CHAPTER FIVE: MARSHLAND VISIONS

> We all do read the landscape, but we are not all equal in the process of "authoring" it.
>
> ———(Mitchell 2000: 139)

In this book I have thus far sought to address two issues fundamentally engaged by any landscape reconstruction: *visibility* and *visualization*. By visibility I mean our ability to see and recover terrain and landscape evidence; by visualization our ability to make sense of what is recovered. I have thus far been especially concerned with the former (visibility), and I have dealt with this on a number of levels.

At the level of physical terrain, I have invested rather heavily in a detailed discussion of the taphonomy of archaeological sites in the lower alluvium, and their relationship to underlying geology. I felt this important, because in the course of this study—that is, while attending many panels and workshops, and in discussions with recognized experts in the field—it has become clear that disciplinary specializations and separations have tended to isolate crucial evidence in specialized journals, often behind eye-glazing walls of jargon.

Such divisions are not uncommon; nor is noticing them particularly insightful. But the effects of this division of labor have not always been obvious. It is not merely a matter that they have isolated strands of evidence (although this is always a problem). Rather, my concern has become that these divisions tend to create perceptual differences among their practitioners, based upon customary levels of analysis and geographic scale. No common language exists between those accustomed

to examining point data from point sites, and those who examine broader phenomena from great heights. Thus, this entire work stands as a kind of plädoyer for the essential role of air and satellite photographs, at multiple scales, as both data sets in and of themselves, and as organizing frameworks for the integration of point data derived from borings and excavations with surface surveys, historical documents, and other ephemera—that is, for landscape visualization.

Having established—I hope beyond reasonable question—this re-envisioning of the physical terrain surrounding the early cities of southern Mesopotamia, I recognize that we must now begin in some systematic fashion to think through the social implications of those misunderstood wetland origins. There are some obvious ecological and economic approaches suggested by the technical findings presented in Chapters Three and Four. Further investigating these would require several seasons of intensive data collection: they must await a future work. Instead, I wish in conclusion to turn briefly to a third "V" that lies behind data visibility and underlies terrain visualization: Cultural beliefs about what can and should be done within a terrain, and social practices that govern what is done there. That is, I wish to turn explicitly to the problem of landscape *vision*. By vision, I mean an inherent sense of what should be; can be; might be: an idealized version of landscape that mentally transforms a sense of what is there, and imbues it with future possibilities of what could or should be there. Vision is, in that sense, the psychodynamic process that transforms a present physical terrain into an idealized—or an imagined future—landscape.

I have attempted to show how Western, European, Enlightenment cultural beliefs, coupled with modern social practices, have limited in very specific ways questions posed, evidence seen, and data selected, even as the landscape vision informed by those beliefs and articulated by those practices utterly transformed the hydrology and terrain of southern Iraq. Clearly, over the past century, even apart from economic motivations and technical capacities, landscape vision—that is, ideas about what is, and what should be, the ethical, moral, and political ordering of space within the terrain of southern Iraq—has played an overwhelming role in determining the relationship of a people with their local terrain, and has utterly transformed their experience of it.

At this point, my preoccupation with some of the limits of that particular landscape vision—one informed by biblical and other traditions of scholarship, envisioning irrigated cities on a plain, believing in an Enlightenment social contract that placed a particular burden on "good" government to create "useful" farms from "wasteful" marshlands, and practicing modern top-down, technologically engineered management schema that invested governmental authorities with rights of eminent domain in order to administer vast projects "for the common good"—rightly leaves me open to the criticism that "it is as though the English, French, and Germans have a society and culture, while the people of Iraq have nothing but a landscape" (M. Meeker 2003: personal communication). Of course, seriously addressing the question of whether archaeologists of early urban civilizations should consider social practices and cultural beliefs as variables—and how one might go about doing this—would

require a book unto itself. However, in this concluding chapter, I will attempt a small move in that direction, by way of opening up further possibilities for future research.

To make this small beginning, in what follows I have chosen just one feature of the Iraqi wetland terrain—the ubiquitous reed—that, even in the face of overwhelming evidence of its cultural and social importance through time has remained largely invisible to those who could not or did not recognize the real significance of wetlands or the (economic, social, or cultural) value of "non-agricultural" products or communities. I first show how, due to this peculiar cultural bias, the significance of reeds was systematically written out of landscape valuations by British colonial administrators. In the second half of the chapter, I go on to contrast this view with that of Early Bronze Age depictions of reeds, in an effort to assess, in its broadest outlines, how the landscape vision of early Sumerian administrators differed from those of their millennia-later British counterparts.

