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Spatial History, deep mapping and digital storytelling: archaeology's future imagined through an engagement with the Digital Humanities

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ABSTRACT

Geospatial technologies are transforming the practice of the Digital Humanities, and these developments have direct relevance to the practice of scientifically oriented archaeology. The most recent "spatial turn" among digital humanists can be attributed to both the prevalence of tools like ArcGIS that facilitate such investigations as well as an interdisciplinary convergence upon theoretical models that conceive of socially constructed space. This article will briefly review the current state-of-the-art in the field of Spatial History as well as discuss a number of emerging trends such as deep mapping, digital storytelling and data visualization, utilizing examples from a variety of applications. Moreover, archaeologists can benefit from the substantial investments by the academy in the Digital Humanities, particularly in the United States and Canada. In sum, the article proposes that the scope of archaeological applications of geospatial technologies would be productively broadened through an increased engagement with the Digital Humanities.

1. Introduction

Janus, the Roman god of beginnings and liminal spaces, is often depicted in iconography as having two faces that point in opposite directions (Hamer, 2005). Despite the proximity of Janus' faces, they cannot see one another. In a number of important ways, the predicament of Janus is a good metaphor to describe the relationship of scientifically oriented archaeology to the Digital Humanities at present. Even though archaeologists are frequently among the earliest adopters of digital technologies such as GIS (Geographical Information Systems), disciplinary boundaries between fields such as Anthropology and History result in missed opportunities, both intellectual and material.

Although there is no scholarly consensus on definitions, the Digital Humanities entail the use of computational methodologies to research humanistic questions. The field of Digital Humanities (DH), an outgrowth of humanities computing initiatives launched in the mid-twentieth century, is highly self-aware. Scholarship that addresses the question of what the Digital Humanities are or speculates upon their future forms have become a genre piece (Borgman, 2009; Gold, 2012; Kirschenbaum, 2010; Svensson, 2010). Like archaeology, DH is an interdisciplinary field and features collaborative project-based approaches to research. Besides these described traits, DH also promotes an open-ended, exploratory research design rather than embracing empirical models of hypothesis or model testing. Accordingly, DH tends towards the *avant-garde* or visionary in its search for alternatives to traditional modes of knowledge production (Sousanis, 2015; Svensson, 2012).

In DH, technology is employed in a variety of ways: as a tool, an object of study, an expressive medium, an exploratory laboratory, a venue for activism, etc. (Svensson, 2010). In archaeology, by contrast, geospatial technologies are frequently conceived of and employed as powerful analytical or data-capture tools (Comer and Harrower, 2013; Zubrow, 2006), although there are important exceptions to the general trend such as applications in cultural heritage management, museum studies or combined-approach investigations (e.g. Price et al., 2013; Richards-Rissetto and Landau, 2014; von Schwerin et al., 2013).

Spatial History is a field that emerged in the early 2000s at the nexus of the Digital Humanities, Geography, Sociology, Anthropology and History (Gregory, 2005; Knowles, 2008; White, 2010). The field of Spatial History is already making valuable contributions to scholarship that may be readily differentiated from the manner in which most scientifically oriented archaeologists use geospatial technologies (Bodenhamer et al., 2015, 2010; Gregory, 2005;

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Gregory et al., 2015; Gregory and Geddes, 2014).

Despite archaeology embracing interdisciplinary approaches in general, the emergence of the spatial humanities has gone largely unnoticed among scientifically oriented archaeologists, including GIS users (Bodenhamer et al., 2010; Gregory and Geddes, 2014; Knowles, 2008). Many archaeologists, particularly Americanists whose research is largely based in Anthropology departments, may only be vaguely aware of the larger, long-established field of Digital Humanities more generally. Lack of awareness is not the only impediment to collaboration between archaeologists and digital humanists. Other barriers such as a lack of time or of institutional support certainly contribute to the present situation. However, there are a number of DH research characteristics such as open-ended data exploration, social engagement and a focus on narrativity in research presentation that are germane to archaeological scholarship. Moreover, there are a variety of intellectual and material incentives that make DH-archaeological collaboration worthwhile.

2. Shifting epistemologies

The future of technologies such as GIS within scientifically oriented archaeology depends on how practitioners envision the nature of their intellectual enterprise. Are archaeologists scientists who engage in model testing to develop universalizing theories or are they humanists who employ scientific methodologies like GIS to answer historically specific and contingent questions?

