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Teotihuacan, Mexico

The Role of Ancient Cities in Research on Contemporary Urbanization

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The work of the UGEC project focuses on contemporary cities and policy implications for the future. Why should researchers in this area pay attention to ancient cities? After all, modern cities differ significantly from their premodern antecedents, and archaeological and historical data are very incomplete about key urban processes. Nevertheless, I suggest that ancient cities are relevant to research on contemporary urbanization in two realms: comparison and long-term change.

A consideration of ancient cities, such as the pre-Aztec metropolis of Teotihuacan, Mexico (Figure 1) expands the sample of cities that scholars and policy-makers can draw on for comparative insights.¹ Cities are complex phenomena, and a broader base for comparison reveals the patterns of variability among cities. A larger sample helps scholars to distinguish universal urban patterns from unique occurrences, and general trends from idiosyncratic events. Cities have been built in many different ways over the ages, and urban life has found a wide variety of expressions throughout history. A comparative approach is needed to comprehend, and benefit from, this variability.

Including ancient cities in our frame of reference also allows for study of long-term change. Archaeology furnishes a record of urban success and failure over thousands of years in many parts of

the world (Marcus & Sabloff, 2008). Why did some cities flourish for centuries while others grew and declined over a decade or two? Although archaeologists cannot yet claim to have definitive answers for such questions, we do have the data to address them. As we transform our primary data into patterns of historical urban transformation, the results may very well help scholars understand issues relating to modern cities and environmental change.

The last point brings up a caveat: archaeologists have relevant urban data but few rigorous results to date. Comparisons based on one or two cities may provide insights, but they can also be incomplete and even misleading. Teotihuacan (Figure 1) resembles modern Phoenix (Figure 2) in many ways. Both are large grid-planned cities in arid or semi-arid environments with early economies that relied on irrigation agriculture. Perhaps research on

¹ Teotihuacan, which flourished between AD 100 and 600, is one of the most extensively studied ancient cities in Mexico, in part due to a series of research projects directed by Arizona State University Emeritus Professor George Cowgill (Cowgill, 1997; 2008; Millon et al., 1973). ASU archaeologist Saburu Sugiyama continues the university's research program at the site, and ASU runs the Teotihuacan Research Laboratory, one of the premier archaeological research facilities in Mexico.

Figure 1 | The central Mexican city of Teotihuacan (AD 100 – 650). *Aerial photograph from 1965, by Compania Mexicana de Aerofoto*



Teotihuacan and its fate – five centuries as a flourishing economic and political center, followed by collapse and abandonment – can suggest insights about the future of Phoenix. But a more rigorous approach would aggregate data from a larger sample of ancient cities to draw comparative insights about urban dynamics.

Unfortunately, archaeologists have not yet carried out the kinds of targeted comparative analyses required to integrate the results of many diverse fieldwork projects. During the past few decades my colleagues and I have been piling up an impressive amount of data about past societies, but efforts to synthesize the new finds are still in their infancy (Smith, 2012). In a recent paper (Smith, 2010c) I review three topics in contemporary urban research – urban sustainability, sprawl, and squatter settlements – and show that archaeologists now have data on all three phenomena for past cities (including Teotihuacan), but we have yet to make solid contributions because of our lack of syntheses targeted at these issues.

A closer integration of archaeology with both the social and natural sciences can expand the breadth of research on urban issues. The best contemporary research on urbanization – including the UGEC project – is transdisciplinary in nature. Archaeology can now be regarded as a social science of its own, not merely a sub-discipline of anthropology or history (Smith et al., 2012). Archaeology brings a distinctive set of data and concepts to the table to expand research on cities and other social phenomena (Smith, 2010b).

