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A Long-Term Archaeological Reappraisal of Low-Density Urbanism

Implications for Contemporary Cities

ABSTRACT Dispersed, low-density urbanism has conventionally been considered as a unique consequence of industrialization and factors such as mechanized transport. Pre-industrial urbanism by contrast, has been perceived almost entirely in terms of compact densely inhabited cities with a strong differentiation between an urban and a rural populace. Evidence demonstrates, low-density settlements were a notable feature of the agrarian-urban world, especially in the tropics, and have been a characteristic of every known socio-economic system used by *Homo sapiens*. This paper situates past examples of large, low-density, dispersed urban settlements, with their long histories and their distinct patterns of growth and demise, in relation to contemporary low-density cities. This critical reappraisal of low-density, dispersed cities in the context of a long and culturally diverse urban past is significant for addressing urban sustainability challenges.

KEYWORDS Low-density urbanism; comparative urbanism; cities; urban sustainability; dispersed urbanism; settlement archaeology; urban planning; urban archaeology.

Introduction: Context and Issues

The proliferation of dispersed, low-density urbanism in today's world has inspired considerable scholarly and popular interest (Angel 2012; Ewing and others 2018). Although there is no consensus in the literature, the predominant view has been that low-density settlement patterns are a new phenomenon (Bogart 2006; Nielsen 2017; Moroni and Minola 2019). Dispersed urban forms are still considered to be related to new and novel variables such as mechanized transport (Gutfreund 2005), the commercial real estate industry (Ehrlich, Hilber, and Schöni 2018), the rise of the middle class (Gunn and Bell 2011), and the changing political economy of the consumer city (Salvati and Carlucci 2016, 1356). More often than not such descriptions speak of the destruction of the historical city (Ross 2015, 1–5). But, in fact, low-density urban settlements are not new. Low-density settlements have been a recurring feature of past societies and are particularly prevalent in the tropical landscapes of urban societies in the medieval world (Fletcher 2009). Archaeological precedents provide scholars, planners, and urban experts with complete case studies of low-density cities as they have grown, flourished, and declined over 500- or even 1500-year time spans (Hall, Penny, and Hamilton 2019; Klassen, Weed, and Evans 2018). The life cycles considered by most urban-sustainability experts come nowhere near this time frame (Güneralp and others 2017; Rubiera-Morollón and Garrido-Yserte 2020). If we wish to seriously discuss the design of sustainable and resilient cities for future generations, such archaeological case studies provide valuable experiential references, or 'natural experiments', to use the terminology of Jared Diamond and James Robinson (2010), and dissolve the assumed correlation between industrialization,

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capital markets, and low-density urbanism. Instead, low-density settlement must be viewed as a mode of settlement organization that is currently facilitated by factors such as mechanized transport but is not determined or uniquely caused by the technical and economic circumstances of the past two hundred years. This is crucial for two reasons. First, it is important to know that present-day dispersed urbanism is not a peculiar and transient form of human behaviour and, as a result, it may be rather harder to convert to a compact pattern than opponents of urban sprawl might wish. Secondly, it is important because the removal of a necessary connection to mechanization means that alternative paths to urbanism were possible as a derivative of the industrial revolution. Urban dispersion and the evolution of the industrial capitalist complex are two different processes. The most frequent explanation for the urban forms of the nineteenth and twentieth centuries is to link industrialization and urban expansion in a causal relationship (Bogart 2006). Archaeology shows us that dispersed urbanism has its own clear path, without a strict causal relationship to the political economy of societies. In essence, urban theorists must advance a far more profound appraisal of urban form than the ascription to transport, residential preference, and market dynamics that has been posited so far (Newman and Kenworthy 2006; 1999; 1989; Nielsen 2017; Moroni and Minola 2019). Such arguments imply that modern-day low-density urbanism is an inevitable consequence of the industrial urban complex. By challenging and removing deterministic links between low-density cities and industrialization (Ewing and others 2018), society can adopt a more nuanced approach to understanding low-density urban forms and their evolution and performance. Further it frees up possibilities for the transition towards sustainable transformation of current low-density patterns, even if such a transformation will be a rather more demanding task than critics of sprawl might recognize or wish to acknowledge (Ewing and others 2018; Moroni and Minola 2019).

Cities and towns located in tropical latitudes, in Mesoamerica, South Asia, and Southeast Asia, share many similarities with temperate cities (Trigger 2003; Smith 2003). However, they have not received the same focus or volume of research as have the compact urban traditions of the Mediterranean, temperate and arid regions, including Mesopotamia, India, and China (Graham 1999); nor have they received an equivalent measure of global attention, except for the romance of their 'lost in the jungle' image (Clémentin-Ojha and Manguin 2007). As a result, the general archaeological models of urbanism (Zuiderhoek 2017) tend not to be based on the cultural traditions of the humid tropics (Graham 1999; Isendahl and Smith 2013). This paper is an initial step towards correcting that bias and establishing a body of knowledge that provides the pre-industrial precedents for modern, low-density industrial cities. To do this the paper challenges the artificial separation between pre-industrial cities and industrial cities and focuses on low-density spatial patterns that reoccur through time. As Monica L. Smith argues:

> Rather than seeing cities as fundamentally changed by the advent of the Industrial Revolution and the global connections of the modern world, new anthropological research suggests that both ancient and modern cities are the result of a limited range of configurations that structure human action. (Smith 2003, 2)

Low-density cities are now well documented in the archaeological record. In lowland Central America, Maya cities have been well known since the 1960s (Willey 1956b; 1965; Sabloff and Fash 2007). More recently, the great urban complex of Angkor has been mapped (Evans and others 2007); it extends across approximately 1000 km^2 of central route-grid networks, surrounded by dispersed occupation mounds in vast suburbs, interconnected by canals and roads. There is also a need to consider the examples of the great Buddhist cities of the dry zone of Sri Lanka, Anuradhapura and Pollonaruwa (Coningham and Gunawardhana 2013). They involve central concentrations of massive shrines and monasteries, surrounded by an even scatter of occupation around networks of huge reservoirs and canals. Pagan in Myanmar (Hudson 2004) is another example, although more on the scale of the Mayan centres. There were even mobile, widely spread-out urban settlements (Fletcher 2020). In Ethiopia, mobile low-density cities, the *ketema*, were the temporary dry-season capitals of the rulers, classically represented by Addis Ababa in 1897, just as it settled into its present, permanent location (Pankhurst 1979). We must now recognize that this type of urbanism is also more common than supposed. The Mughal's tented, moving capitals in India are the best known representative of this pattern. The sprawling, transient population that congregated in the dry season around the Achaemenid capitals of Persepolis and Pasargadae perhaps belong to this category (Cleary 2018).

The proposition that the low-density city is a rather more common yet overlooked form throughout history is illustrated by the capital of the Spartans, the Achaemenids' ruthless enemy, whose 'city' was described as consisting of 'five villages' and being

semi-urban in nature (Cartledge 1980). Sparta was disparaged, albeit accurately, by Thucydides, who commented:

> Suppose the city of Sparta to be deserted, and nothing left but the temples and the ground-plan, distant ages would be very unwilling to believe that the power of the Lacedaemonians was at all equal to their fame. Their city is not built continuously, and has no splendid temples or other edifices; it rather resembles a group of villages, like the ancient towns of Hellas, and would therefore make a poor show. (Thucydides, 1. 10)

Sparta was an example of a dispersed settlement (Morris 2005), of a type that was probably common in Greece in the archaic period — 'like the ancient towns of Hellas'. Nevertheless, Sparta is still described as consisting of a 'cluster of separate villages' in recent literature (Zuiderhoek 2017) rather than as an extensive area of dispersed suburbs around a central urban area. And that Spartan model was a dominant feature of the history of classical Greece for nearly three hundred years. The Western perception of urbanism has been so comprehensively taken over by the compact, bounded image of classical Athens as the definitive form of urbanism that it requires the titanic scale of Angkor and the present-day Southeast Asian *desakota*[1] to bring the alternative Spartan model into full public view.

The critical comparative approach presented in this paper, commences with a brief overview of the descriptive measures and language used to characterize low-density cities. This is followed by short regional case studies on the recognition and survey of both medieval and modern low-density cities. The paper concludes with a discussion on the contribution long-term assessments of low-density urbanism can make to contemporary urban decision-making. The discussion is framed using critical aspects of the debates on sustainability, and covers aspects such as the durability of urban forms and the processes, economies, and environmental contexts that support those forms. Such long-term temporal perspectives have important implications for decisions made about the sustainability of today's cities. As Christian Isendahl and Daryl Stump (2019) argue, information from the past needs to engage with the possibilities and the risks of the present and future.

