The Urban Mind
Cultural and Environmental Dynamics

Edited by
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4. Cities and Urban Landscapes in the Ancient Near East and Egypt with Special Focus on the City of Babylon

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ABSTRACT
The authors give a brief overview of socio-environmental interactions underpinning urbanism in the part of the world with the longest urban development, that is, the Ancient

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1 Olof Pedersén wrote the first version of the Ancient Near East and edited the final version of the chapter. Paul Sinclair wrote a first version of the section about Egypt and suggested details and provided improvements for the whole chapter. Irmgard Hein rewrote the section about Egypt, and Jakob Andersson wrote sections about the Near East and suggested improvements for the chapter.
Near East and Egypt 5000–100 BC. Further details are presented for southern Mesopotamia, with a special focus on the city of Babylon during the reign of Nebuchadnezzar II in the 6th century BC.

Introduction

The earliest towns and cities in the world are found in the Middle East, and therefore this is the area providing the longest historical perspectives on different aspects of urban development and the relation between nature and urban settlement. In this chapter we call the modern area the Middle East, and the ancient cultures as accepted in modern research will be treated as the Ancient Near East. We use commonly accepted definitions of towns and cities in the ancient Near East as elaborated below in the section “Cities in the Ancient Near East”.

We will look at the origin, location, size, form, and abandonment of urban structures, and their trajectories. We will consider the inhabitants of towns and cities, their organization, ideas and languages, their relation to the immediate surroundings and to other urban entities. We will also discuss in what ways the environment and climate could have influenced towns and cities, in particular their location, size, form, and abandonment. The reverse will also be considered, namely the possible influences that ancient urban structures and urban landscapes had on the environment, for example, salinization, vegetation reduction, and problematic water management. We will look at the interaction of towns and cities with the surrounding landscapes and with areas and cities farther away. We will also make an attempt concerning longer-term conclusions on the cycles of development and decline of urban complexes on local and sub-regional scales.

In addition, we will try to move towards an understanding of the cognitive and ideological aspects of the societies reflected in the special form of towns and cities. However, a deeper understanding of the principles of the “urban mind”, governing or influencing the spatial organization of towns and cities, is a much larger question and beyond the scope of this programmatic phase of the project.

Archaeological excavations have been carried out for more than 100 years in a large number of cities and towns in the Middle East and Egypt, and they have given a great deal of material evidence for urban life. During the excavations on Ancient Near Eastern sites, several hundred thousand ancient texts written on clay tablets with cuneiform script have been unearthed, and in the Nile valley large quantities of Egyptian inscriptional material on papyrus and other materials have been recovered. The analysis of this enormous amount of information has often been rather slow. In later decades, environmental factors studied from the viewpoint of natural sciences have supplied further important means for analysing the Ancient Near Eastern cities and urban landscapes. We will try here to lay out a preliminary integrated approach to these materials.

A paradoxical situation in research is that, despite the great amount of archaeological work done, there are difficulties obtaining detailed information on sites and their surroundings. This is in part owing to the difficulty of investigating deep tell sites, which results in much more information about the upper levels and much less about the deeper ones. Above all, many sites have never been examined, so the material we have access to is just a selection (hopefully a representative one) of what existed in ancient times.
The materials and the methods used for this preliminary overview of the development of cities in a core area of human history are multifarious and point to the need for a large number of additional and more detailed examinations. The methods and tools used here involve a combination of modern geographical information systems (GIS) using Google Earth, environmental information, agricultural information, summaries of archaeological surveys, and architectural computer programs for city reconstruction. These approaches are combined with more traditional humanistic information from archaeological excavations and studies of a large number of ancient documents, some newly available, and comparisons with other traditions. We will touch upon problems of relating the empirical archaeological and historical data and societal organization, especially state systems and empires, but details must form another project. A preliminary synthesis will be discussed in relation to current views of resilience and systems ecology theory.

Urban developments in the Middle East will be studied from three analytical perspectives. General questions will be discussed in a large perspective for the Ancient Near East and Egypt. Southern Mesopotamia will be used to provide a somewhat more detailed overview of urban life. Finally, the city of Babylon, especially during the reign of Nebuchadnezzar II, will serve as an example of possibilities for future research in the field.

In this preliminary survey, it has only been possible to treat a few selected main points. Much more should be done in a continuation of the project. Obvious areas little treated here are the Levant, Iran, and Turkey. Even more intensively discussed areas like southern Mesopotamia or even Babylon cannot be exemplified with proper detail, pending more intensive research.

Broad perspectives: the Ancient Near East and Egypt

Even before urbanisation, the Ancient Near East was the main centre for early agricultural development and domestication. The earliest Neolithic agricultural villages dating from c. 10000 BC, with an estimated size of one hectare or less, were as a rule situated in numerous fertile fan areas just a few square kilometres in extent along rivers in the borderland between mountains and plains, giving production potential and communication advantages.2 Exceptionally large and well-known examples of such early settlements are Jericho (2.5 ha, c. 9000 BC) and Çatalhöyük (13 ha, c. 7000 BC), described in the previous chapter.

Early urbanism was a gradual process that occurred over several centuries in the early urban centres of southern Mesopotamia but also in northern Mesopotamia and Egypt. The earliest known settlements on the large south Mesopotamian floodplain of the Euphrates and the Tigris – an area extending more than 60000 square kilometres – are from as late as c. 5000 BC. The relatively late appearance of settlements there may be explained by the possible covering of earlier small settlements by alluvial deposits, or that the extensive floodplain posed challenges, which required a larger-scale society as discussed below.

2 E.g. Sherratt 1980.
By about 4000 BC during the so-called Uruk period there was a marked increase in the number and size of towns, and the first cities like Uruk began to appear. There was now a more developed societal organization, in order to manage the extensive irrigation work and the construction of cities. A network of communication ensured the procurement of raw materials as well as certain finished products. The physical control of the irrigation works and the organization of the large population in the towns and cities also required that the administration had the ability to develop writing and other bureaucratic procedures, providing a basis for future cultural and scientific development. The advent of writing, around 3200 BC, marks the start of the historical period which adds a new dimension to our understanding, not only thanks to the physical evidence but also to the written historical documentation about contemporary society. We will illustrate the following 3000 years with selected details (Table 1).

<table>
<thead>
<tr>
<th>Year</th>
<th>Period Mesopotamia</th>
<th>Cities and Towns Mesopotamia</th>
<th>Egypt</th>
<th>Period Egypt</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000 AD</td>
<td></td>
<td>Baghdad</td>
<td></td>
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</tr>
<tr>
<td>1000</td>
<td>Hellenistic</td>
<td>Neo-Babylonian</td>
<td>Babylon</td>
<td>Late Period</td>
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<tr>
<td>1000 BC</td>
<td>Middle Babylonian</td>
<td>Nineveh</td>
<td>Nippur</td>
<td>New Kingdom</td>
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<td></td>
<td>Old Babylonian</td>
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<td>Qatna</td>
<td>Old Kingdom</td>
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<td></td>
<td>Ur III</td>
<td></td>
<td>Kanesh</td>
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<tr>
<td>2000</td>
<td>Old Akkadian</td>
<td>Tell Leilan</td>
<td>Ebla</td>
<td></td>
</tr>
<tr>
<td>3000</td>
<td>Early Dynastic</td>
<td>Uruk</td>
<td>Hierakonpolis</td>
<td>Early Dynastic</td>
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<td></td>
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<td></td>
<td>Merimde</td>
<td>Predynastic</td>
</tr>
<tr>
<td>4000</td>
<td></td>
<td>Uruk</td>
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<tr>
<td>5000</td>
<td></td>
<td>Uruk</td>
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Table 1. Chronology of the Ancient Near East and Egypt with main periods and cities referred to in the text.

