

CHAPTER 1

Physical and Cultural Landscapes of Assyria

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Introduction

The history of the land of Assyria is, to a considerable extent, the story of a continuous attempt by individuals, communities, states, and empires to define their places in their landscapes. In basic economic terms, people had to feed their families, which meant adapting to the possibilities and limitations of climate and environment for agriculture and animal husbandry, and sometimes extending them. For the elite elements of society, the environment was a critical variable in how palace walls were decorated, how gardens and parks were created, and how tribute was collected. Climate and environment played important roles in determining the scheduling of royal campaigns and in which directions they went. The limitations and fluctuations of climate were a major concern in religious contexts as well, as priests and kings attempted to intercede with the gods for the favorable growing conditions that sustained cities, enabled trade, and revealed to the people the good relationship between the king and the gods.

The physical landscape of Assyria was far from immutable. Fluctuations in temperature, rainfall, and seasonality took place on yearly, decadal, and even millennial scales. Human communities were responsible for modifications that turned the physical environment into the cultural landscape. The nature of these cultural changes have much to tell us about past societies. At one end of the continuum, landscapes were modified by the aggregate actions of their inhabitants, whether they were farmers, shepherds, craftspeople, or traders. Individuals might have only limited effects on their surroundings within their lifetimes, but their collective actions can leave a tremendous, often unintended, footprint. The best example of such cumulative action is the *tell*, the classic form of archaeological site in the Near East, the largest of which grew to 40 m or higher. Tells formed over centuries or millennia as individual households built, repaired, tore down, and rebuilt stone and mudbrick structures on the

same spot (Rosen 1986). The intention of the builders was simply to provide a physical space for their households, not to create a looming aggregate of decayed mud brick on the landscape; the cumulative result of many generations engaging in this simple domestic behavior, however, had just such an effect.

On the other end of the continuum, landscapes could be modified according to royal will; kings and their planners imposed their particular political, economic, demographic, and cosmological visions upon the surrounding land. The resulting landscape elements were often monumental due to the royal household's ability to mobilize vast amounts of labor toward its ends. These structures are more difficult to remove, and therefore disproportionately likely to survive to the present than lesser changes.

This chapter reviews the physical environment and cultural landscapes, both emergent and imposed, in the regions of modern northern Iraq, southeastern Turkey and eastern Syria that encompass the central part of the ancient "Land of Assyria" (Figure 1.1). Although this geographic designation was only meaningful in the late second and early first millennia BCE, in the time of the Middle Assyrian and Neo-Assyrian empires, it provides a convenient geographical framework within which to consider earlier landscapes, especially the Early

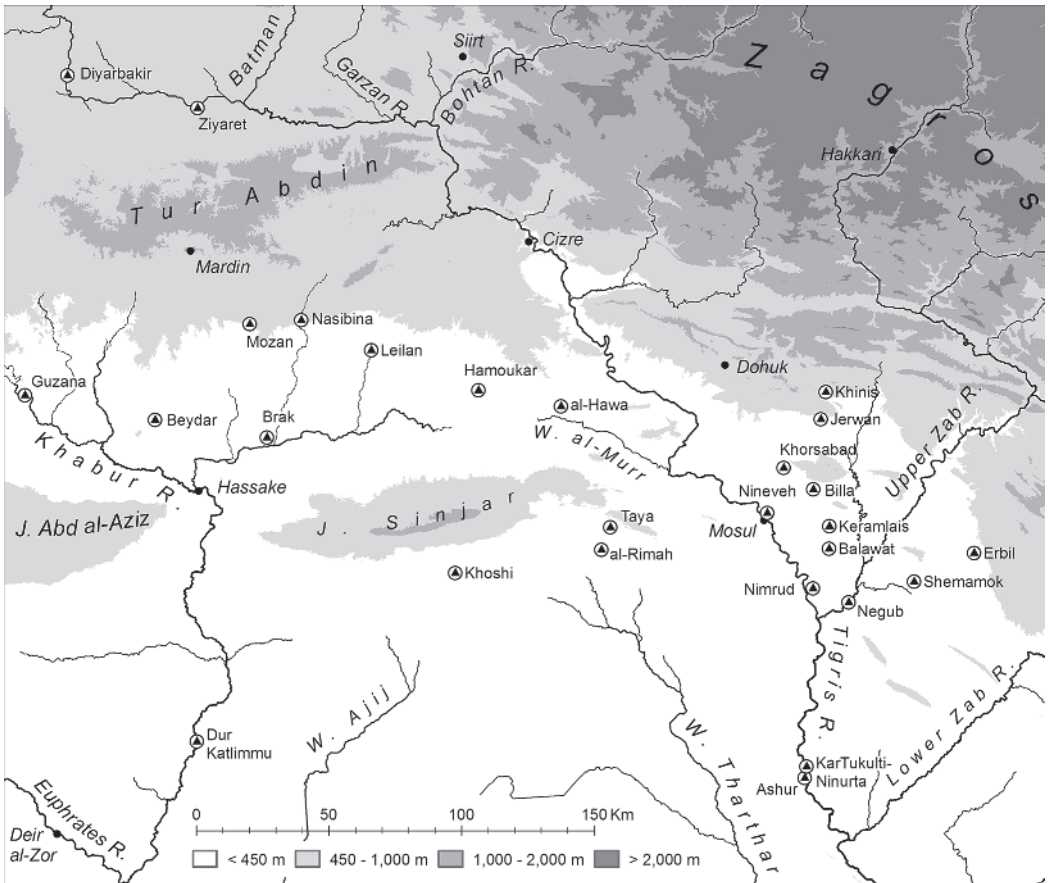


Figure 1.1 Topography, hydrology, and major sites of Assyria (northern Iraq, northeastern Syria, and southeastern Turkey).

Bronze Age (EBA) urban phase of the late third millennium BCE. Geographically, this region encompasses the middle stretch of the Tigris River between the Eski Mosul and the Fatha gorge, its tributary valleys and plains to the east, the Cizre plain in the north, and the Upper Khabur and Sinjar plains, as well as the Khabur river valley, to the west. These latter areas, while outside of the Tigris Valley “heartland,” were considered by the first millennium BCE Assyrian kings to be historically part of the “Land of Ashur,” and were administered as such (Postgate 1992, 1995; Radner 2006; Kühne 2012).

A particularly useful framework for approaching Assyrian landscapes through time is the “signature landscape” concept developed by Tony Wilkinson (2003: 11–14). Signature landscapes describe certain combinations of landscape elements that recur across space and time. These landscapes tend to be products of either especially powerful state actors, or of particularly durable and widely shared activities that resulted in the deep etching of a suite of features into the landscape. In both cases, the features survive and sometimes even structure subsequent settlement and land use. Signature landscapes are generally associated with, but not dictated by, combinations of physical environment and social factors (most commonly economy, political structure, and cosmology). Here one might consider the lowland irrigation landscapes of southern Mesopotamia, the oasis-based water catchment systems of the deserts, and the terracing and runoff agricultural systems of highland Yemen. The land of Assyria hosted two distinctive signature landscapes in the Early Bronze Age and Iron Ages under nearly identical environmental conditions, described below. It is thus an excellent case study in the variable connections between cultural landscapes and sociopolitical organization.