An examination of the epistemological shift that has occurred in landscape studies, long-affiliated with GIS approaches, is particularly revealing. The theoretical emphases of regional landscape studies in Anglo-American archaeology have transformed in recent decades (Patterson, 2008). The cultural ecological approaches that were common in the mid-twentieth century have been challenged by a variety of post-modern, post-positivist philosophies (Ashmore, 2004; Knapp and Ashmore, 1999; Llobera, 1996). While some archaeologists previously equated the concept of landscape with the physical environment, a growing group of scholars now embraces a socio-historical perspective to the study of past landscapes. Therefore, the scope and focus of GIS-enabled studies have also shifted to explore humanistic questions. In response, landscape archaeologists (e.g. Knapp and Ashmore, 1999) called for approaches that incorporate social and spatial theory (Harvey, 1973; Lefebvre, 1991; Soja, 1989; Tuan, 1979), resulting in a shift in the field from an emphasis on behavioral modes of interaction to social dimensions of landscape production (David and Thomas, 2008; Milevski and Levy, 2016).

A review of current literature reveals that archaeologists have internalized the post-modern, post-positivist critiques leveled in recent decades (David and Thomas, 2008; Patterson, 2008), and are investigating traditionally humanistic lines of inquiry such as experience of space or tracing historically specific developments (Creekmore, 2014; David and Thomas, 2008; Earley-Spadoni, 2015a; Fisher, 2009; Fitzjohn, 2007; Giles, 2007; Harrower, 2016; Kosiba and Bauer, 2013; Richards-Rissetto and Landau, 2014; Ristvet, 2014; Supernant and Cookson, 2014; Wheatley, 2004). Given that the shift has already occurred from environmental to socio-historical conceptions of landscape, it is beneficial to define areas in which geospatial approaches can be broadened through an engagement with DH and Spatial History since landscape archaeology has many points of intersection with traditional humanistic inquiry.

3. Deep mapping

In recent years, deep mapping has emerged as a focus of research in the Spatial Humanities (Bodenhamer et al., 2015; Roberts, 2016). It is important to note that there is no scholarly consensus on what a deep map is or what the process of deep mapping entails. I will provide a definition as a point of departure for discussing the topic. A deep map is a multi-layered, digital cartographic representation that allows map creators to annotate and illustrate geographical and social space in various ways, often using multi-media elements, commenting and super-imposable layers. Deep maps may integrate aspirational or imaginary space, and be collaborative, open-ended workspaces (Roberts, 2016). Deep mapping can provide temporal resolution to cartographic data (Ethington and Toyosawa, 2016), which addresses the fact that historical events occur in both space and time. However, static images are not particularly effective at capturing the temporal element of archaeological data. Deep mapping permits the animation of, for example, archaeological settlement systems to illustrate their temporal depth, the element of change over time (Gregory et al., 2015). Deep mapping is, furthermore, the process by which a deep map is produced, making it simultaneously a platform, product and process (Bodenhamer et al., 2015). A deep map is not simply a digital map—it is a complex construction composed of layers of meaning and process, as discussed below.

Deep mapping is relevant to the agenda of public archaeology because it provides a multi-media, intuitive way to display geographically referenced historical or archaeological data for both general and specialist audiences. The RICHES project at the University of Central Florida is a public history and archaeology interface that displays and analyzes images, objects, documents, oral histories, podcasts, videos etc. in an interactive mapping environment (https://riches.cah.ucf.edu/), drawing upon collections and archives housed at universities, museums, libraries and historical societies. A set of purpose-developed tools called the Mosaic Interface (MI), distinguishes the platform from a data archival project in that the MI analyzes each item for time, location, tags and topics to propose additional materials. An algorithm selects additional materials that may be germane to research interests, suggesting additional items a user may wish to consult (Fig. 1). The software uses the described algorithm to simulate having a talented archivist or librarian propose additional research materials for one's project based upon similarities with a viewed item. Users can create their own collections through storyboarding and bookbag tools created by RICHES. The platform also employs a number of purpose-developed tools that permit multiple geographical locations and attributes to be assigned to the same item, a situation that helps the platform developers express complex object biographies. This feature reflects the reality that an object can possess a complicated provenance, i.e. discovery in one place and a multi-locational history of ownership, crossing state or international borders.

Regarding digital storytelling, a topic that will be discussed in greater detail below, the Mosaic Interface permits users to contribute their own collections and develop their own narratives. The MI features tools such as digital exhibits, timelines, map overlays, and visualizations, allowing users to develop their own narratives, reflecting a post-modern interest in breaking down the traditional barriers of authorship-authority and subject-object; the platform also encourages the development of multiple narratives (e.g. Barthes, 1977; Ryan, 2002; White, 1987).

Multiple-geographical location functionality allows a single location to be expressed by a variety of historical and linguistic names, including, for example, Seminole or Spanish toponyms. Accordingly, deep mapping is an excellent format for discussing disputed geographies, a difficulty archaeologists frequently face. In many parts of the world, the simple act of applying a toponym, a name on a map, is a controversial gesture. Assigning a place name

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