Describing Low-Density Cities

Dispersed urbanism is a ubiquitous feature of the modern world and has created a taxonomic melange. Today's low-density cities look nothing like the older, dense downtown areas that most of us still call 'the city'. Historical downtown precincts now exist in a much wider and more extensive context, characterized by suburbs, freeways, farmland, parks, and jogging paths. The corporate office, car park, and mall have replaced the town square, city block, and high street. The number of neologisms for urban areas today emphasize just how difficult it is to describe and understand these dispersed environments, which the extensive social-science and planning literature refers to using a variety of terms, such as conurbation, megalopolis, *desakota*, low-density complex, peri-urban, suburban cities, edge cities, and sprawl (Brenner 2014, 15).

Low-density, dispersed regional cities contain far more open space than their compact counterparts (Angel, Parent, and Civco 2012). The open space includes agricultural land, derelict brownfield sites, remnants of forest, natural drainage networks, and obsolete urban precincts. Within low-density cities, the ratio of open space to built space is significantly greater. Landscape plays a profound role within these dispersed cities. Given the increasing significance of open space and the dissolving of rural and urban categories, a new language and set of descriptive metrics are required to provide empirical foundations for intuitive observations (Boyko and Cooper 2011).

Although there is a range of metrics and physical attributes used to describe an urban form, density is the classic measure used for describing both modern industrial and pre-industrial cities (Tsai 2005; Storey 2006, 2). The simplicity of the index makes it useful as a global, comparative metric, allowing urban researchers and professionals to process data as a series of points or transects. The data can then be visualized as a density surface or as density gradients, without the need to rely on arbitrary boundaries, or cut-off points, which have inhibited the understanding of low-density urbanism to date. Understanding variation is crucial, both across different examples in different regions and within any one urban settlement. To construct a picture of urban densities, it is essential that variation in density is understood at the scale of the urban region, the metropolis, the urban precinct, and the urban parcel.

Central to urban definitions in archaeological (Drennan and Peterson 2012, 62) and urban planning (Dovey and Pafka 2014, 66–67) contexts is the idea that there are two broad kinds of urban den-

1 The vast industrial urban systems of Southeast and East Asia were first recognized and described by McGee (1991) as *desakota*. This neologism literally means village-city and forms the characteristic urban form within this region.

sity: demographic and material. Some cities have quite high demographic densities and low material densities, whereas others may have a high concentration of built structures but very low or temporary demographic densities. Demographic growth in developed countries has slowed dramatically and, in some cases, populations are shrinking. However, this does not prevent material growth as populations move out of urban cores to live in and build on the peripheries of cities. By contrast, cities in developing countries are growing dramatically in terms of both population and material. Both types of spatial urban growth contribute to increasingly dispersed settlement patterns (United Nations Population Fund 2007; Angel, Sheppard, and Civco 2005). Demographic distributions within a city do not always correlate with the distribution of built structures. Although some cities are experiencing suburban population growth, their physical centres are experiencing a decrease in density. This is true of Paris, Brussels, Amsterdam, Rotterdam, Lyon, Chicago, and, the classic example, Detroit. Some cities, such as London, are experiencing a general population decline, but this pattern is divided between a sharply decreasing population in the core area of the city and a less marked decline in suburban areas (Oswalt and Rieniets 2006). Gregory K. Ingram (1998, 1022), writing for the World Bank, stated that population growth in large cities does not usually increase the population density of already dense areas; rather, it encourages population increases in less developed, extensifying areas at the periphery of the city.

One way of measuring the correlation between built environments and population distributions in dispersed cities is with gradient curves that describe the spatial distribution of populations. Within those overall gradients, an urban area may also have spikes of population density. Redistribution of populations across metropolitan areas occurs because there is not a causal link between demographic density and the material structure of a city. The material framework of a city, by virtue of its subdivision pattern, or the type of its constitutive materials, may constrain density. However, this framework does not necessarily determine land uses or population densities, both of which change more rapidly than does the material framework. Some urban areas may be abandoned as other areas thrive.

Contrary to common assumptions, there are no general, globally applicable, modal population-density values for urban areas. Such values are not supported by the reality of urban or rural environments in either historical or contemporary contexts (Fletcher 1995, 73–79; 2009, 8). Population-density values vary dramatically for urban areas as has been noted for many years, for example by Doxiadēs (1968, 126). Locating concepts and categories such as 'the city' within a global spectrum of densities is problematic. The range of densities in and between cities is staggering. Cities such as Atlanta have an enormous footprint, of more than 5000 km^2, but are populated by a meagre 800 people per km^2. Chinese cities often have densities of 4000 to 10,000 people per km^2, and European cities operate at around 4000 per km^2. Australian cities typically have densities of around the 2000 people per km^2 mark (Susteren 2005). It is evident that there is neither a causal nor a definitional relationship between density and the urban condition. There are rural areas in developing nations, such as Bangladesh, with densities approaching or surpassing the urban densities in industrialized nations, such as the US and Europe (Fletcher 1995, 92–95; Qadeer 2000; 2004).

High demographic density is not a sufficient proxy for the urban because it is not a definitive measure of a society's level of urban development and nor has high density historically been a requirement for urbanism. As for urban settlements, the spatial variation between rural settlements is high, not only between cultures, but also within geographic regions. Density is a useful index when describing urban or rural settlements, but it is necessary to couple it with other metrics for it to be meaningful. The United Nations collated definitions of the 'urban' from around the world in an attempt to produce a uniform overview of urban areas. However, it reached the conclusion that the tremendous variety of settlement types in the world meant that it was not possible, nor desirable, to adopt uniform criteria to distinguish urban areas from rural areas (United Nations Department of Economic and Social Affairs Population Division 2012, 31). V. Gordon Childe (1950) and Robert McCormick Adams (2005) emphasized the need to define urban settlements with a variety of socio-economic and spatial criteria. Countries such as Indonesia base urban definitions on a combination of population density, economic activity, and the presence of 'urban-like' infrastructure and institutions (Department of Economic and Social Affairs 2016, 119). In contrast, China bases its definitions primarily on administrative boundaries and with the presence of administrative committees (McKinsey Global Institute 2009). In the Chinese historical perspective on urbanism the definition of the city has been dominated by the sign for 'wall' (von Falkenhausen 2008, 209–10). Commonly used yet artificial distinctions between urban and non-urban areas rely on a hierarchical distinction between demographic densities. City centres are the densest environments, followed by less dense suburbs,

rural areas, and wilderness (Segal and Verbakel 2008; Cowgill 2004, 526–28). However, modern dispersed cities teach us that specific high-density population values are not necessary for urban operations to take place (Segal and Verbakel 2008). The World Bank (Gill 2009) suggests that the rural–urban dichotomy is not an adequate approach to managing cities and recommended, instead, more realistic representations of the built environment based on an evolving 'portfolio of places'. Increasing urbanization results in a continuum of both density and urbanity, with a primary city at one end of this continuum, followed by a whole spectrum of settlements, ranging from large satellite cities to small-scale villages and towns to larger conurbations. It is only possible to loosely classify such places as either rural or urban. Today, a combination of geospatial and socio-economic sources are critical in defining different urban areas. Individual urban agglomerations lend themselves to definition through remote sensing of land-use areas, whereas metropolitan and megalopolitan areas require a more complex mix of demographic and remote-sensing analysis. This mix is required because, by definition, metropolitan areas encompass non-contiguous urban areas within a functionally related area. The polycentric urban territory requires new ways of examining and understanding urban territories. What follows is that the identification of these kinds of urban settlements requires extensification of survey methodologies rather than a focus on the more obvious, higher-density central areas. The following archaeological cases demonstrate just that — a gradual expansion of survey methods combined with new theoretical models and urban epistemologies.

The 'Discovery' of 'Lost' Cities in Tropical Forests

Dispersed urban settlements were relatively unknown for around five hundred years after the decline of tropical-forest urban centres of the Maya, Khmer, and the Sinhalese. Except for the occasional sixteenth-century explorer, no travellers from the compact urban societies of the 'Old World' had seen the dispersed urbanism of the literate societies, outside the modern incarnations in North America and Europe. Even the Chinese, with their long and continuous literary and administrative tradition, had only a few descriptive records of visits to such past cities. The most famous example of such records is that of Zhou Da Guan's visit to Angkor in 1295–1296 — although he, of course, perceived only the part that he could categorize in terms of a typical Chinese-type urban walled enclosure (Zhou Da Guan, *A Record of Cambodia*).

