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Urban Network Evolutions: Exploring dynamics and flows through evidence from urban contexts

"Now in earlier times the world's history had consisted, so to speak, of a series of unrelated episodes, the origins and results of each being as widely separated as their localities, but from this point onwards [after the Second Punic war] history becomes an organic whole: the affairs of Italy and Africa are connected with those of Asia and of Greece, and all events bear a relationship and contribute to a single end."

Polybius, *Histories* 1.3

The rise of urban societies as the vehicles of societal processes has long been recognized as a turning point in history. However, the nature of urbanism and the way in which scholars define it remains a point of fierce discussion. While one might argue that there is no one way of defining urbanism and the forms it takes, it is important to try to tackle the underlying issues of what distinguishes urban societies, in particular what qualities make them urban. Urbanism and urban development are often discussed and researched within a diachronic perspective, giving the subject an evolutionary or linear framing. Such a framing insists that there is a defined beginning, trajectory and model, as well as, potentially, a defined end to urban societies and urbanism that can be studied through the interpretation of urban remains or historical sources. Thus urbanism is often taken to have emerged in a recognizable, coherent form at one point in time – and fairly rapidly – and thence developed into something more refined and elaborate.

Moreover, the emergence of urban societies is often assumed to be embedded in the emergence of states and political organizations. While this mode of inquiry has colored our conception of what it meant to be urban, there are other useful approaches that might shed light on how societies developed and which mechanisms lay behind such developments. One mode is to consider urban networks as dynamics and flows, which can inform us about the ways societies respond and develop, and which tell us about their thresholds of resilience (Raja and Sindbæk forthcoming).

The quote opening this chapter clearly shows how, already by the time of the Punic Wars, a contemporary observer could perceive his world as intimately connected across a wide geographical space; Polybius even notes the idea of an interlinked world history. Networks are underlined as central to understanding developments in the world. Cities were indeed the glue that bound regions together both internally and externally. Cities and their societies were the drivers of both contact and development. Since relationships and connections might be seen as imperative to urban behavior and dynamics, we are interested in exploring them from a network perspective. Understanding the nature of such connections and their meanings might allow for a more nuanced view of the diversity of urban societies and their behaviors over time. While much emphasis has been given to the material culture, particularly its monumental expressions, a network perspective brings new means of viewing different urban societies and how they interacted with the surrounding world as well as the strength of these networks.

The Centre for Urban Network Evolutions (UrbNet), based at Aarhus University, Denmark, was established in 2015 with a grant awarded by the Danish National Research Foundation. Its mission is to study urban societies in terms of their social networks in the broadest sense. In archaeological and historical research, this approach represents a new, explorative, even experimental perspective on a crucial topic. There is much debate among researchers about the transformative significance of urbanism in human history. Still, this development has often been studied as a byproduct of the development of political institutions, particularly state power; otherwise it is seen in material terms as a rise in settlement complexity rooted in regionally founded demographic growth. UrbNet explores an alternative suggestion: that what is distinct about urban civilizations and their role in world history is a property of the communications that they facilitate within and between societies. In this perspective, the networks of societies take center stage and become benchmarks for the ways in which those societies act and prioritize.

Urbanism can be a catalyst for changes in ways of life marked by social complexity and networks of wider, ultimately global, interdependence. Current research suggests that urban networks may have been critical in rapidly triggering societal and environmental changes across vast spaces a number of times in history. Crucial – and controversial – examples include the 4th-century BCE Hellenistic expansion, the rise of the Roman Empire, the 6th-century CE Justinian Plague, the 8th-century CE Abbasid-Tang "maritime silk road" and the 13th-century CE Mongol World System. In situations like these, it is crucial that we investigate and understand the relevant networks in detail. Here, a high-definition archaeological approach is one way to gain insight into specific situations that may have marked turning points. By investigating materials, such as glass or bones in a high-definition perspective (Barfod et al. forthcoming; Ashby et al. 2015) – and guided by new questions pertaining to wider networks and local developments, for example, availability of local fuel or import possibilities – new patterns and explanations emerge.

The development of urbanism affects social networks in a number of ways. Family affiliations may become more entangled and focused on individuals in urban societ-ies as compared, for instance, to societies primarily organized through clans, tribes or lineages. The frequency of day-to-day meetings, and the likeliness of encountering strangers, are multiplied in urban centers, whence reciprocal non-kinship ('civil') relations and modes of dealing with others are stimulated. Political societies in urban populations tend to involve a negotiation of interest between interdependent, crisscrossing groups, which could weaken and balance power hierarchies and encourage wider participation in political affairs. Perhaps the most widely debated aspect of urbanism and social networks, however, concerns the emergence of commercial networks of exchange, which may also be tied to the networks linked to social structures. How we can disentangle networks, which on the one hand pertain to close affiliations and on the other hand stretch beyond these, remains to be seen.