Along the way, I also attempt to show that reeds were themselves at all times a valuable resource, an ecological component of the agro-pastoral system that has contributed significantly to rural surplus generation in the service of urban populations. Thus, their presence in or absence from administrative documents cannot be attributed to some simple calculation of their economic benefits or contribution. Rather, their presence or absence in administrative records becomes an explicit marker of the presence or absence of a felt sense of a social contract—of a sense of mutual recognition of and obligation between—urban and marshland inhabitants.

Almost from the moment of their landing at the mouth of the Shatt al-Arab, officers of the British Imperium counted, measured, assessed, and "improved" any place or product that might channel profit to their civilizing enterprise. Yet, while scarcely a person or thing moved through the Mesopotamian realm that was not packed in, loaded on, shaded by, warehoused under, fired with, or made of palms, reeds, or rushes; though not one donkey, horse, mule, sheep, goat, camel, cow, or buffalo grazed from birth to rendering pit without seasonal sustenance from wetland grasses; though hardly a floor was laid, wall was finished, roof was set, nor awning attached without woven matting or thatch filler, following World War I nearly four decades passed before any government attempted to measure or tax reed products, or to count reed fuel and fodder as an agricultural resource. The earliest accountants of Sumer—situated in towns intimately associated with neighboring marshes—suffered no such blinkered view. From the moment of regularized record-keeping, reeds and reed products figured as prominently in lexical lists and delivery tallies as grain, livestock, dairy products, and other storehouse commodities.

In 1863, after reflecting in glowing terms on the rich Gulf trade in pearls, dried fish, wool, cloth, dates, grain, and horses,[1] the British Political Resident at Bushire (on the Persian Gulf coast) reported to the Chief Secretary to the Government of Bombay that "the Arabian…portions of the Gulf coast-line may be capable of supplying at a profit hides, horns, glue, saltpeter, and wool" (Pelley 1863: 618). He was especially enamored of the enlightened government of the free port of Kuwait, and stressed its

[1] For rice, teak, boat masts, clove, coconut pulp, and coconut oil from Zanzibar, and for long cloths, rice, coffee, planks, and spices from Malabar and Bombay.

astounding potential as a locale for a coaling station, telegraph office, and steamer terminus (Pelley 1863: 620). By contrast, nearby Fao, he wrote, "would ill-suit our purposes; *its climate and locality among delta marshes would render it fatal to Englishmen*" (Pelley 1863: 621, emphasis added). While waxing poetic about the "clean, active town, with a broad and open main bazaar, and numerous solid stone dwelling houses stretching along the strand, containing 20,000 inhabitants" that was Kuwait, he notes only in passing that the exported horses' forage, no doubt collected from the deadly delta marshes, "comes down the Bubiyan Creek from Bandar Zubair" (Pelley 1863: 619), while the exported dates, along with "a complimentary present of dates from Basrah in token of suzerainty and for the supposed protection of the mouths of the Basrah river" were actually received or shipped from the Shatt al-Arab (Pelley 1863: 620). Of Basrah itself, he wrote,

> it looked to me…like a blending of Nugger and Tatta in Sindh, the same outskirt of date trees and half-discarded canals, the same river fringing, the same irregular tumble-down piles of mud-brick houses…the same dirty picturesque children…the same wonder how the place ever got half built, and whether anything was ever new, finished, or repaired (Pelley 1863: 621).

In his report, Basrah's exports were reduced to marginalia in tiny type, even though the value of the exported dates alone—dates watered by tidal flushing through those "half discarded canals," and packed by the unnumbered parents of the "dirty picturesque children"—at "40 lakhs of rupees" (Pelley 1863: 621) was worth ten times that of *all* exports from Kuwait, valued at only "four lakhs of rupees" (Pelley 1863: 619). Basrah's real value, from Pelley's perspective, was not its commanding position in recruiting agricultural labor to harvest dates and collect fodder, but its position