Europeans first began to encounter abandoned, dispersed urban settlements in the great tropical forests of the world in the nineteenth century. To the explorers, the cities were 'lost' places, buried in a romance of mysterious tragedy. Local populations knew the great urban landscapes, with their monuments and texts, and they often advised and assisted travellers to reach them. European reports of Anuradhapura began to appear from the seventeenth century, but it was only in the nineteenth century that the great sites of Anuradhapura and Polonnaruwa were 'rediscovered' and secured in the Western consciousness. When British administrators were surveying Sri Lanka in the nineteenth century, the ruins of Anuradhapura and Polonnaruwa were 'discovered' by British archaeologists, such as H. C. P. Bell (Devendra 1959). This pattern of discovery and rediscovery is surprisingly similar to that which occurred at Angkor. Various missionaries visited the site early in the nineteenth century, but it was only in the 1860s, when Henri Mouhot (1863) publicized the discovery through engravings and souvenirs, that the site captured the public's imagination. In a similar way to the reuse of medieval infrastructure in Sri Lanka, colonial administrators in Cambodia retrofitted parts of the medieval infrastructure of the dispersed complex of Angkor in an attempt to increase agricultural production in the 1920s and 1930s (Groslier 1979). The growth in awareness and popularization of Maya settlements shared some similarities with the 'discovery' of the Sinhalese and Khmer settlements. After the classic Maya period, the demographic concentrations of the Maya shifted from the inland centres, with their elaborate monuments, to the relatively plain architecture of the post-classic settlements on the coastal areas of the Yucatán Peninsula. Although the Spanish established some centres such as Mérida, they were not as interested in the Maya landscapes as they were in the gold-rich Aztec lands of Mexico.

In the first half of the nineteenth century, an Englishman, Frederick Catherwood, and an American, John Stephens, explored the abandoned Maya centres of Copán, Palenque, and Uxmal (Bahn 1996, 111–12). On their second expedition, they located the mighty Terminal Classic centre of Chichén Itzá in central Yucatán and numerous smaller sites. Like Mouhot, Catherwood recorded the Maya art in magnificent drawings. Catherwood's drawings were remarkably accurate and inspired a surge of literary and scientific activity (Bahn 1996, 111–12).

Landscape Approaches and Dispersed Urbanism in the Archaeological Record

Even though most of these sites were rediscovered in the nineteenth century, it was only in the second half of the twentieth century that an understanding of them as dispersed urban settlements developed, especially in Mesoamerica, Southeast Asia, and Sri Lanka. The recognition of dispersed urbanism in the archaeological record is the result of landscape-based investigations and settlement. Comparisons between such societies first occurred in relation to the Maya and Khmer, when Michael D. Coe (1957; 1961; 2003) pointed out the similarities in the layouts of their settlements. Both societies featured two basic urban elements — magnificent temple complexes surrounded by clusters of residential structures. The work of the Mayanists (Fig. 3.1) in the 1950s and 1960s led to the conception of the sprawling urban landscape, spread around the clusters of ceremonial buildings (Willey 1956a; 1956b; Sabloff 1990; Sabloff and Fash 2007; Chase and others 2011). However,

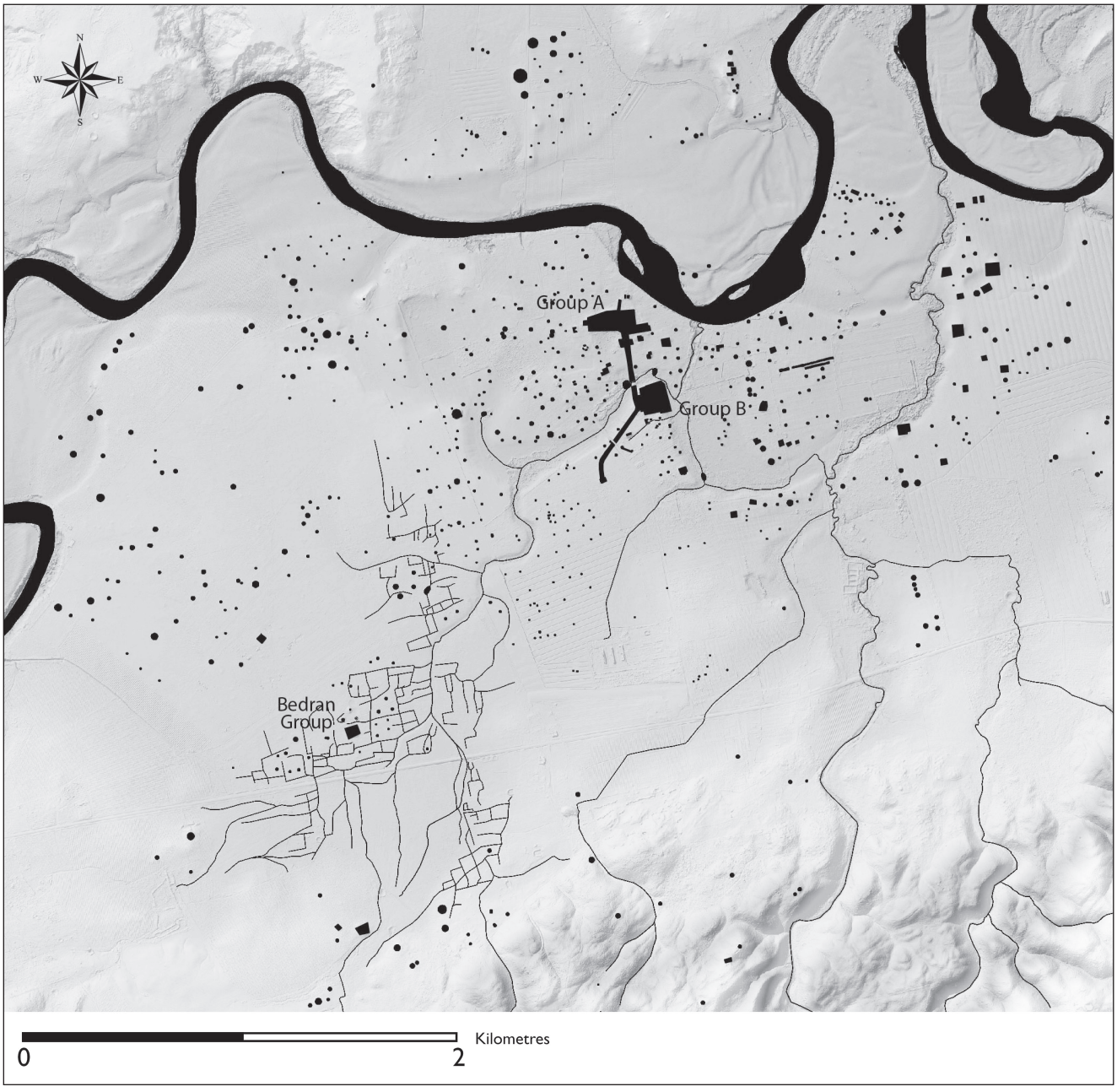

Figure 3.1. Dispersed Maya settlement pattern at Baking Pot, Belize, Central America. Despite the variation in density, spatial structure, and functional components in Maya sites, they all demonstrated a dispersed pattern of settlement surrounding elite religious centres — the two basic elements of the lowland Maya settlement pattern. Map adapted from data provided by Claire Ebert (Ebert, Hoggarth, and Awe 2016).

a more global picture of dispersed urbanism only began to emerge a decade or so later, with articles such as those by Bennett Bronson (1979), which suggested similarities with societies in Indonesia and Sri Lanka. More recently, Fletcher has placed Angkor in a global milieu as a low-density urban complex (Fletcher 2000–2001; Fletcher and others 2003). Survey programmes at Anuradhapura (Coningham and others 2007; Coningham and Gunawardhana 2013), Bagan (Hudson 2004), and Angkor (Evans and others 2007) in the first decade of the twenty-first century continued to transform our understanding of low-density urbanism.