The study of cultural landscapes is made challenging by the divergent histories of scholarship in the eastern (Iraqi) and western (Syrian and Turkish) halves of the Assyrian core. The Assyrian heartland along the Tigris River is one of the birthplaces of the modern discipline of archaeology, due to the efforts of Layard, Botta, and others in the great capital cities of the empire (Larsen 1996). These early excavations produced huge volumes of architectural, art historical, and epigraphic data that are still mined today for new insights. In terms of landscape and settlement studies, however, the hinterlands of the great capitals have been almost terra incognita until very recently. Early landscape observations were anecdotal and opportunistic, but remain unsurpassed forty or more years after they were made (see especially Bachmann 1927; Jacobsen and Lloyd 1935; Oates 1968; Reade 1978). The “golden age” of survey archaeology in southern Iraq in the 1950s and 1960s (e.g., Adams 1981, reviewed in Ur 2013) had almost no impact on research in Assyria, which was characterized by a “closing of perspectives” (Liverani 1988: 80). The western half of the Assyrian core, on the other hand, has witnessed an explosion of surveys and landscape studies since the 1970s (reviewed in Wilkinson and Barbanes 2000; Morandi Bonacossi 2000 and below). At the time of writing, this imbalance in archaeological survey is beginning to be corrected via new projects in the Kurdistan Region of Iraq, in particular in the hinterlands of Nineveh, Erbil, and Kilizu (see, e.g., Ur et al. 2013; Ur and Osborne 2016; Morandi Bonacossi 2012–13; Morandi Bonacossi and Iamoni 2015; Kopanias and MacGinnis 2016).

Despite these biases within the overall dataset, it is possible to describe general trends in the evolution of cultural landscapes, although some aspects will require ground confirmation in the future when new projects in Iraq and its Kurdistan Region begin to be published. After describing aspects of the physical environment, this chapter considers one of the most dramatic landscape shifts in the history of the ancient Near East: the transition from the emergent urban landscapes of the late Early Bronze Age (ca. 2600–2000 BCE) to the imposed landscape of imperial Assyria in the early first millennium BCE.

Physical Environment of Assyria

The geological framework of Assyria was born when the Arabian plate impacted the Eurasian plate in the Miocene Epoch, causing the formation of the Taurus and Zagros mountain ranges, as well as the elevation of the Tur Abdin and the Jebels Abd al-Aziz and Sinjar regions (Lovelock 1984). Westerly air masses acquire moisture from the Mediterranean Sea and release it as precipitation across this area. The amount of precipitation is high in the mountains to the north but diminishes as one moves south into the steppes of Syria and Arabia. In the western part of this region, water flows through the Upper Khabur basin in two perennial streams and, ultimately, into the Euphrates River. The Tigris River receives water from several left bank tributaries, most notably from the Eastern Khabur, Upper Zab, and Lower Zab rivers. The region east of the Tigris River has several other small perennial streams and seasonally flowing drainages (*wadis*) as well.

Geology, climate, and hydrology have combined to form a broad band of productive soils in both the river valleys and across the northern part of Assyria (Buringh 1960: 204–22; Weiss 1986; Courty 1994). To the north, in areas of higher rainfall, the reddish brown soils (Calcic xerosols) are especially fertile. Further south into the dry steppes, the soils have higher gypsum content and are less productive. It is likely that much of this region was originally a grassy parkland with oak and pistachio trees, but millennia of intensive grazing, cultivation, and fuel gathering dramatically impoverished its natural flora (Guest 1966; Deckers and Pessin 2010). The river valleys of the Tigris, Khabur, and their tributaries have particularly rich soils. In southern Mesopotamia, the Tigris and, especially, the Euphrates were easily exploited for broad irrigation because they formed levees. In the Assyrian core of northern Mesopotamia, however, the rivers are incised within narrow valleys, making irrigation challenging and largely restricting it to the adjacent river terraces.

For much of the past four millennia, these conditions may have been similar to those of present-day Iraq. At several points, however, shifts in climate may have had social impacts. Most notably, an abrupt environmental event has been proposed to explain the collapse of the late Early Bronze Age urban phase and the decomposition of several political dynasties in Mesopotamia and beyond (Staubwasser and Weiss 2006, reviewed most recently in Wossink 2009, Danti 2010). An extended dry phase has been implicated in the “dark age” at the end of the Late Bronze Age, a time when formerly cultivated landscapes fell under the control of Aramaean pastoral groups (Neumann and Parpola 1987). Even without such hypothesized events, climate and precipitation fluctuated annually. In some periods, these conditions placed limits on the nature and extent of the settlement landscape, but, in the two periods discussed below in particular, individuals, communities, and polities found ways to overcome them.

Cultural Landscapes: Past Research and Methods

What is known of the landscape of Assyria stems from a century and a half of archaeological observation. In the nineteenth century, early excavators rendered anecdotal impressions of sites and landscape features. These initial observations have several elements in common. For instance, the archaeologists concentrated on monumental finds, particularly rock-cut reliefs. Although the reports often included detailed and valuable recordings, the interpretations were often flawed or incorrect. Layard, for example, interpreted the aqueduct at Jerwan

as a bridge (1853: 215–16) and failed to notice the canalhead structure at Khinis, which was the *raison d'être* of the massive rock relief that received his attention. In addition, these observations were made in the course of opportunistic travel, when the focus of excavation was on the elite palaces in the great capitals. The excavation reports appear almost exclusively in travel narrative form. The great exception is Felix Jones's "Vestiges of Assyria" map series (Jones 1855), which captured many elements of the immediate hinterlands of the great capitals that have long since disappeared.

The quality of observations and the accuracy of interpretation improved in the twentieth century, especially the recording of rock reliefs (Bachmann 1927) and of the remains of monumental irrigation systems (Jacobsen and Lloyd 1935; Safar 1947; Oates 1968; Reade 1978). These pioneering studies explored the relationships between these features, the imperial capitals, and other monumental aspects of the landscape. For example, David Oates (1968) used the physical traces of canals around Nineveh and Nimrud to evaluate population estimates. Julian Reade (1978) perceived a recurring connection between rock reliefs and state sponsored irrigation features, and proposed that Sennacherib's system was primarily an ideological device rather than a functional system.

Although invaluable, these monument-focused studies still cannot be related to patterns of settlement. No systematic settlement surveys have examined the hinterlands of the great capitals or the plains east of the Tigris River (although see now Ur and Osborne 2016; Morandi Bonacossi 2012–13), but several reconnaissances have investigated the western banks on the plain south of the Jebel Sinjar (Lloyd 1938; Reade 1968) and the Wadi Tharthar (Ibrahim 1986).

