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Mapping truth?
Spatial technologies
and the medieval city:
a critical cartography

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This paper offers a critical review of the potential contribution that cultural-historical geographers' recent debates on mapping and cartography make to those users of GIS and other 'spatial technologies' in the production of digital maps in archaeology and history. Using 'critical cartography' as a contextual framework, the paper demonstrates how GIS applications open up both insights into modern map-making processes as well as their medieval counterparts, and concludes that there are common aspirations — truth claims — in both.
Keywords: cartography, subjectivity, spatial humanities, post-processualism, GIS

Questo articolo offre una revisione critica del recente dibattito tra geografi culturali-storici riguardo il potenziale contributo del GIS e delle altre tecnologie spaziali riguardo la cartografia e la produzione di mappe digitali per l'archeologia e la storia. Usando una "cartografia critica" come cornice, si dimostra come le applicazioni GIS aprono nuovi orizzonti riguardo al processo di produzione delle mappe moderno e medievale, e conclude che esistono obiettivi comuni.
Parole chiave: *cartografia, soggettività, spatial humanities, post-processualismo, GIS*

As *modi operandi* spatial technologies are increasingly being used by those Anglophone archaeologists working on past landscapes and environments, both for academic study as well as management. Using Geographical Information Systems (GIS) for storing, retrieving and quantifying archaeological data, as well as terrestrial scanning and global-positioning systems (eg. LiDAR; GNSS) for landscape surveying and remote data capture, are techniques that are now accepted into the mainstream of archaeological practice (see Wheatley, Gillings 2002; Conolly, Lake 2006). Yet underlying these approaches is an implicit — and sometimes explicit — trust in the empirical truth of the spatial data and car-

tographic representations that results from their use, a belief that the techniques themselves can allow us in the present to somehow recapture the past. The aim of this paper is to reflect further on this issue by looking critically at the use of GIS as a tool for mapping. To do so a developing geographical critique of cartography is used as a basis to query the trust placed in spatial technologies in archaeological science. Using case studies that have used spatial technologies to map and analyse medieval cities and their landscapes and geographies, the paper argues that GIS offers interesting opportunities for conceptual and empirical reflection, as well as posing methodological challenges. To this end, the following discussion sets out how using GIS in archaeological research both contributes to and benefits from recent critical debates among humanities scholars on the subject of 'mapping' and 'truth'.

1. GIS and 'mapping truth'

GIS pervades contemporary academe in numerous ways, both as a research and teaching tool. Foremost it is a technical and methodological solution to analysing and exploring spatial information and the great advantage of using GIS for those archaeologists with a quantitative leaning is that it enables them to introduce location as an analytical criterion, making it possible to study spatial variations in different archaeological data sets, particularly where statistical as well as map outputs are required (since GIS can quickly generate maps showing spatial patterns and geographical distributions, as well as help in statistical and spatial modelling, see Gregory, Ell 2007; Lilley 2012). For the most part, then, as an application GIS has seen usage especially among archaeologists working within a scientific tradition for whom research questions and agendas are aided by the technical and analytical power offered by current GIS software and ancillary programmes.

As GIS has become an increasingly important and defining part of what archaeologists do, it has also similarly engaged those in cognate 'spatial' disciplines, particularly within geography, planning and civil engineering, where again there is a strong 'science' tradition. Generally, however, archaeology's cognate disciplines in the humanities, such as history or literature, have only latterly shared in this uptake of GIS (Bodenhamer, Corrigan, Harris 2010). This may be explained perhaps in part by the inferred scientific connotations of 'GIS' itself – it is sometimes branded Geographical Information *Science* – as well as by the expensive computing hardware and software and technical expertise actually required to employ it. Nevertheless, there is a burgeoning area of GIS-

based research fostered by a disciplinary crossover between geography, archaeology and history. Labelled HGIS, or 'Historical GIS', by some, or 'temporal GIS' by others, this concerns particularly the use of GIS to explore historical and geographical relationships, of building into analyses not only a consideration of spatial dimensions but also a temporal ones, thus identifying patterns over time as well as space (Knowles 2002; Gregory, Ell 2007). The analytical capability of GIS, and its ability to handle large sets of quantified data, allows the analysis of pottery or coin distributions, for example (see Conolly, Lake 2006). Once again, though, this application of GIS follows a 'social-science' model, based upon analysing large *quantitative* data-sets, rather than a more humanities-orientated *qualitative* approach.

It is not just archaeologists who are increasingly recognising the historical potential of using GIS, however. A recent set of essays exploring 'how maps, spatial data, and GIS are changing historical scholarship' reveals historians likewise engaging with its use and application to explore particular kinds of historical data and questions (Knowles, Hillier 2008). Once again their emphasis is on the 'scientific' qualities seemingly offered by using GIS and the apparent advantages to be gained by analysing large spatial data-sets and quantifying these. One area where this is not the case, however, concerns the use of GIS to map past landscapes, using a combination of cartographic and archaeological evidence, such as historic maps and aerial photographs. This is an area of archaeological study that uses GIS in map-making in a *qualitative* rather than a *quantitative* sense, reconstructing settlement patterns, field systems, and routeways at local and regional scales for example (eg. Turner, Crow 2010; Williamson *et alii* 2011). In such cases spatial technologies are in essence facilitating and expediting traditional and established techniques of landscape archaeology, undertaken previously using 'analogue' methods. The new technologies themselves are not being exposed or challenged, and yet of course landscape archaeology — at least in the Anglophone world — has been at the vanguard of *post-processualism* and archaeology's 'cultural turn' in the past few decades (Hodder, Hutson 2003; Johnson 2006; Tilley 2008).