The study of dispersed urbanism in archaeology began with the Maya sites and the innovations inspired by Gordon R. Willey's settlement archaeology. Willey's work shifted the emphasis from Mayan elites to the broad residential and agrarian landscapes that were of consequence to the majority of the population. The increasing attention given to the settlement archaeology of the Maya was predominantly brought about by Willey's work in lowland Mesoamerica on the classic Mayan settlements of the seventh to the tenth centuries AD (Ashmore and Willey 1981; Feinman and Billman 1999). Willey's work revealed that the Mayan centres were not isolated ceremonial centres, but were located within extensive settlement regions, dotted with house mounds, within the valley of the Belize River. Willey found that these house-mound clusters ran in a more or less continuous distribution from the Guatemalan frontier for a distance of around 50 km to the north and east, with each cluster consisting of groups of a dozen to three hundred or more mounds (Willey 1956b, 778). Willey's study of the Maya lowlands of the Belize Valley led him to envisage that the relationship between the scattered residential clusters and ceremonial centres was considerably more tightly knit than the conventional picture supposed (Willey 1956b, 777). According to Willey (1956b, 778), the continuous settlement of the Belize Valley created the 'impression of a large but well-integrated network of theocratic stations and substations, all supported by a peasantry indoctrinated with many of the values of urban life'. Willey's settlement studies of the Belize Valley (Willey 1956a; 1956b; 1965) were followed by similar studies by Willey and other archaeologists at Tikal (Haviland 1965; 1966; 1970), Seibal (Tourtellot 1970), within the Rio Bec region (Adams 1981), in southern Quintana Roo (Harrison 1990; 1993), at Dzibilchaltun in the northern Yucatecan plains (Kurjack and Garza 1981; Ashmore 1981; Willey 1990, 170), and at Caracol (Chase and others 2011). Despite the variation in density, spatial structure, and functional components in this sample of sites, they all demonstrated a dispersed pattern of settlement surrounding elite religious centres — the two basic elements of the lowland Maya settlement pattern. This has been articulated in terms of the green city and the agro-urban landscape by Elizabeth Graham and Christian Isendahl (2018). Equally the outer suburbs and peri-urban landscapes are clearly represented in the new LiDAR surveys of the classic Maya region in lowland Mesoamerica (Canuto and others 2018). These settlements demonstrated remarkable variety and scale, but featured the same clustered housing. In some urban settlements, this clustering was more fragmented, whereas in others, it was tightly organized or diffused amongst the agricultural landscape more evenly. In all the examples, there was a great deal of open space between the residential clusters (Fig. 3.1).

Maya cities such as Piedras Negras, Tikal, and Caracol had distinct clustered central areas and varying arrangements of extensive suburban areas. Most sites presented a gradation of settlement density from the core zones out to peripheral residential clusters (Webster 1980, 834) and more clearly shown in the recent LiDAR surveys. Surveys of Maya centres between the 1960s and 1980s indicated that residential densities were in the order of about six people per hectare (Sharer and Traxler 2005, 688). Inter-site densities would have been much lower. Even though cities such as Copan had a higher density of structures than most Maya centres, its structure remained dispersed, with the scattered residential clusters interspersed and a large amount of space between them.

A new vocabulary developed to discuss such urbanism, and the emphasis was not so much on the individual buildings, but instead on how multiple structures related as a unit. Groups of large buildings at Tikal became 'twin pyramid complexes', and habitation mounds were described as 'clusters'. The new emphasis was on the regular spatial relationships between and within the clusters (Becker, Jones, and McGinn 1999, 138). Scott Fedick (1996) contributed a landscape vocabulary, speaking of 'mosaics' of land use. The use of this new vocabulary shifted the emphasis from the individual site to the site's position within the landscape and, most importantly, to its relationship with open space. The complex geometric and apparently randomly dispersed scattering of Maya residential clusters has contributed to some scholars avoiding a discussion of the significance of the dispersed layout of the settlements. The structure of Maya settlements can perhaps be described as fractal, and more sophisticated analytic methods (Brown and Witschey 2003) using such geometries may provide insights into the structure of low-density urbanism in other societies.

Figure 3.2. Angkor's suburbs and hydraulic network formed a vast, low-density urban complex. This map of Greater Angkor, Cambodia, Southeast Asia continues to expand and change with advances in theory and survey methods. Map courtesy Evans and others (2007; 2013).

Research on the Maya has presented us with a whole portfolio of cities to aid our understanding of dispersed urbanism. By contrast, our understanding of Khmer urbanism has developed from studies of Angkor over the last hundred years by the EFEO, then the intensive surveys of Greater Angkor by Christophe Pottier (1999), and by the Greater Angkor Project (Evans and others 2007; Hendrickson 2007; Hawken 2012) and LiDAR coverage in collaboration with KALC (Evans 2016). Since 2010 the analysis has extended to more Angkorian settlements through the work of Damian Evans and others on Koh Ker, Banteay Chhmar, and Sambor Prei Kuk as well as the surveys on the Kulen (Evans 2010; 2016; Evans and Traviglia 2012; Evans and others 2013). The first compelling vision of the city of Angkor as a dispersed urban complex was put forward by Bernard P. Groslier (1979), building upon a century of scholarship. Groslier's diachronic vision of the metropolis presented a network of large-scale hydraulic infrastructure that integrated the temples and agricultural landscapes. However, the systematic demonstration of the existence of such an urban landscape only really began in earnest with Pottier's (1999) mapping and excavation programme. The density of archaeological sites, mapped by Pottier from aerial photographs, was far greater than shown on previous maps. The new maps revealed that the

temples of Angkor were located amid a repetitive pattern of dispersed occupation clusters including habitation mounds around local temples and water tanks, forming extended hydraulic suburbs. Fletcher and others (2003) proposed that these suburbs and the hydraulic network formed a vast, low-density urban complex. The entire complex was mapped by Pottier (1999), Evans (2007), and Hawken (2012; 2013) showing that over nearly 1000 km² of numerous occupation clusters were dispersed amidst Groslier's large-scale hydraulic infrastructure and rice fields to create the urban complex of Greater Angkor (Fig. 3.2).

In central northern Sri Lanka, another form of dispersed urbanism emerged (Fig. 3.3), structured around the exploitation of the region's distinctive dendritic pattern of valleys and perennial streams. This pattern of dispersed urbanism is remarkable for its evolution and stability over a 1500-year period and for its dramatic and irreversible decline after the thirteenth century AD. Like the settlements of the Maya and the Khmer, Sinhalese settlements demonstrated closely interlocking urban and rural spatial systems (Coningham and Gunawardhana 2013). The settlement infrastructure operated at both a territorial and a metropolitan scale. At the territorial scale, the system consisted of a series of cascading tanks in a one-settlement–one-tank system (Gunawardana 1971). Each tank and settlement association formed an ecological unit that was hydraulically and socially integrated with surrounding communities through a system of *rajakariya* or corvée labour — literally, 'service to the king' — which required common

Figure 3.3. The agrarian urbanism of Anuradhapura, Sri Lanka, South Asia is characterized by a low-density pattern consisting of residential settlement sites, monastic sites, irrigation tanks, and rice fields. Map adapted from data provided by Manuel and others (2013).

people to dedicate a certain number of days to the maintenance of hydraulic infrastructure for the benefit of their hydraulic society. At the local scale, the Rajaratan settlement pattern was based on a three-part functional relationship between the temple (*vihara* or *dagoba*), the tank (*wewa*), and the paddy field (*ketha*) (Siriweera 2002; Chandrasena 2007, 31).

This pattern of temples surrounded by residential clusters of an urbanized farming population, which worked in and commuted to the temples regularly, can be seen in Maya, Sinhalese, and Khmer urbanism. Images of isolated temples lost in the exotic jungle have gradually been displaced by those of a highly structured landscape of residential localities and agricultural infrastructure, especially at Caracol. The tropical forest world was the locus of a form of urbanism quite different from the conventional, pre-industrial Eurasian–East Asian model of compact, bounded cities. The agrarian-based, low-density, dispersed cities offer a crucial comparative reference that assists in understanding the significance and potential consequences of the range of urban variation that exists globally today.

Patterns of Contemporary Dispersed Urbanism

Globally, the spatial footprints of cities are radically expanding, and urban population densities are decreasing (Angel, Sheppard, and Civco 2005). Considering the tremendous variety of metropolitan forms, the near universality of this trend is extraordinary. Cities in developed nations are dispersing; those in the developing world are dispersing at an even greater rate (Angel and others 2016). If current trends continue, the area of urban land cover in both developing and developed regions will more than double between 2000 and 2030 placing pressure on a range of biodiversity, agricultural, and other vital systems (Seto, Güneralp, and Hutyra 2012, 16083). Such expansion threatens global biodiversity, ecosystems, and croplands (Seto, Güneralp, and Hutyra 2012, 16083; Bren d'Amour, Reitsma, and Baiocchi 2017).