The situation has dramatically improved, however, in the western half of this region, mostly within the modern states of Turkey and Syria. Starting in the late 1970s, a series of reconnaissances and intensive surveys identified and recorded thousands of archaeological sites on the Cizre plain, the Wadi al-Murr, the upper Khabur basin, and the lower Khabur river valley (see reviews in Morandi Bonacossi 2000; Wilkinson 2000; Wilkinson and Barbanes 2000). Several of these projects have also considered the "off-site" landscape, including features such as canals, field systems, roads, and tracks (Wilkinson 2003: 44–70). The archaeological landscape of western Assyria often must be used to make generalizations for the eastern heartland that have only recently been subjected to fieldwork-based confirmation in the Kurdistan Region of Iraq.

The most recent research has capitalized on the widespread availability of remote-sensing datasets. In the decades prior to the first Gulf War, the Iraqi government placed strong restrictions on the use of aerial photographs by foreign researchers. Two recent trends have democratized the research process, however. Imagery from declassified American intelligence satellite programs such as CORONA and HEXAGON is now globally available and inexpensive, and has been used to document ancient communication (Ur 2003, 2010b; Altaweel 2008) and irrigation systems (Ur 2005; Altaweel 2008; Ur and Reade 2015). More recent multispectral satellite imagery and topographic data can also detect sites and landscape features (Altaweel 2005; Menze et al. 2006; Menze and Ur 2012); these images are free or available at low cost to academic researchers. In some cases, it is possible to interpret these images with reference to the ground observations of earlier archaeologists, but much of the remotely sensed work will still require field confirmation in the future.

Over the past 150 years, these methods have produced a broad dataset concerning settlement and landscape in the land of Assyria. At two periods in particular, the inhabitants of these lands created vivid but very different cultural landscapes: the later Early Bronze Age (ca. 2600–2000 BCE) and the Iron Age (ca. 1000–600 BCE).

Emergent Landscapes of the Early Bronze Age

The most prominent feature of Near Eastern cultural landscapes is the mound (variously *tell*, *tepe*, or *höyük*). Mounds are the cumulative result of centuries or even millennia of sedentary inhabitation using predominantly mud brick architecture. In the Neolithic Period, settlements were small and transitory, with occupation generally lasting only a few generations before communities relocated. This pattern lasted until the Ubaid Period, when settlements became more permanent and the resulting settlement mounds began to reach considerable heights (Akkermans and Schwartz 2003: 159–60). Throughout this early phase, communities split before growing demographically large, and, consequently, sites were small. Most experiments in settlement agglomeration appear not to have been durable, such as the extensive settlement at Khirbat al-Fakhar (Al-Quntar et al. 2011).

In the Ubaid Period, communities developed a durable spatial mindset on the proper way to settle: in a nucleated form, over a long term, and preferably set atop a pre-existing mound, whether continuously occupied or not. One factor in this shift must have been economic: the emergence of widely-recognized rules for land tenure, whether at the household or the community level, to regulate how the settlement's agricultural and pastoral resources were managed and transferred. Settlement stability was not, however, entirely economically motivated; it is likely that generalized and shared cultural attitudes about settlement had developed. Such attitudes were responsible for individuals and groups choosing to remain on tells, or selecting abandoned ones for the location of new settlements. This general mindset underlaid specific meanings and significance that were attributed to individual places, now lost to us in the absence of written records. The new spatial mentality appears to have been strongest in the late third millennium BCE, when almost all settlement occurred atop tells, and then to have broken down over the course of the second millennium BCE, finally replaced in the Iron Age with a radically different spatial logic (see below).

The pattern of tells changed radically in the middle of the third millennium BCE, when a series of large settlements formed across the northern arc of the Fertile Crescent. This settlement landscape included new forms of land use that left a remarkably deep imprint on the landscape. This process was not the region's first steps toward urbanism; Tell Brak had already coalesced into a 130-hectare city by the middle of the fourth millennium (Ur et al. 2007, 2011). But while Tell Brak, and Khirbat al-Fakhar before it, were isolated phenomena, urbanism in the Early Bronze Age was widespread throughout northern Mesopotamia.

The most prominent elements of this demographic shift were a series of spatially extensive, densely occupied settlements that ranged up to 120 hectares in size. Most of these cities expanded from already ancient tells to include broad lower towns. For example, at Hamoukar, a 15-hectare tell dated to the fourth millennium was resettled around 2600 BCE, and a 90-hectare lower town to its south was settled; within this area, 98 hectares were occupied between ca. 2600–2000 BCE (Ur 2010b: 104–9). Similar growth patterns occurred at Tell Mozan, Tell Leilan, Tell al-Hawa, Tell Taya, Tell Khoshi, and Tell Baqrta, all of which expanded in excess of 60 hectares. Population estimation is a particularly uncertain science (Postgate 1994), but the largest of these cities may have been home to 10,000 to 15,000 persons. Excavations at these sites revealed remarkable concentrations of political and economic power: monumental temple and palace institutions, writing and administrative technologies, craft specialization and mass production, and considerable disparities in status and wealth (recently reviewed in Stein 2004; Ur 2010a; Matney 2012).

In some regions, the urbanization process took place at the expense of settlements in the hinterland. In the Wadi al-Murr, for example, the urbanization of Tell al-Hawa could be explained entirely by the abandonment of villages in its hinterland; site numbers were reduced, but the total settled hectares remained roughly constant (Wilkinson and Tucker 1995: 50–3). Elsewhere, the appearance of towns and cities included growth in both site numbers and total settled hectares (for example, around Hamoukar and Tell Beydar; Ur 2010b: 104–9; Ur and Wilkinson 2008: 307–8). In these cases, Early Bronze Age cities probably benefited from immigration or nomadic sedentarization.

The enormous pressures that this urban settlement system placed on its landscape resulted in dramatic transformations visible even today in the archaeological landscape. The necessity of feeding large urban populations placed strains on the traditional dry-farming based agropastoral economy, with two main effects. Settlements chose to extensify cultivation by bringing more land under the plow. This process can be documented in the landscape via shallow linear features that represent the remains of ancient trackways (Wilkinson 1993; Ur 2003). These tracks are mostly invisible on the ground, but can be mapped using aerial and satellite photographs. They are overwhelmingly associated with sites of the Early Bronze Age urban phase across northern Mesopotamia (Ur and Wilkinson 2008: 310–11). They also occur in northern Iraq, where dating them is complicated by a lack of archaeological surveys (Altaweel 2008: 65–9; Ur et al. 2013). These tracks became depressed as farmers, shepherds, and their animals traveled through cultivated land, where their movements were constrained by fields on either side. Where land was uncultivated, movement was unrestricted, and depressed tracks did not form; hence, the presence of tracks is a proxy indicator for the presence of fields (Wilkinson 1994).

