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Definitions and Comparisons in Urban Archaeology

ABSTRACT I discuss two key issues for the analysis of early urban settlements: definitions, and comparative analysis. There is no 'best' definition of terms like city or urban. These are not empirical descriptions of the archaeological record; they are theoretical terms whose definition should match the research goals and questions of a study. Most archaeological definitions of city and urban use combinations of six dimensions of variability: size, functions, urban life/society, form, meaning, and growth. I then review seven reasons for archaeologists to pursue comparative analysis of past cities. Comparative analysis is necessary if we are to move beyond descriptions of individual cities to build an explanatory science of urbanism in the past.

KEYWORDS Urban theory; comparative urbanism; ancient cities; urbanism; towns; comparative analysis; analogy.

The inauguration of the *Journal of Urban Archaeology* comes at a key point in the archaeological study of past urbanism. Excavations and surveys of urban sites have grown tremendously in the past two decades, and there are now many archaeological studies providing new information about a growing number of urban sites. Archaeologists working on urbanism in different regions and time periods need to be able to see what is happening in other traditions. This development alone would justify the establishment of a new journal to tie the field together. But the very growth of information brings with it a need for theory, comparison, and synthesis, and the promotion of these broader goals is another role the new journal can play.

As a contribution to the development of greater understanding and improved explanations of archaeological data from past cities, I discuss two conceptual and methodological points — definitions and comparisons — based on my recent book manuscript, *Urban Life in the Distant Past* (Smith forthcoming). Attention to these topics can help move the archaeological study of past cities into a new realm of explanation and understanding.

What Do We Mean by Urban and City?

There has been much confusion in archaeology about the meanings and definitions of city and urban. In the past, I have participated in debates over the best way to define cities (Smith 1989), and I have promoted various archaeological approaches to urbanism and urban definition (Smith 2007; 2016). In part because of these debates and rival claims, I chose to rethink the question from the bottom up in my recent book (Smith forthcoming). That is, rather than begin with the ways different archaeologists have defined these terms, I devised a conceptual approach based on theory and comparison, and I applied this approach to a variety of early cities. My focus in that book is on 'premodern cities'. By premodern, I mean settlements dating to the medieval period or earlier in Europe and the Mediterranean, and prior to European conquest and domination in other parts of the world. In line with the aim of this new journal, I focus primarily on archaeological evidence for past settlements, even for periods with extensive written documentation.

Basic Principles

My approach begins with three guiding principles:

1. Definitions are tools; one's definition of city or urban depends on one's goals and questions.
2. Do not reify the concepts of city or urban.
3. The settlement should be the primary unit of analysis, not the city. We should acknowledge that some 'urban' attributes and practices apply to non-urban settlements.

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These principles flow from a basic social-scientific approach to knowledge (Gerring 2012; Smith 2017a).[1] In this approach, four levels of concepts can be distinguished (Kaplan 1964, 54–62):

1. ***Observational terms*** are 'those whose application rests on relatively simple and direct observations' (Kaplan 1964, 55). An archaeological example would be a row of stones excavated at a site.
2. ***Indirect observable items*** call for a greater level of inference, but are typically well accepted within a discipline. Interpreting the row of stones as part of a house fits at this level.
3. ***Constructs*** 'are terms which, though not observational either directly or indirectly, may be applied and even defined on the basis of the observables' (Kaplan 1964, 55–56). The household — as the social unit that once inhabited a house — is such a construct.
4. ***Theoretical terms*** cannot be defined by observables; they derive from a theory or a systematic body of thought. 'Observations do not give meaning to the theoretical term but rather mark the occasions for its application. Its meaning derives from the part that it plays in the whole theory in which it is embedded, and from the role of the theory itself' (Kaplan 1964, 56). For archaeologists, notions such as kinship, social class, market system, or empire — as applied to houses, households, and other phenomena — are theoretical terms, as are terms such as city and urban.

Abraham Kaplan's discussion of social-scientific concepts helps contextualize my starting principles for the study of premodern cities. These terms form a hierarchy, moving from observations with low levels of theoretical content to theoretical terms that are strongly theoretical in their orientation. The terms city and urban are theoretical terms. They cannot be identified directly from observations of the world; they must be inferred by combining a theoretical approach with archaeological data. The identification of a row of stones as a house wall is usually independent of one's goals, questions, and theory, whereas the identification of a settlement as a city is strongly dependent on one's goals, questions, and theoretical approach.

Another way to frame this concept is to note that cities and urbanism — particularly in the premodern domain — are not real things. Settlements, on the other hand, *are* real. They exist in this world. Archaeologists excavate their remains, and it is usually obvious whether a given site was a place where people resided. 'City' and 'urban', on the other hand, are categories or concepts that we apply to some settlements, when it suits our goals. If we have different goals, we may use different definitions. In the language of philosopher John Searle (1995), settlements are brute facts, while cities are institutional facts. One of Searle's examples is money. The fact that a piece of paper in my wallet has value and can be exchanged for goods and services is an institutional fact. It depends on the existence of institutions, beliefs, and practices that allow particular kinds of pieces of paper to be used to purchase things. But the physical properties of this same bill — its ability to be folded or rolled up, or burned, or marked with a pen — are brute facts. They do not depend on an institutional framework or common beliefs within a community of people. There is no 'brute fact' of 'citiness' or 'urbanity' as intrinsic attributes of a settlement, something waiting to be discovered; these are institutional facts that only make sense from a given perspective, using a particular theoretical approach, with a given definition.