There has been a great lack of good computerised working tools for the geography of the Ancient Near East. Recently, Google Earth has made satellite photos freely available. Depending on the area, the photos may vary from quite good high resolution to medium resolution; fortunately, the parts of the area that were only available with lower, less useful resolution have now been upgraded. However, the localisation of even the most well-known Ancient Near Eastern sites has often been a problem. Therefore, a first step was to provide a system of place marks for Ancient Near Eastern archaeological sites for Google Earth. Some 2000 sites have been marked so far, and they currently provide the largest such open access collection anywhere in the world. Although still in a very preliminary form, the collection gives a general idea of the distribution of, and insights into, a number of sites (Fig. 1).³

³ Available as an ANE.kmz file at http://www.anst.uu.se/olofpede/Links.htm for free download and with instructions for use with Google Earth. Support for this project has come from Urban Mind, Uppsala University, and the Excellence Cluster Topoi at Freie Universität Berlin. It has been possible to use library resources at Institut für Altorientalistik
One of the problems has been the many different coordinate systems and datums used when mapping the Middle East. Simply to use available coordinates for locations of Ancient Near Eastern sites often does not work even when using standard transformation algorithms in GIS-programs. The basic values are often not published according to an identifiable unified system. The only secure method to identify the sites on Google Earth turned out to be an optical search for the right formations in the satellite photos and the use of available coordinates only for reaching approximate areas. This method resulted in a large number of sites correctly placed with correct coordinates. However, much more work has to be done in order to get all the less well-known sites correctly located. For the future, the preliminary tool ANE.kmz has the potential of becoming much more advanced, for example with division of the sites on the basis of chronology and size.

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4 This applies to detailed work even concerning the ambitious Tübinger Atlas des Vorderen Orients with a number of maps in large format including an index (Register zu den Karten/General Index Vol. 1–3, 1994) as well as two series of studies Reihe A (Naturwissenschaften) 1977–, and Reihe B (Geisteswissenschaften) 1972–.

5 Detailed excavation surveys and plans of excavations, some aerial photos, as well as detailed French, British, Russian, and Arabic maps have been used when preparing the preliminary ANE.kmz. Much detailed work has still to be done.
Environmental conditions in the Ancient Near East

Karin Holmgren and Martin Finné of Stockholm University have provided a short overview of the climate proxy data of the Ancient Near East with data mostly from regions outside the core area of Mesopotamia. Here, a first attempt will be made to integrate the climate information with historical and archaeological material to arrive at the three perspectives of investigation chosen for this study.

The basic prerequisites for agriculture as support for cities are adequate precipitation and suitable soil quality. The Middle East can be roughly divided into a northern, western, and eastern peripheral zone, which allows rain-fed agriculture, and another southern, central zone where agriculture is only possible with irrigation. A minimum of 200–250 mm secure rainfall per year has often been taken as a rough border between the zones. Depending on seasonal fluctuations and possible climate changes, there may be additional variations. In southern Mesopotamia and similar areas, agriculture is dependent on complete irrigation of the entire landscape. In other parts of the Middle East with more precipitation, rain-fed agriculture is possible, but even here sometimes better harvests can be achieved with some sort of limited irrigation (Fig. 2).

Owing to the dependence of Mesopotamia on the water of the Euphrates and the Tigris, the climate data from the sources of these rivers may be especially important and are therefore discussed in greater detail below. The main climatic material with such a geographic distribution is from Lake Van, where after a long wet period c. 4200–2100 BC there was a shift towards a more continental climate with a period of diminishing precipitation that lasted for several centuries,
followed by a long dry period c. 1400–100 BC, after which essentially modern conditions prevailed.6

Traditionally, the climate of the Ancient Near East has been treated as essentially stable with some variations. However, with increasing availability of better quality proxy data, there have started to appear studies that try to differentiate some critical periods, for example the centuries after c. 6200, 3200, 2200, and 1200 BC. The most discussed is 2200 BC; the latest, 1200 BC, has been dismissed as based on outdated proxy data.7 Limiting factors in comparing data from different approaches are the continually better but still too imprecise dates and a limited understanding of how to interpret the proxy data.

Some extreme climatic situations are described in the Ancient Near Eastern literature. Well known is the great flood in the Mesopotamian Atrahasis and Gilgamesh epics and in the biblical book of Genesis. Copies and excerpts of the Mesopotamian epics have been found in the entire region all the way to the Mediterranean. So far all modern attempts to relate such narratives to events in the physical world have been less than convincing.

Landscapes in the Ancient Near East

From the middle of the 19th century on, the study of the Ancient Near East has been based on an unusually good source situation with a combination of huge numbers of contemporary cuneiform texts and large quantities of archaeological finds. The focus has of course shifted over time. From the beginning, interest was mainly directed towards the many thousands of cuneiform clay tablets with detailed textual information about economic, historical, cultural and religious life. Studies were also focussed upon large archaeological sites, often concentrating on their monumental temples and palaces. The very abundant small sites have not been studied to the same extent as several of the larger ones.8

In the mid-20th century, large-scale archaeological surveys in southern Mesopotamia placed the individual sites in relation to networks of canals and settlements.9 In the following decades there was a tendency to make the surveys more detailed with new and better methods, and as a result there were major changes to the reconstructions, and the surveys were expanded to include other selected areas of the Middle East. There was also a tendency to recognize what can be called archaeological landscapes of the Middle East as regions with different types of landscape, described by Wilkinson as landscapes of irrigation, flat tell landscape, reluctant (sic) desert, and highlands.10

In the landscape of the Ancient Near East, fields and gardens as well as areas for pasture surrounded the cities and towns, which were often built along rivers or canals. Streets linked the settlements.11 As will be discussed in more detail below, the fields and gardens were used as food supply for cities and towns in

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6 Wick et al. 2003.
7 Weiss et al. 1993; Jas 2000; Staubwasser and Weiss 2006. According to the climatological material presented above by Holmblad and Finné, there are no events around 1200 BC as assumed for the Van material by Neumann and Parpola 1995; this has already been pointed out by Wilkinson 1995, 151, due to a re-dating by 1700 years.
11 Frankfort 1950.
addition to produce coming from nearby settlements. For larger cities, the immediate surroundings may not have been sufficient to provide for the population in the city.

Whereas southern Mesopotamia, which is treated in the following section, is totally dependent on irrigation, the landscapes in the northern, western, and eastern parts of the Ancient Near East normally get enough rain to sustain agriculture as a basis for cities. However, attempts to distribute additional water for agriculture also occur in these areas. This is especially known from the periods and areas with the greatest cities, as the following example will show.

In his recent study of Assyrian irrigation in northern Mesopotamia, A. Bagg12 assumed that the climate was essentially stable. This is an area where agriculture without irrigation is possible. However, during the period 1400–600 BC, there were canals supplying water to the capitals Nineveh, Kalhu (Nimrud), and Dur-Sharrukin. The water was destined especially for the gardens around the cities but was also used to increase the reserves of the fields nearby. Kalhu had a canal system partly in tunnels. There were four canal systems bringing water to Nineveh. Sennacherib’s aqueduct is a famous part of the water system from the mountains to Nineveh. The water for these canals did not come from the nearby Tigris but from tributaries from the mountains in the north and the east. This is often explained as due to the rapid flow of the Tigris. An alternative explanation worth examining in more detail could be that the extended drier periods noted above for the Van area during these centuries also increased the need for irrigation. If so, there may have been an adjustment of the water resources due to increased needs and at the same time less water in the rivers, a matter that demands further attention.