Another response of farmers was to intensify, by introducing nutrients into the soil via manuring. Organic refuse was collected along with other domestic debris and composted in settlements to be spread out upon the fields later. What remains of this practice in the landscape are the incidental bits of inorganic debris, which have been kept in the topsoil by millennia of succeeding agriculture (Wilkinson 2003: 117–18). The landscapes surrounding the cities of Hamoukar (98 ha), Brak/Nagar (70 ha), and Tell al-Hawa (66 ha) have dense scatters of potsherds, which are the surviving evidence of intensive agriculture in their immediate hinterlands (Wilkinson and Tucker 1995: 19–23, Ur 2010b: 65–76, Ur et al. 2011, Ur 2015).

Together, radial trackways and manure zones describe inner intensive and outer extensive zones of cultivation that reach their greatest extent around the large cities. They are not, however, limited to large cities; smaller radial systems and manure zones are found around towns and even small villages of only a few hectares. In the Beydar region, small villages may have been cultivating at a rate in excess of the needs of their estimated population, and possibly even to an extent greater than the villagers could have undertaken themselves, which raises interesting questions of labor mobility (Ur and Wilkinson 2008: 313–15).

Pastoralism was also important, although it is more difficult to quantify spatially. The increased cultivation of barley around these cities and towns may have been for animal consumption as fodder (Charles and Bogaard 2001: 319). Fodder production would also explain why many settlements appear to have been cultivating far more land than their estimated human populations would have required. The conversion of former pasture areas between settlements into cultivated land therefore may have been offset by an increased emphasis on settlement-based flocks.

The Early Bronze Age cultural landscape was thus a very full one, modified extensively by human communities. Sedentism and settlement nucleation reached unprecedented levels not to be seen again until the Neo-Assyrian Period (and, even then, only in a few political capitals; see below). The agro-pastoral economies of these urban settlement systems operated at high intensity, as farmers brought outlying territory under the plow and attempted to enhance the yields of already-cultivated lands closer to their settlements.

Despite the intensive and potentially overextended agricultural economy, and the monumentality of settlements and landscapes, we should not assume that the hand of a centralized administration lay behind these developments. Monumental palace and temple complexes did exist, but there is no evidence that they managed or inspired this expansion of agricultural production, or that they coerced people to nucleate at urban sites. There is no unequivocal evidence, for example, for centralized storage of cereals or animals (Ur and Colantoni 2010). The trackways, over 6000 kilometers of which have been recorded in northeastern Syria alone, are not part of planned communication routes, but rather emerged through the uncoordinated but purposeful actions of farmers, shepherds, and their animals. The motivation for agricultural intensification must be sought at the household level, possibly as new commensal strategies assumed central importance for creating and maintaining social relationships (Ur 2009). The Early Bronze Age urban landscape appears to have been the unplanned result of widespread rules and attitudes about land tenure, household based surplus production, and the social roles of communal meals.

Further evidence comes from the patterns of movement revealed by the preserved trackways. Most simply radiate outward from settlements and fade out beyond the fields, but some connect with trackways radiating from nearby settlements to create networks (Figure 1.2). In no cases were there direct tracks between cities, or between capitals and subsidiary towns (e.g., between Brak and Beydar). Movement through the landscape, even that of political elites, respected local systems of agriculture and land tenure (Sallaberger and Ur 2004).

This emergent landscape was potentially unsustainable, however; the combination of high population density, urban nucleation, intensive agriculture, and variable climate placed these settlement systems at high risk of collapse. Agent-based computer modeling suggests that villages and towns could survive most droughts (Wilkinson et al. 2007: 65–6), but large population centers were especially vulnerable. Large cities could be sustained under normal conditions of climatic variation if their neighboring towns and villages could be convinced or coerced to contribute agricultural surplus, but, in the face of multi-year droughts, this overextended system was liable to collapse (Wilkinson 1994). Initially, it was proposed that urbanism and political entities had collapsed on account of an abrupt aridification event, variously attributed to volcanoes, meteorites, or global changes in atmospheric circulation (Staubwasser and Weiss 2006; Weiss et al. 1993). This model has been critiqued in recent years in favor of new models that recognize variation in local settlement trajectories (Kuzucuoğlu and Marro 2007; Wossink 2009; Danti 2010; Ur 2015).

Imperial Landscapes of the Neo-Assyrian Period

By the start of the seventh century BCE, the landscape of northern Mesopotamia had been transformed in ways that would have rendered it unrecognizable to an Early Bronze Age urban dweller. At the most basic level, the settlement landscape of cities, towns, and villages



Figure 1.2 EBA sites and linear trackways in the region of Tell Brak and Tell Beydar (based on Ur 2010b Map 3).

with broad catchments of intensively cultivated fields between them had disappeared. In its place was a nearly even distribution of small villages or hamlets. On the other hand, a handful of cities had grown to tremendous sizes. The walls of Nineveh, for example, could contain seven of the largest Early Bronze Age cities. With the shift towards larger cities, the Assyrian cultural landscape set a pattern that would become typical for the great empires that succeeded it (Wilkinson and Rayne 2010; Adams 2005).

This transition unfolded in the second millennium, after all of the great Early Bronze Age cities were either abandoned (e.g., Leilan and Hamoukar) or substantially transformed (e.g., Tell Brak). The descendants of the former urbanites now migrated with their animals as part of a pastoral lifestyle that is well documented in the Mari tablets (Fleming 2004; Durand 2004) but exceedingly difficult to discern in the archaeological record (Lyonnet 1996). Cities of the Middle Bronze Age in northern Mesopotamia were fewer and uniformly smaller than their Early Bronze Age predecessors. The memory of the earlier cities remained, and many were deliberately resettled and even refortified, but urban populations never regained their former density. At Tell Leilan, for instance, the lower town was largely “hollow” and therefore presented a blank slate upon which royal palaces and other large institutions could be inscribed (Ristvet 2008 fig. 3). Late Bronze Age (Mitanni and Middle Assyrian) cities were also small and infrequent, with the notable exception of Kar-Tukulti-Ninurta, a 500 ha planned city that hinted at the future direction of urban settlement (Dittman 1990). A variable pattern of ruralization describes most of the western part of the region, with some isolated Late Bronze Age towns and cities (Ristvet 2008; Wilkinson 2002; Szuchman 2009;

Ur 2010b: 157–160); no comparable systematic data exists for the Assyrian core along the Tigris River, however.

The settlement landscape of the early first millennium BCE was dominated by the great capital cities. The original political capital and enduring religious center was the old city of Ashur, which, at 70 ha, was within the range of Early Bronze Age urban sites. The political center moved to a series of increasingly large new foundations: Aššurnāširpal II founded the city of Kalhu (Nimrud; 360 ha); Sargon II founded Dur-Šarrukin (305 ha); Sennacherib expanded Nineveh to 750 ha (Stronach 1994; Oates and Oates 2001). These planned imperial capitals were three to seven times larger than even the most populous cities of the Early Bronze Age, and would have required a much larger agricultural catchment to sustain them (for Nineveh, see Wilkinson 2003: 128–30). The provincial capitals were also large, but well within the range of Early Bronze Age urban sites (e.g., Dur-Katlimmu at 110 ha; Tušhan at 35 ha; Kühne 2011; Matney et al. 2011).