There would seem to be a tension, therefore, between (on the one hand) the built-in scientific modes of analysis associated with spatial technologies and (on the other) the post-processual approaches that have done so much to explore archaeology's subjectivities and philosophical underpinnings as a 'science'. One way of addressing this apparent conflict, and in so doing reflect more critically on maps resulting from GIS-based studies of medieval urban landscapes and spaces, is to examine the debates by historical geographers on the truth claims of maps, itself borne

out of a reaction in the later 1970s to geography's neglect of the subject's underlying theoretical and epistemological questions (see Daniels *et alii* 2011). The debate geographers have had on the power of maps, and the emergent critical cartography of the 1980s and 1990s, has much potential to offer a critique of GIS in the context of a post-processual, humanities-based archaeology whose trajectory over the past twenty years reflects common ground with geography's post-modern, 'cultural turn'.

2. 'Mapping' as a discursive field: towards a reflective and critical GIS

Considering one of the core uses of GIS is in creating maps it is especially puzzling that recent critical debates on 'mapping' have so far been overlooked by so many of its users. It is, after all, an obvious place from which to start any attempt to offer a critique of the use of GIS in the context of archaeology's humanities tradition. During the late 1980s and 1990s particularly, historical and cultural geographers (and others) were engaging again with 'the map' and 'mapping' but in ways that had not occurred before. Embedded within geography's 'cultural turn' of the day, cartography gained new meanings and relevance, informing, for example, post-colonial debates on geography's imperial past, and offering ways of seeing mapping not simply as a literal process but as something more imaginative, figurative and metaphorical that connected humanities geographers' study of images and texts with those in other disciplines, notably in art and literary criticism (Cook *et alii* 2000).

This fertile exchange between humanities-orientated geographies and critical theory provided a basis for theorising maps and map-making, most plainly seen in the later work of J.B. Harley, whose revisionist approach to the history of cartography exposed how not only was there a long-standing 'politics in maps' but also an equally lasting relationship between 'maps and politics' (Harley 2001). It is here that there is some potential to begin to theorise GIS 'mappings' and in so doing reflect upon a more humanities-based GIS. Recently, in a thorough review of Harley's 'philosophy of cartography', Matthew Edney (2005) drew a distinction between 'mapping' and 'map-making'. The former he says has a broader meaning, as is made clear for example in essays collated in Denis Cosgrove's (1999) *Mappings* volume. It finds particular currency and favour among literary historians, who tend to take 'mapping' to be figurative and metaphorical, rather than seeing it in the more conventional, narrower cartographic sense. Instead, for the latter, Edney prefers to use the phrase 'map-making', meaning the actual process of producing maps. In Harley's (1988a) work on the 'secrecies of cartography' and 'decon-

structing the map', for example, he dealt with both these aspects, linking 'mapping' with 'map-making'; both also help to resituate (H)GIS within a humanities tradition of archaeological research, and thus more inline with recent critical debates on past landscapes.

One of the recurring themes in Harley's rethinking of mapping and map-making is the role of maps in constructing ideas of truth as well as the way cartographers in their work seek to construct cartographic truthfulness (Harley 1988b). The broader conception of 'mapping' helps in theorising this relationship between maps and truth, for it highlights not just the manifold kinds of 'mappings' that exist but also their myriad and complex meanings for those who engage with them. Mappings are thus imaginative, performed, experienced, lived out, by all of us, and not simply the preserve and domain of cartographers making maps (Cosgrove 1999). This idea of mapping as a *discursive field* — constructed, contingent, negotiated — opens up possibilities of seeing maps differently. For a start it reminds us that maps are not neutral or inert, but socially and culturally-constructed objects, latent with symbolism and meanings and with the power to exert influence over all those who use them and view them. Harley (1988a) explored this particular theme in his essay on 'Maps, knowledge and power' in the influential volume of essays on the *Iconography of Landscape* which itself mapped out a new agenda for humanities geography (Cosgrove, Daniels 1988). Harley's (1988a) essay demonstrated maps' complex relationships with humanity, both in having agency in human affairs, as well as an inherent subjectivity, as particular versions of 'truth'. No longer was it possible, or indeed acceptable, for geographers (and others) to trust the map. Instead, the map simply reflected the processes that created it — and the values and beliefs of mapmakers. This again provided a basis for rethinking the relationships between maps and truth (see Kitchin, Dodge 2007).

It is one thing for observers and users to place trust in a map, but what of the intent of the map's maker(s), the cartographers, whose practices are considered trustworthy and whose perceived duty it is to produce 'truthful' maps? Here Harley pointed out that the cartographer's pretence of objectivity and neutrality was just that; and that this applied not just to historic maps with their idiosyncrasies and apparent 'distortions' of cartographic 'reality', but to modern maps too, even those widely-used and commonly-owned state-produced topographic maps that, on the surface, would appear to give a straightforward representation of how the land really lies. In Harley's view, there were no exceptions: all maps, whatever they purported to be and to show, were simply different versions of geographical 'truth', and had no legitimate claim on being either objective or neutral. The key to understanding this,

Harley claimed, is to look critically at the 'art' (and 'science') of map-making, and the practices of those who decided what to include in and exclude from maps; namely map-makers. This, of course, includes all those of us who use maps in our work, not just 'professional' cartographers.

While historical and cultural geographers in the 1990s were quick to embrace Harley's ideas on interpreting historic maps as social and cultural constructions, particularly in debates on the role of maps in nineteenth and twentieth-century Western imperialism (eg. Barnes, Duncan 1992; Bell, Butlin, Hefferman 1995), the practice of actually *creating* maps seemed itself to be dwindling among geographers. Perhaps not surprisingly, then, less critical attention was being paid to the use of maps (and of map-making) in contemporary archaeological discourse, not least in GIS-based landscape studies where maps are a key feature, both as sources of information and also as outputs (eg. Turner, Crow 2010; Williamson *et alii* 2011). Where there is any criticism levelled against GIS it generally comes from certain 'radical' scholars who seek to expose its relationship with, and origins in, military intelligence and governmental surveillance, for example in the US (Pickles 2004). But of course the same criticisms that Harley had confronted cartographers with — of exposing the hubris of cartographic truthfulness — might also be applied to the users of GIS, and the (archaeological) maps that result from our work, whether of medieval cities or some other cultural phenomenon.