Cities in the Ancient Near East

Towns and cities have a central place in Ancient Near Eastern cultures. Cities are larger and have a more complex organization than towns. The ancient cities in the area can be counted in the hundreds, towns in the thousands, and if anyone would like to include the smaller settlements there would be several tens of thousands that are known in one way or another.

There are some common characteristics for Ancient Near Eastern cities and towns in addition to settlement size and the obvious concentration of population. A wall surrounded many of the towns and cities in the Ancient Near East. Sometimes even a section of a city had its own wall. Because the city walls can sometimes be seen with very little excavation, the size of a city is often (as below) given as the approximate area inside the walls. In many cases this may be far too small, as it has frequently been shown that large suburbs surrounded the walled cities. However, owing to a lack of proper studies it is often not possible to give other figures.13

Other characteristics of cities and towns are that they had monumental architecture in their central parts. Temples are typical components, and palaces and

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13 Postgate 1994. For a simple definition of settlement sizes, cf. Adams and Nissen 1972, 18, village 0.1–6.0 ha, town 6.1–25 ha, urban centre more than 50 ha, and city 400 ha. Algaze 2008 has a modified division: hamlets approx. 0.1–2.5 ha, villages 2.6–5 ha, small towns 5.2–9 ha, large towns 10–14 ha, small cities (corrected here from obvious misprint) 24–25 ha, cities 40–50 ha, and primate cities 100 ha.
other administrative buildings can often be found.¹⁴ There was a social stratigraphy and hierarchy in such large settlements. City rulers led the early independent Sumerian city-states, while mayors were responsible for cities in the later, often more populous, Assyrian and Babylonian states. There was also a political and religious elite interested in prestige goods. Many citizens were free men (awīlum), but there was also a dependent group as well as slaves.

In order to keep the society functioning, there was a need for administration, which often led to bureaucracy. This can be seen, for example, in the use of seals, which is sometimes indicative of access to goods at various levels of the bureaucratic hierarchy.¹⁵ With writing, we get documentation centres in the form of archives and libraries, facilitating contemporary life and giving us an historical perspective on human activity not available in societies without writing.¹⁶

In the ancient Mesopotamian languages, both towns and cities were denoted by the same word, Sumerian ūru or Akkadian ālûm, whereas villages and small agricultural hamlets could be described with other expressions. Of course, there was a varying degree of complexity and a wide range of sizes among the small towns as well as the large cities. During several periods some of the largest cities enjoyed special privileges.¹⁷

From prehistoric times on, one can point to the existence of trading networks linking the Ancient Near East to the surrounding regions. From the mountainous regions different types of stone, metal, and timber were exported to the Mesopotamian floodplain. Mesopotamia, lacking most raw materials, in turn mainly exported cereals, unrefined wool, and textiles, and also served as a node for imported materials and products made thereof.¹⁸ The agents were individual merchants, sometimes organized in family firms, which were common in the Old Assyrian trading system and well documented from Kanesh in Anatolia c. 1900 BC.¹⁹ Sometimes they represented large financial institutions like the state.

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¹⁴ Frankfort 1950
¹⁵ Hallo & Winter 2001; Gibson and Biggs 1977.
¹⁶ Nissen, Damerow and Englund 1990; Pedersén 1998.
¹⁹ Veenhof 2008.
or large religious institutions. Towns and cities on the floodplain were also part of a short-distance trade network with the surrounding agricultural areas and nearby towns. In connection with larger urban centres, there were marketplaces for the exchange of products.

Famous large cities include among others Uruk (550 ha, c. 2700 BC) in southern Mesopotamia and Nineveh (700 ha, c. 650 BC) in northern Mesopotamia. These were followed by Babylon (800 ha, c. 570 BC), which will be treated in more detail below. Characteristic for these cities is that they were abandoned after hundreds or even thousands of years of occupation and are now open for archaeological examination. Other cities like Damascus and Aleppo may also have been quite large, but because the modern cities cover the ancient ones, we have very little contemporary evidence from the ancient levels there.

Most towns and cities have grown for many years and have an organic, irregular layout partly following the terrain, with winding roads and irregular agglomerated buildings. Some towns and cities or sections thereof are more planned, with a tendency to be round or square with straight streets and regular buildings. Often the size of the cities and their multilevel structures have not yet allowed complete geomagnetic surveys for underground town plans, but there is great potential for future research. A few examples will be discussed later on including Babylon, which will be treated in some detail.

The number of inhabitants in the very large cities mentioned above can only be approximated between 55000 and 300000. The estimations of population density in Ancient Near Eastern cities usually range between 100 and 200 persons/ha, but a maximum figure of just under 400 persons/ha is a possibility, all depending on the geographical area, the type of settlement, and the period in more recent history used as a point of comparison. These are just average figures for the whole settlement disregarding high and low density areas in the cities. Only future research that combines ethno-archaeological data with archaeological and textual evidence for large urban areas can lead to better estimates. One problem, of course, lies in trying to assess how much of a city or town consisted of areas with domestic housing, and another problem is the differences in density between different parts of a settlement. In certain periods and places buildings might have had more than one storey, which could also affect population numbers, allowing for a higher rate of occupation per surface unit.

During the last decades, there have been extensive excavations of a number of often quite large Bronze Age cities in northern Mesopotamia and to the west,
often with spectacular results. Ebla (Tell Mardikh, 50 ha, c. 2300 BC) and Qatna (Tell Mishriqeh, 100 ha) in western inland Syria, as well as Shubat-Enlil (Tell Leilan, 90 ha) and Urkesh (Tell Mozan, 30 ha) in north-eastern Syria, are all examples of excavated sites, and there are many other, often smaller sites. The surrounding areas have also been surveyed, giving clear indications of the relation between the central city, sometimes with outside suburbs, and the surrounding landscape. The square layout of the wall around Qatna gives the impression of a planned city, which is only partly substantiated inside. More properly planned towns, possibly for military use, are small sites like the Old Babylonian Shadup-pûm (Tell Harmal) and Haradum (Khirbet ed-Diniye), approximately 2 ha in size.  

When working with the excavation at Shubat-Enlil (Tell Leilan) in north-eastern Syria and the collapse of this city and others in the nearby area, the question of the reasons for this regional collapse came up. Was the political weakness of the government the main cause, or could, for instance, climatic change be a contributing or even main factor? As can be seen in the chapter by Holmgren and Finné, we are not convinced of all the implications suggested by the common, modern, climate interpretations of archaeological material, but the matter needs more study.  

The long-term excavations of the Hittite capital Hattusha (200 ha, c. 1250 BC) have unearthed city walls, with sections of the city having their own walls, open spaces, and public buildings such as temples, palaces, and administration buildings. A recent find of the largest storage facilities in the Ancient Near East in the form of silos for 7000–10000 m³ barley shows the administrative facilities to secure the sustainability of the population.  

Assyrian capitals in northern Mesopotamia during the Neo-Assyrian period 800–600 BC were relocated essentially from south to north along the Tigris: first Assur (80 ha), followed by Kalah (modern Nimrud, 380 ha), Dur-Sharrukin (320 ha) and finally Nineveh (700 ha). There may have been several reasons for the moves, but access to water was simplified by the move in a northerly direction, and as mentioned earlier these centuries may form part of a period with less precipitation in the Van area near the sources of the Tigris. This is one of several possible links between modern climate data and history that have to be examined carefully.  