These great urban centers dominate archaeological discussion because of their excavation histories and their artifacts, which presently fill the world's great national and imperial museums. These cities were, however, few and far between. The Assyrian countryside was remarkably rural, especially when compared to the Early Bronze Age urban phase. Early reconnaissances failed to notice this dispersal because they focused on high mounds, the quintessential and most easily recognizable site form. Recent full-coverage systematic survey across Iraq, southeastern Turkey, and northeastern Syria has revealed a fully settled Neo-Assyrian landscape of small towns, villages, and farmsteads. Most of these settlements were small (two hectares or less) and are now low mounds, on the order of one to two meters high. When earlier sites were resettled, it tended to be on a reduced scale; for example, a three-hectare village appeared on the northeastern corner of Hamoukar's massive Early Bronze Age lower town, and a one-hectare farmstead sat on the northern fringe of Brak's 130 ha fourth millennium city (Ur 2010b: 112–14; Ur et al. 2011). In some cases, isolated temple structures appear to have been erected by the state within the ruins of former cities, for example at Tell al-Rimah and Tell al-Hawa (Wilkinson and Tucker 1995: 61). Assyrian towns emerged as extensive low mounds in the shadows of older mounds, and, consequently, have been largely overlooked by archaeologists, who have favored excavations at tell summits (Wilkinson et al. 2004).

The rural pattern of Assyrian settlement was remarkably widespread. On a regional scale, the filling of the landscape has been demonstrated almost everywhere that systematic observations have been made (reviewed in Morandi Bonacossi 2000, Wilkinson and Barbanes 2000, Wilkinson et al. 2005). The Neo-Assyrian period saw the greatest expansion, in terms of the number of sites, as demonstrated by surveys around Tell al-Hawa, Hamoukar, Tell Brak, Tell Beydar, and Erbil (Figure 1.3; Wilkinson and Barbanes 2000; Wright et al. 2006–07: 13; Ur 2010b; Ur and Osborne 2016). The Cizre plain, the last major alluvial plain upstream from the Assyrian capitals, experienced an identical settlement expansion (Parker 2001), as did the lower Khabur valley (Morandi Bonacossi 1996; Kühne 2010).

The evolution of the Assyrian settlement landscape occurred in three primary ways. As described above, major sites of the Bronze Age were resettled, although almost always at a much more modest scale. Furthermore, the “vacant” spaces in between these earlier settlements were filled in, in a manner that suggests a conscious attention to the interfaces of the former settlements' catchments. Such infilling is well demonstrated for the Wadi al-Murr (Wilkinson 1995: 145–7) and the region of Tell Beydar (Wilkinson et al. 2005 fig. 12). Finally, lands previously considered too marginal for agriculture were now heavily settled.

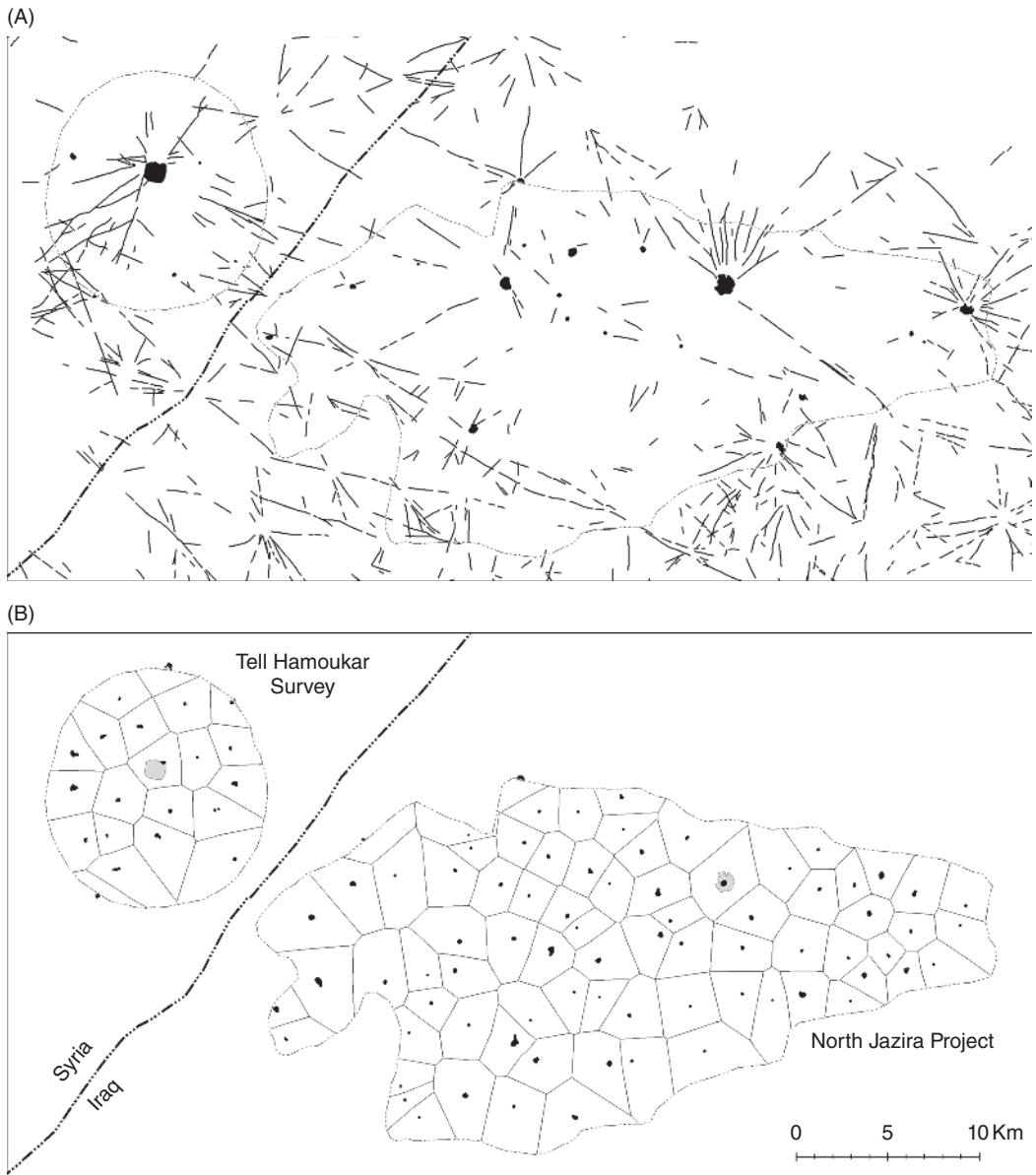


Figure 1.3 The evolution from nucleated to dispersed settlement in the Hamoukar and North Jazira Project areas (based on data from Wilkinson and Tucker 1995, Ur 2010b). A. Urban settlement and trackways in the later EBA, ca. 2600–2000 BCE; B. Rural settlement in the Iron Age (early 1st millennium BCE).