The concept of 'settlement' was defined by Kwang-Chih Chang as 'the physical locale or cluster of locales where the members of a community lived, ensured their subsistence, and pursued their social functions in a delineable time period' (Chang 1968; see also Chang 1962). The focus is on the place were a group of people — from a few individuals to several million — lived or dwelt. Settlements may last for anywhere from one day to thousands of years. From this perspective, the temporary campsites of mobile hunter-gatherers are settlements, as are cities.

If settlements are 'brute facts' of archaeology, then it makes sense to use them as a basic unit of analysis. When our research shows that a given settlement was large and complex, or served as a hub in a regional economy, then we may want to classify it as an urban settlement. In Searle's framework, this is an institutional judgment; in Kaplan's (1964) scheme, 'urban settlement' is a theoretical term, not an observation. The fact that some key features of cities also characterize smaller, non-urban settlements (e.g. dense

1 On a philosophical level, my approach — like most work in the social sciences today — can be described as scientific realism: there is an external world independent of our senses, and that world can be known through research that follows explicit methods to produce accounts that are testable (Bunge 1993; Little 2010). Scientific realism is opposed to idealistic approaches such as social constructivism, relativism, poststructuralism, and other postmodern-associated philosophical approaches (Bunge 1993; 1995; Smith 2017a). I should note that some archaeologists promoting post-processualist views (Johnson 2010) have used outdated and inadequate definitions of 'science' as a basis to criticize the scientific approach in archaeology (Smith 2017a), thereby inhibiting productive theoretical dialogue.

Table 2.1. Major dimensions used to define cities and urbanism.

Dimension	Definitions and examples
Primary Dimensions	
1. Size	Population; area; density
2. Urban functions	Activities and institutions within a settlement that have an effect beyond the borders of the settlement
3. Urban life and society	Social complexity and variation; top-down and bottom-up processes
Secondary Dimensions	
4. Urban form	Architecture, form, layout, planning, housing
5. Urban meaning	Cosmic and religious symbolism; Rapoport's levels of meaning
6. Urban growth	Expansion in the size or economic productivity of a settlement; extensive and intensive growth

population or heterogeneous social composition) is a further warning about the dangers of reifying the concept urban. This perspective allows archaeologists to proceed with analysing settlements without agonizing over definitions or worries about whether or not a given site was urban or not.

The Dimensions of Urbanism

As a background to the topic of urban definitions, I introduce the concept of 'dimensions' to organize major attributes of settlements and cities. Dimensions are bundles of related variables. In my framework (Smith forthcoming), three dimensions stand out as most important: size, urban life, and urban functions. Also important, but of less value for defining cities, are the dimensions of form, meaning, and growth (Table 2.1).

1. Size

In my theoretical approach, the size of a city — its population, area, and density — is the most important causal dimension of urbanism. That is, size has a major influence on the other dimensions. Although cities today are vastly larger than those in the distant past, the role that population size plays within a given settlement system is quite similar in the present and the past, something revealed by settlement scaling research (Lobo and others 2019; M. E. Smith 2019). Archaeological works that give importance to city or settlement size include Fletcher (1995), Bowman and Wilson (2011), and Fulminante (2014).

2. Urban Functions

I employ the concept of urban function from urban geography (Lloyd and Dicken 1977): an urban function is an activity or institution located within a settlement that affects life and society beyond the borders of the settlement. The presence of urban functions makes a city an important place within its region. Villages lack urban functions, whereas a political capital — by ruling a polity — has urban functions, at least in the political realm. Urban functions were first articulated in economic geography by central place theory, a model of the spatial locations and sizes of market centres (see discussion below). Urban functions are useful in studying regional and macro-regional social patterns because they deal with the ways a central settlement articulates with its hinterland. In this usage, if an urban shop only serves people in its neighbourhood, then its activities do not constitute urban functions. But, if people travel from other settlements to use the shop, those transactions signal economic urban functions.

3. Urban Life and Society

This is the broadest domain of urbanism, the realm of social complexity and variation. This dimension includes institutions — the top-down processes that affect urban life, including social class, wealth inequality, and the role of government — and bottom-up or generative processes — those processes where individuals and households create social patterns and changes through grass-roots actions, independent of the role of the state or central institutions. Key realms of generative urban life are households, neighbourhoods, occupations, ethnic diversity, and patterns of poverty and prosperity.

One way of summarizing the variety of traits that make up this dimension is to note that they are markers of social complexity. Any settlement has houses, but urban settlements tend to have both large and small houses corresponding to wealth or class differences. Any settlement has economic consump-

tion activities, but cities tend also to have markets or shops, specialists, workshops, and other economic institutions above the household level. In short, cities were the settings for social complexity in most premodern societies, as they still are today. There are countless archaeological studies of urban life and society in the past. Most focus on individual sites or regions (e.g. Cahill 2001; Arnauld, Manzanilla, and Smith 2012; Bowes 2010; Chirikure and others 2018), and a growing number of studies take an explicitly comparative perspective to urban life and society (e.g. Kohler and others 2017; Earle and Smith 2012; Fletcher 2009; Feinman 2018; Yoffee 2005).