Urban organization through the ages

My first example is a transdisciplinary research project based in the School of Human Evolution and Social Change at Arizona

Figure 2 | Phoenix, Arizona. *Photo by Melikamp, from Wikipedia (Creative Commons Attribution-Share Alike 3.0 license)*



Source: http://en.wikipedia.org/wiki/File:Phoenix_AZ_Downtown_from_airplane.jpg

State University. The project, titled “Urban Organization through the Ages: Neighborhoods, Open Space, and Urban Life,” is a team effort by six faculty: three archaeologists (Barbara Stark, George Cowgill, and myself), a geographer (Christopher Boone), a political scientist (Abigail York), and a sociologist (Sharon Harlan). We are part of a series of innovative transdisciplinary projects collectively titled, “Late Lessons from Early History,” funded through ASU’s Intellectual Fusion Investment Fund.

The participants in our project share interests in urban form and urban life – particularly neighborhood dynamics – and a broad comparative view of urbanism. One of our first efforts was to examine the dynamics of ethnic and class clustering in cities across time and space. We discovered that patterns of segregation and clustering are enormously diverse across history, with a variety of top-down and bottom-up drivers generating (or inhibiting) clustering in different circumstances (York et al., 2011). We found that there is no such thing as a “typical” city in any urban tradition (such as medieval Europe or the Islamic Near East). One lesson is that urban dynamics require explanation on the level of individual cities and regions, and that it is fruitless to search for typical patterns. Our findings on the antiquity and universality of urban neighborhoods (Smith, 2010a) dovetail with research on modern neighborhoods (Sampson, 2012).

Another activity of our joint project was to examine the nature of urban open spaces from a comparative perspective. Open space in cities takes many forms, from large public plazas to neighborhood parks. We identified seven types of open space and examined their occurrence throughout history at various spatial scales, from the entire city to individual blocks. Our typology is

described in Stanley et al. (In press), and we also have published several individual comparative studies of different kinds of urban open spaces (Stanley, 2012; Stark, In review).

For our next project we plan a study of inequality in access to urban services in two samples of premodern cities: archaeological cases and historical cases. Outside of a few studies of medieval cities, no one has yet to examine service access for cities before the modern era. We know that ancient cities had high levels of wealth inequality, but did wealth inequality extend to unequal access to basic services? What is the range of variation among premodern cities and how can it be explained? By digitizing maps

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Figure 3 | The temple of Angkor Wat in the city of Angkor, Cambodia. Photo by Bjørn Christian Tørrissen, from Wikipedia (Creative Commons Attribution-Share Alike 3.0 license)



Source: http://en.wikipedia.org/wiki/File:Angkor_Wat.jpg

and conducting GIS spatial analyses of premodern cities, we aim to understand urban services and patterns of inequality in the past that we will compare to what is known of modern cities. This kind of systematic comparative research is necessary in order to produce reliable, systematic knowledge that can aid scholars of modern urbanism.

Current archaeological research on ancient cities

Low-density cities

Archaeologist Roland Fletcher has developed a model of tropical agrarian, low-density urbanism (Fletcher, 2009; 2012) to describe ancient societies such as the Classic Maya and the Khmer of Angkor. The earliest archaeologists were attracted to these sites by the monumental architecture – those features that attract tourists today. The towering temple of Angkor Wat, located in the Khmer city of Angkor, is a good example (Figure 3).

From the perspective of comparative urbanism, spectacular temples are less interesting than residential zones. Groups of three or four houses were arranged around a patio and were surrounded by considerable open space. Today these spaces are filled with jungle vegetation, but in the past the area between house groups was farmed intensively. Archaeologists are working on this issue at Angkor, but for the similar Maya cities of Central America chemical analyses of urban soils reveal traces of phosphates from ancient fertilizers (Isendahl, 2010). Archaeologists are showing that urban agriculture is nothing new (Barthel & Isendahl, 2012); tropical city-dwellers and others have been practicing it for millennia.²

Neighborhoods have distinctive spatial expressions in low density cities, where they take the form of spatial clusters of houses (Smith, 2011). The configuration of house groups interspersed with cultivated areas produced a level of urban sprawl comparable to the automobile-generated sprawl of contemporary U.S. cities. Figure 4 shows the extent of Angkor, as recently mapped by Fletcher's team (Evans et al., 2007), at the same scale as a density map of metropolitan Phoenix. The mechanisms that generated ancient and modern sprawl probably differ greatly, although there is still little systematic research on ancient sprawl.