In the Early Bronze Age, most such lands would have been considered too dry for cultivation and better used as a pastoral resource, whereas, under Assyrian control, they were filled with nearly the same continuous scatter of small settlements as the wetter plains. The lower stretches of the Khabur River, near its junction with the Euphrates River, had been sparsely settled below Dur-Katlimmu throughout the second millennium, but experienced a

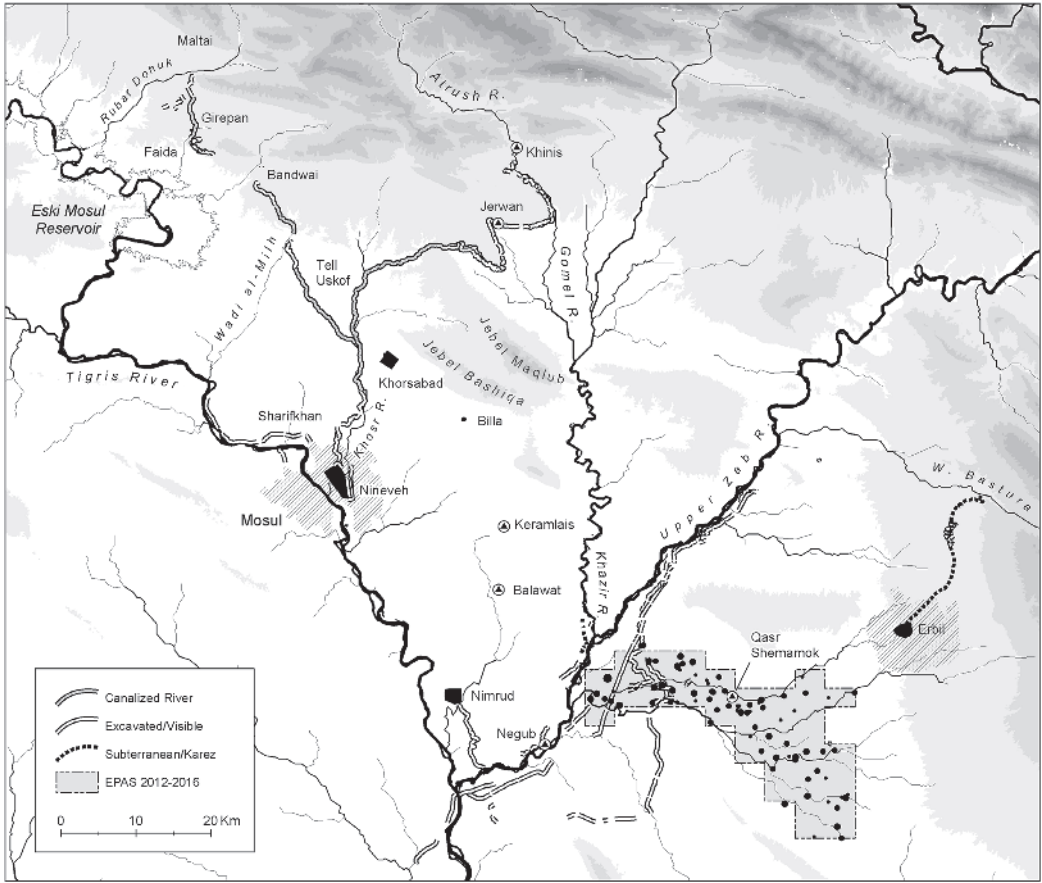


Figure 1.4 Sites, canals, and other features in the Assyrian imperial core.

remarkable expansion in occupation in the eighth century (Kühne 1995; Morandi Bonacossi 1996). Simultaneously, the steppe around the Wadi Ajij, a region that presently has less than 200mm of rainfall annually, underwent an explosion of village settlement (Bernbeck 1993; Kühne 2010), as did the steppe around the Jebel Abd al-Aziz (Hole and Kouchoukos, in press). The steppe around Hatra likely experienced a similar expansion (Ibrahim 1986).

The demographic transition was accompanied by, and probably closely related to, a dramatic interference in the natural hydrology. Neo-Assyrian kings paired the construction of new capitals with the excavation of massive irrigation systems that would bring water to their hinterlands (Figure 1.4), and would irrigate a broad expanse of Assyria that had previously been subjected to the vagaries of rainfall (extensively reviewed in Bagg 2000). The Assyrian kings boasted about their irrigation projects prominently in royal inscriptions, some of which were inscribed on or adjacent to the irrigation systems themselves, allowing for an approximation of the chronology.

The first canals constructed under royal impetus appeared in river valleys already in the Late Bronze Age, in association with Kar-Tukulti-Ninurta and Ashur in the heartland of the Tigris Valley (Bagg 2000), and possibly also along the lower Khabur River (Ergenzinger

et al. 1988, Kühne 2012). New systems were created in the ninth to early seventh centuries alongside the new capitals and the deliberate deportation of captured populations into the cities and their hinterlands (Oded 1979). The canals that are best documented with regard to the textual and archaeological record are the construction projects attributed to Aššurnāṣirpal II (884–59 BCE) and, especially, to Sennacherib (704–681 BCE). The fields surrounding the new capital at Kalḫu (Nimrud), although the city itself was constructed on a terrace of the Tigris River, were irrigated with water from either the Upper Zab or its right bank tributary the Khazir River (Oates 1968; Davey 1985; Ur and Reade 2015). This 35 kilometer canal, which was called the *patti begalli*, followed the right bank of the Lower Zab until the river approached its confluence with the Tigris River, at which point the canal turned north to the city. Most of the canal's course was open, but at one place its engineers tunneled through a rocky outcrop to maintain the canal's gradient (Davey 1985).

Sennacherib was the most prolific canal builder of the Neo-Assyrian kings and claimed to have ordered the construction of a vast array of canals throughout the northern hinterland of his new capital at Nineveh, which remade a large percentage of the hydrology of northern Assyria (Bagg 2000; Oates 1968; Reade 1978; Ur 2005). The canals were dug in four increasingly ambitious phases (Reade 2000, 2002). The first was the Kisiri canal on the Khosr River, which involved the excavation of 13.4 kilometers of canals immediately upstream from Nineveh. The second phase watered the plain east of the city, but has not yet been located by archaeologists. The third phase, which focused on the northwest, and the fourth phase, which was aimed to the northeast, were massive undertakings. The third phase, called the "Northern System" included a chain of canals that tapped rivers and springs along the foothill fringes from Maltai near Dohuk to Tell Uskof. While not all of these canals were interconnected, the last two canals on this chain redirected some or all of the upper courses of the Wadi Bandwai and the Wadi al-Milah and transferred them into the Khosr River, where they could flow to Nineveh (Ur 2005; Morandi Bonacossi 2012–13; Morandi Bonacossi and Iamoni 2015). The excavated length of these canals is just under 25 kilometers, but three of them involved the excavation of 100 meter-wide earthworks through watersheds, which were up to 20 meters deep in some places.