4. Urban Form

This dimension includes architecture and the layout and planning of cities. This is a crucial realm for archaeology, since much of our knowledge of past cities comes from elements of urban form. As in the case of urban life, there are countless studies of urban form within specific regional urban traditions (Steinhardt 1990; Connah 2001; MacDonald 1986; Houk 2015), but few that cut across regions (Gates 2011; Smith 2007; Kostof 1991).

5. Urban Meaning

For some archaeologists, 'meaning' seems to be the most important dimension of urban analysis (Bowser and Zedeño 2009; Parker Pearson and Richards 1994; Rykwert 1988; Alt and Pauketat 2019). Because symbolic or cosmological meanings are exceedingly difficult or impossible to reconstruct in the absence of written texts (Rapoport 1990; Flannery and Marcus 1993; Trigger 2003), such analyses must rely very heavily on historical documents (Rykwert 1988; Lilley 2009; Carrasco 1991). Many archaeological discussions of urban meaning are highly speculative, with only a tenuous connection to the empirical record (Ashmore 1991; Pauketat, Alt, and Kruchten 2017), a practice I criticize elsewhere (Smith 2005; 2007; see also Blanton 1995 or Smith 2011).

6. Urban Growth and Decline

Whereas archaeologists can often document the growth and decline of ancient urban settlements, there has been little theoretical or conceptual work on this topic for premodern cities. Urban economists, on the other hand, are obsessed with urban growth (Glaeser 2011; O'Sullivan 2011). While much of the work in urban economics is difficult or impossible to apply to premodern cities (where the existence of money, firms, industrial production, or wage labour may not be pertinent), specific forays of urban economists into the past have generated some useful results on the topic of urban growth and decline (e.g. Bosker, Buringh, and van Zanden 2013; De Long and Shleifer 1993). There has been archaeological research into declining and abandoned cities and towns (Christie and Argenti 2012), but few considerations of general features or cross-cultural regularities.

These six dimensions serve two roles for understanding early urbanism. First, they identify empirical domains within the realm of cities and urbanism. Some archaeologists focus on city size, for example, while others focus on urban life and society. Second, these dimensions illustrate variation in theoretical approaches to the definition and analysis of early cities. The major definitions of city and urban differ in their use and emphasis of specific dimensions. It is to the realm of defining cities and urbanism that I now turn.

Definitions

> It is notoriously difficult to agree on a cross-culturally applicable definition of 'the' city, but we cannot do without definitions altogether […]. No single criterion, such as sheer size or use of writing, is adequate, and it seems best to use a somewhat fuzzy core concept rather than to try to establish criteria that will clearly demarcate all cities from all noncities (Cowgill 2004, 526).

There are innumerable definitions of city and urbanism in the literature of urban studies. Most of these are not useful for premodern times, for reasons articulated by urban anthropologist Anthony Leeds some time ago:

> Most current discussion of 'urbanism' and 'urbanization' can be shown to be ethno- and temporocentric and based on a historically particular class of urban phenomena and urban forms of integration […]. Generalizations are then made about 'urbanism' and 'urban society' based essentially on the urban experience of the past few hundred years, apparently without the realization that all urban phenomena of the past four or five hundred years have been ineluctably affected by the expansion of the capitalist system, in short by the development of what Wallerstein calls the 'World System'. The generalizations are, then, in fact not about 'urbanization' in general but about a single form of 'urbanism' or 'urbanization', its evolution, and its acculturational by-products (Leeds 1979, 227–28).

Forty years later, the situation has only improved slightly. In this section, I review the urban definitions most commonly used in archaeology.

Louis Wirth's Sociological Definition of Cities

Many archaeologists have used the sociological definition of Louis Wirth: 'For sociological purposes a city may be defined as a relatively large, dense, and permanent settlement of socially heterogeneous individuals' (Wirth 1938, 8). This is perhaps the most influential definition of city in the literature of urban studies generally, and in archaeology, even when Wirth is not cited (e.g. Sanders and Webster 1988; Kusimba 1999, 121–24; Cowgill 2004, 526; Gates 2011, 2). Emphasizing the dimensions of size and complexity (urban life), this definition fits contemporary cities in the developed world very well. Definitions both depend on and invoke theories and concepts, and the sociological definition works well with many of the approaches to theory and research on contemporary Western cities (Parker 2004; Sampson 2009; 2012).

While Wirth's sociological definition of urbanism works well for cities today, it does a poor job of identifying premodern cities in many regions. For example, ancient urban settlements of low population density will be excluded from urban status, yet a number of ancient state-level societies — for example the Classic-period Maya and the Khmer of Southeast Asia — were characterized by 'low-density urbanism' in the past (Fletcher 2009; 2012). Should Tikal or Angkor be excluded from urban status because their densities are not high enough? This concern led archaeologists to adopt the functional definition of urbanism.