The challenge, then, for those whose maps of past landscapes rely on GIS is to begin to use Harley's 'philosophy of cartography' in ways that can begin to question the mappings and map-making that they are engaged in. Such a critical and reflective GIS would not only then borrow something of the recent critical geographical discourse on 'mapping and truth' (via Harley) but also perhaps demonstrate how GIS might itself inform and influence archaeology's 'post-processualism' when it comes to studying past landscapes. To show how this might be done, the following part of this essay uses recent and ongoing work that has deployed GIS to explore aspects of geographies and landscapes of Britain in the Middle Ages. The aim is to relate these particular exercises in GIS-based mappings and map-making to the broader issues of 'mapping and truth' raised so far.

3. Behind the map: using GIS as an 'interpretive space'

Using GIS to explore medieval cities and their landscapes and geographies is a comparatively unusual application. Geographers and historians working in the field of (H)GIS generally deal with much later historical periods than the Middle Ages, especially the nineteenth and

twentieth centuries, for which abundant and comparable sources are available to create spatial databases for individual cities or countries, or on certain themes or issues. On the other hand, with fewer contemporary maps surviving from which to digitize, and a much more disparate and dissimilar body of written records and material culture from which to construct quantitative data sets, there is no such luxury for those archaeologists studying European medieval landscapes and culture. In other words, the particular empirical direction in which practitioners of HGIS have largely pushed much of their recent work is problematic for those medievalists — be they historians, geographers, or archaeologists — also wishing to employ GIS in their work. This problem is not an insurmountable one, however, as other papers on the subject of spatial technologies and the medieval city show.

Two areas where GIS has been used to advantage in recent years is in attempting to engage with medieval 'mappings' and use GIS as an *interpretive space*; not simply as a means of trying to reconstruct modern maps to show what medieval landscapes looked like at the time but to understand more how urban landscapes and geographies were constructed and experienced in the Middle Ages (see Lilley 2011a). These are areas that clearly relate to, and connect with, Harley's critique of 'mapping truth' outlined earlier. His arguments about looking behind the map — of questioning the way maps present geographical truth — help us to begin to use GIS not simply as a tool to analyse landscapes and maps but to show what this can reveal about otherwise unwritten processes involved in our own map-making as well as exploring cultural experiences of past landscapes.

These two themes arise out from research projects using spatial technologies to map and analyse medieval geographies and urban landscapes, deriving from projects carried out at Queen's University Belfast over a period of some ten years, to date[1]. The purpose here is not to describe these particular projects in detail — they have been discussed elsewhere (eg. Lilley, Lloyd 2009; Lilley 2011b) and each have dedicated web-sites containing further information — rather the intention is to reflect on the experience, both as medievalist and geographer, of using GIS critically, and from this signal the contribution GIS-based research can make to the kinds of issues — for example, of mapping and representation, and landscape and culture — that lately have become an important part of a post-processual archaeology.

[1] The projects are: *Mapping the Medieval Urban Landscape* (2003-2005); *Mapping the Realm* (2005); *Mapping Medieval Chester* (2008-2009); *Linguistic Geographies* (2010-11). For details see, www.qub.ac.uk/urban_mapping; www.medievalchester.ac.uk; www.goughmap.org

Case Study 1: Mapping medieval geographies

Recent studies of medieval maps tend to emphasise their symbolism and meaning. This is in part a reaction to those past historians of medieval cartography and geography who pointed out how geographically 'wrong' maps were in the Middle Ages compared to their modern counterparts. Thus, particular iconic maps such as the Hereford *mappamundi* and the so-called 'Gough map' of Britain, dating from the thirteenth and fourteenth centuries respectively, are no longer viewed as counterpoints to modern-day cartography but instead understood through the eyes of those who had created them and used them at the time (see Kline 2001; Birkholz 2004) (fig. 1). These maps are, therefore, 'imaginative' medieval mappings, full of symbolism and iconography, both religious and secular, and should be seen as such. But this current take on medieval maps and cartography might at the same time be under-valuing the possibility that in the Middle Ages, as now, there were those who sought cartographic 'truth' through using maps to create a 'truthful' view of their world. Here again, GIS has useful a role to play.

As Paul Harvey (1987) has observed, relatively few maps in the Middle Ages were made to depict individual countries. One of the few is a fourteenth-century map showing the whole of Great Britain, plus parts of the coastlines of France, Ireland and Norway. It is named after one of its former antiquarian owners, Richard Gough who bequeathed it to the Bodleian Library in Oxford in 1809. The map itself is unique and anonymous, and dated at the earliest to the 1370s on palaeographic and toponymical grounds (see Solopova 2011). Dan Birkholz (2004), who has recently reviewed the potential cultural and iconographic significance of the map, claims alternatively that it is a later surviving copy of a lost prototype map belonging chronologically to the reign of Edward I and English sovereign claims on Scotland and Wales. Of course, all maps are, to follow Harley, symbolic and political. What makes the Gough map particularly remarkable – apart from its uniqueness and obscurity – is its detailed representation of insular Britain, especially its coastal outlines and urban geography, for the Gough Map first and foremost is a map of the towns and cities of Great Britain depicted in a way that aims to show their relative geographical positions such that even today the map could be used to navigate from London to York for example. The impression of Britain that it gives is thus a geographically-recognizable one, as if whoever created it was aiming to produce a map in the familiar, modern sense; that is as a cartographically 'accurate' and 'truthful' representation.