**Cities in Egypt**

The Nile valley is the earliest urban development in Africa. When attention is given to the change from 1–2 ha mobile encampments and early sedentary settlements to larger aggregated settlements it is usually focused on the Predynastic period which is seen as a precursor to early Egyptian Dynastic urbanism. Of particular interest is the site of Merimde Beni-Salame from the early 5th millennium BC, excellently published and with an estimated area of 25 ha. The recent

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26 Secher 2000.  
27 Altaweel 2008.  
important contribution by Kuper and Kröpelin provides an up-to-date view of climatic variability for the whole of north-east Africa.\(^{30}\)

Given the earlier doubts about the existence of urbanism in Egypt, the past 50 years have seen remarkable developments in the field of urban studies. It is often said that much of the evidence for early urbanism has been destroyed or lies out of reach below fertile agricultural soils, but studies of what remain must be classed as one of the success stories of archaeology.\(^{31}\)

A series of fundamental contributions to our current understanding of urbanism have been provided for the Lower Nile Valley and Delta\(^ {32}\) and for Nubia.\(^ {33}\) Excellent analytical overviews of the Nile Valley can be seen in the work of Kemp and others. Hassan integrated a detailed assessment of Nile flood levels and climate change with his analysis of the development of urban settlement systems, showing the correlations between periods of low floods and the first and second intermediate periods as times of crisis for urban society in Egypt. This work has provided an estimate of the number and territorial extent of villages and towns and their likely demographic composition (Plate 1).\(^ {34}\)

The analytical frame outlined above provides a context for appreciating the detailed work on individual urban site complexes in 4th-millennium Predynastic Egypt, such as the serially hegemonic capitals of Naqada, Hierakonpolis in Upper Egypt, and the recently well-excavated town at Tell el-Farkha (4.5 ha) in the eastern Nile Delta. The latter settlement already shows functional splitting between different areas of the town. A first monumental building from the mid-4th millennium BC was found, which leads to the interpretation of the site as “residence, combined with stores” for trade supervision by the people of the Naqada culture in the north of Egypt.\(^ {35}\)

The Early Dynastic towns of Sais and Buto in the Nile Delta were apparently associated with early trade to West Asia. Other towns such as the walled settlement of Abydos were cult centres. The typical spatial layout of Early Dynastic

\(^{30}\) Kuper and Kröpelin 2006.

\(^{31}\) Sjöberg 1960.

\(^{32}\) Butzer 1976; Kemp 1977a, b; Bietak 1979, 2010.


\(^{34}\) Kemp 1989; O’Connor 1993; Hassan 1993; Troy 1999.

towns from c. 3200–2700 BC shows a walled, relatively densely settled core with functionally differentiated ritual, administrative, and production sectors.36

Besides the naturally developed town structures, the planned settlement plays an important role rather early in Egyptian history. The pyramid towns of the Old Kingdom belong to this category. One of the best examples is the town community at Heit el-Ghurob in Giza, which served the construction and maintenance of the pyramidal area in around 2500 BC, and which can be traced to an extent of at least 7 ha. The construction contained a separate quarter with regular “gal-

Among excavated settlements from the early Middle Kingdom we recognize in the earliest level at Tell el-Dab'a the structure of an orthogonally constructed settlement for a state-run colonisation town near the north-eastern border, a construction which had an enclosure wall, serving the establishment of royal administration.38 The town Kahun, which often serves as a model town for the Middle Kingdom, showed around 1870 BC a grid-planned street system of 12–14 ha in extent with subdivisions apparently for different social classes.39

In the Middle Kingdom, the fortresses in the southern border area in Lower Nubia were established, as exemplified by the Buhen complex (approx. 1.3 ha) in the second cataract, and during the New Kingdom the protected areas within the fortress walls were enlarged and open town sites grew up in the vicinity.

In the New Kingdom, a renewal of the fortifications in the border areas took place, whereas in the interior the urban settlements underwent a significant expansion in size and complexity dominated by two themes, namely kingship and ritual cults.

Tell el-Dab'a had expanded already earlier, in the Second Intermediate Period, and formed the large city of Avaris, with a palatial quarter at the main riverside including a garden and protected by a fortified wall (extension not known); the city expanded over several mounds (estimated size 250 ha, c. 1580 BC). During the early New Kingdom, it served as a residential area in the Delta for the Egyptian court, and continued around 1250 BC on a greater scale as part of the Ramesside Delta capital of Piramesse, doubtless with military installations, and huge temple estates including vineyards were established.40

A generous wide open spatial planning can be seen in the short-lived (17 years) freshly created residential town of Tell el-Amarna in Middle Egypt, located in a bay on the Nile and surrounded by natural cliffs, with a built-up territory of about 600 ha. The population is estimated to 30000 or more around 1370 BC.41

The temple cities of Thebes, Heliopolis, and Memphis, with the exception of Heliopolis with its religious focus, were also at times seats of kingship. Memphis, which also served as a military centre, has some 300 ha of visible remains.

The extension of the analytical frame southwards brings into sharp focus problems with identifying the now partly submerged urban history of Nubia. The site of Qasr Ibrim is one example which shows a very long established urban

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36 Hassan 1993; Troy 1999.
38 Czerny 1999.
39 Often quoted as Lahun or El-Lahun, see Quirke 2005 and Bietak 2010.
42 E.g. by O’Connor 1993.
tradition which spanned a number of different cultural divides from the beginning of the first millennium BC until after the 17th century AD; even an earlier foundation may be assumed because of rock chapels from the New Kingdom.43

The major contribution of recent years, however, must be the excavations at Kerma which have provided significant new details on what is probably sub-Saharan Africa's first urban settlement, based on grain cultivation and cattle keeping and extending to 20 ha at its height in c 1500 BC.44

In the longer term slow variables of the longue duree acting of the urban settlement systems of the Nile Valley, there seems to be a spatio-temporal shift southwards at multiple century scale of later urban development with Napata and Meroe as prime examples. In accounting for these shifts in emphasis, one might point to increasing complexity and vulnerability of the urban sites themselves in addition to slow-acting variables of climate change with its direct effects

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43 Caminos 1968.
44 See Bonnet 1990, 2004, Bonnet et al. 2006; Connah 2001 for summaries.
upon cattle-grazing resources as well as salinization affecting agrarian production systems, and metal working depleting wood resources. Multiple factors affecting different aspects of the urban settlement system are most likely to have induced the changes.

Mid-scale perspectives: southern Mesopotamia

Alluvial deposits from the Euphrates and Tigris have created the vast southern Mesopotamian floodplain. Movements of the rivers and deposition of silt, but also of mineral salt in the soils, have been crucial factors in creating the landscape, providing opportunities but also degrading what is there. The regular precipitation on the southern Mesopotamian floodplain is too low for rain-fed agriculture. However, with the proper use of irrigation it is possible to have an agricultural landscape that can feed large cities. There have been several changes, some of them major, in the landscape over the millennia. Details have been studied
During the last century, but there is still much more to be done to understand the interplay between different decisive factors. A first glance at a map or a satellite photo shows the Euphrates in the western end of the plain and the Tigris in the eastern. The Euphrates in particular is often split into several branches (Arabic Shatt). Between the rivers, there are several remnants of ancient river branches or canals with abandoned cities along the dried-out water courses.