The fourth phase system extended from a weir on the Gomel River at Khinis, where it is associated with Sennacherib's inscriptions and reliefs (Bachmann 1927; Jacobsen and Lloyd 1935; Fales and del Fabbro 2012–13). This system flowed through 55 kilometers of excavated canals before adding its water into a tributary of the Khosr. Along its course, the water passed over a stone-built aqueduct at Jerwan (Jacobsen and Lloyd 1935). The Jerwan aqueduct was constructed with an estimated half million cut stone blocks and included several short inscriptions naming Sennacherib as its mastermind as well as mentioning several elements of the surrounding landscape.

The imperial capitals were not the only beneficiaries of imperial canal construction. Sennacherib also commissioned a system that redirected water over 22 kilometers from the Wadi Bastura to the outskirts of Erbil (Safar 1947; Ur et al. 2013: 104–6). Unlike Sennacherib's other canals, the Bastura canal was largely subterranean, and was accessible via vertical shafts at 42 meter intervals. In the eastern provinces, long canals watered the river terraces on both sides of the lower Khabur River, although these constructions have not yet been attributed to a particular Assyrian ruler (Ergenzinger et al. 1988).

Imposed water features served multiple purposes. Of particular importance was their basic economic function: to raise crop yields and to lower the risks that are inherent in rain-fed

farming. Economic factors have been downplayed in previous studies, which have emphasized the ideological role of the system (e.g., Bagg 2000; Oates 1968; Reade 1978), but evidence from remote sensing shows that offtakes from these canals were found throughout the system, and would have provided local irrigation water at substantial distances from Nineveh, for example in the regions of Girepan and Jerwan (Ur 2005: 341–2). A transportation function has also been proposed (Ur and Reade 2015). These irrigation canals would have been critical for sustaining cities that had far outstripped the demographic thresholds of the Bronze Age (e.g., Wilkinson 1994).

The canals must, however, be seen as part of an ideological transformation of the landscape of Assyria in order to imprint upon it the power of the Assyrian kings and their divine legitimacy. No rural farmer, whether he was a native Assyrian or a forcibly transplanted Aramaean or Babylonian, could have failed to recognize the awesome power of a king who could redirect rivers and could recreate conquered landscapes in his own country (Ur 2005: 342; Wilkinson et al. 2005: 50). This ideological connection was made explicit with inscriptions and reliefs associated with, or inscribed upon, many of these canals' features. Most famous is perhaps the series of reliefs associated with the weir at Khinis, including the so-called "Bavian inscription," wherein Sennacherib gives his most lengthy description of his irrigation constructions, along with information about other events in his reign. Most importantly, the associated monumental relief (Figure 1.5) shows Sennacherib standing before Assur and Mullissu, who bestow upon him the symbols of kingship. The iconographic message is that this canal was constructed by the divinely-installed Assyrian ruler. Similar depictions of the Assyrian king and the gods occur in association with canals at Maltai, Bandwai, and especially Faida, where the reliefs are immediately adjacent to a sluice, inescapably visible to the farmer who draws water out of the canal and down onto his fields (Reade 1978).

The Assyrian landscape was crossed not only by water but also by human movement. It can be assumed that localized movement took a form similar to the radial patterning of the Early Bronze Age, as described above, although few such systems can be dated unambiguously to the Iron Age. Some linear features have been captured on satellite photographs around Nineveh and Ashur (Wilkinson et al. 2005: 32–7; Altaweel 2008), but most evidence comes from textual sources, which describe "royal roads" (variously transliterated as *ḥarrān šarri* or *ḫūl šarri*) between the Assyrian capitals and the major administrative towns of the provinces (Fales 1990: 98–9; Kessler 1997; Graf 1994: 171–2). Despite the use of the term "road" in English translations, there are few indications that these features were constructed or planned. Most probably, they were tracks that hosted royally maintained way stations (*bit mardēti*) along them.

Many aspects of this imperial landscape were tied closely to the royal dynasty and appear to have disintegrated almost immediately upon its collapse in the late seventh century. The capitals were so thoroughly vacated that they had largely disappeared from memory only a few centuries later. Most of the small villages and hamlets were abandoned, and, thus, the extensive agricultural settlement pattern also dissolved. Emerging modeling results suggest that the dispersed rural settlement pattern may not have been viable from a long-term ecological perspective (M. Altaweel, personal communication), and so, in the absence of Persian or Babylonian royal coercion, rural villagers may have had both social and economic cause to abandon their settlements. With the de-urbanization of the capitals and the apparent abandonment of the countryside, the Median and Babylonian conquerors had little interest in maintaining the major irrigation works. They did, however, choose to maintain the network of "royal roads," which was the basis for the Achaemenid system (Graf 1994).



Figure 1.5 Austen Henry Layard exploring Sennacherib's monumental relief at Khinis, as depicted by Frederick Cooper.

Unlike the Early Bronze Age cultural landscape, which emerged without central planning, the Assyrian landscape was, to a great extent, the intended product of imperial decision makers. Many elements were planned and imposed in a top-down manner, reflecting underlying visions of the proper way for humans to inhabit their world (Wilkinson et al. 2005). The Assyrian landscape often incorporated elements that had long been in existence, most notably settlements such as Ashur and Erbil, which had ancient populations and long-standing religious and political significance. New capital cities and the extensive rural settlements were imposed atop and surrounding existing landscape features, the growth of which cannot be explained by natural demographic growth or settlement fission. Rather, both cities

and countryside appear to have been forcibly settled by captured and deported populations from elsewhere in the empire, a practice that is well documented in royal inscriptions and letters (Oded 1979: 366–9; Morandi Bonacossi 2000; Wilkinson et al. 2005). In the case of the lower Khabur and adjacent Wadi Ajij, for example, it is likely that the expansion of rural sites can be related to Adad-nirari III's deliberate colonization program described on the stele found at Tell al-Rimah (Page 1968; Morandi Bonacossi 2000; Kühne 2010).

Contributing to this process was the increasingly sedentary nature of Aramaean pastoral nomadic groups (Wilkinson and Barbanes 2000). For example, Adad-nirari II's account of his campaign across the Upper Khabur plain to Nisibin and Guzana includes many hints at the nomadic past of their kings, mentioning almost no settlement elsewhere on the plain (Postgate 1974: 234–7). Given the abundant and extensive settlement pattern revealed by archaeological survey (described above), it is likely that these nomads were settled coercively on their former winter pasturelands and compelled to adopt an agricultural lifestyle by the Assyrian conquest.