The Functional Definition of Cities

Bruce Trigger was the first archaeologist to articulate this view: 'It is generally agreed that whatever else a city may be it is a unit of settlement which performs specialized functions in relationship to a broad hinterland' (Trigger 1972, 577). The urban functions that identify a city can be economic, political, or religious. This definition uses only one of the primary dimensions of urbanism; size and complexity are left out. While Tikal or Angkor might not have populations that are sufficiently large and dense to satisfy Wirth's definition, they clearly had monumental buildings that signal past urban functions. These cities had temples larger than other settlements, suggesting that their religious influence extended beyond the settlement proper, and they had royal palaces with resident kings whose influence extended far beyond the city.

The functional definition of urbanism grew out of central-place theory, which provides a group of concepts for analysing the regional configuration of cities. Central-place theory deals with the balance or trade-off between sellers — who want to locate in common settlements to achieve economies of scale — and consumers, who want goods and services to be located nearby; the movement of both buyers and sellers is limited by transportation costs (Christaller 1966; Lloyd and Dicken 1977; Mulligan, Partridge, and Carruthers 2012). There are a number of applications of this approach by archaeologists (Inomata and Aoyama 1996; Smith 1979). To identify a settlement as functionally urban, one must examine the entire settlement system for a region. To identify a settlement as sociologically urban, on the other hand, only requires data on the target settlement itself.

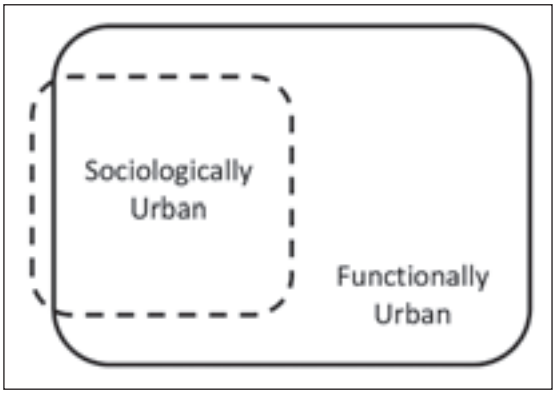

Figure 2.1. Relationship between the sociological and functional definitions of urbanism. Drawing by author.

In the 1970s, anthropologists broadened the concept of urban function to include features in the domains of politics and religion (Blanton 1976; Fox 1977; Marcus 1983). In the political domain, urban functions are about the control of people or territory outside the boundaries of the city. Cities with political urban functions are either capitals of a polity or else administrative centres within an empire or large polity. The functional definition of cities has been used extensively by archaeologists (e.g. Blanton 1976; 1982; Marcus 1983; Woolf 1993; Trigger 2003; Smith 2007; Fernández-Götz and Krause 2013), and it has stimulated more conceptual and methodological development than the sociological definition. Figure 2.1 illustrates the relationship between these two definitions. Almost any city that fits Wirth's definition will also fit the functional definition, but the inverse is not the case. Archaeologists have engaged in contentious debates about the usefulness of these two definitions.

Table 2.2. Urban attributes of Aztec settlements of varying size. For urban definition, each urban tradition will have its own list of attributes. Table based on Smith (2016), Table 10.2.

Attribute	Type of variable*	Capilco (Village)	Cuexcomate (Town)	Yautepec (City-state capital)	Tenochtitlan (Imperial capital)
Settlement Size					
population	M	100	800	13.000	210.000
area (ha.)	M	1	15	210	1.350
density (persons / ha)	M	100	50	60	155
Social Impact (urban functions)		***2***	***3***	***11***	***15***
royal palace	P/A	-	-	x	x
royal burials	P/A	-	-	L	x
large (high-order) temples	P/A	-	-	x	x
civic architecture	S	-	1	2	3
craft production	S	1	1	2	3
market or shops	S	?	1	2	3
Built Environment		***0***	***8***	***9***	***10***
connective infrastructure	P/A	-	-	L	x
intermediate-order temples	P/A	-	x	x	x
elite residences	P/A	-	x	x	x
formal public space	P/A	-	x	x	x
planning of epicentre	P/A	-	x	x	x
Social and Economic Features		***2***	***6***	***8***	***10***
elite burials	P/A	-	-	L	L
social diversity (non-class)	P/A	-	-	L	x
neighbourhoods	P/A	-	x	x	x
agriculture within settlement	P/A	-	x	x	x
imports	S	2	2	2	3
Total attribute score		**4**	**17**	**28**	**35**

**Type of variable:* M: quantitative measurement or calculation; P/A: presence/absence; S: measurement scale (1: low; 2: moderate; 3: high); x: present (scored as 2); L: likely present (scored as 1)

The Physical City and the Social City

A contrast between the physical and social aspects of cities is becoming increasingly popular in the literature of urban studies. This is phrased in various ways, including physical city vs functional city in urban economics (Demographia 2017), and physical city vs socioeconomic city for complexity-based scaling analysis (West 2017, Chapter 7). The most concise statement of this contrast — and the version that best fits premodern cities — is that of Bill Hillier (1996b, 41): 'Physically, cities are stocks of buildings linked by space and infrastructure. Functionally [socially, in my scheme], they support economic, social, cultural, and environmental processes'. This distinction brings the challenges of urban archaeology to the fore. We map and excavate physical cities, but we want to reconstruct social cities. The physical/social distinction is less useful for identifying cities or urbanism in the past, but it is useful conceptually as a way to organize our knowledge and research.