Thanks to the Bodleian Library in Oxford, the Gough map's current owners, a digital scan (raster) of the entire manuscript was made avail-

Fig. 1. 'The Gough Map' (c.1370) – scanned image, 2009. Original in Bodleian Library, University of Oxford. Image courtesy of the Bodleian Library.

Fig. 2. Digital Gough Map showing feature layers digitized using ArcGIS.

able to use as a basis to create a digitized version of it in a GIS (see Lilley, Lloyd 2009). The resulting database is freely available online[2]. From the manuscript map a series of layers were digitized for its constituent cartographic features: rivers and coastlines; roads and routes; places and settlements; regional names and topographic features; and antiquities (fig. 2). Through this digitizing process the Gough map, as a qualitative historical source, was transformed into quantifiable 'spatial data' (see Lloyd, Lilley 2009). It was this that enabled the map's geographical depiction of Britain to be analysed for its cartographic accuracy; or to be more specific, to explore how well the Gough map's cartography matches up with that of modern-day cartography. This was not an attempt to make some teleological argument that the Gough map represented a critical 'stage' or paradigmatic turning-point on the path to 'modern map-making'. Instead, it is an attempt to use the map's inherent geographies as a basis from which to tell us something of contemporary perceptions of medieval Britain and its constituent cities, towns and villages.

The Gough map shows just over 650 places in all. Using the digitized Gough map as a basis, the relative positions of these places as located on the map manuscript were compared with their locations according to modern grid co-ordinates. The methodological details of this process have been covered elsewhere. It relied upon using quantitative analyses and regression procedures, producing statistical correlations that re-

2 See *Linguistic Geographies: The Gough Map of Great Britain*, e-resource, at www.goughmap.org

vealed how the Gough map's placing of settlements compare with those mapped out today. The results of these analyses have shown that the locations of towns and cities selected by the map's maker(s) were carefully and deliberately plotted out (for details see Lilley, Lloyd 2009). Moreover, a high degree of spatial 'accuracy', in a Cartesian sense, is particularly evident in certain parts of the map, notably southern and eastern England. This geographical variation in the map's cartographic 'distortion' and 'truthfulness' as a representation of Britain can itself be mapped out using particular GIS software, revealing otherwise hidden clues about how it was made and for whom (fig. 3).

What this GIS-based analytical exercise suggests is that whoever created the Gough map conceived of its purpose in a way that is comparable to how many maps are still viewed today – as 'truthful' geographical depictions. This has implications for thinking through further how 'mappings' and 'map-making' related to each other in the Middle Ages, and how then, as now, both co-existed as mutual ways of imagining and picturing the world. It suggests there were those who wished to create maps in the modern cartographic sense, and who could do so, not only
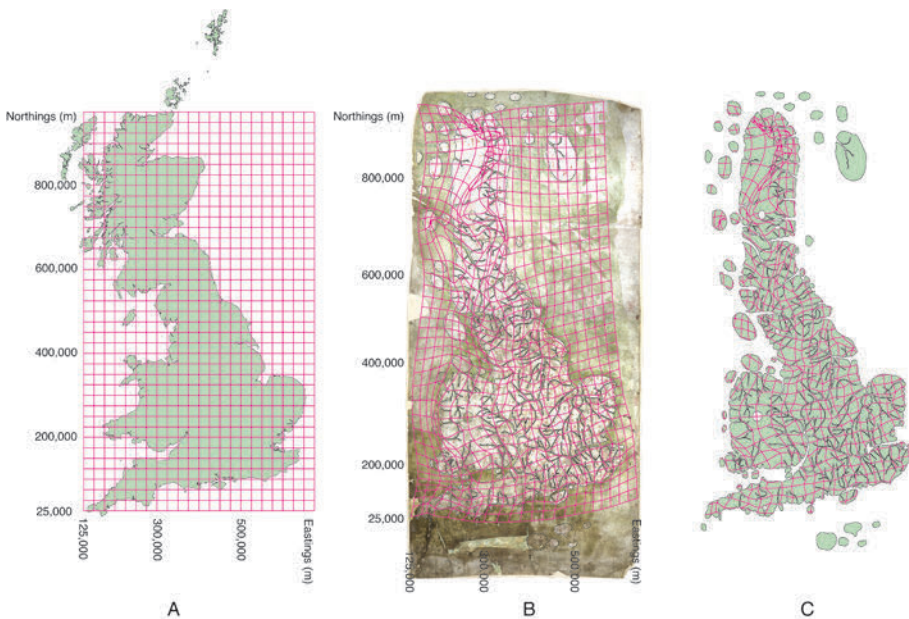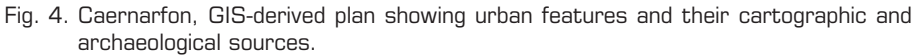

Fig. 3. The use of a 'distortion grid' to show those parts of the Gough map which display greater and lesser degrees of cartographic 'truthfulness'. The degree and variation of 'distortion' in the Gough map is shown (centre and right) by the way the overlying grid is warped.

by collecting geographical information on where places lay in relation to each other but also then positioning their locations on the actual map-manuscript with some degree of consistency in the use of linear scale. Coming to such a conclusion as this is unsettling for some medieval scholars, who instead prefer to see medieval maps more as imaginative 'mappings' rather than products of incisive 'map-making'. It may also un-settle those more used to thinking of the Middle Ages as being somehow fundamentally different in philosophical and scientific outlook compared to the modern age. Yet, using GIS to explore medieval geographies reveals that there was an attempt being made at 'mapping truth', and that some-thing of the ideas and processes of map-makers in the Middle Ages is yielded by employing statistical and quantitative methods to analyse those maps that they produced.