During earlier millennia both rivers flowed more toward the centre of the floodplain. Yearly deposits in the flat landscape not only make agriculture possible, but also result in a long-term movement of the rivers. The states along the rivers and river branches were forced to direct or redirect rivers and canals manually. This was mostly successfully done, but occasionally huge unintended changes occurred.45

There are no good proxy climate data sets available from southern Mesopotamia itself, so paleoenvironmental information from the surrounding areas has to be used (see above). The data from Van in the north are highly relevant in regard to the amount of water in the Euphrates and the Tigris, the foundation for the necessary irrigation. The nearest proxy data from western Iran show different trends than the northern material. The south-eastern monsoon data, as far as incursions from that direction can be shown to be relevant, also partly point in other directions. Much more basic research has to be done here in the future. The few boreholes from Mesopotamia itself have so far not produced any published climatological data. Here new research may well change the picture.46

**Landscapes in southern Mesopotamia**

There have been several archaeological surveys during the last 60 years attempting to trace the ancient river branches and the locations of the ancient sites in southern Mesopotamia. The findings of large amounts of ancient cuneiform texts on sites and the reading of these texts have made secure identifications of ancient city names possible. Other less secure identifications may be based on circumstantial information from texts that do not come from the site itself (Figs. 4, 5).47

The rivers, river branches, and canals are in principle flowing on a somewhat higher level than the surrounding terrain. This is the opposite of a rain-fed landscape. Yearly inundations and deposition of silt occur especially in the months after the snow melts in the mountains. The states tried as far as possible to control the whole riverine system. The need of organization and control of landscape and irrigation, and the resulting administration, may be important driving forces behind the creation of towns and cities.48

The landscape consisted of hundreds of cities, towns, and smaller settlements situated along a network of river branches and canals. The whole riverine system is a combination of natural landscapes and effects of human activities. Any kind of neglect or mismanagement can result in problems with salinization of the soil, unwanted inundations, areas turning into desert, and movements of the rivers. A good political control was essential for keeping the landscape in order. Unstable

47 See Gasche 1989, 111–131 for the identification of several of the major settlements on the Mesopotamian floodplain, predominantly with occupation from the Old Babylonian period.
situations and war may cause serious problems undermining the livelihood of hundreds of thousands of people.49

Gardens and fields in ancient as in modern times were situated along river branches or canals next to the settlements. As a rule, the production units consisted of long, narrow strips of land with the upper short side situated closest to the water. Here, gardens with date palms were placed; vegetables and fruit trees could be found under the date palms, and occasionally also a house. At some distance, there were fields often for barley, and farther away were pasture areas and unused, occasionally salty land. This is the standard scheme that can be observed both in ancient cuneiform texts as well as in the pre-modern and even modern landscapes (Fig. 6).50

In recent decades, there have been new studies of the ancient environment of the landscape in the northern part of southern Mesopotamia, leading to altered reconstructions of the ancient river positions. In the eastern part of southern Mesopotamia these questions have never been properly investigated, but now satellite images are used to prepare future field research, and studies are conducted on Persian Gulf shorelines with surrounding areas.51

The Euphrates repeatedly shifted in stages towards its present course at the rim of the western plateau. A major move of the Euphrates westwards has been proposed for the Old Babylonian period. This may be a reason for the apparent lack of evidence for habitation in cities in the southern part of the Mesopotamian floodplain during the late Old Babylonian and early Kassite periods, c. 1700–1400 BC, an issue that has been discussed at some length in academic writings over the last 20 years. Several cities may indeed have been deserted in the southern area, but cuneiform texts that have recently been made available, for instance from the First Sealand dynasty (c. 1500 BC), indicate that modified explanations may have to be proposed. The precise dates of moves, detailed reasons, and effects must be a matter of future research that could lead to very interesting results.52

The last 60 years have resulted in what may be described as a radical change of the agricultural landscape. New main canals with networks of adjoining minor

49 Jacobsen and Adams 1958. Diverting rivers as a wartime act is witnessed in cuneiform sources, e.g., Kutscher 1989, 118.
50 Wirth 1962; Postgate 1994.
52 A lack of datable material from late Old Babylonian and early Kassite periods in southern Mesopotamia has been noticed by Gasche 1989, 109–143, Plan 8; Gibson 1993, 8; Adams 1981, 155–158, with fig. 27–28; Wilkinson 2003, 85. Charpin, in Charpin et al. 2004, 342–346, has pointed to textual evidence for moving persons and cults from the southern to the northern parts of the Mesopotamian floodplain. The recent publication of cuneiform texts from the first Sealand dynasty by Dalley 2009 seems at least partly to indicate more continuity in the south.
canals in regular shapes have been created by means of construction machinery. Therefore, for the description of what is here called modern traditional agriculture, the standard agro-geographical work by E. Wirth based on materials available in the 1950s and early 1960s is of importance, giving detailed information about the situation before the main modern reworking of the agricultural landscape in Iraq started. However, it can be seen that many of the modern irrigation canals more or less follow previous alignments of rivers and ancient canals, so it is not a total change but rather a reworking of the landscape.53

As of 1955 three large artificial lakes west of the plain serve as seasonal reservoirs in addition to the traditional inundations of marshes.54 In recent years, a series of new dams have been constructed on the Euphrates and the Tigris in Turkey, Syria, Iran, and northern Iraq. This will continually diminish the water available in southern Mesopotamia.

**Cities in southern Mesopotamia**

Beginning in the mid-19th century, there have been a large number of excavations of important cities and towns with constantly improving archaeological techniques and methods. Most of the excavated and many of the unexcavated ancient cities and towns have been marked on the downloadable ANE.kmz for Google Earth (Figs. 4, 5).

Some important cities in southern Mesopotamia can be listed from approximately 3000 BC to AD 760, and roughly speaking from south to north with an indication of their size inside the city walls: Ur (70 ha), Uruk (550 ha), Larsa (350 ha), Lagash (440 ha), Girsu (350 ha), Isin (120 ha), Nippur (220 ha), Babylon (800 ha), as well as Seleucia, Ktesiphon and Baghdad; among these only the last is still inhabited.

Over the course of centuries, there seems to be a trend in movement of political power from the southernmost part of southern Mesopotamia to the middle and finally to the northern part of the southern Mesopotamian alluvial plain. There is also a movement from different branches of the Euphrates to the Tigris on the east part of the plain. If this apparent move of political power in a northward direction should stand the test of future archaeological findings from the south, it may be questioned whether there is an environmental reason for it, like salinization of soils or climate change, or if there is a political explanation, or indeed a combination of factors.

Two primary periods of growth in numbers of large settlements and aggregation of population in urban centres on the southern floodplain are c. 2900–1800 BC and 500 BC–AD 500.55 The first of these periods represents the formative phase of cuneiform literature. As indicated above, in literature as well as in bureaucratic sources the Sumerian *uru* and the Akkadian *ālum* were used to denote towns and cities. Other terms could be used for villages in an agricultural landscape or suburbs of a larger urban centre. No further distinction based on size or importance seems to have gained prominence.56 Cities and towns were situated next to rivers and canals as seen above. Some large cities also have a river or canal

53  Wirth 1962.
54  Lebon 1955.
in the middle dividing the city into at least two parts. This was the situation, for example, in Uruk, Nippur, and Babylon, which will be discussed further below.

In the early periods, Uruk was the largest city in the southern part of southern Mesopotamia. A city wall dated to the early part of the Early Dynastic period (c. 2900–2300 BC) surrounded the city. The Gilgamesh epic claims that King Gilgamesh (c. 2700 BC) constructed the wall; we have no definitive proof but the dating and general circumstances may allow it. Within the walled city there were large temple complexes. In fact, the Gilgamesh epic ascribes 14 per cent of the city to temple complexes and twice that space within the city to gardens, probably an ideologically motivated statement but possibly with some merit. Gardens and canals are attested and reconstructed in Uruk more than 2000 years later, during Neo-Babylonian and Hellenistic times.57

A famous clay tablet from the Middle Babylonian period shows a map of the city Nippur. Town walls with several gates surround the city. River branches and canals run along the outskirts of the city as well as in the middle, dividing it into two main sections. Several temples are marked, and in the southwest corner a large area inside the city walls is described as a garden (Fig. 7).