Social Interactions

In the mid-twentieth century geographers started mapping the movements of goods and people, within and between cities (Haggett and Chorley 1969). Today, many economic geographers and urban economists define cities in terms of the spatial patterns of such interactions. Urban economist Edward Glaeser (2011, 6), for example, provides this informal definition of cities: 'Cities are the absence of physical space

between people and companies. They are proximity, density, and closeness'. He later says, 'The central theme of this book is that cities magnify humanity's strengths. Our social species' greatest talent is the ability to learn from each other, and we learn more deeply and thoroughly when we're face-to-face' (Glaeser 2011, 250; see also Storper and Venables 2004). Some scholars have generalized this perspective into the notion that, 'Cities were evolved primarily for the facilitation of human communication' (Meier 1962, 13), or 'More than anything else, the city is a communication network' (Lynch 1981, 334).

Increases in social interactions produce energized crowding, something I discuss in more detail in Smith (2019). In urban economics and related fields, social interactions — and the principle that interactions increase with population — are the bases for quantitative models of settlement scaling, and the outcomes of those models can be identified and measured, for both contemporary and ancient cities (Lobo and others 2019; Ortman and others, this volume). Roland Fletcher's (1995) model of settlement growth also uses social interactions to define the basic dynamics of settlements and cities. Today, patterns of movement and interaction are becoming easier to measure with the availability of 'big data' for many cities (Bettencourt 2014; Blei and Smyth 2017). But for archaeologists, social interactions within settlements remain difficult to measure directly, and the use of social interactions to define cities operates more at a conceptual than an empirical level. Outside of the settlement-scaling literature, one of the few uses of the social-interactions definition is found in Fisher and Creekmore (2014, 9).

Archaeological Features on the Landscape

For a paper on the identification of cities using archaeological data (Smith 2016), I devised a simple method to examine urban attributes at settlements within a single urban tradition. Most of the attributes correspond to the 'physical city'. I compiled information on the presence of key urban features and institutions at three Aztec sites I had excavated. I also include the Aztec imperial capital Tenochtitlan (Table 2.2).[2] The table includes attributes organized into four dimensions: settlement size, social impact (urban functions), features of planning and the built environment, and social-economic features. The attributes are selected using three criteria: (1) each has significance in some theory or concept of urbanism; (2) each can be recovered with archaeological fieldwork; and (3) each has some significance within the particular urban tradition (Aztec settlements, in this case).

I apply crude numerical scales to highlight variation along these dimensions. The Aztec settlements in Table 2.2 illustrate a continuum from village to imperial capital, with all four dimensions — size, urban functions, built environment, and institutions — showing increasing scores at each step along the scale. The 'total attribute score' is a numerical approximation of a general urban dimension for Aztec settlements. The biggest gap in the attribute score is the 400 per cent jump from the village to the town. For commoner wealth and lifestyle, the big break in this sequence is between the imperial capital and the other settlements. Nadine Moeller (2015, 15–26) uses a broadly similar approach by defining types of urban (and non-urban) settlements and describing the specific archaeological traits that are relevant for ancient Egyptian urbanism (see discussion below).

Network Definitions

A number of archaeologists have used the position of a settlement within a regional network of interaction to define cities and urbanism (e.g. van der Leeuw 2007). This perspective has been developed most extensively in the work of the Centre for Urban Network Evolutions at Aarhus University. Rubina Raja and Søren Sindbæk (2018, 14) state that the main difference between urban and non-urban societies, 'is a property of the communications that they [cities] facilitate within and between societies'.

Vague Polythetic Definitions

The complexity of cities, coupled with problems in defining cities (see quote from Cowgill above), have led some archaeologists to avoid clear definitions in favour of heterogeneous lists of traits that may or may not be present for a given ancient settlement. Monica Smith (2019, 12), for example, defines a city as, 'a place that has some or all of the following characteristics: a dense population, multiple ethnicities, and a diverse economy with goods found in an abundance and variety beyond what is available in the surrounding rural spaces'. Other examples of this trend are Joyce Marcus and Jeremy Sabloff (2008, 13) and Bisserka Gaydarska, Marco Nebbia, and John Chapman (2020), who state in one place that they deliberately refuse to define 'urban' and, in another passage, list nine traits that identify Trypillian sites as urban. This polythetic approach can provide a useful perspective for settlements within an urban

2 See the original paper (Smith 2016) for an earlier version of this table and a parallel table for Iron Age oppida settlements.

tradition (see the archaeological-features approach above), but it prevents comparative analysis among different traditions.

Idiosyncratic Definitions

I include here two idiosyncratic approaches to urban definition. First, some archaeologists have adopted idiosyncratic definitions, not based on theory or comparative consideration, in order to claim that a particular settlement system was 'urban' in character. For example, Michael Heckenberger and others (2008, 1214) define Amazonian urban systems as, 'multicentric networked settlement patterns, including smaller centers or towns' (see also Heckenberger 2013). The list of nine 'urban' traits by Gaydarska, Nebbia, and Chapman (2020) includes features absent from most treatments of urbanism (e.g. the overall social structure, and the scale of subsistence), suggesting that their approach is also idiosyncratic in nature.