Case study 2. Mapping medieval townscapes

Relatively few maps of whole towns and cities were produced in Eu-rope in the Middle Ages, and even though all had urban landscapes that were, to some extent or other, a product of a process of design and planning, only one example of a plan drawn for this purpose appears to have survived (Harvey 1987, p. 492). A means of resolving this is to create new maps of medieval urban landscapes, and using these — and in particular their built form — as a basis for exploring what processes of urban design and planning were at work in the Middle Ages shaping towns and cities. Here GIS is a useful tool, not only for creating these new maps but for analysing the layouts of their urban landscapes.

Combining in a GIS the historic town-plans of a given place togeth-er with field-surveys of local urban topography and findings from ar-chaeological work provides a basis for creating just such maps and for identifying the morphological characteristics of medieval towns and cities (see Lilley 2000) (fig. 4). This map-making process was under-taken for a group of 'new towns' all founded for King Edward I in north Wales within a thirty-year period at the end of the thirteenth century in order to help secure English control of Wales (Lilley, Lloyd, Trick 2005a). The resulting series of detailed digital maps of Edward's new towns enable, for the first time, the towns' urban layouts to be com-pared at the same scale, and their morphological similarities and differ-ences identified (Lilley, Lloyd, Trick 2007a) (fig. 5a, 5b, 5c). Relating these town-plans and their morphologies to contemporary written ac-counts then helps us to understand the social processes that shaped urban landscapes in Edward's day. In this context, the GIS at the heart of this map-making exercise was simply a tool, a means to an end, but

Fig. 4. Caernarfon, GIS-derived plan showing urban features and their cartographic and
archaeological sources.

in creating these maps two conceptual issues arose: firstly regarding
the maps as constructions of cartographic 'truth'; and secondly, in
thinking of how these new maps related to *medieval* 'urban mappings'.

Taking on board Harley's ideas on questioning the purported truth of
cartography, it seemed important and necessary to try and destabilise
the assumed authority of the maps being created to represent Edward's
new towns, and to show them for what they really are — a modern con-
ceit. This is achieved in two ways: firstly by making available (through an
online version of GIS) the original materials and database that went into
creating these maps, so that, in principle at least, anyone with the inter-
est and the software could (re)use the project's GIS data to create new
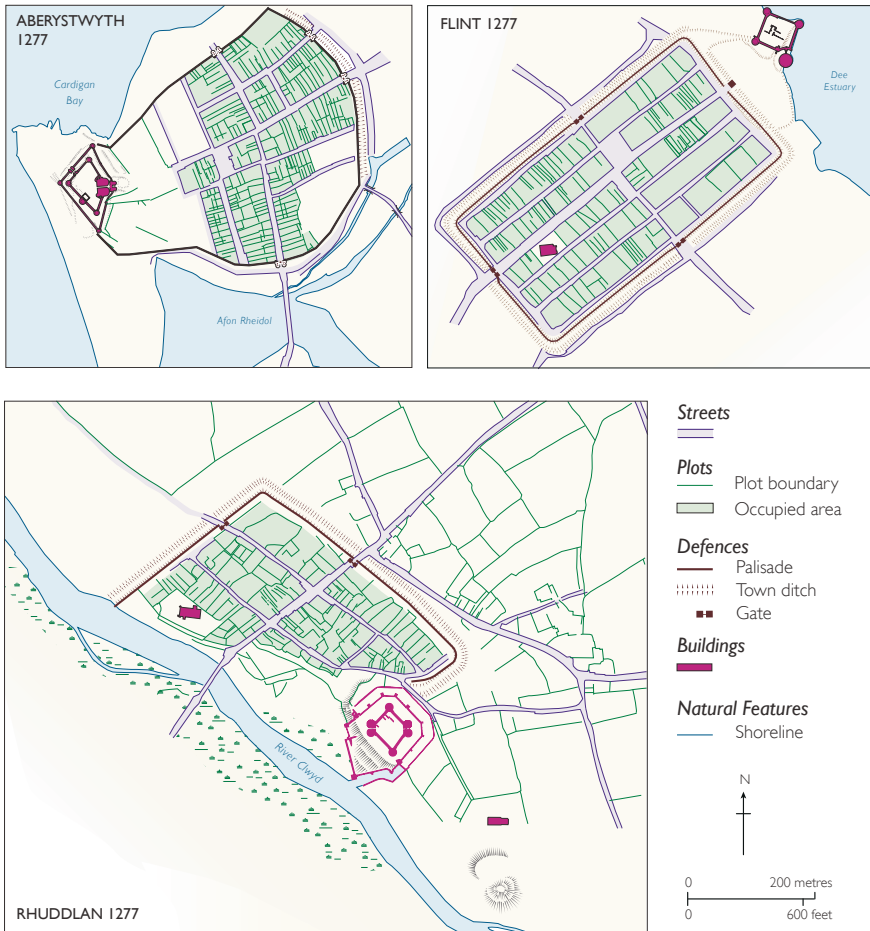
Fig. 5a. The new towns of King Edward I: GIS-derived reconstruction maps reproduced at same scale (Aberystwyth, Flint, Rhuddlan).

maps of their own, and so enable the content and the interpretations of our maps to be challenged (fig. 6). These GIS data are thus made available as free online downloads via a web-served digital atlas of Edward's new towns (Lilley, Lloyd, Trick 2005a). Secondly, as an aid to cartographic 'transparency', not one but three separate output maps were produced for each town included in the study (fig. 7). Through them, the map-making process is made visible and traceable.