enroute to Baghdad along “any extension of the present steam communications through the Gulf” (Pelley 1863: 622). Against Pelley’s marginal notation and denigrating description of deltaic terrain, a half-century later Mandate administrators saw a different landscape. They estimated that 75% of the world’s date consumption was produced in Iraq, principally “in the neighborhood of Basrah, where the belt of date palms on either side of the river Shatt al-Arab has an average width of about a mile, and stretches from Fao to Qurna, a distance of 108 miles.” By that time, their reports of agricultural production and export included wool, grain, pulses, oils, intestines (casings), hides, skins, tobacco, cotton, flax, hemp, liquorice, dried fruit, almonds, nuts, gum, gall-nuts, and silk—some of these in infinitesimal quantities, or merely expressed as hopeful possibilities. Despite this optimistic vision, agricultural production of fodder, fuel, and packing material remained nearly invisible. For example, in a government press book of that period, the photographic plates documenting date cultivation around Basrah clearly depict the reed mats and baskets used during date collection, sorting, local sale, and packing for export (Government of Iraq 1919), and in summarizing date export volumes, a report-writer notes that over half the annual total (about 60,000 tons) was packed “in baskets containing about 150 lbs” (Rush and Priestland 2001: 329–30). However, neither the total number, nor the origin, of the eight *million* baskets therefore required to handle that tonnage was noted.

It is not as if British troops and administrators bypassed (or passed blindly through) deltaic terrain. The first British East India Company factory was established in Basra in 1763, and thirty years before Pelley’s report made its way to Bombay, the

Chesney expedition had sought to commence mapping potentially profitable (and shortened) lines of communication to India from Turkey along the Euphrates and Tigris. This work paved the way for Sir Austin Henry Layard's 1841 expedition to Nineveh (even as border skirmishes along the Tigris brought the Ottoman and Persian empires to the brink of war). In 1847, the Treaty of Erzeroum appointed a Commission of Delimitation to lay down the frontier between them, from Baghdad to Muhammara (Khorramshar–Abadan). The attempt, carried out over the next four years, was mostly unsuccessful, but it did afford English archaeologist W.K. Loftus the opportunity to explore the ruins of Biblical Chaldea (such as Ur) along the lower Euphrates. Steamer traffic was regularized by the 1850s (Loftus 1856, Chesney 1868, McNie 1935: 6–8), and, as discussed in the introduction, by the turn of the century Ottoman modernizers had commissioned Willcocks' comprehensive assessment of agricultural "potential," given a hydraulic re-engineering of the delta and its wetlands (page **Error! Bookmark not defined.**, **Error! Reference source not found.**). But British land measurement away from the rivers began in earnest only with the arrival of the Turco-Persian Boundary Commission in late 1913. As "the culminating act of seventy odd years of diplomatic *pourparlers*, special commissions, and international conferences between the four Powers concerned" (Hubbard 1916: 1), delegations representing the imperial governments of Turkey, Persia, Russia, and Great Britain were charged with demarcating the 1,180-mile-long international frontier, from Pelley's old post at Bushire (on the Persian Gulf coast) to Mount Ararat (in Armenia).

Benchmarked to the previous century's Survey of India,[2] within a year—in an effort completed despite the onset of World War One—Indian Army surveyors accompanying the British delegation mapped the boundary between the Ottoman and Persian territories, and erected two hundred and twenty-three concrete pillars to commemorate the feat (Hubbard 1916: 1).[3]

Presaging Hall's journey to Ur six years later (Hall 1930), after traveling three weeks on a crowded Pacific & Oriental steamer from Marseilles, to Port Said (Egypt), though the Suez canal to Aden, thence Bombay and up the Indian coast to Karachi, with a change of ships at each port, Hubbard finally landed at the junction of the Karun with the Shatt al-Arab on 11 December 1913. After six weeks delay, spent outfitting the expedition and waiting for the Turkish and Persian delegations to arrive overland from their respective capitols, a cortège some 400-strong set out for the long trek to Ararat. For eleven months, the Commissioners, with their entourage of deputies, transport officers, engineers, medical officers, secretaries, clerks, surveyors, masons, armed escorts (mounted on cavalry chargers shipped from India), and one Russian naturalist, were accompanied by a 230-mule pack-train bearing everything

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[2] Edited primary materials are published in Phillimore 1950–68. For a short, highly readable historical treatment see Keay 2000.