The city was a central concept in the Sumero-Akkadian outlook on the world. Each city had a supreme divinity, connected with gods of other cities by means of kinship. Sumerian hymns extolled the qualities both of the cities and of their deities.58 The destruction of cities was considered a consequence of desertion by the gods.59 Even the afterlife was sometimes pictured as an immense city, with a bureaucratic regime mirroring that of the world of the living.60 On a more pragmatic note, Sumerian proverbs and debate literature often made use of the dis-

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57 Cocquerillat 1968; George 2003.
58 Biggs 1974: 45–56; Sjöberg and Bergmann 1969.
59 Cooper 1983; Michalowski 1989; Tinney 1996.
tinction between city and countryside. The distinction led to humorous contrasts between city dwellers and their rural counterparts, with the latter most often emerging morally superior.61

There are many basic questions still to be answered about urban life in southern Mesopotamia. An obvious problem is that the location of one of the most glorious capitals, Akkad c. 2200 BC, has not yet been established. The south-eastern part of the plain has hardly been studied, and here numerous towns were situated. The present lack of climatic and environmental proxy data makes reconstructions preliminary, but there is a large potential for future research on long historical development of cities in this core area of historical urban development.

High-resolution perspectives: Babylon

Babylon was long a leading city in the world. The most famous periods were when the city was capital of Babylonia during the reign of Nebuchadnezzar II (604–562 BC in the Neo-Babylonian period) and about a millennium earlier during the reign of Hammurapi (1792–1750 BC, middle chronology) in the Old Babylonian period. The most magisterial period of Babylon was as capital during the Neo-Babylonian period under Nebuchadnezzar II when it was the largest city in the world within city walls. Whereas the capital of Hammurapi is known from references in contemporaneous documents from other sites, the high groundwater level has so far made it virtually impossible to reach that level by means of normal archaeological excavations. The situation is quite different and archaeologically much more promising for the Neo-Babylonian capital. The city was gradually abandoned during the Hellenistic period and many inhabitants moved to Seleucia on the Tigris and later on to nearby Ktesiphon. Finally, all these cities were abandoned and the capital moved to Baghdad.

The ruins of Babylon are situated near the west end of the northern half of the fertile floodplain of southern Mesopotamia some 85 km south of Baghdad, the modern Iraqi capital. On the immediate south side of Babylon are the outskirts of the modern city of Hilla, the capital of the modern Iraqi province that has also been given the name of Babylon.

Owing to its abandonment, Neo-Babylonian Babylon is rather well preserved and easy to reach from the surface, and has yielded a huge amount of archaeological information including remains of many buildings of different types and several thousand contemporaneous cuneiform clay tablets from ancient archives and libraries in the city, giving information about a number of different aspects of city life. It is a great advantage to archaeologists when texts are written on clay tablets.

Landscapes of Babylon

The branch of the Euphrates flowing through the city has dominated the landscape around Babylon all the way up to present time. The area is traditionally, like the area around Baghdad, a centre for intensive, small-scale agricultural units often with gardens for growing vegetables and fruits.62

62 Wirth 1962.
The nearest cities were situated 15 to 30 km away and included Kish, Borsippa, Dilbat, and Kutha. Upstream and downstream along the Euphrates lay the towns of Sippar and Marad, located some 60 km away. The landscapes between were full of other towns and smaller settlements; hardly any of these have been well studied.

Water management was essential for the area. The impressive system of river branches and canals had to be constantly updated and taken care of. Sometimes new main canals were laid out in the landscape, for example between Babylon and Kish in the Neo-Babylonian period. Modern constructions in the landscape have often led to considerable changes, but the ancient systems can often be seen because modern irrigation canals tend to be built on or next to the remains of ancient canals.

According to ancient cuneiform texts, canals could be found in all directions from Babylon: the New Canal to the northwest, the Borsippa canal to the southwest in the direction of Borsippa, the Old Kutha canal in the northeast, the Banitu canal to the southeast leading to Kish, and the Piqudu canal to the south. The New Canal, the Borsippa canal, and the Banitu canal can be approximately identified in the landscape.63

In inscriptions of Nebuchadnezzar II, reference can be found to two huge dams, which he ordered to be constructed. One of them extended from the vicinity of Babylon all the way to Kish some 15 km to the east, and the other was even longer, some 60 km north of Babylon from Sippar in the west to Upi in the east. The northern dam has been traced archaeologically in the area of Sippar. In the areas north of both dams were large marshes with water. This was part of a constructed landscape. According to the inscription, the dams were supposed to serve military defence purposes. They were, however, also part of the large reserves of water used during the late parts of the agricultural season. Such water reservoirs were mentioned by ancient kings in their inscriptions and have been part of the landscape at least during periods of strong political power. For all their worth economically and militarily, such dams demanded regular upkeep and military supervision to safeguard against sabotage. The modern variant can be seen in the form of the water reservoirs in the west of southern Mesopotamia.64

The most common agricultural units in the area of Babylon were long, narrow pieces of land, similar to those referred to above in southern Mesopotamia (Fig. 6). The upper short side was situated at a river branch or canal. Here, near the water, the gardens were placed; at a distance, there were fields, often for barley. A basic unit could be about 20 metres wide with room for two rows of date palms and could be several hundreds metres long. The description fits well both with numerous cuneiform texts dealing with agriculture and with modern traditional agriculture around Babylon; most units are 1–25 ha in size.65

A large number of gardens with date palms were situated around Babylon, but according to contemporaneous cuneiform documents the gardens sometimes also lay in the area between the inner and outer eastern city walls. Ancient legal documents testify that there were several families living inside Babylon that owned gardens and fields in areas around the city. Other persons, who often leased the fields and gardens, conducted the actual work on the fields and in the gardens. Even if the green areas inside the outer city wall served as possible expansion.

63 E.g., Wunsch 2000; Zadok 1985.
65 Wirth 1962.
areas for construction of buildings, they also provided security in times of siege and reservoirs for ecosystem services.\textsuperscript{66}

The surrounding fields and gardens could not provide sufficient food for such a large city as Babylon. Therefore, large-scale, state-organized transport of food was carried out by boat along the Euphrates to Babylon. According to the cuneiform documents in the palace archive dating to the reign of Nebuchadnezzar II (604–562 BC), a fleet of ships brought barley in huge quantities from several cities in the area between Sippar in the north down to Marad in the south as well as from the Chaldean tribal area of Bit-Dakuri further downstream and the Sealand in the southernmost Mesopotamian wetland. The barley was stored in

\textsuperscript{66} Wunsch 2000; Baker 2009.
Babylon in large silos supervised by the palace (Fig. 8). The ecological foodprint of Babylon stretched across a more than 300-kilometre-long oval shaped area in terms of subsistence but much more widely in regard to imported metal, timber, and luxury items.

City of Babylon

A preliminary digital model of Babylon has been prepared for the project. Essentially the main public buildings existing during the reign of Nebuchadnezzar II have been given a preliminary reconstruction. The historical information used for the reconstruction is on the one hand the published archaeological evidence from the German excavations 1899–1917 supplemented with later results from the Iraqi excavations, and on the other hand the large number of contemporaneous building inscriptions found during the excavations as well as a preliminary utilisation of the huge amount of often basically unpublished clay tablets with cuneiform writing that were found on the site (Fig. 9).

In the next step of the project, separate levels for different historically and archaeologically attested periods will be added to the preliminary model. The plan is also to add to the model the well-known wall decorations, for example at the Ishtar Gate and the Street of Procession. The model will be used to answer a number of questions connected with city development, such as the impact of historical and environmental factors, and will of course also generate new questions.

