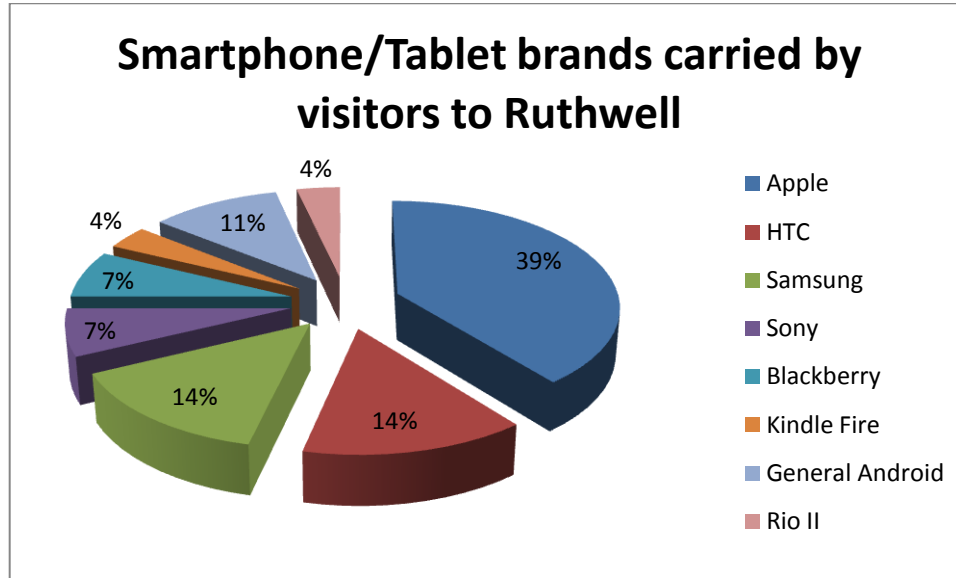
Visitors to Ruthwell travelling with smartphone and/or tablets

Figure 54: Graph portraying the number of visitors with Ruthwell with mobile devices.
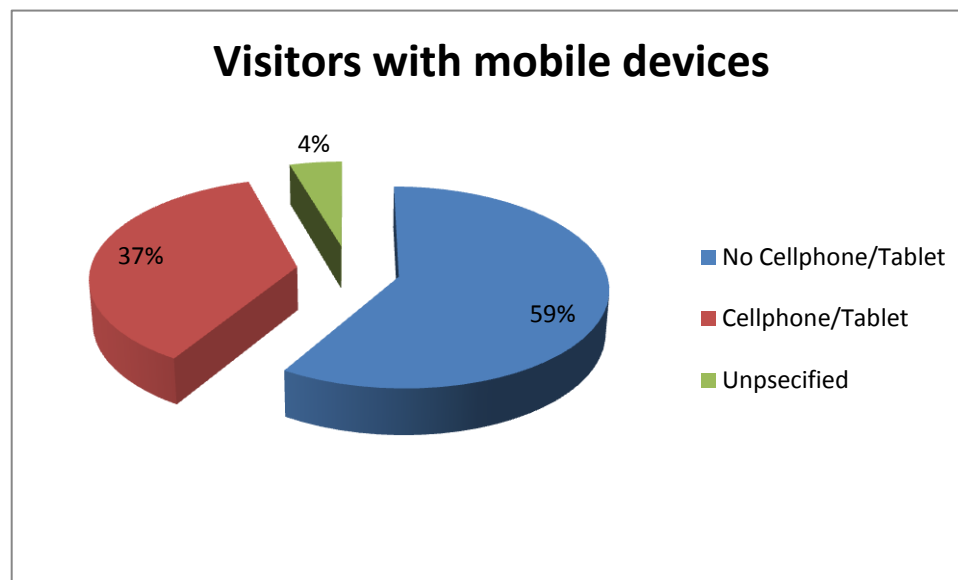
Of the 108 visitors to Ruthwell, the majority of them travelled without a smartphone or tablet (59%). 37% of the visitors did have a smartphone or tablet with them. A very small portion of visitors (4%) did not indicate if they did or did not have a smartphone or tablet with them. This particular statistic is interesting because many museums often assume that the majority of their visitors travel with mobile technology (see Tallon 2008, xiii; also CHIN 2012a; Smithsonian Institution n.d.a.). But it seems, at least in the case of Ruthwell, that this is not entirely true. This is could be a question of demographic, age, location of residence, or even the nature of their visit.

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Figure 55: Graph showing the brands of smartphones and tablets carried by visitors to Ruthwell.

Smartphone/Tablet brands carried by visitors to Ruthwell

- Apple — 39%
- HTC — 14%
- Samsung — 14%
- Sony — 7%
- Blackberry — 7%
- Kindle Fire — 4%
- General Android — 11%
- Rio II — 4%