It is possible to trace three phases of urbanization over the last three hundred years. The first phase of global urbanization began in the eighteenth century, with the industrialization of the now developed world. The second phase of urbanization began in the second half of the twentieth century, with the expansion of the so-called post-industrial cities, and the third distinctive phase is currently demonstrated by the rapid urbanization in Asia, South America, and Africa, which is characterized by a simultaneous transition to industrial and service-based, post-industrial forms (United Nations Population Fund 2007, 1). These three phases of urbanization are alike in their dramatic shift to low-density patterns.

The conventional pattern of a dense city core, surrounded by suburbs, a peri-urban fringe, and a rural hinterland does not accurately describe today's cities. Industrial cities have experienced extensive decentralization, becoming predominantly suburban and peri-urban cities (Ingram 1998). Today's urban centres stretch from one city to another in polycentric agglomerations of varying density, in what Kim Dovey and Elek Pafka (2014) call density 'assemblages'. Rather than expanding continuously outwards, cities today frequently develop multiple centres in non-contiguous developments that leap-frog over patches of open space to develop satellite patches.

Twentieth-Century Urban Space in the West

The dispersed cities that Europeans live in today have primarily developed from compact medieval cities (Hohenberg and Lees 1995). Even though the European medieval city is a late innovation in the history of urban forms, the lived experience of this type of city has strongly informed the Western conception of urban form. The simple reason for this is that the basic street pattern of almost every European city core is a product of the medieval period. Since its establishment, this pattern has been demonstrably resistant to change (Friedrichs 1999) and now exists within an extensive urbanized territory. This is not an abstract territory of urban nodes and virtual networks but a landscape of built infrastructure and fragmented urban space.

This urban landscape has been documented by the architect Xaveer De Geyter (2002) using Landsat 5 imagery and geographic information system (GIS) data. De Geyter's images spatially describe the fragmented, curving urbanized band of development that stretched from London to Paris, then down through Belgium and Switzerland to Italy. This megalopolis was nicknamed the 'Blue Banana' by Roger Brunet (1989) in the 1980s. Since that time, various descriptions of the dispersed territory have portrayed Europe as a complex urbanized mosaic (Illeris 1992; Hospers 2003; Reimer 2010). Brunet's (1989) description explained how cities in Europe had an influence beyond their national borders and acted together as *tissus de villes*. Interestingly, it showed Paris as quite isolated from the urban economic tissue; the production of the report may have been motivated, in part, by Paris's situation within what Brunet called

a *lacune* (literally, a gap). Brunet's maps were perhaps the first to portray the modern cities of Europe graphically as an integrated ensemble of shared economies, international functions, new network technologies, and shared demographic behaviour. Since Brunet's work, maps produced showing this regional urbanity have become commonplace. The urban territories of today, described variously as 'growth triangles' and 'regional development zones', all owe something to Brunet's maps. Just as we have learnt to see these extended modern urban regions through conceptual and mapping innovations, archaeologists such as Robert McCormick Adams (1981) have used innovative approaches to visualize and map earlier urban regions such as 'Heartland of Cities' in southern Mesopotamia. The deep history and vast urban scale of such landscapes remains obscure to most contemporary urbanists who operate with a shallow appreciation of the urban and ecological foundations they build upon.

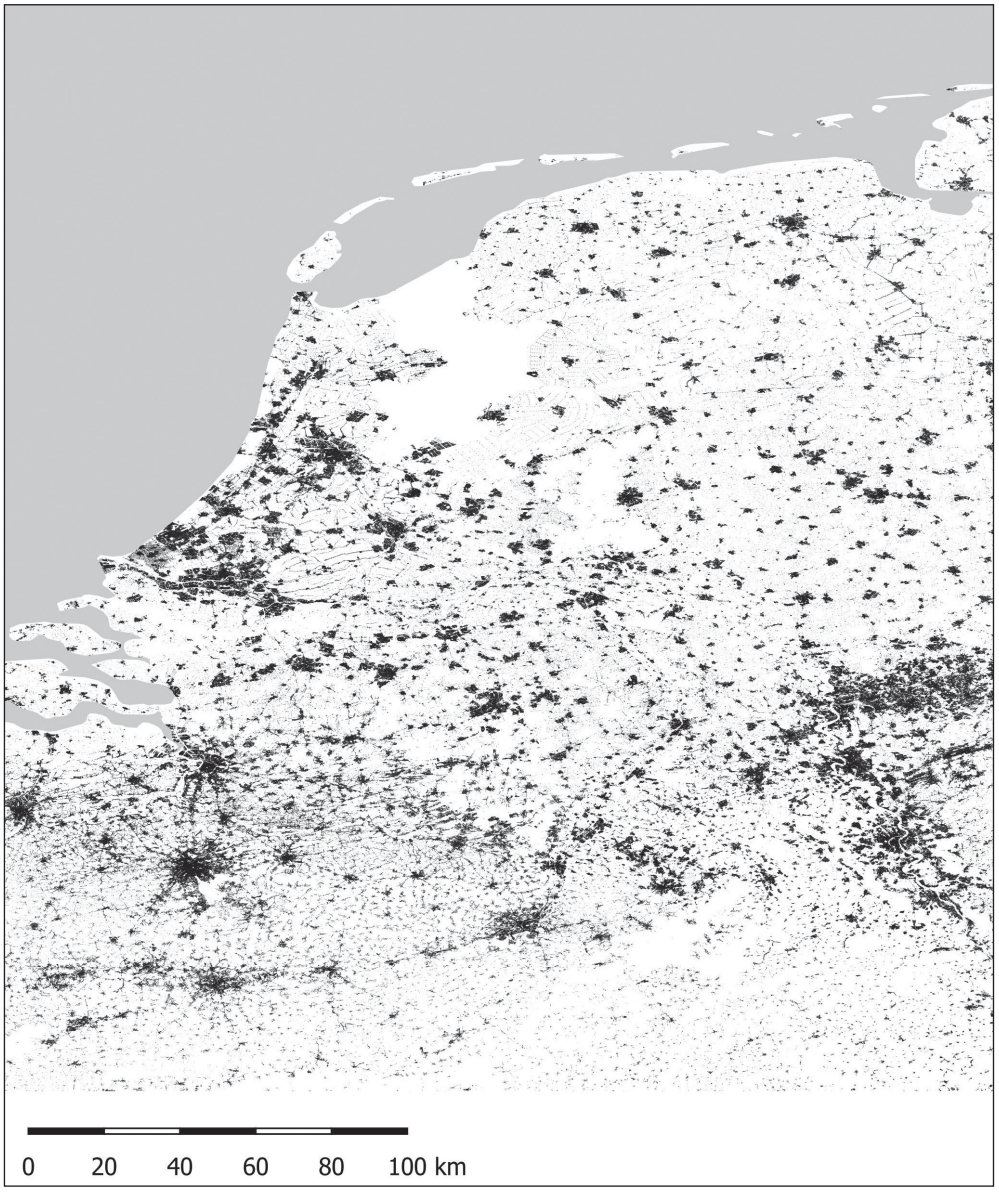

Figure 3.4. The Randstad, Netherlands, the Ruhr, Germany, and the Flemish Diamond, Belgium are some of the many urban regions within northern Europe. They form a continuous, if fragmented, urban landscape, incorporating many areas of open space as is characteristic of extended urban regions globally in Europe, the Americas, and Asia. Map by authors produced with data from OpenStreetMap (planet dump, data file from 2020, <https://planet.openstreetmap.org> [accessed 24 January 2021]) and Global Urban Footprint data (Esch and others 2017).

Europe's industrial revolution followed Brunet's blue banana, and three hundred years later urban and economic development remains concentrated within this industrialized arc (Polèse 2010, 73). The contours of this urban territory mainly follow the axis of the navigable Rhine River, from Rotterdam in the north to Basel in Switzerland, taking in the dense conurbations of the Dutch–Randstad, the Rhine–Ruhr, and the Rhine–Main. This region was linked with English towns across the Channel prior to the industrial revolution. These links, combined with the Rhine's confluence of river systems, gradually developed into a complex web of canals, which fostered economies of scale and agglomeration. Over time, new networks involving paved roads, rail, and highways complemented what is arguably the densest navigable waterway system in the world (Polèse 2010, 74).

