



Archaeology in the Digital Age

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Archaeology and Cartography: Why Theory Matters

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Maps are graphic representations that facilitate a spatial understanding of things, concepts, conditions, processes, or events in the human world. [Harley and Woodward 1987:xvi, quoted in Crampton and Krygier 2005:17]

Maps and archaeology have a long history. Heinrich Schliemann produced many maps and plans through the course of his excavations in what he deemed ancient Troy (Schliemann 1884). Spatial interpretation at all scales has long been part of the archaeological discourse (Ashmore, 2002; Ebert 2004). Ashmore (2002:1173) states “Myriad scholars, in the United States and elsewhere, have long sought to reconstruct social (or societal) organization from the archaeological record, as viewed through artifacts and features mapped across space (e.g., Chang 1958; Childe 1951; Fox 1932)”. Trends in archaeological cartography have followed those broader themes in archaeological theory as well as in cartographic, geographic and social theory. The “completion” of a map of Teotihuacan in 1970 (Millon 1970) after 8 years of work beginning in 1962 (Millon 1964) is a great example of the state of spatial archaeology prior to the advent of Geographic Information Systems (GIS) Technology. This project can be seen as a processual consumption of what Crampton and Krygier term “Scientific Cartography” (2005:20). That is, the use of techniques, method and theory for creating more accurate maps developed during and after the Second World War for the purposes of archaeological research. Millon (1964, 1970) describes the project in detail, the methodology used and the attention to detail and accuracy by the project members in the creation of the map. It is seen as a descriptive tool, context for explanation.

To this day archaeologists remain consumers of cartographic methodology, and thus of cartographic theory. It is important then to trace the history of theory in cartography and geography in the broader context of general social theory. The critical drive in cartography stems from a rejection of Robinson, Jenks and Morrison’s attempt to create a methodologically “pure” cartography, devoid of politics or bias, simply representing the

world as it is (Crampton and Krygier 2005). Post-processual archaeology and critical cartography both recognize the situated-ness of knowledge (Crampton and Krygier 2005; Trigger 2007, 467- 468). Both stem from postmodernist philosophy on the creation of knowledge, as Trigger explains: “Postmodernists agreed that there could never be a single objective version of human affairs; instead there were multiple versions or truths seen from different standpoints, such as those of poor and rich, winners and losers, females and males, different professions and various ethnic groups” (2007:447).

In the face of the potential demise of objectivity the Robinsonian pursuit of pure cartography was seen as problematic at worst, and misguided at best. Monmonier states this in an extreme way, “A single map is but one of an infinitely large number of maps that might be produced for the same situation or from the same data” (1996:2). The sustained critique of the objectivity of scientific inquiry, whether it comes from post-processual archaeologists or critical cartographers has undoubtedly had an impact on the uses of GIS and other forms of computation in archaeology. Geographic Information Systems, like other forms of information systems should be viewed as one of many possible tools to investigate archaeological and ultimately anthropological research questions.

Other Archaeologists have approached this issue from other angles... The issue is multifaceted, it is one of translation as well as representation. The fact of the matter is that archaeologists, as specialists in another discipline, are forever consumers of Cartographic theory, typically of whatever theoretical paradigm is the mainstream. Gillespie (2007) looks at this issue in terms of the interplay between technical method, archaeological questions, and theoretical leanings in the context of the maps of the site of La Venta, in Mexico.

Gillespie looks at over 100 years of drawings of the site of La Venta, both plan views of the architecture present at the site, as well as profiles of excavations. If the general layout didn't stay the same, and we didn't know in most cases without a doubt know that these maps are of the same part of the same site... you might believe you were looking at two or more physically distinct sites. Part of this is certainly due to increasingly extensive clearing as well as excavation. However many of the maps seem to show a fictive layout of proposed or archaeologically determined building footprints, as opposed to the actual current physical state of the site. Others show both current physical state as well as archaeological footprints concurrently, or differently for different parts of the site. There is no coherent way in which each element of the site is represented on the various maps through time. This presents a problem for modern archaeologists attempting to make sense of excavations conducted a century ago on a scale that is no longer possible on a site which no longer exists.

This is one of the primary reasons why 3D reconstruction of archaeological sites can be such a powerful tool for archaeology moving forward. A 3D model of a unit contains far more data than the corresponding interpretative maps can possibly convey. The models can be re-interpreted as understanding of the cultures, archaeological theory, or the site stratigraphy develops. Interpretative or thematic maps can be re-drawn from the 3D model, years or decades after the excavation unit is closed, reburied and long gone. Of course, it's tempting to think of the model as being representative of the real world, but unlike every other mapped set of data, it's actually a translation and an abstraction, itself limited by technical as well as interpretative factors.

I will deal more with the specific challenges and limitations of 3D modeling for Archaeology in my next post.

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