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67 Pedersén 2005a N1, and forthcoming.
68 The ArchiCAD program has been used. Support for the work with the digital model of Babylon has come from Urban Mind, Uppsala University, and Excellence Cluster Topoi at Freie Universität Berlin.
69 Koldewey 1990 and Pedersén 2005a both with detailed bibliographies.
The earliest known history of Babylon does not stem from findings in the city itself but is known from other cities. The high modern groundwater level in Babylon makes it impossible to excavate the lower archaeological levels at present time.\textsuperscript{70}

For several centuries Babylon consisted of the inner east and west cities divided by the Euphrates, which flowed through the middle. The size of Babylon was at that time some 400 ha or 4 km\textsuperscript{2}. During the reign of Nebuchadnezzar II in the 6th century BC, he expanded it with the outer eastern city to twice the previous size, approximately 800 ha or 8 km\textsuperscript{2}. These are the measurements of the areas inside the city walls. The density of occupation is not known except for in selected archaeologically investigated areas. There existed densely populated areas, monumental buildings, fortifications, waterways, green areas, open spaces, and streets. Based on the approximate estimations of population density referred to above, the number of persons inside the city walls would be about 80000 to 300000, but such approximations are quite uncertain and based on more modern comparisons. The ancient names of a number of suburbs around Babylon outside

\textsuperscript{70} Gibson 1972 reported the finding of Early Dynastic III pottery in the city area. Sollberger 1985 has presented a preliminary historical overview of the oldest textual material.
the city walls are known, but so far the location of only one possible suburb has been established.71

Babylon (Fig. 10) had for many centuries the characteristics of a main Ancient Near Eastern city. There were several temples, a main palace complex and other administrative buildings, city walls surrounding the central part of the settlement, main streets, and a huge number of private houses for living and manufacture. During the reign of Nebuchadnezzar, there was a great change not only in size with the enlargement of the eastern outer city wall but also in monumentality. Many of the public buildings were enlarged and rebuilt using baked bricks instead of traditionally unbaked mud bricks. The bricks were of such a good quality that until the Babylon excavations around 1900, they were constantly broken away from the ancient walls and reused in modern buildings in nearby towns and cities.72 Examination of bricks may provide not only information on the firing used for the large-scale brick production but also data about subsistence, as plant remains often become embedded in the fabric of bricks.

The Euphrates flowed for centuries through the middle of Babylon from north to south, west of the palace. According to the excavators, the Euphrates changed its course and cut through the eastern inner city, east and south of the palace area in late Achaemenid-Hellenistic times. They assumed that the Euphrates might have reverted to its old course west of the palace during the Parthian period. In modern times the Euphrates branch cuts through the western city. We may suggest a topic for further studies, namely that one possible reason for the change may have been Nebuchadnezzar’s expansion of his palace into the river, which thereby did not give high floods enough leeway.73

The city walls around the inner city consisted of two massive walls with a street in between. Outside this complex were a quay wall and an 80-metre-wide moat with water. Around the new eastern outer city, there was a similar construction providing the eastern half of the city with a double fortification system. It must be remembered that in later Hellenistic Greek tradition these walls of Babylon were one of the architectural Wonders of the World.74

Among the eight gates in the city walls around the inner city, the four of the eastern inner city have been excavated. The most famous was the Ishtar Gate next to the palace attested in an inscription already 1000 years before Nebuchadnezzar.75 He rebuilt it and made it into a magnificent piece of architecture with figural decorations of glazed coloured bricks. He also raised, by several metres, the level of the main Street of Procession together with the Ishtar Gate and the palace area nearby, as well as some temples. The reason given in his inscriptions was to enhance monumentality but also to provide protection from the high groundwater, which obviously caused problems.76

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71 A detailed survey of the area is badly missing. The first archaeological attestation of a suburb of Babylon may be Tell Abu ez-Za’ad some 3 km south of the outer city wall of Babylon in the north-eastern outskirts of present-day Hilla. The reports at the ICAANE in London 2010 to be published in Sumer showed, however, Parthian remains on the excavated floors.
72 Koldewey 1990.
73 Koldewey 1990. There is an ongoing discussion about the dating of the river branches in Babylon, but only a new examination of the levees themselves can settle the precise dates.
74 Koldewey 1990.
75 Pientka 1998.
76 Langdon 1912.
The highest building in Babylon was the tower, the zikkurrat, belonging to the temple of the main god Marduk. Nebuchadnezzar’s rebuilding had a foundation 90 x 90 m and was 90 m high, and would have been visible from far away in the flat landscape. It figures as the Tower of Babel in the Bible.

The town planning of Babylon, as far as it is known from the different periods, represents a mixture of organic aggregation and planning. The straight lines of the city walls, the almost rectangular inner city walls, some main almost straight streets, and monumental buildings with often almost rectangular plans are quite well known. However, only seldom does perfect symmetry, long straight lines, or 90-degree angles on a large scale occur. There almost always seems to be evidence for modifications of a partly planned scheme. This is quite apparent in the areas with private houses, where buildings are often irregular, and streets and lanes may be winding and reflect older historical constructions. There is a great need of geomagnetic surveys of the whole city area. In the older inner city, it may be difficult to distinguish between levels from different periods, but the eastern outer city created by Nebuchadnezzar which is hardly examined archaeologically may turn out to be a one-level city more suitable for such a survey (Plate 2).

Babylonian topographical texts give a detailed contemporary description of sections of the inner city of Babylon. Forty-three temples, the two city walls, the eight city gates, and several of the streets are referred to by name. Other information is totally missing at least in preserved parts of the text; for instance, there is no reference to the palaces in Babylon, which are otherwise well known from both archaeological excavations and a number of other texts. The topographical

texts are also silent on the subjects of houses for living, business, trade, and early industrial production. All this has to be supplied by means of other textual or archaeological sources.\textsuperscript{78}

The population of Babylon during Nebuchadnezzar’s reign was mixed. Babylonians and Chaldeans representing the old inhabitants spoke Babylonian, an Akkadian dialect, while other groups distinguished themselves as Arameans and spoke their own language. In addition, there were large groups of people from all over the Babylonian empire, as well as outside it. Even hundreds of foreign mercenaries are attested in Babylon for protection. Sumerian, no longer a spoken language, continued to be used for scholarly and religious purposes. Information about the people can be found in the archives and libraries with cuneiform texts on clay tablets preserved in the city.\textsuperscript{79}

The largest Neo-Babylonian private archive so far excavated concerns members of the family Egibi. When found in southern Babylon during early clandestine excavations in the 19th century, it numbered possibly a few thousand clay tablets, preserved in a series of clay pots. Among them are some 250 tablets dealing with the family members’ ownership of agricultural fields and date palm gardens in the area of Babylon. The gardens are essentially situated outside the city walls, but there are also examples of gardens between the old inner and the new outer city wall in the east.\textsuperscript{80}

One of the architectural Seven Wonders of the World was the Hanging Gardens in the palace of Nebuchadnezzar, occupying a pride of place among Ancient Near Eastern man-made constructions. These gardens were not mentioned in any preserved cuneiform text and the location in the palace area has never been definitively proven. However, there have been many suggestions. Another exclusive garden was the Juniper Garden attested with religious functions at least during the later Hellenistic period.\textsuperscript{81}

Babylon, like several other Mesopotamian cities, was a centre for early science with advanced mathematical calculations and long-term astronomical observations centuries before the systematisation by the Greeks. Documentation libraries with cuneiform texts dealing with such matters have been excavated. Both international and local trade activities are documented in several archives found in the houses of businessmen in Babylon. The remains of shops and workspaces along streets have been unearthed in residential areas in the city. A reworking of the archaeological and textual materials from Babylon could provide interesting new information about the range of crafts practised.\textsuperscript{82}

Babylon is an example of a great city, which is the main political centre of an empire. The population, basically Babylonian but with numerous other ethnic and linguistic identities attested, had tried to adjust itself to the requirements of the landscapes within the possibilities offered as the main centre of the largest contemporary empire controlling vast surrounding regions. Nebuchadnezzar rebuilt Babylon with great monumentality at a time when it was the largest walled city in the world. The use of glazed, baked, and unbaked bricks but seldom stone for the buildings is an elementary example of the adjustment to the resources in the area. The interaction between the city and the surrounding landscapes, both

\textsuperscript{78} George 1992.
\textsuperscript{79} Pedersén 2005a, 2005b.
\textsuperscript{80} Wunsch 2000.
\textsuperscript{81} Koldewey 1990, 99–107; Krischen 1956; Finkel 1988, 38–58.
\textsuperscript{82} Pedersén 2005a, and forthcoming.
nearby and farther away, has to be studied in more detail, and a main question is why the city was finally abandoned. Was it because of political or environmental reasons, or a combination? Did the landscape no longer support such a city, or did a changed political situation no longer support the large-scale interaction of city and landscape?