The Flemish Diamond of Belgium illustrates this condition well. Despite being one of the most densely populated regions in Europe, with 1100 inhabitants per km^2, 60 per cent of the Flemish Diamond consists of open space, including fields and forests. Rather than dense, isolated compact cities, the region consists of a continuous, if fragmented, urban landscape, comprised primarily of open space. Although a natural landscape is perceived when travelling through these open spaces, the forests and fields sit within the densest regional network of infrastructure in the world (De Geyter 2002, 162).

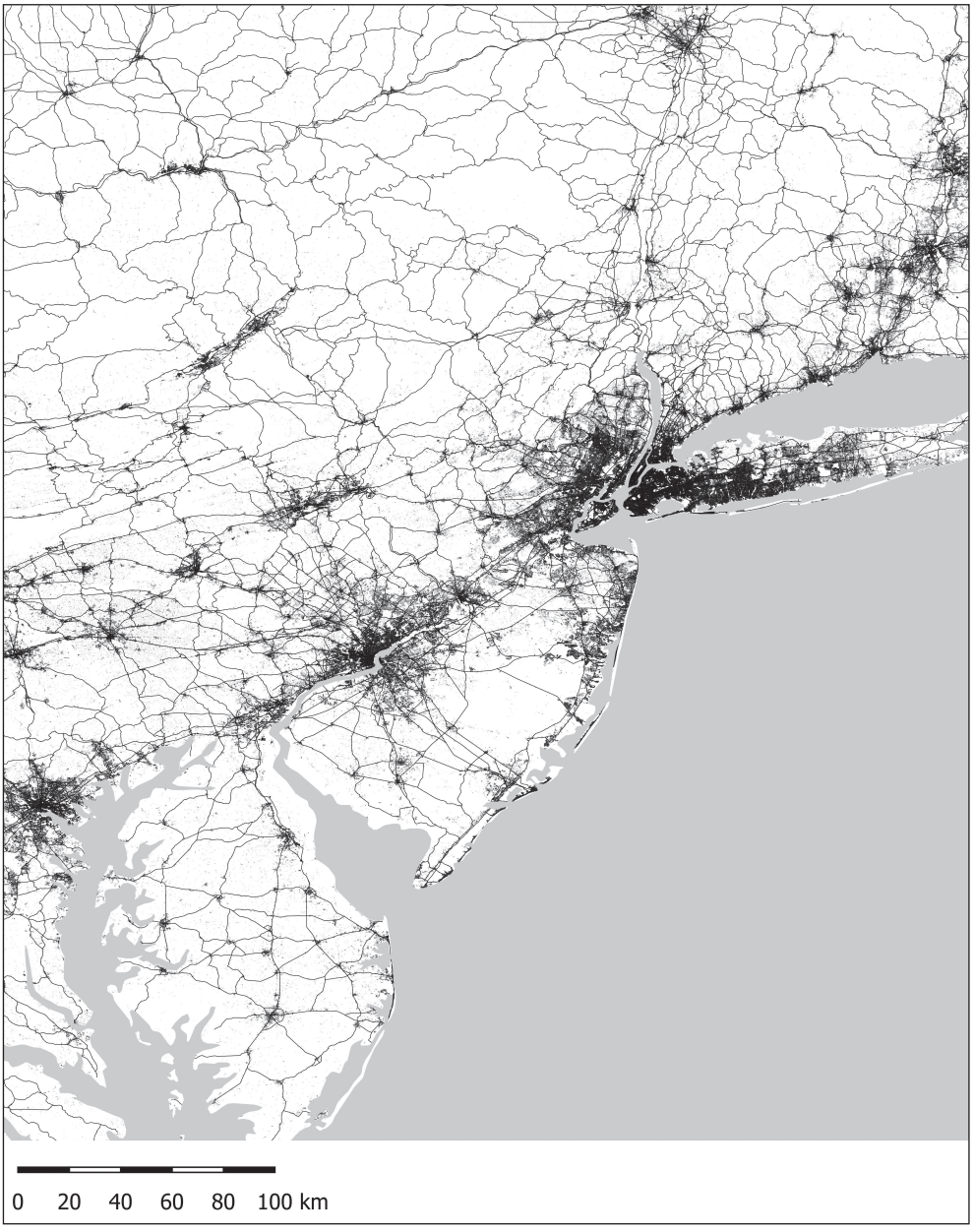

Figure 3.5. The East Coast Megalopolis, USA, North America. In the 1960s French geographer Gottman described the formation of the urban territory located on the US eastern seaboard — the East Coast Megalopolis. Gottman was the first to clearly conceptualize the existence of this extended urban region in terms of land-use, demographic, and economic patterns. This vast territory is, however, not so different from the scale of medieval Khmer low-density urbanism. Current day Baltimore and Washington, DC fit comfortably side by side within Angkor's footprint as we now understand it. Gottman's insights have continued to shape our perception of urban regions. Map by authors produced with data from OpenStreetMap (planet dump, data file from 2020, <https://planet.openstreetmap.org> [accessed 24 January 2021]) and Global Urban Footprint data (Esch and others 2017).

This type of dispersed city is perhaps most apparent where the historical nineteenth-century city forms were either overwhelmed by new industry or never really took hold, for example, in the Ruhr area of Germany (see Fig. 3.4). Europe is first and foremost an urban archipelago comprised of 3500 agglomerations with more than 10,000 inhabitants, 365 agglomerations with 100,000 inhabitants, and 32 agglomerations with more than one million inhabitants. The constellations of interconnected small and medium-sized cities are the defining characteristic of Europe's urban territory (Mega 2010, 19), with the larger cities, such as London and Paris, being the outliers from the general pattern.

Brunet's organization, the Délegation à l'aménagement du territoire et à l'action régionale (DATAR) (in English, the Delegation for Spatial Management and Regional Action) was created in 1963 as a central state agency 'to accompany the development of the French desert around Paris' (Cole 2006, 37) and to promote decentralization strategies. In the 1960s, another French geographer, the well-known Jean Gottman, gave an account of a similar urban territory located on the US eastern seaboard — the East Coast Megalopolis (Fig. 3.5). His comprehensive account traced the development of scattered nineteenth-century towns into a polycentric urban region dominated by the four interconnected metropolises of New York, Boston, Philadelphia, and Baltimore. Gottman's insights went beyond a simple discussion of population densities. He powerfully described the complex socio-economic drivers, the land-use patterns, and the polycentric nature of the urban region. Importantly, he demonstrated the reality of urban growth and shattered the stereotypes of compact European cities and expansive agricultural hinterlands that defined the Western urban tradition (Gottman 1961). Gottman's insights have continued to shape our perception of urban regions (Gottman and Harper 1990; Morrill 2006; Lang and Knox 2009) and have been critical in assisting the recognition of low-density agrarian urbanism within the archaeological

record that existed in previous centuries (Evans and others 2007).

Many professionals and scholars regard the US as the archetype of dispersed urbanism. US technological stereotypes and land uses colour much of the discussion of dispersed urbanism today. Dramatically lower in density than its dispersed European counterparts, the urbanism of the US is epitomized by iconic technologies such as cars and freeways. However, such technological aspects of US urbanism are a distraction from the urban spatial pattern that will most likely be a much more enduring legacy. Postwar US development produced a multi-nodal integrated urban structure at both the metropolitan and megalopolitan scales (Lang and Knox 2009, 790). Robert Lang and Paul K. Knox (2009, 790) suggested that the increased scale at both levels did not tear cities or regions apart, but produced new types of connectivity. The megalopolitan project (Lang and Dhavale 2005), which was designed to show where the next one hundred million Americans would live, identified twenty emerging megalopolitan areas that are defined as a complex of metropolitan areas, with overlapping commuting patterns and various types of urban landscapes, such as urban cores. Even though dense urban fragments, such as Manhattan and downtown Chicago, are the epitome of urban density, these fragments sit with Gottman's much larger, much more dispersed megalopolis. These dense centres are mere moments in an extensive, fragmented, and functionally related urban fabric. Like a Khmer pyramid and monastery sitting within a dispersed residential landscape of rice fields and thatched suburbs, Manhattan is not an anomaly but the elite centre for a much wider urban territory. The densest city in the world, Hong Kong, has the same relationship with the Pearl River Delta, a vast urbanized region of rice fields, factories, and aquaculture, which typifies what the scholar, Terry McGee (1991) has called the *desakota* city — a city with agriculture interspersed throughout its urban structure, where residents adopt both rural and urban livelihoods. The residential dispersal that was characteristic of the low-density cities of the agrarian world prior to *c.* 1500 AD reappears, without any direct cultural or historical connection, in modern conurbations.