Visitors were also asked to indicate the specific type or brand of smartphone they had if they answered "yes" to having a smartphone or tablet with them. Of those who answered "yes," only 28 actually specified their chosen device brand. At 39%, the majority of visitors carried iPhones or iPads (Apple), which is important in relation to the discussion of NFC tags in chapter three since Apple has decided not to include the technology in their devices. However, all of these brands are capable of downloading a specially designed application or a QR code reader.
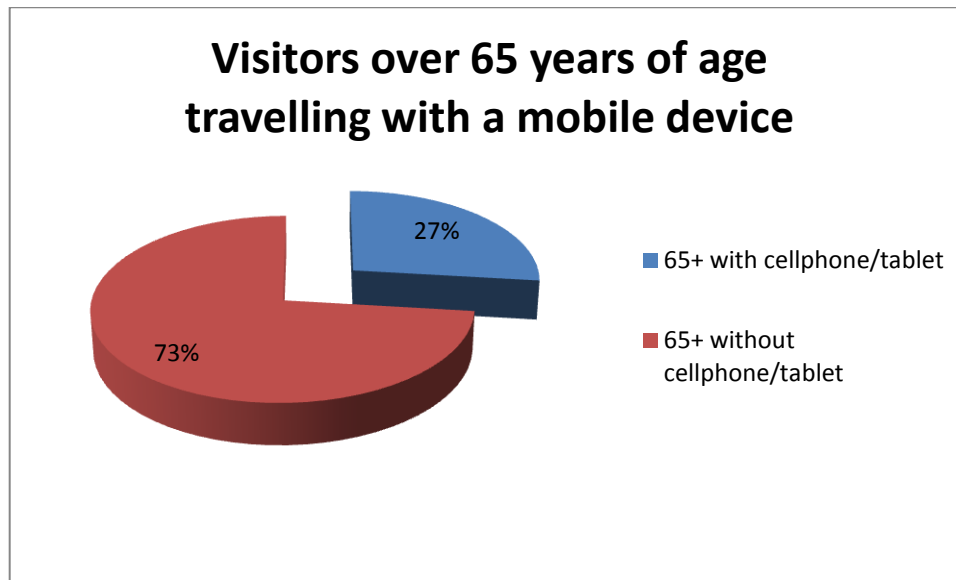
Age could be a definite factor in why many visitors come to Ruthwell with no mobile device. Since 33% of visitors are over 65 years of age and 73% of those over 65 travel without a mobile device, it seems likely that this particular age group is what is skewing the results of visitors travelling to Ruthwell with mobile devices. However, it could also be a locational reason (specifically, a visitor's location of residence), as we'll see below.
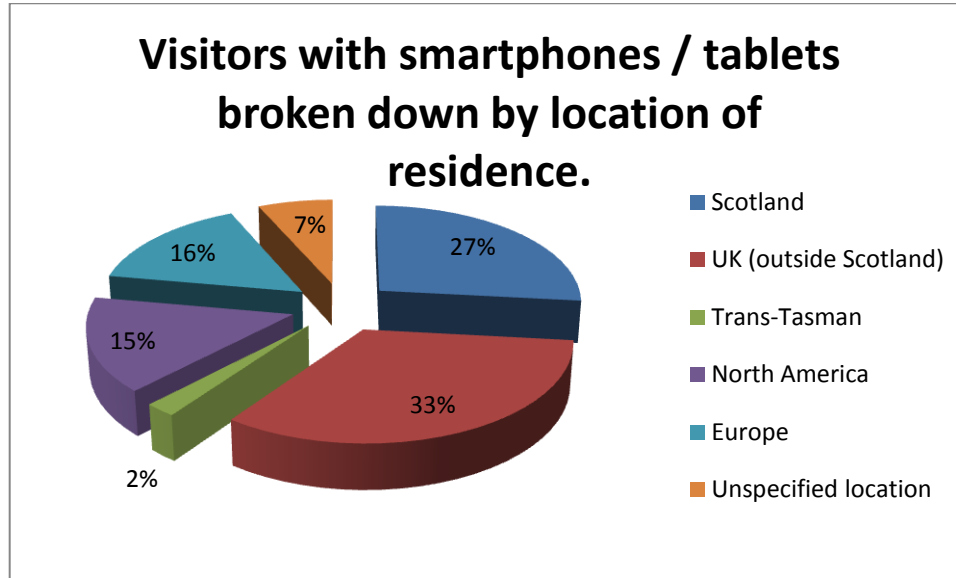
54% of the visitors from Scotland had a smartphone or tablet with them. Of the visitors from outside Scotland but still from the UK, 30% of them brought a smartphone or tablet. Of the visitors from Continental Europe, 35% brought a smartphone or tablet. The majority of travellers from North America (78%) brought a smartphone or tablet. Of the Trans-Tasman (Australia and New Zealand) visitors, one (33.3%) brought a smartphone or tablet, and of the three visitors from unspecified locations, 60% brought a smartphone or tablet. It seems then, that visitors from England (the most common residence for visitors) are the ones not bringing mobile technology with them to the site while visitors from the more immediate area (i.e. Scotland) and further away (North America) are.

This raises the question on the saturation rate of mobile phones in the UK and Europe. The graph below represents the percentage of population per country that have smartphones or tablets. 62.2% of the total UK population have mobile devices. This is a relatively high saturation rate (see Canada's 56.4% for comparison), and so makes it interesting that this is the group of visitors that travel the least with mobile technology.

This could be a question of demographic (age, where they are travelling from, or even the nature of their visit). With the large number of visitors from the UK travelling to Ruthwell, it seems like the main question may be how to convince this particular group, if they have the technology, to bring it to the site.

Figure 58: Penetration rate of smartphones by country (values in percentage of population). Information and statistics from *Our Mobile Planet* by Google.
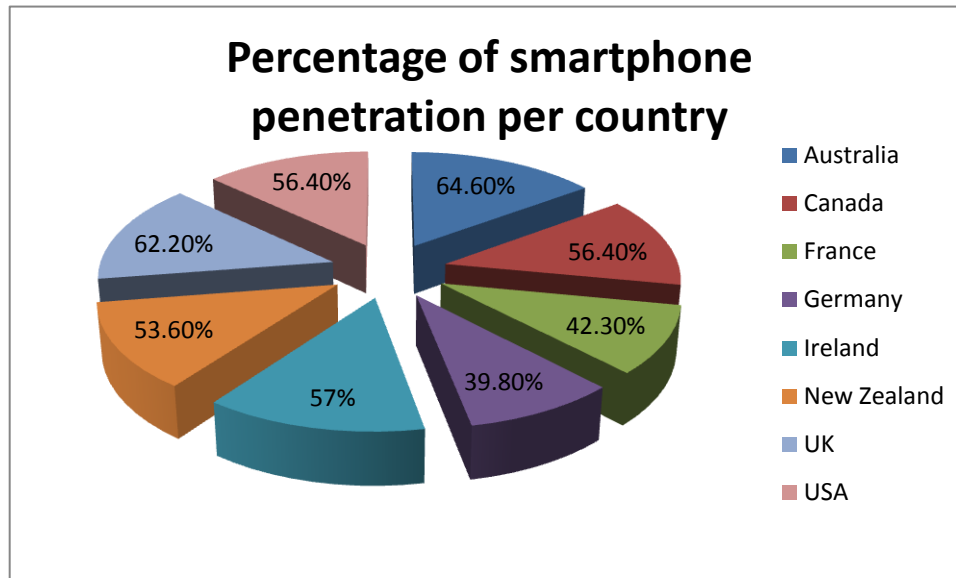
Reasons for visiting
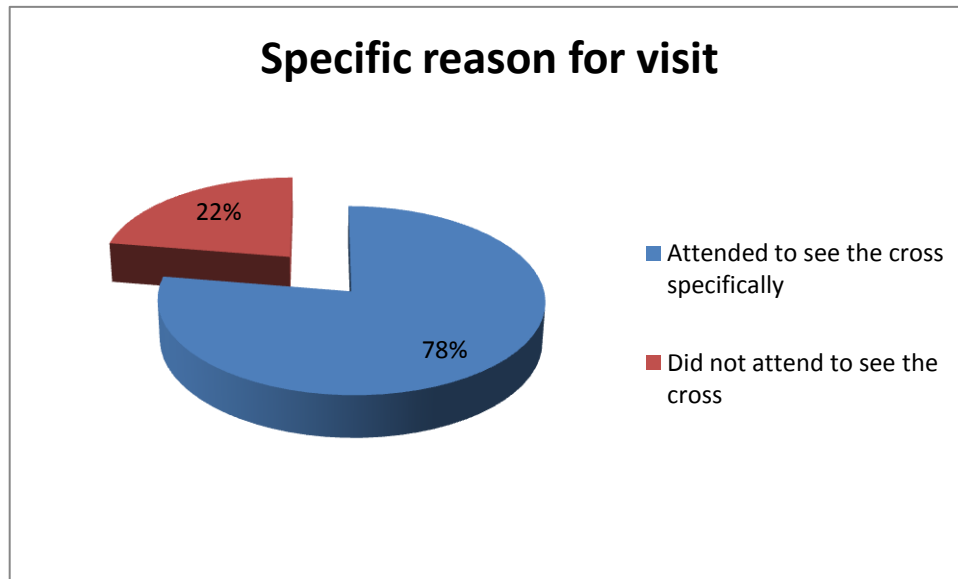
The majority of visitors (78%) went to Ruthwell to specifically see the Ruthwell Cross. The other visitors (22%) indicated they did not specifically travel to Ruthwell for the Cross.