So rather than hiding the decision-making that went into creating the maps of the towns, the deficiencies in the sources available, and the methodological stages used in interpreting these materials, are laid bare

Fig. 5b. The new towns of King Edward I (Holt, Caernarfon, Conwy, Criccieth).

for all to see. The 'truthfulness' of these cartographic representations of medieval new towns is thus brought into question by taking advantage of the way GIS works, namely by exposing the series of layers of geographical information (such as historic maps) used in constructing the spatial database for each town and which had formed the basis for making our maps of their medieval urban landscapes. In essence, this means putting Harley's critique into practice.
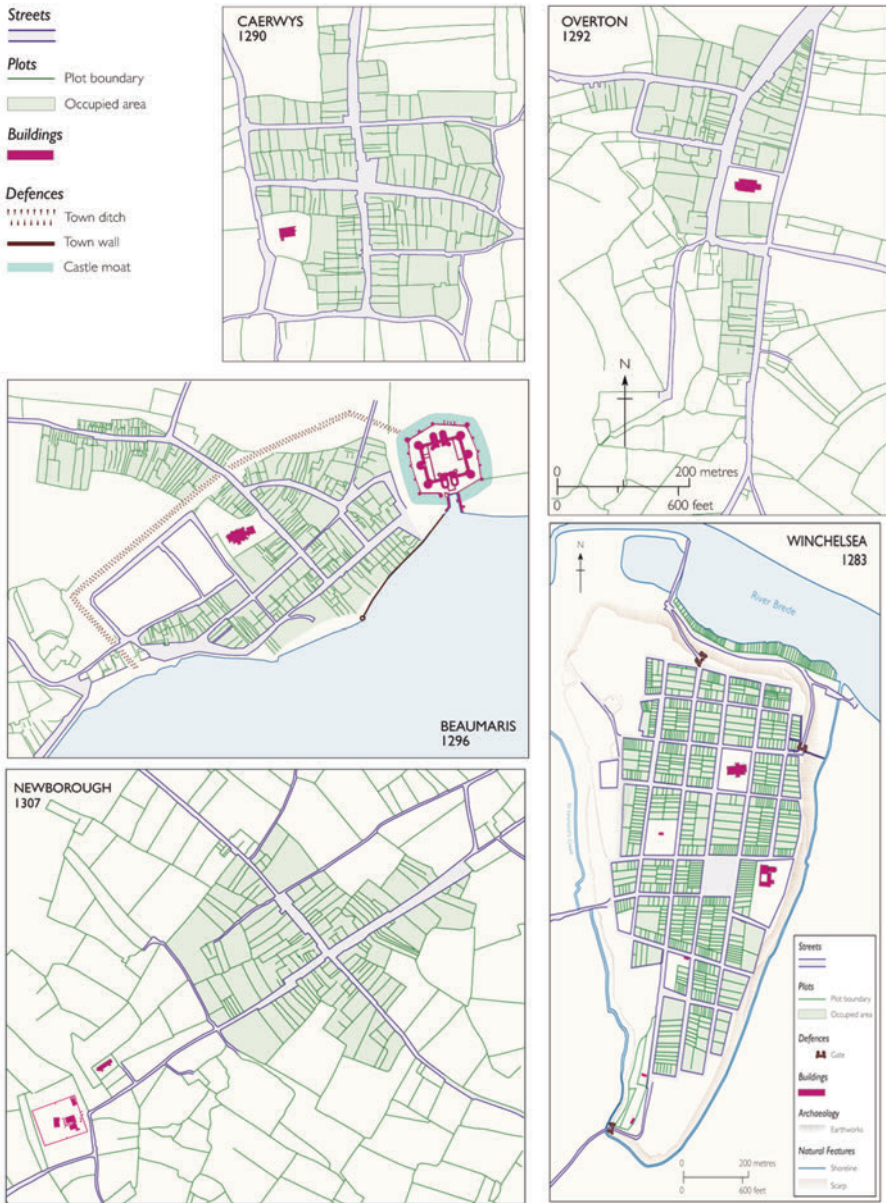
Fig. 5c. The new towns of King Edward I (Caerwys, Overton, Beaumaris, Winchelsea, Newborough).