A second idiosyncratic approach consists of taking the surprisingly common, yet mistaken, view that V. Gordon Childe's (1950) well-known list of ten features of the 'urban revolution' is a scheme to define or identify cities (e.g. Maisels 1999, 25–27; Steadman 2015, 133). As I explain elsewhere (Smith 2009), Childe used these traits to identify the transition to the first state-level societies, not as a scheme to identify cities; 'urban revolution' was his term for the rise of the first states, a process that included the development of cities (his first trait).

Flexible Definitions

For individual research projects that focus on cities or urbanism, the choice of definitions is a crucial task. Analysis of regional patterns may favour a functional definition, since that approach explicitly invokes regional patterns. Analysis of the effects of population density might be carried out either with Wirth's sociological definition, or perhaps a more limited subset of Wirth's factors would be appropriate (e.g. Osborne and Cunliffe 2005; Fletcher 2009; 2012).

For some purposes, a basic descriptive urban definition is needed to set the bounds of inquiry. This is the situation for studies of regional urban traditions or comparative patterns. In my book on urban life, for example, I begin with this definition: the terms city or urban describe settlements where population and activities are concentrated in space (Pumain and Rozenblat 2018). This is a deliberately vague and flexible definition; I go on to explore different approaches to definition (as reviewed above), and show how distinct definitions are useful for particular purposes (Smith forthcoming, Chapter 1).

An excellent example of this kind of simple and flexible approach to defining cities and urbanism is Moeller's (2015) study of ancient Egyptian urbanism. Instead of proposing a single definition of urbanism, Moeller uses a more general approach. She notes that population size or density cannot be part of the definition of cities (or types of cities) due to the fragmentary nature of the remains and the difficulty of bounding Egyptian settlements. Therefore, 'A definition that is useful for towns and cities in ancient Egypt needs to be based more heavily on their role and function, their geographical location, and their overall layout' (Moeller 2015, 11). Moeller then isolates seven types or categories of settlement, and identifies the nature of the archaeological evidence for each. These are: national capital; provincial capital; state foundations with urban character; state foundations of non-urban character; fortresses; special-purposes settlements and production sites; and villages (Moeller 2015, 15–26). She is careful to note the provisional character of this typology, which is meant to be a working scheme:

> The aim of this typology is to offer a framework for the analysis of the urban fabric and should by no means be regarded as the only approach through which settlement in Egypt should be viewed (Moeller 2015, 15).
>
> The framework of an attempted typology is a useful starting point from which to investigate the archaeological data from excavated sites and helps to broadly categorize the available evidence. It is important to emphasize that such a typology has its weaknesses and does not capture all the facets of the different kinds of settlements and in addition shows a certain degree of overlap. Such a typology does not really encompass the essence of the urban fabric but only provides some general guidelines (Moeller 2015, 376).

Moeller's approach is similar to the archaeological-features definition described above. It combines material attributes of actual settlements with theoretical notions of urbanism and society in Egypt.

Comparative Analysis for Premodern Cities

Why Compare Things?

Scholars in the social sciences and history use comparisons for a variety of purposes. Judit Bodnár (2019) summarizes these under three categories: discovery (to learn new things about cases, variables, or relationships), generalization, and causality. As ana-

lysed by William Sewell (1967), these basic reasons for comparison can be traced back to the great historian Marc Bloch (1925). In this section, I modify this scheme and discuss seven specific reasons why archaeologists should compare cities (or, more specifically, compare traits or aspects of cities); these are listed in Table 2.3.[3]

Table 2.3. Reasons to compare premodern cities.

Discovery
1. To better understand a given case
2. To identify new processes and patterns
Generalization
3. To generalize about a phenomenon
4. To distinguish the unique from the universal
Causality
5. To uncover causal dynamics
Broader reasons
6. To combat recentism
7. To promote synthesis

A common misunderstanding, in both history and archaeology, is the idea that comparative analysis must use whole societies or settlements or nations as the unit of analysis. Indeed, much of the methodological literature on comparisons in history, archaeology, and the social sciences argues that the most productive comparisons are *not* those between nation states or whole societies, but rather those between specific attributes or traits or processes (Kocka 2003; Smith and Peregrine 2012; Steinmetz 2014; Hoyer and Manning 2018). Such whole-society comparisons can trigger the claim that comparison is an invalid method because each site or culture is unique. But, in the words of historian Jürgen Kocka (2003, 41), 'One cannot compare totalities, in the sense of fully developed individualities. Rather, one compares in certain respects'.

In archaeology, comparison often takes the form of an argument by analogy. This process involves the use of a group of cases that make inferences about a target case, using inductive logic. The definitive methodological work on analogy in archaeology is Wylie (1985); I provide an updated treatment in Smith (2018). Unfortunately, many archaeologists continue to make the whole-society error mentioned above (e.g. Eppich 2020).