Of those who did not come specifically to see the cross indicated they visited because of they like history and/or culture. A surprising number visited only as part of a

social outing (19%), and the third most popular reason for visiting was for education. A small number (4%) indicated that they visited as part of a personal family genealogical pilgrimage and were presumably together.[53]

Figure 61: Graph portraying reasons for visiting Ruthwell.
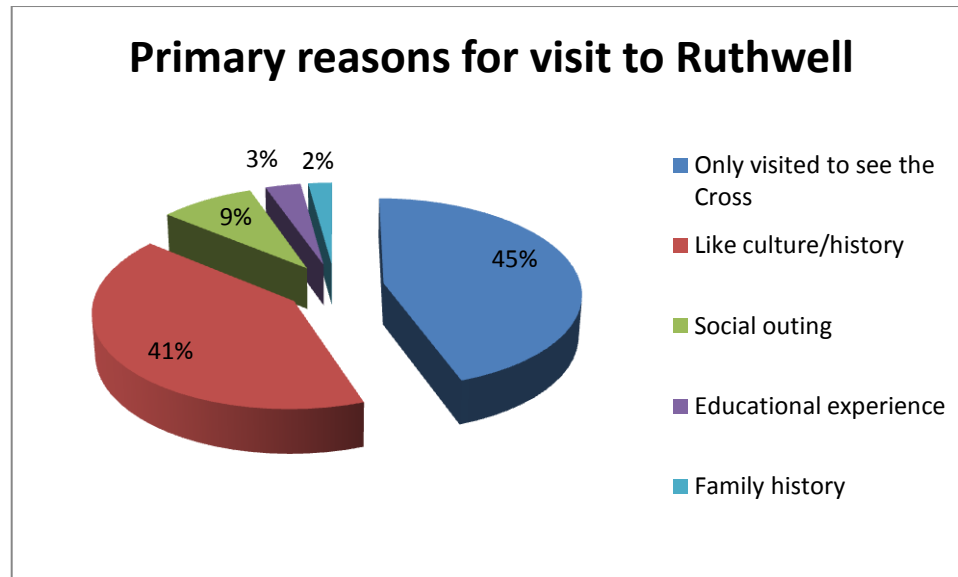
Of the visitors who indicated they visited specifically to see the Ruthwell Cross, nearly half of them (45%) indicated it was the only reason for their visit. However, 55% came due to other interests as well: 41% of them visited because they like history and culture; 12% came due to an educational or social outing; and 2% came due to genealogical and familial connections (to the Dinwiddie name).

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[53] Those who wrote that they visited Ruthwell due to family connections (Dinwiddie) were all from the United States. It may be possible to infer that these visitors were travelling together.

Planned visit

Figure 62: Graph portraying when visitors planned to see other sites while in the region.
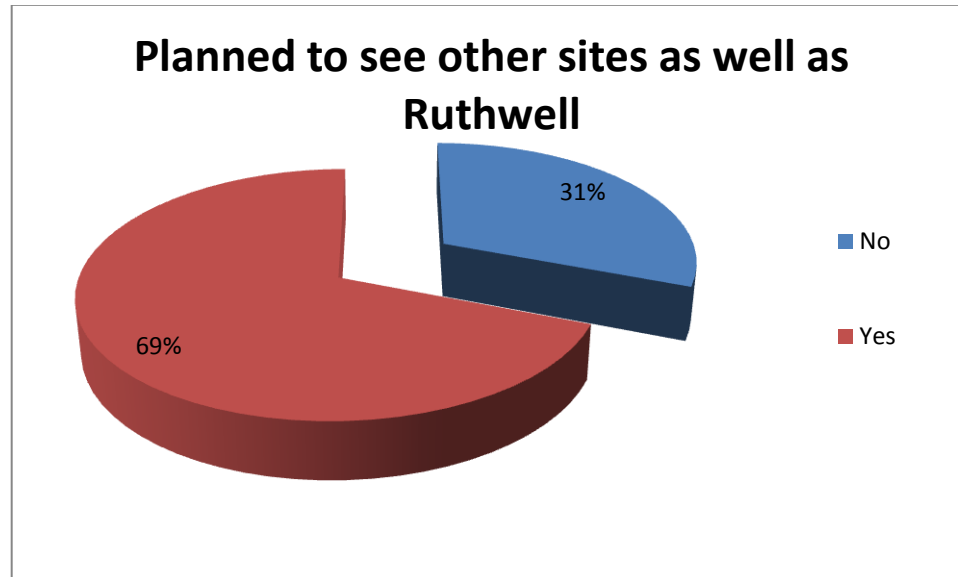
The majority of visitors had planned to see more than the Ruthwell kirk and Cross during their visit. Answers as to what else they planned to see ranged from Sweetheart Abbey, the Annan and/or Dumfries Museums (and Burns related sites in Dumfries), Caerlaverock Castle, Threave castle, Motte-and-Bailey castle, the Savings Bank Museum, Hadrian's Wall, the Bewcastle Cross, Durham Cathedral, Whithorn, among others.[54] The majority of these sites, with exception to the Durham Cathedral, Hadrian's Wall, and the Bewcastle Cross, are all within the region of Dumfries and Galloway; however the three exceptions are all within a two-hour drive of the Ruthwell site.

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[54] Interestingly, around eight individuals indicated their next stop was the Ruthwell Savings Bank Museum. When I had visited the museum with Daniel O'Donnell in April of 2012, the curator there had told me that the majority of visitors visited the two sites in the opposite order – the Savings Bank Museum was supposedly where visitors stopped first and learned of the Ruthwell Cross and subsequently decided to visit it after the museum.

Figure 63: Graph portraying other sites visitors had planned to visit while in the area.