Babylon, southern Mesopotamia, and even the whole of the Ancient Near East should also be seen as part of integrated systems. This is important in order to utilize the long historical information in a larger perspective. Several pioneering attempts have been made, but much has still to be done. M. Van de Mieroop has used historical system models in order to study the Mesopotamian city in historical perspectives. A. Yoffee and G. Algaze have used anthropological and archaeological system building in interesting ways in order to reach new and important general insights. The world system theory of C. Chase-Dunn has not yet lived up to a well-founded empirical basis for the area, but can be promising in the future. The resilience theory of C. L. Redman has already shown interesting general possibilities when not used in an overly simplistic way. There is much more that should be done here with system building in order to understand the long historical development of city life in the Ancient Near East and relate it to a world perspective. There will probably never be a single theory explaining all aspects of city life, but a multiplicity of theories can be of help in interpreting the data in larger perspectives. In order to achieve well-balanced results in a larger perspective, there is also a need to perfect the material basis with further genuine surveys, GIS analysis, archaeological excavations, as well as intense study and interpretation of the huge amount of ancient texts.

Concluding perspectives

This short survey has shown some aspects of socio-environmental interactions underpinning urbanism in the part of the world with the longest urban development, that is, the old city cultures in the Ancient Near East and Egypt c. 5000–100 BC. The Ancient Near East was the place for the oldest farming cultures with the first villages, the first towns, and the first cities, and here we have the longest recorded history of city life. Some aspects of the large perspective of the whole of the Ancient Near East have been dealt with briefly.

When comparing climate data from different approaches for the same area, it is important that they have the same historical date. We have assumed that currently available dates are useable. Here much more work has to be done, and important changes can occur. Data will certainly be refined and data from more sites will be possible to use. An apparent weak point is the currently nonexistent climate proxy data from southern Mesopotamia itself, limiting our present work. The relation between climate change and history will probably be far better known in the coming years.

The landscapes in the Ancient Near East over the course of thousands of years consisted of cities, towns, and villages in relation with each other and with surrounding agricultural landscapes, often in a greater regional or international net-

83 Van de Mieroop 1997.
85 E.g. Chase-Dunn et al. 2006.
86 Redman & Kinzig 2003; Redman 2005.
work. The urban sites could be found along rivers and canals which provided the necessary water for the urban population, and which, especially in Mesopotamia and Egypt, made possible the irrigation needed to sustain the lives of the inhabitants. The first large cities were developed out of the towns during the 4th millennium BC, with Uruk as the first known quite large city. The following period, c. 3000–100 BC, has been examined in greater detail. This is especially the case for southern Mesopotamia and the city of Babylon, for which more details have been supplied for the reign of Nebuchadnezzar II around 600 BC.

A town wall for protection and separation often surrounded towns and cities. In some periods or areas, walls may not yet have been discovered or may have been limited to protective outposts and not to the central country area. The urban structures are often the result of uncontrolled growth or only limited planning, but clear planning may exist for specific sections, like town walls, main streets, and monumental buildings. Examples of more completely planned towns include, for example, military or workers’ towns in Egypt and Mesopotamia of limited sizes.

During the millennia considered here, we have a number of partly contemporaneous, partly successive large cities in the Ancient Near East and Egypt, but many more small and medium sized towns. Babylon was one of the largest cities and around 600 BC the main one, with 800 ha contained inside the walls. This city has been used for some more detailed examinations in order to show the potential for more detailed research in the future. Much more work can be done on existing ancient texts concerning the city, the size, the function of different sections of the city, and the surrounding area.

In central or prominent places, towns and cities had monumental buildings consisting of temples for the gods and palaces for the kings, as well as living areas of quite different social qualities. All this shows a social and intellectual stratification for which there is not only archaeological evidence but also a large number of references in ancient texts. There is a great need of surveys and geomagnetic examinations of some of the largest cities, and especially of Babylon and its surroundings. Only in this way can the town plan be properly established both inside and outside the town walls.

We have looked at the interaction of towns and cities with the surrounding landscapes and with areas farther away as well as with other cities. Gardens and green areas surrounded the urban structures outside the walls, but were also found inside the town walls in some places, either planned for royal or temple gardens, or left as areas for possible future building expansion but used in the meantime as green lands. The extent and function of these areas have to be studied in greater detail. The preferred places to live were often in the city, where also the large landowners disposing of the surrounding agricultural landscape had their residences. The relation to the surroundings was necessary in order to provide food and basic raw materials. Changed political circumstances may have caused interruption of the long-distance boat transport of food to Babylon, leading to further stagnation of that city in later periods.

We have considered the inhabitants of towns and cities, their organization, ideas and languages, their relation to the immediate surroundings and to other urban entities. In some towns and especially in main cities, there were ethnic and linguistic minorities to some extent. The resulting mixture of peoples and languages in large cities has to be studied with greater care. The estimations of population as well as similar statistics always have a special interest for the gen-
eral public, but so far the estimations are based on rather weak comparisons with later material. This aspect is worth deeper and more careful examination.

The early cities in the Ancient Near East are the oldest in the world. The location along rivers and canals as well as the size and form of urban structures is of interest for deeper understanding. Some of the cities have continuous occupation from ancient times until today, but most, and in fact (almost) all, in southern Mesopotamia were abandoned after a shorter or longer period of time and the population moved to other, nearby sites. The reasons for these relocations have to be studied in greater detail. Can the abandonment be explained by changes in the river courses, destruction of the soil, or other reasons?

Climate and environmental changes caused the cities to use the existing resources in new ways and to adjust to the altered situation. There were continual adaptations until the changes were so drastic that individual sites and entire areas had to be abandoned by the inhabitants. A few examples, such as southernmost Mesopotamia around 1700–1400 BC, have been given, but many details have to be clarified before the question can in any way be regarded as settled.

We have also attempted to do the opposite, that is, to see the possible influences of ancient urban structures and urban landscapes on environment and perhaps even climate, such as salinization, vegetation reduction, and problematic water management. We have also made a preliminary attempt to point to a possible study of longer-term conclusions on cycles of development and decline of urban complexes on local and sub-regional scales.

We have attempted to move towards an understanding of the cognitive and ideological aspects of society reflected in the special form of towns and cities. However, a deeper understanding of the principles of the “urban mind”, governing or influencing the spatial organization of towns and cities, is a much larger question and outside the ability of this programmatic phase of the project.

For future research, two preliminary working tools have been developed during this preliminary phase. They are the freely downloadable ANE.kmz-place marks giving Google Earth identifications of Ancient Near Eastern sites, and the preliminary digital model of Babylon.

Much more work has to be done before any of the discussed long-term perspectives of historical city life in the environmental landscape context can be properly understood.

Finally, there is a need for a new form of synthesis based on a proper methodological re-evaluation of the increasing number of more exact climate proxy data, archaeological surveys and excavations, and based on comparisons with the huge amount of ancient texts with often detailed relevant information which still await proper evaluation.

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