1. To Better Understand a Given Case

Archaeological remains are localized, consisting of individual buildings, sites, or regions. Given the importance of analogy for understanding the social implications of archaeological remains (Smith 2018; Wylie 1985), it is almost impossible to say anything interesting about a given site without some kind of comparison. All archaeologists use comparative data this way to illuminate their finds, whether or not they are interested in a generalizing approach. On a basic level, we constantly compare our finds and interpretations to those of other sites in the same region or time period. For example, I was surprised to excavate a number of rock piles covering unusual offerings at the provincial Aztec site of Cuexcomate. In order to understand these features and their possible use, I examined comparative archaeological data from other Mesoamerican sites, as well as comparative historical data from written sources. As a result, I concluded that these were ritual deposits that commemorated the end of a fifty-two-year calendrical cycle (Elson and Smith 2001).

The use of comparative data to understand a given site or case is so widespread and common that it is rarely singled out as a distinct method or approach. Comparisons can be informal, or they can be more explicit and systematic. Formal comparisons are frequently concerned with quantification and sampling (Smith and Peregrine 2012), and such methods can produce richer, stronger, and better archaeological interpretations of individual cases than hasty comparisons using a few ad hoc examples (Smith 2015).

2. To Identify New Processes and Patterns

A different goal of comparison is not to learn about the cases per se, but rather to use the cases to learn about larger social processes and patterns. Before I published my book on Aztec cities (Smith 2008), information on many of these sites had been scattered in obscure reports and publications. By assembling the data and comparing these settlements, I was able to identify a number of new processes. For example, whereas archaeologists had previously thought that architectural similarities between provincial cities and the capital Tenochtitlan were based on imperial conquest and expansion, I was able to show that many similarities had in fact spread throughout central Mexico long before the formation of the Aztec Empire. This, in turn, led to a new appreciation for networks of elite interactions in the pre-imperial period.

3 My discussion here is an expansion on a list of four reasons for comparative analysis that I published previously (Smith 2018).

3. To Generalize about a Phenomenon

This point pertains to the realm of cross-case analysis, where the goal is not to use comparison to understand a single site or feature, but to learn about similarities and differences among the cases within some domain. Generalization is impossible without comparison. The main temple in Aztec Tenochtitlan — the Templo Mayor — was used by some archaeologists to generalize about Aztec temples in general. But when I assembled a larger sample of Aztec temples in my book, it became clear that while some features of this temple-pyramid are general features of Aztec temples (e.g. that the central temple at a site faces west across a plaza), others (e.g. its form as a twin-stair pyramid) only occur on a few Aztec temples (Smith 2008).

4. To Distinguish the Unique from the Universal

Poor comparative methods over the years have led to many errors in generalizing about premodern cities. Max Weber (1958) claimed that the defensive wall was a universal feature of premodern cities, and Hillier (1996a) implied that all cities have streets, both of which are false generalizations. As a Mesoamerican city, Teotihuacan was unique in a number of respects, including the extent of its orthogonal planning (Smith 2017b). Yet its inhabitants participated in a near-universal Mesoamerican cult based on specific gods of rain and storms (Carballo 2016). This knowledge of unique and universal features only comes from comparing Teotihuacan with other Mesoamerican settlements. Inadequate attention to comparison has led to many incorrect conclusions about premodern cities.

5. To Uncover Causal Dynamics

Causation in the human sciences is a complex issue, one that archaeologists have tended to ignore in recent decades. But some notion of causality — whether of traditional causal forces or systems models with feedback — is required for most social scientific approaches to cities and other social phenomena. Because of the difficulty of applying statistical models of causality to archaeological data, archaeologists usually must be satisfied with more informal causal models. Nevertheless, whether one is using formal causal methods (Pearl and Mackenzie 2018), causal mechanisms (Bunge 2004; Demeulenaere 2011), a natural experiment model (Diamond and Robinson 2010), or an informal causal scheme (Blanton and Fargher 2008), comparative data — and rigorous comparative methods — are crucial if we are to understand and explain how societies and cities worked in the past, and how they changed (Hoyer and Manning 2018; Kocka 2003; Steinmetz 2014).

One outcome of my study of Aztec cities was the claim that the primary causal force shaping both the creation and form of these cities was the striving and propagandistic efforts of petty kings to show off their power. This inference came from showing similarities of building types and layouts, and linking those features to political dynamics using collective action theory (e.g. Levi 1988). For Teotihuacan, I employed comparisons with earlier and later cities to show how the trajectory of urban forms in central Mexico was shaped largely by the efforts of Teotihuacan rulers to reject earlier forms of urban planning, and then the efforts of later kings to reject Teotihuacan urban planning principles (Smith 2017b).

6. To Combat Recentism

The final two reasons to compare past cities operate on a broader plane, and concern the ways these settlements inform understanding of both recent cities and urbanism, and general patterns of urbanism that may transcend the premodern/modern divide. Recentism in a scholarly discipline refers to the 'considerable narrowing of the time periods that inform its empirical and conceptual studies' (Jones 2004, 288). That is, published research in historical geography and related fields — over the past half century — has tended to concentrate increasingly on more recent time periods. For sustainability science, for example, 'long-term trends' only operate over the span of the past few decades (Kates and Parris 2003), a laughable notion to archaeologists. If recentism can be avoided by comparing cities in the distant past to those in the recent past or the present, then scholarly understanding of urbanism as a general process will be based on a much stronger empirical basis.