Other sites planned for visit

- Annan Museum
- Dumfries/Burns sites
- Sweetheart Abbey
- Caerlaverock Castle
- Whithorn
- Savings Bank Museum
- Hadrian's Wall
- Bewcastle Cross
- Durham Cathedral
- Kirkcudbright
- Threave castle
- Bruce's cave
- Motte-and-Bailey Castle
- Various other sites and views
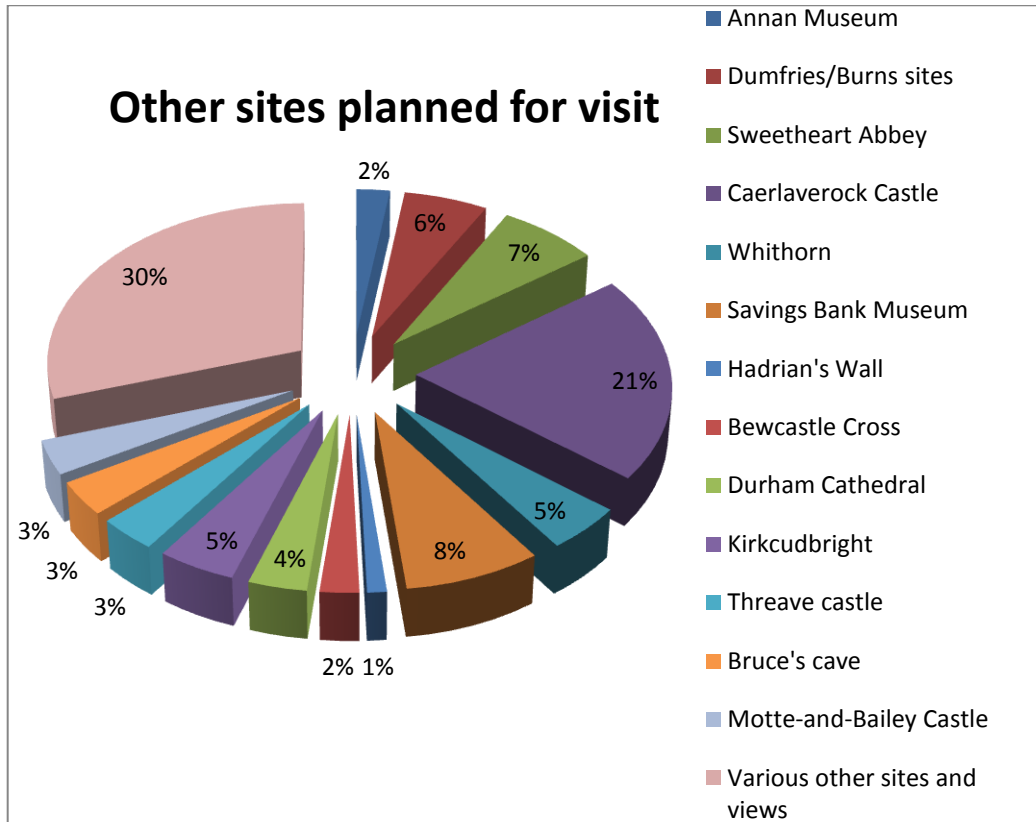
Research prior to visit

Figure 64: Graph portraying visitors who researched Ruthwell before visiting.

Research before visit

- Did research
- Did not specify
- No prior research
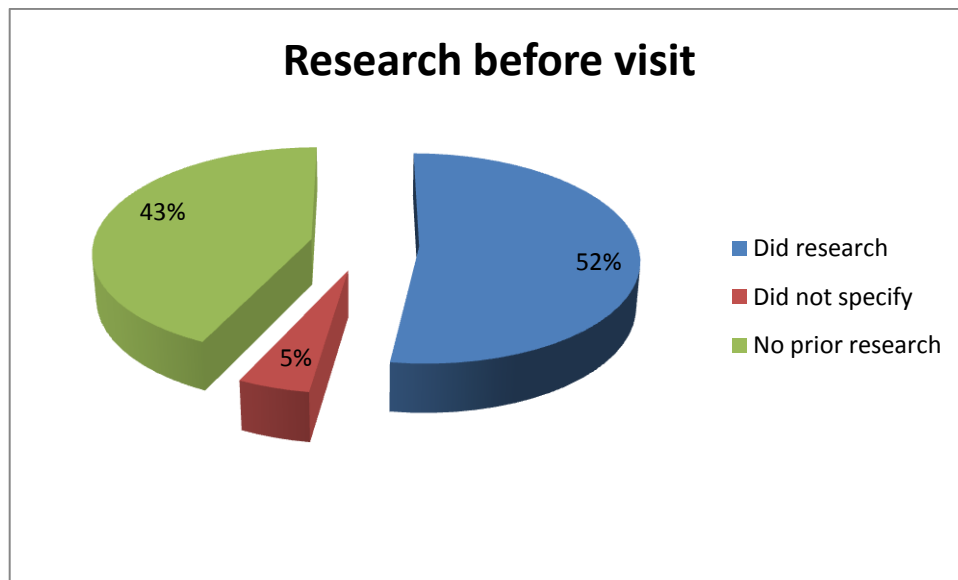
Visitors were asked if they had done research about the site prior to visiting Ruthwell. This question is also closely related to the question about how visitors learned of the site before visiting (detailed in the section below). Slightly more than half indicated that they did some kind of research before visiting (52%) while slightly less than half (43%) indicated they did no prior research (with 5% not answering the question at all).

Figure 65: Graph portraying types of research done before visting Ruthwell.
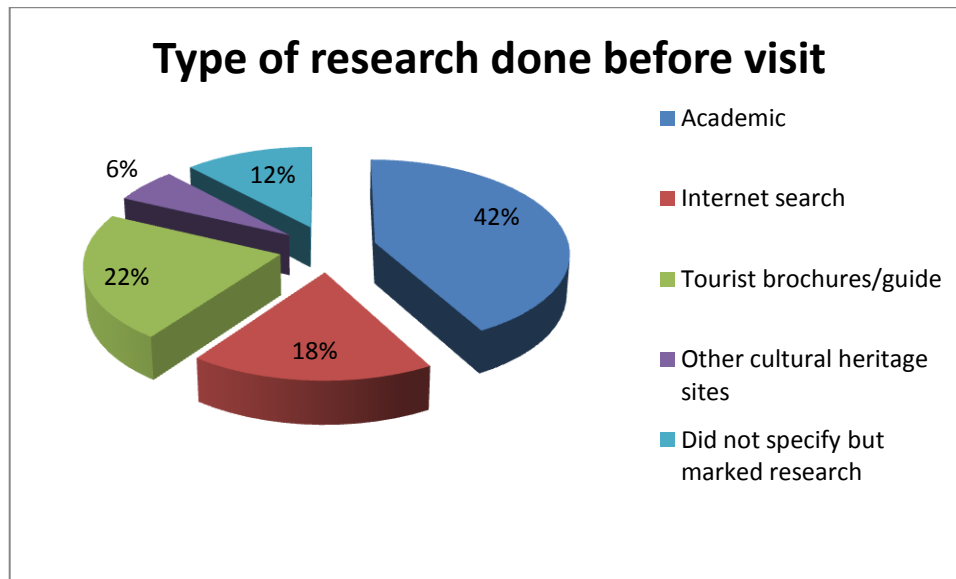
When asked what type of research done specifically before visiting, 42% indicated that they had studied or learned of Ruthwell while at university, while 22% did research using tourist brochures and travel guides. 12% did not specify what type of research they had done but marked that they had done some, while 18% researched the site online. Three visitors (6%) indicated that the research they had done was while at other cultural heritage sites (specifically at Bewcastle and the Durham cathedral). It is interesting to note that the majority of visitors to Ruthwell are those who studied it and are presumably the scholars and academics interesting in Anglo-Saxon history, art, and artefacts. It is possible that these visitors would already be aware of Ruthwell's connection to Bewcastle, Hadrian's Wall, or even Hoddom.