Commercial exchanges are seen in some historical studies as an almost universal catalyst for social complexity, particularly for the emergence of urban places as markets in the widest sense – be it for politics, trade or religion (e.g., Taylor 2013). At the other end of a wide continuum of models, others regard it as a derived mechanism of distribution, dependent on the political institutions of state power (e.g., Wickham 2009). A pervasive lack of data on the early stages of many urban societies has allowed widely diverging reconstructions of their origins and development to persist. Research on urbanism is still chiefly informed by the privileged view afforded by the extensive records left by later, sometimes millennium-old urban societies (e.g., Ancient Mesopotamia, Classical Rome and Greece, Medieval Europe and China). Consequently, whether urbanism and exchange patterns are viewed as developing as (in a pertinent metaphor) two sides of one coin or as developments that unfolded independently depends on the convictions of the individual scholar.

UrbNet seeks to expand our knowledge beyond these – often politicized – conceptions by focusing on case studies that are considered marginal to, or at odds with, established definitions or narratives. This may come about by considering sites that seem to diverge from the pattern of 'normal' towns and cities, such as maritime emporia, caravan stations, or religious centers. It could also come about by focusing on aspects of citizens' life that have not been considered specifically 'urban', for example religion, family patterns, or economic activities such as urban gardening or fishing. Or it may be by tracing the flow of materials – metals, glass, furs and hides, etc. – that challenge the traditional, conceptual divide between bulk consumption and luxury commodities as well as between long-distance trade and local circulation. This research may provide a better basis for determining, for example, if the development of long-distance trading networks always involves the emergence of sites and societies with urban characteristics; or how often the emergence of large, dense and complex settlements stimulate exchange networks.

This book showcases a number of examples that define the UrbNet approach to network evolutions in order to illustrate the various ways in which it is possible to enquire into the diverse nature of the networks and dynamics that stood at the core of ancient urban societies. When seeking to characterize how urbanisms have developed in terms of social networks it is not enough to reconsider existing data from a new

perspective. The majority of evidence known today has been gathered with reference to different perspectives, and much of it focuses on the structural and political properties of urban sites, such as their size and density, or features like town walls, monuments or public spaces (Hansen 2006). To understand how networks have operated in and between urban societies, we need to establish new datasets and, sometimes, develop and refine new methods for acquiring these data. A key challenge is thus to improve the means of archaeology to study developments across sites and regions. This requires us to understand the nature of contexts and finds and identify the pace of changes in site histories well enough to assess and compare their potential causes.

This is why some of the work conducted at UrbNet concerns technical matters such as improving the precision of dating methods for site-chronologies, improving the means of tracing the origin of archaeological materials or assessing the nature of the contexts. A much more challenging task than mapping sites and ruins and establishing the relative age of building-phases, this quest for new types of data aligns UrbNet's research agenda with the potential of recent advances in archaeological science and geoscience. To obtain new answers, fundamental questions concerning human history must translate into investigations concerning things such as the isotopic composition of materials; the morphology, geochemistry or microbiology of sediments; the statistical distribution of dating results or the subtle patterns of 'big data'. Even more challenging, the results need to translate back into historical narratives in order to realize their potential.

This last task calls for researchers with interdisciplinary training and broad outlooks, which is rare among researchers today but critical to the future development of historical and archaeological research on complex societies. UrbNet, therefore, has an important task in training scholars within this field, bridging scientific methods with contextual, historical studies. Such training must build on a knowledge of several fields of research, often crossing the boundaries of the humanities and sciences. It must also seek to bridge these through common hermeneutics, in some case by synthesizing approaches that may seem mutually exclusive. Developing UrbNet, and pursuing the basic research problems it aims to answer, is therefore not a short-term goal but a process which will require multiple levels of development and will inevitably take several years to unfold. The current book and its contributions are one step along this path.

Acknowledgements

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Urban green spaces, as part of a wider environmental context, have the potential to help address problems 'upstream', in a preventative way – considered a more efficient approach than simply dealing with the 'downstream' consequences of ill health (Morris et al., 2006). Recent studies have provided evidence of multiple benefits from urban green space, through various mechanisms, and with potentially differential impacts in various populations. Epidemiological studies have used a multitude of approaches to measure the effects of urban green space availability and accessibility on the health outcomes of study participants.