[3] This cartographic exercise became the foundational backbone for the British "T.C." (Tigris Corps) and final "I" (International) quarter-inch (1: 253,440) Fao–Baghdad–Aleppo map series. Begun by the Survey of India detachment's ground survey party at the outset of the British invasion at Basrah in 1914, rapidly expanded with the aid of aerial reconnaissance through out the war (with improvements and additions made by both British and German cartographic departments as terrain changed hands, it was finally completed in 1924 (see page 25; **Error! Reference source not found.**; for a detailed discussion see British Naval Intelligence 1944: 646–8).

imaginable from tin baths to theodolites, including muleteers (mounted on local Arab mares), guides, batmen, cooks, launderers, grooms, cleaners, and personal pets (Hubbard 1916: 16–19, 26–32, 50–51; 94–95). *En procession* in full-dress regalia six hours per day through the outer delta, along the Luristan piedmont, up the Diyala valley, and through the mountains between Urmia and Van, "the caravan stretched for two or three miles across the plain" (Hubbard 1916: 94). While the surveyors went about the concrete business of the enterprise, the Commissioners were entertained by local dignitaries; the officers amused themselves by riding, hunting, and fishing, and the escort fended off occasional small raids.

Despite the best efforts to transport the Commissioners in a style befitting their dignity and the importance of their mission, "the degree of comfort or discomfort in the camp varie[d] in pretty direct ratio with goodness or badness of the water supply," which was at times fetid, (for them) undrinkably brackish, or both (Hubbard 1916: 91). As their journey initially passed through the outer delta, across the Karun and Karkeh, and continued through "a huge tract of extremely fertile country, which a little labour in irrigating would make as productive as any in the world….watered by the scanty streams which come off the Eastern watershed of the Luristan mountains and flow down to the marshes which fringe the bank of the Tigris" (Hubbard 1916: 70, 76) it was not as if the marshes themselves, nor the towering reeds demarcating their borders, went unnoticed. Indeed, led by the transport officer, provisions, forage, and mail were delivered weekly through the marshes by parties from Amara, al-Gharbi, Kut, and Baghdad (Hubbard 1916: 96). Of the journey's outset, the British

Commissioner's secretary remarked that:

> as far as Umm Chir the frontier could be marked on the map but not on the ground; for the reason that the first part of it runs through an arid desert too dry for travelers to pass through, the second part through an immense marsh (the Kor el-Azem) which is too wet. The desert and the greater portion of the marsh being uninhabited, there was, moreover, no need for pillars even if it had been possible to erect them; so the frontier was made to follow convenient lines of longitude and latitude and left to look after itself (Hubbard 1916: 58–59) (Figure 1).