How visitors found the Ruthwell site

Figure 66: Graph portraying various ways visitors learned of the Ruthwell site.
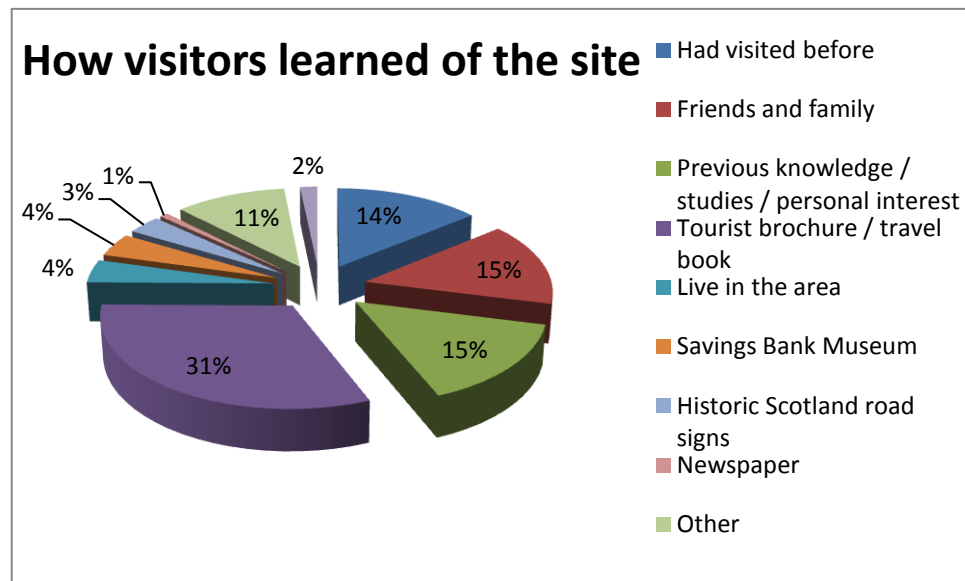
Visitors were asked how they had discovered/learned of the Ruthwell Cross and

site. The graph above shows 121 responses (more than the 108 responses expected on the

visitor cards) because some visitors indicated more than one source for learning about the

cross and site. The section labelled "Other" is broken down in the graph below. The

graph above shows the majority (31%) of visitors learned of the site by consulting tourist

brochures and travel books. Other means of knowledge, prior knowledge (due to

university studies, live in the area, a personal interest, etc.), friends and family, and

previous visits are all roughly equivalent (11%, 15%, 15%, and 14% respectively) and

make up just over half of the visitors (55% all together). 4% of the visitors knew of the

Ruthwell Cross and site because they lived in the area. 4% of the visitors learned of the

site and cross by visiting the Ruthwell Savings Bank Museum in the village of Ruthwell.

One (1%) visitor learned of the site by a newspaper article, and three (3%) learned of the

site by following the Historic Scotland road signs. Two survey cards (2%) had "Other" checked but did not specify the alternative source and two (2%) did not check anything.

Figure 67: Graph portraying the specific alternatives for how visitors learned of the Ruthwell site.

Alternative Ways Visitors Learned of Ruthwell

Legend:
- Durham Church replica
- Lonely Planet travel guide
- Chauffeur / travel guide
- Caravanning travel book
- Kemble's Intro to English Runes
- Baedeker's Scotland travel book
- The Ruthwell Cross ed. Brendan Cassidy
- This England magazine
- Book on Anglo-Saxon Poetry
- Mayhew-Smith Brtain's Holiest Places
- Personal family history
- Undiscovered Scotland website
- Map

Results

Although museums often assume that the majority of their visitors have access to mobile technology (see Tallon 2008, xiii; also CHIN 2012a; Smithsonian Institution n.d.a.), this survey of visitors to the Ruthwell kirk suggests that this was true of only a third of those who came to see the Ruthwell Cross. It is interesting to note that the majority of visitors from the UK who live outside Scotland were the ones who came with no smartphone or tablet. In contrast, visitors from further distances (North America and Europe, specifically) brought mobile devices, yet chose to fill out the paper version of the survey rather than the online version. This could mean one of two things: 1. That when provided with an option that requires extra steps (such as opening a QR reader on a

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mobile phone and then following the URL linked), visitors will always choose the easier option when the digital selection offers no added benefit; 2. There was no available wi-fi on the premises, there was little to no data service while in the church, and/or they did not want to use roaming minutes or data, which tends to be expensive in foreign countries.

Despite nearly half the visitors claiming they did no research prior to visiting the site, the majority of visitors did come with a prior knowledge of the cross. This discrepancy in the data may suggest that visitors filling out the surveys differentiate between "research" and "planning a visit." Regardless of what visitors consider research, a clear majority of those who came planned their visit in advance and did not come as a result of a chance sighting of a road-side sign. Although every visitor to Ruthwell was satisfied with his or her visit, there were a number dissatisfied with the interpretive material provided (with one *specifically* stating it needed to be updated). In some cases, the guide book was missing, no postcards were available for sale, and for some reason the visitor missed the other material provided on-site (such as the wooden panels). Additionally, the majority of the visitors indicated they had planned to visit a number of other sites in the local peninsula, meaning that visitors to the area are indeed exploring the region as whole. A digital interpretation plan would provide a more comprehensive and stable interpretation tour to supplement the current programme as well as provide visitors with the information when the guide book is sold out, and connect the other sites on their planned visit to the one they are currently exploring, provided visitors have some type of mobile device with them.