Ancient urban sustainability

Many definitions of sustainability include longevity – the length of time over which a particular practice or society survives (Denevan, 1995; Patten & Costanza, 1997), and this factor has been applied to urban sustainability by Grant (2004). Archaeologists have an abundance of data on the longevity of

² See also "Aztec Urban Agriculture," <http://wideurbanworld.blogspot.mx/2011/11/aztec-urban-agriculture.html>.

settlements. The caveat mentioned above (that archaeologists have yet to conduct systematic research that synthesizes a large sample of cases) holds for urban sustainability, but it is possible to make some preliminary observations.³

As an example, I consider longevity for archaeological cities and towns located in a full-coverage, regional survey of the valley of the Yautepec River in the Mexican state of Morelos (Smith, 2006). With the exception of site 200, none of these urban sites has been excavated extensively. Artifacts were collected from the ground surface of each site, and limited test excavations were conducted at several of the sites. These methods permit the size of each site to be determined, along with the chronology of its occupation.

Although these data have yet to be subjected to systematic analysis, the longevity patterns are highly suggestive. The earliest urban sites, founded in the Late Formative period (green in Figure 5), were situated in the best environmental location: at the edge of the widest expanse of rich alluvial farmland in the entire valley. These sites survived for many centuries, some for nearly two millennia, and it seems clear that their success was due in large part to their location with respect to high quality farmland.

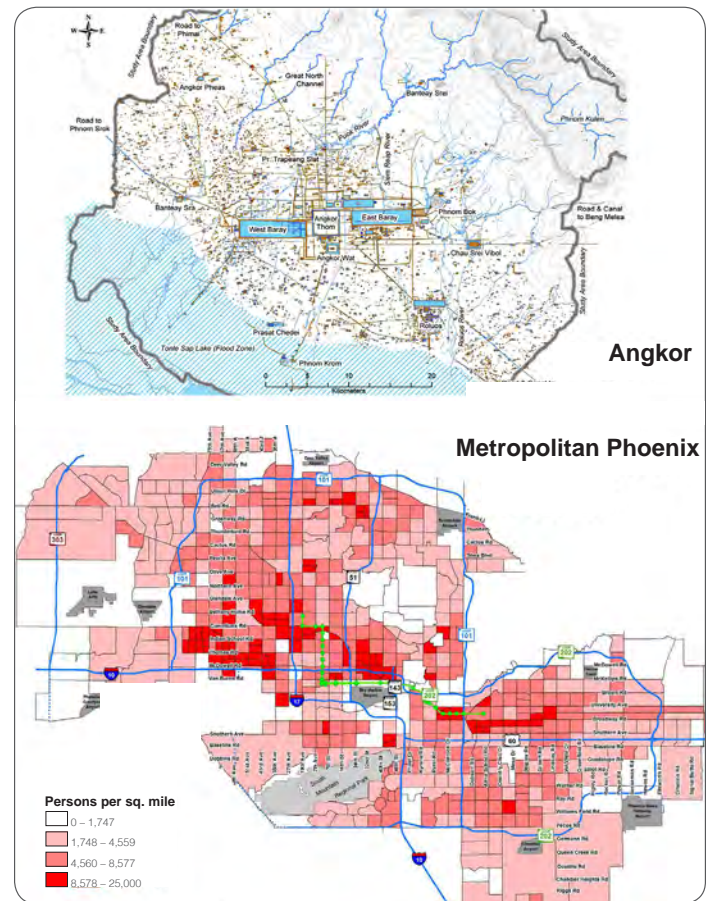
The most rapid and extensive episode of urbanization took place in the Classic period (red), coincident with the conquest of the Yautepec Valley by an empire based at Teotihuacan. Classic period urbanization in this area was generated by administrative needs; these towns probably organized the production and shipment of cotton to the distant imperial capital. When the empire faltered, all but one of the sites was abandoned.