It cannot be assumed that all kings shared the same vision for the landscape. No king ever left a comprehensive treatise on the subject (Radner 2000: 233), although non-textual iconographic clues appear repeatedly throughout Neo-Assyrian royal art (Winter 2003). Common characteristics emerge, however, over several centuries of Assyrian imperial control: the construction of walled cities of great spatial extent; population expansion not by natural demographic growth but by the physical emplacement of conquered groups; an evenly settled and agriculturally productive countryside, also populated via forced settlement of captured peoples; the labor-intensive reworking of Assyria's natural hydrology to sustain cities and their agricultural hinterlands; and the dispersal of the symbols of royal power and its divine legitimacy through a program of monumental relief carving.

The origins of the Assyrian landscape vision may have come, at least in part, from emulation. When Aššur-naširpal II commissioned the creation of a new capital at Nimrud, large walled cities had been in existence in northern Mesopotamia for over a millennium, but were subject to a certain demographic carrying capacity imposed by the environment and socio-technical limitations (Wilkinson 1994). Instead, Assyrian kings probably looked to the south, as they had for centuries. Since the late fourth millennium BCE, the plains of southern Mesopotamia had been characterized by cities hundreds of hectares in scale, densely populated, and surrounded by rich agricultural lands whose productivity was enhanced with elaborate systems of irrigation. Emulative aspects of the Assyrian landscape vision could also be specific. For example, Sargon II and Sennacherib commissioned replicas of north Syrian and Babylonian landscapes in their respective capital cities, including the simulation of marsh conditions and the importation of botanical samples (Brinkman 1995: 28–9; Radner 2000: 239–40; Thomason 2001).

Conclusions and Future Prospects

The transition from the Early Bronze Age landscape to the Iron Age landscape in the land of Assyria represents a dramatic shift between two particularly clear signature landscapes, each on opposite ends of a continuum between emergent and imposed landscapes. Despite clear evidence of centralized political authority and socioeconomic inequality, the cities of the Early Bronze Age have very few unambiguous signs of planning. Likewise, the simultaneously intensive and extensive agricultural system undergirding them bears no direct

evidence of royal or any other form of coercion in its formation. Rather, it appears that both were largely an emergent result of widely held rules and values concerning household subsistence, land tenure, patterns of movement and communication, and spatial patterning. Centralized authorities did not impose urbanization, trackway patterning, and agricultural intensification, although they may have benefited from these processes. The Early Bronze Age model developed to its greatest extent in the second half of the third millennium BCE, but had its origins in durable and nucleated agricultural patterns of settlement that extended back to the fifth millennium BCE (Wilkinson 2003: 105–9).

The Neo-Assyrian landscape of the ninth to seventh centuries BCE developed in an almost identical physical environment in terms of soils, hydrology, and climate. Nonetheless, the Neo-Assyrian model presented a dramatically different signature, and shows many indications of being deliberately imposed by centralized planners, likely on the basis of a singular vision of the proper form of the Assyrian landscape.

These two signature landscapes, one largely emergent and one largely imposed, both proved to be fragile and ultimately unsustainable. In the case of Early Bronze Age urbanism, the largest settlements grew to scales beyond what the environment and the subsistence economy of the time could sustain in the long term, despite economic adaptations toward expanding and intensifying production; only a few of the largest settlements survived more than a half millennium in an urbanized state. The Assyrian Empire developed technological and social means to overcome earlier urban demographic limits (irrigation, water transport, the efficient spatial distribution of agricultural labor, and a quasi-monetary economy), but the Assyrian cultural landscape dissolved nonetheless, coincidentally (it would seem) with the political collapse of the empire. In this case, the shared values and motivations of the sort that had enabled the emergence of the Early Bronze Age landscape were missing. The citizens of Neo-Assyrian cities and their hinterlands did not necessarily share the landscape vision that had been imposed on them, many of them having been brought against their will from their homelands in Babylonia, Judah, and elsewhere, or forcibly settled on their former pasturelands (Yoffee 1988). The Assyrian landscape was unsustainable not because of environmental limitations but because the imperial authorities and the bulk of the population did not share common identities, values, and ideas about what the land of Assyria should look like.

In archaeology, conclusions are rarely final, but rather are (or should be) the best that can be drawn from the incomplete dataset at hand. The conclusions regarding the evolution of the Assyrian landscape presented in this paper represent generalizations based upon a particularly uneven archaeological record. In particular, the divergent histories of scholarship within the Republic of Iraq on the one hand, and in the Syrian and Turkish Republics on the other, mean that many conclusions drawn on extensive data from the latter two nations must be extrapolated to far less vigorous data from the first. The degree to which urban dwellers at Early Bronze Age sites currently in Iraq (especially at Tell Khoshi, Tell Taya, and Tell Baqrta) modified the hinterlands of their cities is a subject for future research. The same can be said about the nature of Neo-Assyrian rural settlement and land use in the imperial core along the Tigris River, which is currently modeled from urban and irrigation data from excavation and remote sensing in Iraq and from rural settlement data from Syria and Turkey (although see now Ur et al. 2013; Ur and Osborne 2016; Morandi Bonacossi 2012–13).

These conclusions should be taken as points of departure for further testing, rather than as established facts. At the time of writing, there is at least some reason for some optimism, as a new generation of Iraqi scholars of ancient landscapes is emerging (e.g., Al-Hamdani 2008) and foreign research is resuming in the Kurdistan Region (Mühl 2010; Ur et al. 2013).

Remote sensing analyses employing CORONA and more recent satellite imagery have revealed a vast array of sites and landscape features in northern Iraq (e.g., Altaweel 2008) that are only just recently receiving systematic study in the field using the new methods that have been developed in Syria and Turkey over the last two decades. If sociopolitical stability, governmental priorities for cultural heritage, and archaeological research agendas can coincide, northern Iraq may yet see its golden age of landscape archaeology.

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Further Reading

A comprehensive overview of landscape archaeology in the Near East is Wilkinson (2003), which describes the signature landscape concept and discusses both of the case studies presented here.

Recent reviews of Early Bronze Age urban society and cultural landscapes include Stein (2004), Ur (2010a), and Matney (2012); Wilkinson (1994) provides a compelling model for the economic landscape. On trackways, see Wilkinson (1993) and Ur (2009). The climate-driven collapse of Early Bronze Age society was first proposed by Weiss and colleagues (1993) and revised in Staubwasser and Weiss (2006); recent critiques of this hypothesis include Wossink (2009), Danti (2010), and the papers in Kuzucuoğlu and Marro (2007).

On the landscapes of the Assyrian empire generally, see the synthetic overview of Wilkinson et al. (2005). For northern Iraq, the classic study by Oates (1968) has still not been superseded, although see now Altaweel (2008) for a speculative remote sensing-based approach. The rural settlement pattern is discussed in Morandi Bonacossi (2000) and Wilkinson and Barbanes (2000). A comprehensive review of Assyrian irrigation is Bagg (2000); a satellite-based restudy of Sennacherib’s canals can be found in Ur (2005).