This suggests that the types of visitors that visit Ruthwell are a group that needs to be convinced (even more so than others) to bring and use technology: they are an older

demographic and, while more than half the visitors from Scotland and outside the UK

came with an electronic device, none took advantage of an opportunity presented to them

as part of a visitor survey to use the device to complete the survey online using a QR

code. The fact that far less than half the visitors came with an electronic device suggests

that this demographic needs to know more about the value of a virtual tour before they

visit the site. A properly designed and discoverable website could encourage visitors to

bring mobile technology with them as a means of enhancing their visit as well as a way to

stay engaged with the site (and perhaps even contribute to the maintenance of any crowd

sourced online resources) even after they left.

Analysis

As pattern recognition and other AR technologies improve and become robust

enough to allow implementation at remote heritage sites such as Hoddom, Ruthwell, and

Bewcastle, this kind of virtual interpretation will allow heritage professionals and

amateur enthusiasts to improve the visitor experience at individual sites and allow for a

better interaction between the contemporary physical environment and the virtual

territory-museum to which these sites also belong and from which they gain meaning.

However, it is clear from the visitor surveys that there is a major issue with the

implementation of a digital tour: nearly two thirds of the visitors to Ruthwell came

without some form of mobile technology. Nevertheless, we also see that visitors do come

to Ruthwell wanting to study the cross, the church, and the area as a whole. This

demonstrates that there is a receptive audience. Interestingly, it appears that it is the

visitors from the England who come without mobile technology; visitors from Europe

and North America tend to bring a smartphone or tablet with them. This could indicate

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that those travelling from relatively nearby know the area as not being necessarily mobile-friendly and so do not feel any need to travel with a smartphone or tablet.[55] Not only that, but the survey cards collected in the fall indicated that bird watching was the main reason for visiting the area. This could mean that the reason for these specific visits, to observe nature in its environment, did not lend the carrying of an electronic, possibly invasive, device. However, perhaps if a digital interpretation plan for Ruthwell were discoverable on the internet (through Visit Scotland, Historic Scotland, or the church websites), visitors would come prepared with a mobile device. It could also simply be a demographic explanation: the majority of visitors to Ruthwell fall between the ages of 50-64 (35%),[56] as opposed to the British Museum's, which fall between 16-34 (43%; British Museum n.d.) and simply may not be heavy technology users. Visitors from North America and Europe do travel with mobile devices and yet do not seem to be using them on-site. As I mentioned earlier, this could be due to high roaming charges and no access to wi-fi. If internet was supplied in the church it seems reasonable to assume visitors would take advantage of the access and participate in a digital programme. Of course, also mentioned earlier, the digital programme would have to be *value-added* to the current programme and expand on the visitor experience, not just replace the current programme with a digital one, in order to encourage visitors to take the extra time and effort to use their devices.

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[55] On a global scale, the UK is ranked at ninth place with a smartphone penetration at 62.2% of the population.
[56] As a close second, 28% of visitors to Ruthwell are over the age of 65.

Conclusion

Implications

The jump from analogue interpretive models (plaques and signs), to audio guides and guide books, and finally to QR codes was not a large one. The jump then from QR to AR and pattern recognition technology may seem like the same thing, but the implications for how AR technology affects the museum experience are actually quite significant. The use of this technology changes the way we view the museum and it changes the way we interact with cultural artefacts; mainly "we give context to the information we interact with" (Farman 2013, 42). "In other words" as Farman states, "accessing information on Wikipedia while at your desk is quite a different experience from accessing the exact same information from a site-specific interaction with a mobile device" (2013, 42). Individuals travel to heritage interpretation sites to see objects, buildings, and artefacts *in situ*, to experience them tangibly and within the context in which they were meant to be experienced. However, without proper interpretive materials available to them on-site, their experiences can change drastically, as seen with the erroneous material found at Hoddom.

Digital material has the added bonus of being updatable from anywhere, making it easier to keep the information concurrent with contemporary scholarship while allowing for input from the local communities, becoming discoverable to a wider visitor base, and creating a more fully immersive environment, open for exploration and complete engagement, on- and off-site. In addition to these aspects of digital technology, it can also "bridge the gap" between the professionals and amateurs, potentially curing the continual conflict we have seen; they both benefit from the expertise of the other. As demonstrated

in this thesis, rural cultural heritage sites have been best served by amateurs, as with the cases of Ruthwell and Bewcastle that, while lacking an overall cohesive interpretive plan, are cared for by enthusiastic and proud communities who want to share their histories with visitors (and visitors who want to enjoy these locations). On the other hand, the professionally implemented materials, such as those provided at Hoddom, can be factually and museologically problematic, lacking connections to the local area. My main goal here was to demonstrate how we could take what is implicit in the amateur interpretive materials, harness the enthusiasm and excitement portrayed by the local communities, and improve upon them by simply adding a consistent narrative and a cohesive interpretive plan through the implementation of a digital mobile tour. Because the local communities do better work (even if the professional materials "look better"), it is a good idea to start small and build upwards, not only in terms of resources, but also in terms of rhetoric.

In fact, the case at Hoddom is a good example of why working from "the top down" would not be a good idea: the professionals were alone responsible for providing the interpretive aid, but as we saw in chapter two, this material is museologically and intellectually problematic—not only does it turn the visitor *away* from what is historically interesting at Hoddom, it also gives incorrect information of the Hoddom church, and connects the site to a possibly mythological figure and a city two hours away from the local region. The professionals are trying to relate to the site on a global level, assuming the interesting bits (and presumably the bits the visitors will find most interesting) are the connection to the closest major city, when really the most interesting bits are its connections to the local region and the area that makes up the territory-museum. Utilising

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the mobility and personal nature of AR applications to combine the pieces of a territory-museum together changes the way visitors navigate, experience, and *embody* the space. This embodiment is quite different than the way visitors currently navigate and experience the region, since many of the connections to the immediate region are underrepresented and easily missed.

Further Research

Technology

While we have not yet been able to build an application that allows us to fully implement a digital tour at Ruthwell, the day when it is possible to introduce such applications at all three of the sites discussed in this paper is not too far off. As examples of successful applications under more controlled and urban environments have been demonstrated (e.g. "A Gift for Athena," "Ultimate Dinos," "StreetMuseum", "Capture the Pheon"), these approaches bring with them a need for new approaches to the rhetoric of cultural heritage interpretation. While the implementation of such, often game-inspired, rhetoric in active religious sites, such as the churches at Bewcastle and Ruthwell, would require some modification (the very common "scavenger hunt" model currently used to structure such applications in more secular contexts, for example, may prove disruptive in an active church), it seems clear that the educational potential of an interpretive site can be enhanced by the interactivity and interconnectivity such applications provide.