A second issue arose during the course of using GIS to produce maps of Edward's new towns (Lilley *et alii* 2005b; Lilley, Lloyd, Trick 2007b). Again it concerned the conceit implicit in using modern *maps* as
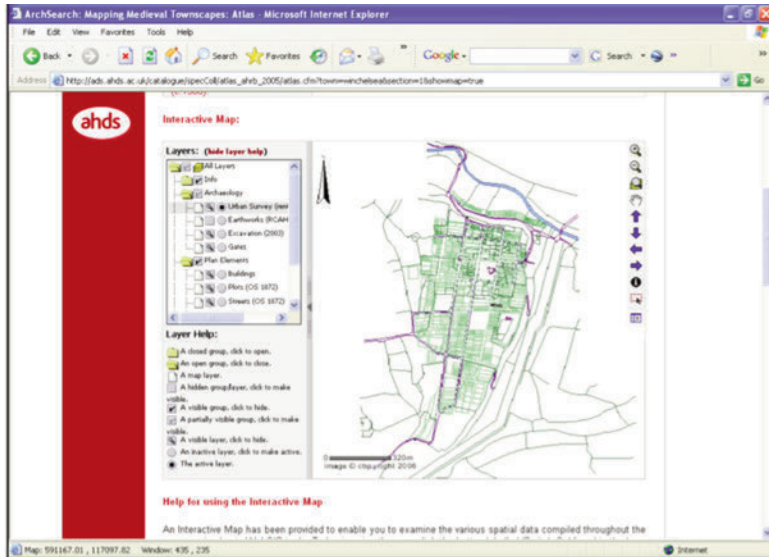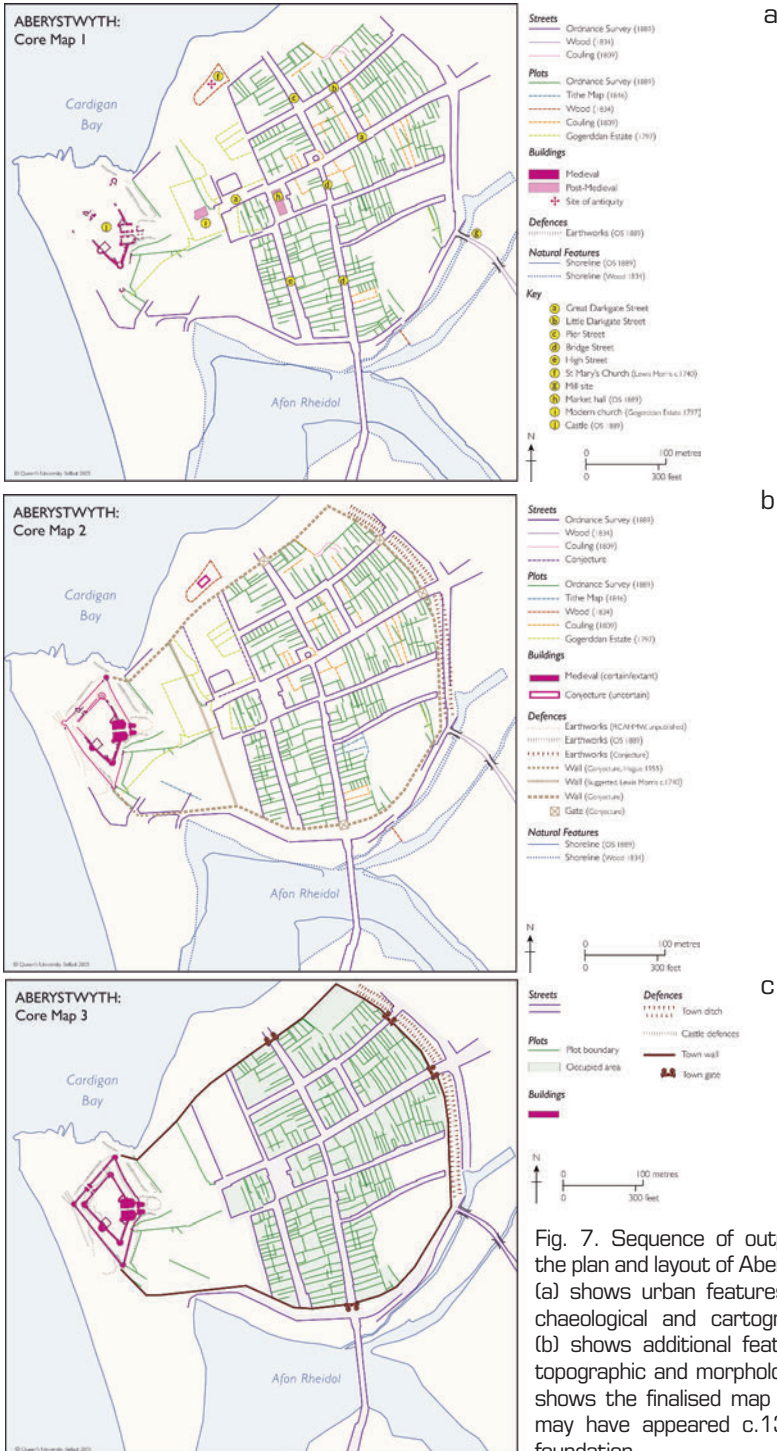
Fig. 6. Screenshot of web-GIS for Winchelsea (Sussex) featured in online digital atlas of King Edward I's new towns (Lilley *et alii* 2005a): http://ads.ahds.ac.uk/ catalogue/specColl/atlas_ahrb_2005/

a particular mode of *mapping* medieval landscapes. Not only are the finished maps of the towns distanced, conceptually, from the ways in which landscapes were generally thought of, experienced and represented during the Middle Ages, the technical map-making process itself, through scanning and digitizing, jarred with what might be considered other, rather more empathetic means of engaging with medieval landscapes through contemporary textual and visual 'mappings'. That is to say, for those individuals who were present in these towns at the time their foundation – and whose actions and thoughts were being sought through our map-making exercise – these GIS mappings would have appeared alien and puzzling, to most.

Simply acknowledging this underlying 'presentism' is not enough, however. In what ways might modern *maps* of medieval urban landscapes be reconciled with medieval *mappings*? One approach is to relate the mapped forms of the new towns to contemporary practices of urban design and planning; in effect placing them in their historical context, and thus attempting to close the perceived 'gap' between *medieval* 'mappings' of urban landscapes and *modern* 'map-making'. In the case of two particular Edwardian new towns (and maps) this contextual approach seemed to work. The analysis of their plan-forms (within the GIS) had revealed striking (and unexpected) similarities in their layout (Lilley, Lloyd,

Fig. 7. Sequence of output maps showing the plan and layout of Aberystwyth (c.1300): (a) shows urban features derived from archaeological and cartographic information; (b) shows additional features derived from topographic and morphological inference; (c) shows the finalised map of the town, as it may have appeared c.1300, shortly after foundation.