The end of the Classic period cities was followed by a prolonged period of lowered rainfall in central Mexico (Metcalf et al., 2000; Stahle et al., 2011), during which few cities were founded (yellow). When rainfall increased after AD 1100 (the start of the Aztec period) another wave of urbanization began, but this time the cities were generated by population increase and the growth of local city-states (Smith, 2008). Aztec urbanization came to an end in 1521 with the Spanish conquest of Mexico, although many Aztec cities continued to be occupied and are still thriving cities today (such as Mexico City). While the data are still too rough to draw detailed implications about urban sustainability, they do suggest that a variety of causal factors were involved, from soil quality and rainfall to political dynamics to regional demography. This case also emphasizes the fact that different types of city require separate explanations for their rise and fall.

From ancient cities to urban policy

I have argued here that archaeological research in ancient cities can contribute to a better understanding of contemporary

Figure 4 | Sprawling cities, ancient and modern: Angkor (Evans et al., 2007, pg. 14280) and Phoenix (<http://www.mapsandfacts.com/asset/June2010Map.pdf>) at the same scale



processes of urbanization. If there are policy implications of the kind of work outlined above, I believe they are best expressed indirectly. It seems unlikely to me that policy makers concerned with urban issues will pay much attention to archaeological data on ancient cities. However, if archaeological findings can take their place within a broader framework of comparative knowledge about premodern cities, they can have an indirect effect on urban policy. Policy should be based on knowledge of a wide range of options and cases (including ancient cities), and not limited to a few examples chosen haphazardly. Until that broader comparative framework is constructed, however, archaeology can contribute to research and policy debates to the extent that other urban scholars recognize the field as a relevant and rigorous social science discipline (Smith, 2010b; Smith et al., 2012).

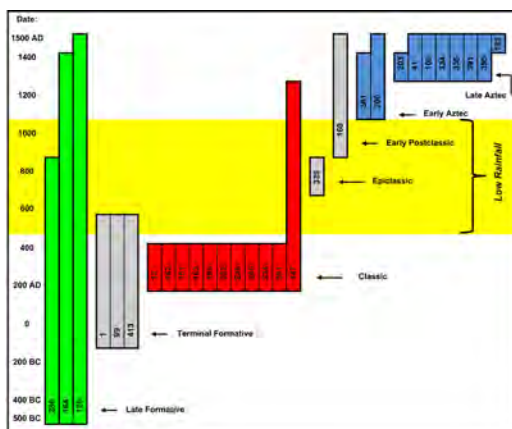
Sociologist Robert Sampson is the leading authority on urban neighborhoods and their effects on individuals and society (Sampson 2009; 2012). His work is widely used in policy

³ For reasons of space I limit consideration here to the sustainability parameter of longevity. Archaeologists are also starting to address other components of (urban) sustainability, including environmental change and social well-being.

circles (Sampson & Morenoff, 1997; Sampson & Raudenbush, 2001), and his perspective is sufficiently broad to incorporate archaeological work on ancient cities. He cites the research of our ASU group in support of a claim for the ubiquity and social importance of urban neighborhoods through history (Sampson, 2012, pg. 437), a claim with policy implications.

By bringing a larger, more diverse sample of cities to the discussion, archaeological research broadens the perspective of urban scholars and improves their explanations of contemporary urban dynamics. I invite the scholars at UGEC and other readers of *UGEC Viewpoints* to take a closer look at ancient cities and see if I am right about their value to research in this area.

Figure 5 | Differential longevity of urban sites in the Yauhtepec Valley in the Mexican state of Morelos. Each vertical bar is an urban settlement; these are grouped by the time period during which they were founded – see Smith (2006; 2010c) for discussion.



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