Asian Cities, Rapid Urbanization, and the Rural–Urban Continuum

Cities in the developed world, which urbanized in the nineteenth to mid-twentieth centuries, are not necessarily the most polycentric worldwide, as urbanization in Asia is moving increasingly towards polycentric forms. Asian urban populations are shifting to suburbs or satellite towns, which are linked to a main centre via commuter networks. This phenomenon is particularly prevalent in large Indian cities, where ring towns or dormitory suburbs have formed around central cities, such as New Delhi and Mumbai. Conversely, urban growth patterns in China have been inclined to produce 'city regions', where largely independent cities have developed mutually beneficial networks within urban territories. Despite the fact that megacities in Asia have received much more attention, both popular and academic, the bulk of future urban population growth is projected to occur in smaller cities and towns, which will form part of a dispersed urban territory in much the same way that the newer urban developments in western Europe have done. Most often, this growth has occurred without a synchronized transition to decentralized government and without timely local capacity building. As a consequence, fragmented peripheral urban growth has been stimulated (Cohen 2006; United Nations Population Fund 2007).

But what has also developed are increasing connections between previously separate urban centres to create vast stretches of urban landscapes in which large areas of previously rural land are distributed amongst extensive urban communication networks. Just as the US cities of the 1960s appeared revolutionary in the eyes of Continental geographer Gottman, cities such as Bangkok, Beijing, Mumbai, Manila, Jakarta, Tianjin, Kolkata, and Guangzhou seem revolutionary to Western geographers and urbanists today. Formerly distanced as exotic locations, such cities provide glimpses of urban possibilities not previously acknowledged. The rapid development in Asia has produced extremely fragmented cities, despite areas of density within the urban territories that far surpass anything in the West. Asia is driving today's wave of urbanization, and it is predicted that the expansion will be nearly thirty times as large as the urbanization that unfolded in the US more than half a century ago. Manuel Castells suggested this in the 1990s, when he wrote that the Pearl River Delta metropolis of southern China, 'only vaguely perceived in most of the world at this time, is likely to become the most representative urban face of the 21st century' (Castells 2011, 439).

It is expected that Asia's current urbanization will occur in less than twenty years and therefore by 2025, nearly 2.5 billion Asians will live in cities that make up almost 5 per cent of the globe's urban population (McKinsey Global Institute 2009, 168). India's urbanization is less proactive and mature than China's planning regime but, over time, it may become more dispersed than China's because of the

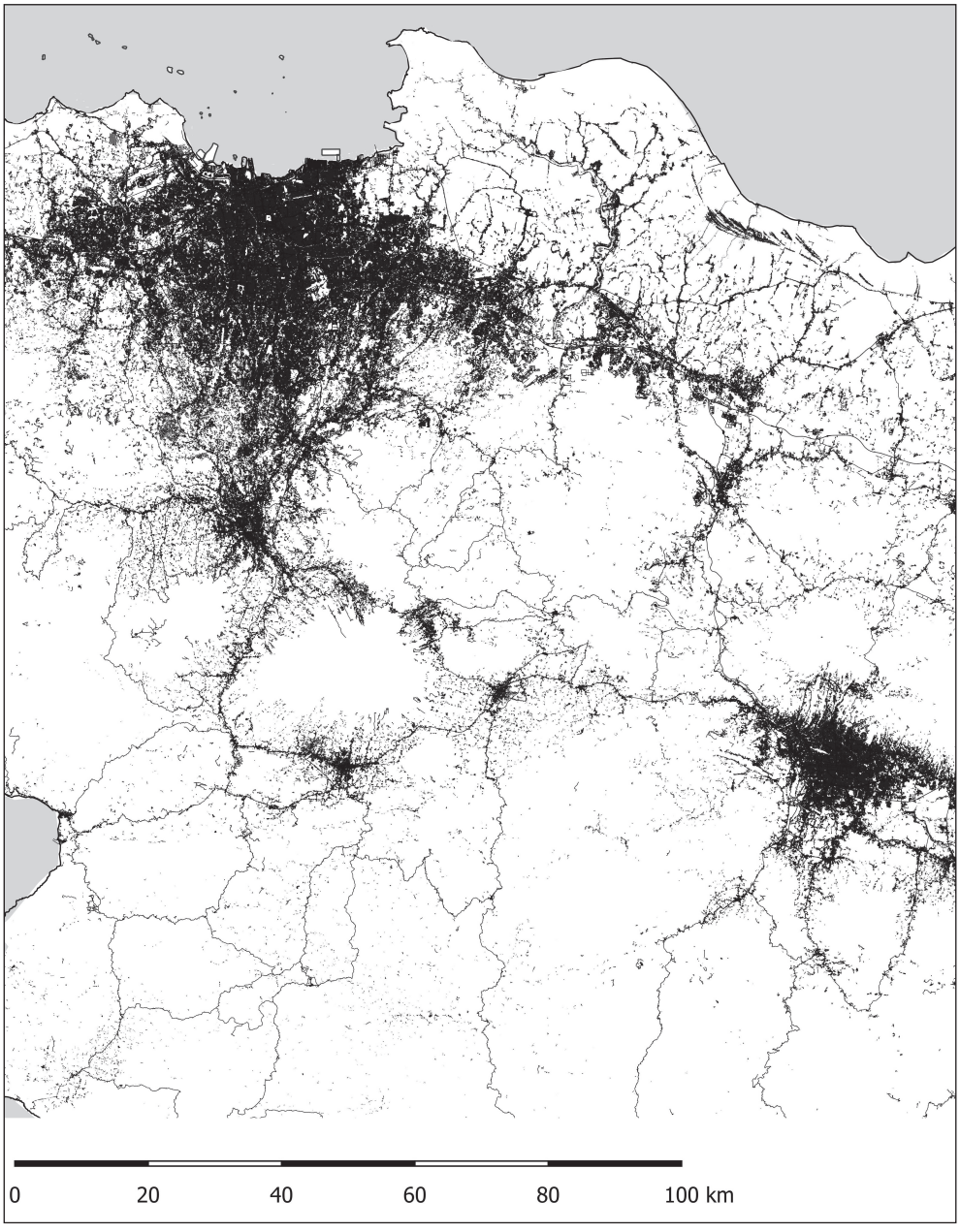

Figure 3.6. Greater Jakarta, Indonesia, Southeast Asia. It was in the Southeast Asian metropolis of Jakarta that the characteristics of dispersed Asian urbanization were first observed by McGee (2008; 1967; 1971) and defined as a *desakota* system. Like many of the urban territories of Asia, Jakarta consists of a large city core within heavily populated urbanizing regions of wet rice agriculture. The Jakarta metropolitan area, known locally as *Jabodetabek* includes the national capital Jakarta as the core city as well as five satellite cities and four regencies in a fragmented and patchy pattern of suburban and agricultural landscapes. Map by authors produced with data from OpenStreetMap (planet dump, data file from 2020, <https://planet.openstreetmap.org> [accessed 24 January 2021]) and Global Urban Footprint data (Esch and others 2017).

diverse portfolio of large and small cities throughout the country and the federal structure of the country (McKinsey Global Institute 2009, 139–42). However, it was in the Southeast Asian metropolis of Jakarta that the particular characteristics of Asian urbanization were first observed (McGee 2008; 1967; 1971; McGee and Universiti Kebangsaan Malaysia 2009; Kelly 2007) and defined as a *desakota* system (see Fig. 3.6).

Many of the urban territories of Asia include large city cores, within heavily populated urbanizing regions of wet rice agriculture. Increases in skilled labour and investments in accessible technology have accelerated the development of these agricultural regions. Cheap mechanized transport, such as the two-stroke scooter, has facilitated the movement of people, commodities, and capital, networking these regions without the need for the high per-capita infrastructure investment that characterized the development of the more developed nations, earlier in the twentieth century. The result of this process has been the creation of urban territories of farmers, with population densities that have frequently exceeded American and European suburbia. The specific nature of industrialization in Asia has been linked repeatedly to the nature of rice production in Japan, Taiwan, and, most recently, China (Bray 1986, 134–39). The tightly interlinked distribution of labour and capital throughout space and time distinguishes these rice economies from those of the West and is a driver of *desakota* development (Bray 1986, 140).