Trick 2007a). This is most easily explained if one individual is assumed to have been responsible for the design and planning of both towns. The most likely candidate for this is Master James of St George, Edward's master architect in Wales at the time. Elsewhere by the late thirteenth century, surviving architectural plans show architects could, and did, design their work on parchment (Lilley 2009). The comparable plans of Conwy and Beaumaris, and the apparent duplication in their layout as revealed using tools in the GIS software, suggests not only that someone drew up a plan to design and lay out the two towns but that this had most likely been done by Master James (fig. 8). If so, he at least was one individual, present at the time, who would have understood our 'modern' maps of Edward's new towns.
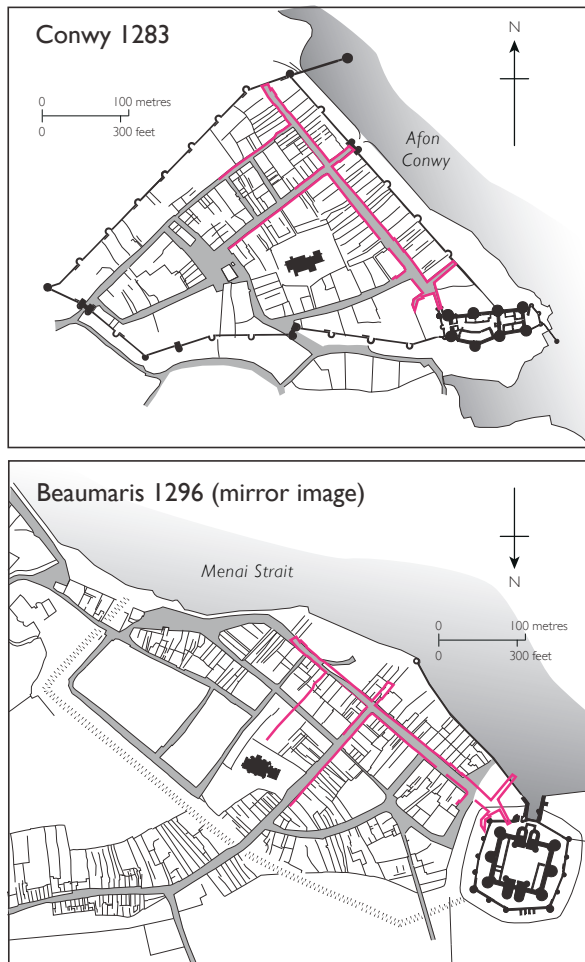

Fig. 8. The plans of Beaumaris and Conwy compared – using GIS tools to invert and compare the vector layers for the towns' streets to reveal common design traits.

Far from GIS being an unsympathetic approach to studying medieval landscapes and culture, therefore, it can be used to aid our knowledge and understanding of wider debates in archaeology's humanities tradition, as outlined here, especially on mapping and representation within the context of post-processualist concerns for greater engagement with experiential and phenomenological approaches. It might be argued, therefore, that two-dimensional (and indeed three-dimensional) cartographic representations of medieval urban landscapes resulting from modern map-making processes were perhaps not so alien to those of the Middle Ages after all, even if the GIS technologies used to produce them obviously are. But at the same time only relatively few individuals would have viewed and conceived of urban landscapes in this particular way in the thirteenth century. Most would very rarely have seen 'maps' (as we call them now) at all in their own day. Perhaps better, then, to place our modern maps of medieval towns and cities alongside those contemporary, medieval 'mappings' — both textual as well as visual — that were present at the time?

4. Conclusion

The aim of this short paper was simply to highlight the potential spatial technologies have for enhancing and defining our understanding of medieval culture. All too often GIS is judged to belong to a scientific tradition, rather than humanities-based archaeological and historical research, even among those who have made use of it to explore historical questions. This is unfortunate, for if GIS is applied with due care, to particular ends, it can connect with the concerns and approaches of (post-processual) archaeologists and those others interested in the subjectivities of material cultures. Here this has been explored by attempting to link recent GIS-based work on maps and mapping of medieval towns and cities with critical debates in geography and cartography developed around issues of 'mapping and truth'. Doing so perhaps helps to show potential not only to users of GIS of the value of attempting to theorise their work, through linking what they do to a wider discourse on mapping and representation (particularly in the light of archaeology's and geography's 'cultural turn'), but also it signals the importance of adopting new and different ways of interpreting texts and images, maps and mappings, and landscapes and cultures.

No doubt for some archaeologists, geographers and historians working within the humanities tradition, the use and application of GIS will continue to appear to be threatening and foreign, and also, for some, somehow even inappropriate simply because the use of these technologies raises the spectres of 'presentism', and (false) claims of objectivity and

Fig. 9. Screenshot of use of combined digital text and map in *Mapping Medieval Chester* online resource (www.medievalchester.ac.uk).

trust. The case made in this essay is that GIS alone does not pose this problem, but rather the ways in which it is deployed. If we can begin to use the analytical potential of GIS to look at familiar subjects in new and interesting ways, and challenge existing views and prejudices, then all the better; and if we can use the presentational potential of GIS to make geographical ideas and knowledge more accessible to a wider audience, and more interesting to engage with, then why not make some use of it?

There is much to be gained by adopting GIS therefore, and archaeology's humanities tradition will lose out if GIS continues to be seen simply as the preserve of the physical and social sciences, and those who believe that 'mapping truth' is still possible. A more critical, humanities-orientated GIS is already long overdue. Such a scheme has begun, combining textual and literary medieval 'mappings' of the English borderland city of Chester with 'maps' of its medieval urban landscape created using GIS as a basis (see Lilley 2011b). How these two mappings of medieval Chester unfold and relate to each other opens up a dialogue between the modern viewer of the medieval urban landscape and those who inhabited and negotiated it at the time (see Clarke 2011; Vetch, Clarke, Lilley 2012) (fig. 9). The preceding essays in this issue of *Post-Classical Archaeologies* variously explore the scope of this on-going dialogue between past and present, showing that spatial technologies are not at all at odds with the theoretical concerns of a critical interpretative discourse among medievalists – historians, geographers and archaeologists – but rather are complementary.

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