7. To Promote Synthesis

A new trend in the natural and social sciences is the active promotion of the synthesis of existing knowledge. This involves secondary-level analysis of previously gathered (and usually previously published) data to reach broader conclusions. Synthesis involves, 'accessing, analyzing, and comparing disparate data sets to produce explanations and insights about human behavior that could never emerge from the analysis of individual projects' (Altschul and others 2017, 11000). This is commonly pursued through the creation of dedicated synthesis research centres designed specifically to promote synthetic research in key fields (Hackett and Parker 2016; Rodrigo and others 2013). Archaeology can boast

of the newly formed Coalition for Archaeological Synthesis (Altschul and others 2017; 2018), and plans are currently underway to host that operation in a synthesis centre at a major university. The settlement scaling research described in Ortman and others (this volume) is an example of archaeological synthesis; by analysing data already gathered from settlement systems, we have come to new conclusions and new understandings of the past.

The synthesis of archaeological data does not require a formal research centre, however; it can be done on a smaller scale. Some prominent examples that use archaeological data are the SESHAT research project (Turchin and others 2015; 2019); the Southwest Social Networks Project (Mills and others 2013; 2015), and a project on ancient inequality headed by Timothy Kohler and myself (Kohler and others 2017; Kohler and Smith 2018). There are few synthetic research projects that focus on premodern cities; one partial example — that includes archaeological and historical data — is the project Service Access in Premodern Cities (Dennehy, Stanley, and Smith 2016; Smith and others 2016; Stanley and others 2016). The potential for generating important new findings is great in this kind of synthesis operation, which is an example of comparative analysis.

Comparison Requires Simplification

'All social science research must do some violence to reality in order to reveal simple truths' (Lazer and Friedman 2007, 673). The 'violence to reality' that these scholars mention consists primarily of simplification. As noted above, it is difficult or impossible to compare complex units in their entirety (Kocka 2003), so the researcher must simplify complex entities (such as past cities) in order to make comparisons on a smaller level. If one refuses to simplify, then comparison is impossible and one exits the realm of scientific, or social scientific, epistemology and research. 'Science seeks to organize knowledge in a systematic way, endeavoring to discover patterns or relationships among phenomena and processes' (Mayr 1982, 23).

The need for simplification in comparative analysis is stated eloquently by Robert D. Drennan and Christian E. Peterson (2012, 88), who suggest that archaeologists need to 'dare to be inaccurate' by engaging in the simplification required by comparative analysis. A parallel point on the need for simplification in social-science theory development is made by sociologist Kieran Healy (2017, 121), who notes that 'Abstraction means throwing away detail, getting rid of particulars […]. This sort of abstraction is part of the guts of social theory'. Abstraction is a kind of simplification.

The simplification called for in comparative analysis is viewed very differently by historians and social scientists. In the words of Bodnár (2019, 5), 'Many historians have serious reservations about doing comparative research whereas sociologists see no problem with it and diligently work on improving methodology'. One reason historians have reservations about comparative analysis stems from their inclination to stay close to their sources (Kocka 2003). In a recent discussion of comparison and analogy in history, historian Peter Gordon (2020) suggests that, 'historians by methodological habit, are inclined to see all events as unique, rather than seeing them, as a political scientist might, as a basis for model-building or generalization'. Gordon also notes that because historians rarely receive training in social-science methods or the philosophy of social science, they often confuse incommensurability with simple difference.

A Comparative Urban Archaeology

The establishment of the *Journal of Urban Archaeology* marks a big step forward in the development of archaeological knowledge about urbanism in the past. On a basic level, the worldwide scope of the journal will make archaeologists aware of urban research in areas of the world outside of their own specialty. At a higher analytical level, this journal can provide a stimulus to the comparative study of past cities, in many regions and time periods. But the simple juxtaposition of articles describing different contexts does not, in itself, constitute comparative analysis, just as the assembly of chapters on diverse early cities in edited volumes (Fisher and Creekmore 2014; Marcus and Sabloff 2008) is not truly comparative. In the words of Juan Carlos Moreno García (2014, 209), 'a succession of chapters, each one "locked" within the limits and idiosyncrasy (methodology, types of sources, scholarly traditions, etc.) of its own discipline, thus [makes] true comparison almost impossible in the absence of a previous well-defined agenda for common research'.

I have made two points in this paper. First, I have promoted a flexible and problem-oriented approach to defining urbanism in the past. Definitions are theoretical terms (Kaplan 1964), they are institutional facts (Searle 1995). They depend on research questions and theoretical approaches. There is no single-best definition of city or urbanism in the past. Rather than spending time trying to fit a single narrow definition to the archaeological record, archaeologists should make their goals and conceptual approach explicit, and those factors will dictate the kind of definition that will be useful.

My second point is that comparative analysis is necessary to develop a rigorous knowledge of the nature, context, operation, and changes of past cities. There are many types of comparison, made of different phenomena at different levels, among cases from many types of context. All of these are valuable, if they are framed with respect to one's research goals and theory. I have tried to show some of the ways that comparative studies of archaeological data from past cities can advance knowledge and improve the study of urban archaeology.

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