McGee, the originator of the *desakota* concept, formed his ideas through long observation of the dispersed settlement of Jakarta as it developed in the 1960s. McGee's (1971; 1967; 1991) *desakota* concept is based on his observation that the conventional division between rural and urban is obsolete in such cities. As the city of Jakarta expanded, it did not alter many of its rural surrounds. Instead, urban and agricultural patches were interspersed with infrastructure and suburban enclaves. The city encapsulated the rural villages, creating a different kind of metropolis. McGee aptly named the condition *kota-desai*, a fusion of

three Bahasa-Indonesian words: *kota* for city, *desa* for village, and *si* for process. Subsequently, McGee rearranged the terms to create *desakotasi* to describe this process of development and *desakota* to describe the settlement that results from that process. The type of urbanism described by McGee involves a regional spatial expression, encompassing central urban cores, satellite towns, peri-urban areas, and extensive intervening spaces with relatively dense populations and intensive traditional agricultural land uses, in which wet paddy cultivation has often dominated. Since McGee wrote about the *desakota* in the 1990s, others have formalized the criteria that characterize *desakota* regions (Desakota Study Team 2008, 12–15).

The characteristics of specific *desakota* regions vary considerably. In South Asia, the diffusion of communication technologies into rural areas is perhaps the major driver of *desakota* dynamics. Roads and mobile phones are having a widespread but little-understood influence on development. The implications for resource management are significant. This technology diffusion is taking place within the context of moderate urbanization trends and high rural population densities. Rather than cities growing rapidly, a more diffuse urbanization of rural areas is occurring (Desakota Study Team 2008, 19–20). Two types of *desakota* developments are occurring in China. Both development models originate from the transition to a market economy. The first model involves large-scale collective development, in which industrial enclaves and superblocks form one of the major drivers of China's rapid urban dispersal (Monson 2008). This developmental model represents a capitalist transformation of the commune. It manifests itself in the form of massive urban fragments inserted into the countryside. By contrast, smaller and more diffuse family–village spatial units are developing according to a bottom-up model. Rural settlements are expanding and merging along linear infrastructure, such as roads, and are developing their own special economies and forms of urbanism (Guldin 1996, 279; 2001). The combination of these two development processes has generated the extremely rapid urbanization of eastern China, as cities expand into territory that is itself becoming urbanized.

What is notable is that the *desakota* urban form is developing in a variety of different contexts suggesting that it is a very robust and active urban phenomenon. State reforms have primarily driven the development of *desakota* regions in China. However, in Africa and Southeast Asia, it is the instability of governments that has driven *desakota* settlement systems, as *desakota* zones present a form of income security against ecological failure and economic vulnerability (Desakota Study Team 2008, 19–20; Hawken 2017). Either way, planning strategies have resulted in a conflation of the urban–rural interface into a more complex peri-urban condition, marked by heterogeneity and fragmentation. The *desakota* phenomenon has generally been overlooked, underestimated, and under-reported for two major reasons. First, there is a prevailing prejudice against urban farming and rural forms of employment within an urban context, as they are seen as backward and polluting (Smit, Nasr, and Ratta 2001). Second, urban authorities in developing countries have not generally facilitated urbanization trends. Most authorities have attempted to restrict the growth of cities (Pearce 2006) by limiting development to forms that fit preconceived ideas of formal planning. These conventional forms rarely facilitate equitable access to diverse income streams (Saunders 2010). Cities are developing spatially to become more dispersed, more fragmented, and more polycentric. Although these three spatial changes vary globally, they are generally a function of scale. Compared with more established urban societies, cities in the developing world are developing according to different urban trajectories, and they are developing different density gradients and using different technological assemblages. However, the general trends of dispersion, fragmentation, and polycentricism are occurring globally (Ingram 1998; Angel 2011; Angel and others 2016).

Equally within the archaeological record the widespread existence of the pre-industrial low-density, dispersed settlement form, which occurs even more widely than just its agrarian-based urban form (Fletcher 2019; Fletcher and White 2018) suggests that we can expect to find more examples of the low-density urban form than have as yet been recognized. The emergence of new survey technologies, and more importantly new analytic methods, have supported the recognition of low-density urbanism in both archaeological and contemporary planning contexts (Hawken 2007). Understanding the nature and existence of low-density urbanism has been challenging in both past and present situations. The extensive and reoccurring nature of low-density urbanism thus requires a theoretical framework that is open and inclusive of both past and present urbanism. Anything less is to face the formidable challenges of global urbanization blind, moving forward without the benefit of the deep knowledge offered by the archaeological record.

Concluding Remarks: Dispersed Urbanism as a Recurring Urban Pattern

From an archaeological perspective, the comparative global project involving dispersed cities has expanded from its initial recognition in the 1950s and 1960s to substantial developments in the twenty-first century. Future research approaches will need to take into account the comparative frameworks put forward by researchers in others regions, and draw on recent advances in spatial sciences to develop a methodology applicable to cities across a broad archaeological time frame. Such a comparative method relies on well-developed examples and a common descriptive base. Humans are subject to the same ecological boundary conditions as other species and exhibit enormous variation in energy and resource use and in social and spatial organization. Therefore, the patterns of variation in urban systems are part of the sustainability challenge now facing cities around the world. It is critical that researchers and the public understand the long-term consequences of this variation so that urban planners, designers, and governments are able to interact effectively with these trends and engage with the risk associated with low-density urbanism under the impact of severe climate change and global resource and systems limits.

Present-day urban societies distinguish themselves from those of the past through rapid innovations and new technologies. It is undeniable that human societies are changing — but in what ways and by how much? Scholars have viewed the questions raised by low-density cities as an innovation tied to technological variables such as the automobile, freeways, and mechanized urbanism. The spread of industrial-based, low-density cities has been perceived as a special phenomenon associated with the massive and unprecedented urban expansion of global populations. Urban scholars tended to view the decline in urban densities as an event unique to our 'urban age'. This rather myopic perspective is increasingly untenable. Scholars such as Neil Brenner and Christian Schmid (2014) have rightly challenged the limited focus of the urban age calling for new theoretical perspectives and methods to enhance our urban perceptions. The 5000-year urban history of humankind contains numerous examples of low-density urban settlements. If examined more closely, the archaeological record should continue to reveal further new evidence of this kind of urbanism. This paper testifies to this increasing knowledge base, indicating that low-density urban environments have occurred as both structural fragments of larger settlements and, frequently, as the dominant settlement pattern in many regions throughout the urban history of humankind.

The debate has changed and it is no longer defensible to speak of low-density settlements as transient or ephemeral phenomenon that can be readily altered. Low-density settlements are, by contrast, a recurring settlement form. Instead of classifying low-density settlements as an aberration, we need to shift our focus to understanding the particular dynamics of low-density urban ecologies and economies, and the specific kinds of pressure that they exert on their regions and inhabitants. The question is no longer how we avoid this condition but what is the best way to manage this massive change in settlement form (Angel 2011). Current urban expansion devastates agricultural and ecological landscapes through its resource-intensive operational processes, its predilection for simple biodiversity associations and monocultures (Bren d'Amour, Reitsma, and Baiocchi 2017; Barthel and others 2019), and unsophisticated land-use policies (Geneletti 2013). Past low-density societies, of which the Khmer and Maya are the most notable examples, were vulnerable to many of the same pressures that we are facing today. Scholars, such as Brendan M. Buckley and others (2014; 2010), Lisa J. Lucero and others (Lucero, Fletcher, and Coningham 2015; Lucero, Gunn, and Scarborough 2011), and Fletcher and others (2017), have called attention to issues of climate change in relation to these societies. Fletcher (2018) has noted the increasing risk of extreme climate events to urban infrastructure in large, low-density cities, and Michael E. Smith (2010) has highlighted the potential for past cities to inform the management and design of current urban settlements and neighbourhoods.

Equally, our own experiences of living within such low-density environments provides archaeologists with a lived reference to reconsider the operation of past low-density societies, which, so often, have been overshadowed by more compact urban forms in the archaeological record. Just as the patterns of the past inform the present, our present experiences can improve our comprehension of the past. Low-density urban environments are with us to stay. It is time we acknowledged the challenge of operating, altering, circumventing, and sustaining such environments as recurring urban patterns rather than as isolated and unusual events.

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