A successful introduction of AR technology would be an effective way of both enhancing the visitor experience at these sites and connecting them to the larger virtual historical network to which they belong. Hoddom, Ruthwell, and Bewcastle are already part of an immersive virtual world: the minute a visitor chooses to explore a site, with or

without access to supplementary material or a mobile device, they are willingly stepping into an alternate (historical) world that is (mentally at least) superimposed on the contemporary landscape. Developing an approach that allows us to capture this reality in practice as well as theory would considerably improve the visitor experience at all three sites.

This of course raises the question of the future of the technology. The technology will continue to improve as time moves forward. AR technology specifically is certainly improving and has improved drastically in the two a half years I have been working on this project. There are many who believe AR is "the next big thing" as we see major corporations (Google and Google Glass, for example) invest in the future of AR:

> Mobile analyst Tomi Ahonen expects AR to be adopted by a billion users by 2020. Intel is betting that AR will be big. The chip maker is investing $100 million over the next 2 to 3 years to fund companies developing "perceptual computing" software and apps, focusing on next-generation, natural user interfaces such as touch, gesture, voice, emotion sensing, biometrics, and image recognition. (Farber 2013)

As these uses challenge the reliability of pattern recognition and AR, the technology will have to improve to continue to be useful, or it will face becoming obsolete.

An Alternative to Pattern Recognition

One other alternative to pattern recognition and AR technology I do not fully explore in this thesis is the option of a native application that can be downloaded before visiting the site and that contains all the interpretive information hard-coded in the application itself, making it accessible off-line (so an available internet connection and cell service is less of a concern). It would not be as "flashy" as an AR application, but it have the added benefit of being simple to download, access, and use, is available on- and off-site, and potentially would not require the installation of a wi-fi router in the church.

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It would essentially act as a digital format for the guide pamphlet already available on-site, but would be updatable and current, would potentially be free or available for a low, on-time fee, and (once downloaded) the user's device would automatically update (or indicate there was an update if the user's phone requires a manual update) when the phone or tablet was connected to the internet.

The reason it is not presented as a fully viable option for the site of Ruthwell is primarily due to the financial requirement of such an application. In order for an application like this to be worthwhile, it would need to be properly designed and programmed by someone with the skills and resources, which means it may be necessary to hire a team capable of creating an application that would not only do the site justice by taking into account its unique needs, but would also give scholars and the local community the option of contributing to the information, all in an attractive package. Unfortunately, Ruthwell is not the British Museum and as such relies mostly on volunteers for care and maintenance of the site. Currently, pattern recognition applications like Aurasma are free to create with and free to download, making it a viable option financially for sites like Ruthwell, but with the added benefit of being on the cutting edge of current technology.

User Interaction

In the particular case of Ruthwell, we saw from the visitor surveys that the age of visitors is older on average (in the age ranges of 50-64, 65+) than other, more urban, museums. These visitors also do not carry mobile devices as much as those to other institutions (see the British Museum n.d; user survey analysis in chapter four). This could

be because of the nature of the visit, the older demographic, or simply because visitors to

Ruthwell are not anticipating a digital aspect to their visit.

The results from the visitor survey may argue against the implementation of a

digital tour at sites like Ruthwell. However, as discussed in chapter four, we could

convince people to bring a mobile device with them by making the Ruthwell kirk and

cross site more discoverable online and more noticeable on-site. Because of the older

visitor base however, the added effort to such an interpretive plan would also need to be

value-added and the visitors may need to be persuaded to participate. Furthermore, those

with smartphones or tablets did not fill out the digital version of the survey, so it may

even be that users who *do* bring smartphones need a good reason to take them out. If this

is the case, it may also "help to assuage the concerns of visitors (and local inhabitants) of

the perceived incursion of new technologies" to Ruthwell, as James Graham highlighted

in an email to me on April 24, 2014, to emphasise how the Ruthwell Cross was the "new

communication technology" of its time (Dinwiddie 2008, 9).[57] The reformation was also

both stimulated by technological innovation, such as the Gutenberg Press (which helped

spread the ideas of Protestant Reformers to a larger audience; see Childress 2007, 155),

but also sought to restrict the way in which technology could be used, an idea that is

exemplified in the tearing down of monuments that had been used as teaching aids, such

as the Ruthwell Cross.

The main question then, assuming the technology holds up and visitors bring

mobile devices to the site, is how to train them to use it, especially at sites that are

unstaffed. If the visitors are a bit older, navigating a digital tour will not be intuitive for

them. I mentioned earlier the "scavenger hunt-like" aspects of certain museum AR

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[57] This is also mentioned on the Historic Scotland interpretive paddles on-site.

applications (such as "A Gift for Athena" or "Capture the Pheon"), which guide visitors around the museum exhibits as part of an ARG and has them collect items (digitally) or solve puzzles on their tablets. ARGs in museums are designed for visitor enjoyment, engagement, and education, and institutions use them to get visitors interested in particular exhibitions or to focus visitor attention on certain aspects of that exhibit. Because AR applications are designed to supplements the "real world" and ARGs are meant to engage visitors in a fictional world, ARGs often implement the use of AR technology. This approach, although often entertaining and trains participants successfully on how to use the app, is not a perfect solution to a sacred space like Ruthwell, or even an outdoor environment with very little in the way of interesting visual markers, such as Hoddom. But they could lead to a solution on how Ruthwell's unique visitor base could interact with the site and learn how to use the technology. This approach would require a modified version of ARG rhetoric, one that is not built around a scavenger hunt or other type of game, but one that still pulls visitors into interacting with the site by exploring it respectfully.

Because Hoddom, Ruthwell, and Bewcastle are already part of an immersive virtual world, and since the regional territory-museum of Dumfries and Galloway really is a virtual world layered in history, visitors are stepping into an alternate historical world that is superimposed on the contemporary landscape. The implementation of mobile technology would just supplement what is there already by laying a cohesive digital map on top of it, giving visitors direction and information along the way. A modified ARG rhetoric could easily be used to guide visitors around these landscapes. This solution would require further research and study however, as it would need to work directly with

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the chosen technology (such as the specific AR application) and be built directly into the tour so that it functions well within the environment.

Sustainability

This leads us into the final pertinent question of stability and sustainability. This is a question of preservation and conservation but within the digital medium. I have already briefly discussed in chapter four how Wikipedia is a potential solution for sustainability, but this is a question that requires more research be fully solved. We see some museums, such as MoMA in New York, linking to Wikipedia for certain information (in this case, author biographies; see Hobma 2013) and an increase in the use of Wikimedia projects for Digital Humanities projects, such as the "The Social Edition of the Devonshire Manuscript." However, museums are still struggling with the question of storage and sustainability in an increasingly digital world (see Young 2012; Beel et al. 2013; Henriksen, Seuskens, and Wijers 2013).

The CURIOS Project (University of Aberdeen 2011) is working on the sustainability of digital archives as a way of supporting interest and local heritage at rural heritage sites while giving the local communities access to contribute to the information. The project is looking at the semantic web and linked data technology "to build a general, flexible and 'future proof' software platform that could help such projects to come into existence and be sustainable over time" (University of Aberdeen 2011). Looking towards this project and the successes and struggles the team members have had with the question of access and sustainability may be one way to find a solution to the question of sustainability at sites like Ruthwell, Bewcastle, and Hoddom.

Sustainability is an interesting, and imposing, problem. However, because of the open access to Wikipedia, this may indeed be the most (at least fiscally) realistic option for sustainability, with the option of moving towards a more controllable system, such as the specially built one approached by CURIOS.

Summary

The primary focus of this thesis is to look at the visitor experience and interpretation plans at rural cultural heritage sites in the UK. In doing so, it discovered three basic but significant points: 1. Cultural heritage sites are driven by technology. 2. Rural cultural heritage sites have been best served by amateurs. 3. Mobile technology can (and should) be looked at as a way of bridging the gaps between the professionals and amateurs.

Knowing that AR and pattern recognition technology will continue to improve, it seems that these technologies are the ideal solutions to help improve folk-run, cultural heritage sites, which function as both individual sites and part of a larger territory-museum in the region. Not only will AR applications and pattern recognition improve on the dissemination of information, visitor experience, and updatability, but by shifting towards a mobile interface it connects one site to another on the same system, essentially building the network for a regional territory-museum. Every region, with its cultural heritage sites and interpretation of history, functions as a territory-museum, with or without official designation. Pattern recognition and AR applications can do the same thing on a site-level basis, especially for a site like Ruthwell, which has superb visitor interpretation material but lacks a coherent narrative. A mobile interface can take all the loose bits and connect them together.

This thesis, at its most basic, takes what is implicit in the amateur efforts at cultural heritage sites and suggests a way to improve on the current material through the use of contemporary technology. It places rural cultural heritage sites within the definition of the museum and looks to the history of the symbiotic relationship with technology the museum has always had as a solution. Looking at the theory and practice behind cultural interpretation, this thesis attempts to overlay the current *in situ* information found at folk-run, rural heritage sites with mobile theory and interpretive materials found at more organised official sites, and it aims to harness the enthusiasm, passion, and pride of the local communities, and combine it with a more coherent interpretation plan.

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Appendix A

Sample of the visitor survey presented at Ruthwell, summer-winter 2013-14

Below is a sample of the English version of the visitor survey I instituted on-site at Ruthwell with the help of the church session's clerk, Susan Broatch, over the summer, fall, and winter, 2013-14. It was one half of an A4 sheet of paper and available in German and French, as well as English.

Visitor Questionnaire

Please take a moment to help us support the local community in improving visitor experience to the Ruthwell Kirk and Cross site, which will be used in conjunction with a Master's Thesis on Cultural Heritage Interpretation. Please fill out this survey card or scan the QR code below to complete the survey on your smart phone or tablet. When you're finished, **please drop the questionnaire in the box at the door of the church.** If you wish to learn more about the ongoing project, please visit http://visionarycross.org or email heather.hobma@gmail.com
Thank you for your participation!

Continued on back

1. Where do you live?
   - ☐ Within 25km of the site
   - ☐ Within Scotland
   - ☐ Within the UK but outside Scotland
   - ☐ Outside the UK
   - ☐ If you answered outside the UK/Scotland, please tell us where:

2. How much time did you spend here?
   - ☐ Less than 30 minutes
   - ☐ 30 minutes to 1 hour
   - ☐ 1 to 2 hours
   - ☐ 2+ hours

3. What was your reason(s) for visiting this site?
   - ☐ Like history/culture
   - ☐ Specifically attended to see the Ruthwell Cross
   - ☐ Specifically attended for a special event/activity
   - ☐ Educational/learning experience
   - ☐ Attended as part of a booked program or group
   - ☐ Social/recreational outing
   - ☐ Other (please specify):

4. Do you feel your visit satisfied your reason(s) for visiting?
   - ☐ Yes
   - ☐ No
   - ☐ Please specify why:

5. What would you have like to have seen or learned from your visit that you did not?

6. How did you hear about this historic site?
   - ☐ Newspaper
   - ☐ Friends or family
   - ☐ Have come before
   - ☐ Live in the area
   - ☐ The Ruthwell Savings Bank Museum
   - ☐ Historic Scotland road signs
   - ☐ Tourist Brochures
   - ☐ Other (please specify):

7. Please indicate your age within the following:
   - ☐ Under 18
   - ☐ 18-34
   - ☐ 35-49
   - ☐ 50-64
   - ☐ 65+

8. What else have you seen or planned to see on this trip?

9. Have you done any reading about the history of the Ruthwell cross or church prior to visiting the site?
   - ☐ Yes
   - ☐ No
   - ☐ If you answered yes, please tell us what type of reading you have done:

10. Do you have a smart-phone or tablet with you?
    - ☐ Yes
    - ☐ No.
    - ☐ If you answered yes, please tell us what kind of smartphone or tablet you use:

11. Have you read any of the information supplied in the church about the cross?
    - ☐ Yes
    - ☐ No
    - ☐ Please tell us what you thought of the materials provided:

Please feel free to provide any additional comments or suggestions you may have here:

Appendix B

A Transcription of the Hoddom Plaque

You are overlooking a site which is traditionally associated with St Kentigern or Mungo, the founder of a monastery in Glasgow, who is said t have built a church and resided here as bishop while exiled to the kingdom of Rheged in the 7th century.

Other than the rectangular mound in the graveyard nothing is visible of the 12th-13th church which became ruinous and was finally abandoned in 1815 when the new church at Hoddom Cross opened.

The monastery complex stood outside the churchyard and was enclosed by a large boundary ditch. The church and house were on the lower ground, with the service buildings like the byres, corn-driers and brewhouses on the higher terrace around it.

The power to nominate the priest for the church was in the gift of the Bishops of Glasgow until the Reformation, perhaps reflecting the St Mungo connection. The patronage of successive Popes is also recorded, starting with Alexander III in 1170, as well as the Lords of Annandale, notably Robert Bruce in the late 1180s.

Written in stone: Ploughing and archaeological excavation has revealed a number of finds in the field around the churchyard. Numerous carved Anglian (Northumbrian) crosses and gravestones have been excavated as well as a piece of an 11th century bishop's crozier and many of the finds can be seen in Dumfries Museum.

The graveyard contains many fine carved headstones showing some good examples of 18th century folk at. Some of the headstones have heraldic emblems often combined with symbols of mortality and immortality such skulls, bones, hourglasses, coffins and winged souls.

If you are interested in the history of St Kentigern/Mungo you might like to visit Culross Abbey and Glasgow Cathedral. Further details available from www.historicglasgow.com.