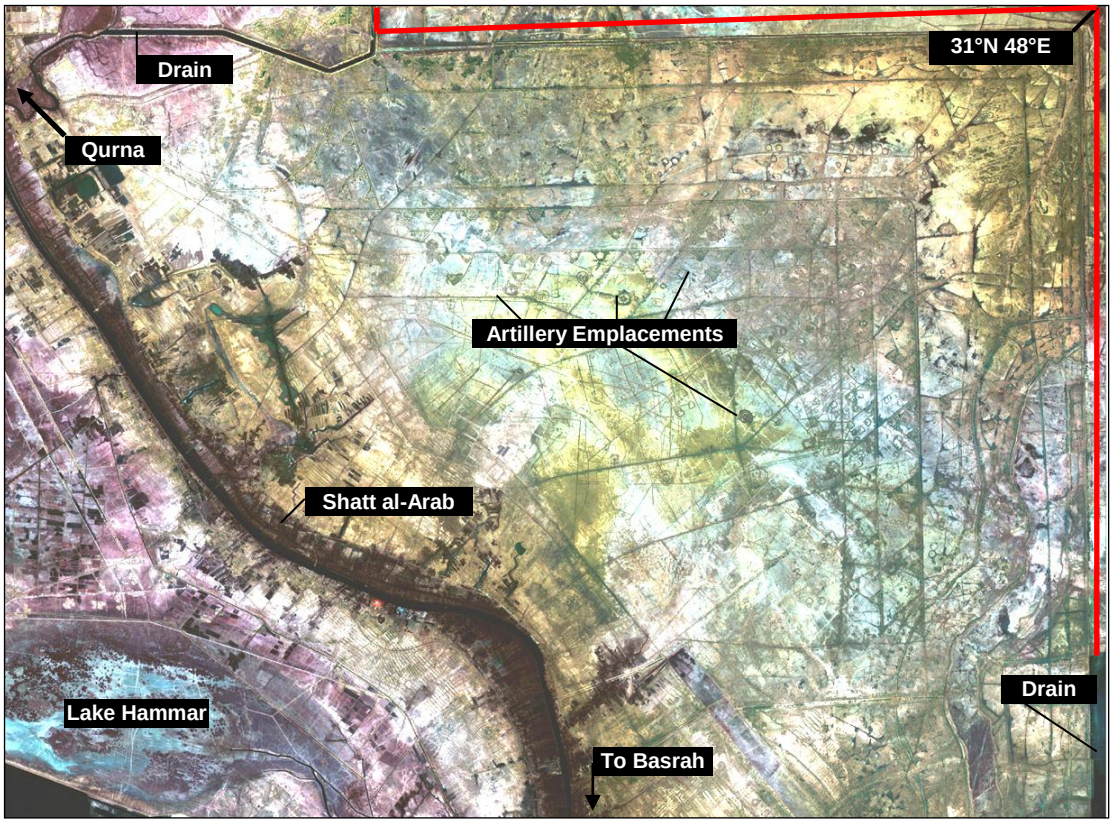

Figure 1: Iran–Iraq border (red). Drainage canals, border fortifications, gun emplacements, and minefields now demarcate a boundary of which Hubbard wrote in 1916: "there was…no need for [boundary] pillars even if it had been possible to erect them; so the frontier was made to follow convenient lines of longitude and latitude and left to look after itself" (Hubbard 1916: 58–59). Source: NASA (MODIS).

Hubbard even separated from the grand procession to travel by boat for two days down the Karkeh and through its impressive wetlands. But his observations betray an incongruous engagement not unlike Pelley's. On the one hand, though

charged on behalf of the Crown with fixing the boundary, he was unconcerned that setting benchmarks along its actual course through the marsh was impossible, since nobody lived there. Yet, in his trip diary he describes Bisaitin (Bostain), "one of the biggest of the marsh villages," which stretched along the lower Karkeh,

> as a single row of huts for miles along each bank of the river, with side streets at intervals on canals leading off the main stream. The huts are long and narrow, the walls consist of bundles of reeds about six feet high, partly sunk into the ground and covered with a barrel roof of reed mats…Each village has one or two mud palaces where the big-wigs live…For an hour we slipped past an endless succession of reed-huts, and crowds of staring Arabs and naked children lining the bank… (Hubbard 1916: 72–73)

In form and extent, Bostain would have been comparable to Suwaich, west of the Tigris (**Error! Reference source not found.**, **Error! Reference source not found.**), or to ech-Chubayish on the Euphrates (page **Error! Bookmark not defined.**, **Error! Reference source not found.**; Figure 2). During the 1950s, though much reduced following the war and several destructive floods, the population of the latter alone was still estimated at nearly 11,000 (Salim 1962: 21). Deeper within the eastern marshes, within a few kilometers of that convenient line "left to look after itself," a score of nucleated towns like Turaba each covered 5–15 hectares of built-up area (**Error! Reference source not found.**, **Error! Reference source not found.**), with innumerable hamlets, similar to that shown at **Error! Reference source not found.**, of a hectare or two apiece in extent delimiting the deep-water reed beds—not to mention various temporary camps and floating platforms within the lakes themselves. None of this went unnoted by Hubbard:

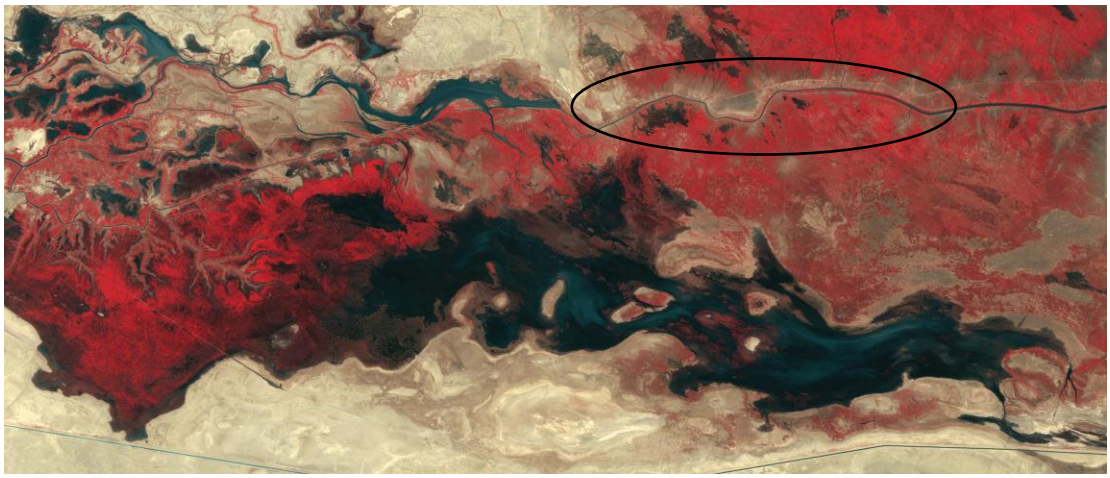

Figure 2: Ech-Chubayish, along the Euphrates north of Lake Hammar. In this false-color image, green reeds appear red. The name means "place of built islands"; in 1959 access was solely by water. As drains emptied the lake, the town was left high and dry. LANDSAT 1991.

> The marsh scenery is wholly unlike anything I have seen elsewhere, and hardly less unique is its population of queer amphibious beings who live among their swamps, isolated from the outside world, and earning a meager livelihood by growing rice and fishing… (Hubbard 1916: 71–2)
>
> Nor did the reeds themselves evade his view:
>
> The boats we meet coming up-stream [are] loaded with cut reeds….The Kerkha abruptly came to an end amidst impenetrable reeds…but the marshmen turned out in force and pulled…us over a bar into a hidden canal about five feet wide and full of other *belems*…[W]e…are now meandering along a vague channel among the reeds….only a few feet wide, with a sharp turn every few yards, and an impenetrable wall of rushes six feet high shutting us in, so that all one can see is the sky and a few yards of water ahead and behind… [W]e…came out into a lagoon thick with waterfowl…waded ashore through the shallows and came on a mile into camp. (Hubbard 1916: 74–75)

But, even though his diary of this "lazy progress down the stream," betrays a blissful romantic engagement:

> After lunch and a shoot on the bank, which is full of francolin and hares, we are again paddling…The river banks are populated by innumerable tortoises, who sit and crane their necks as we go by. There

> are solemn cranes standing sentinel here and there, and kingfishers… flitting over the water (Hubbard 1916: 72).

In the end, the prevailing view with which he had arrived, like a ritual litany, won out over his own observations at the time:

> The main features of the country can be summed up in three words—river, desert, and marsh, the river being, of course, the essential feature. The "Waters of Babylon," which once made Mesopotamia a rival with Egypt for the title of the "World's granary," still keep their fertilizing powers intact. But the old dams, canals, and barrages are gone, and the productive land is now narrowed down to strips of palm groves fringing the river banks. Where the palm groves end the desert abruptly begins. There is nowhere that 'Strips of Herbage strown, That just divides the desert from the sown,' where old Khayyám invites us to wander in blissful oblivion. (Hubbard 1916: 35)

Within a paragraph, a countryside summed up by the three words "river, desert, and marsh" is diminished to an essentialized "productive" palm-fringed river, abutting desert waste.

During the ensuing war, the marshes themselves—posing, as they did, a potential barrier to the movement of troops and war materiel—became the express object of military surveyor's scrutiny (see page **Error! Bookmark not defined.**, note 3). But beyond the useful cartographic depictions of flood basin boundaries, marshy zones, and lake depths (with seasonal variations), the Army camera's eye recorded further aspects of that terrain not explicitly included in the administrative landscape (Table 1). Along the Tigris from Kut to Basrah, incidental to river and camp views (including the axel-deep mud of areas subject to seasonal inundation) were miles-wide vistas of reed marshes and wetland pastures; of roads and lines of kilns ringing marsh rims. Photographs recording the novel reed villages clustered among Basrah's date

palm groves more-or-

Table 1: Selected British Army Photographs Depicting Marshes and Reeds, 1915–19

LOCATION	CAPTION	ILLUSTRATION	*SOURCE
		Marshes and wetland pastures	
Kut–Amara	View of Tigris	Reed marsh	Q27325
Kut–Amara	Mahaila on the Tigris	Reed marshes	Q49785
Kut–Amara	Suwaiqiya Lake or Marsh	Marsh stubble	Q71328
Kut–Amara	Artillery battery	Floating guns and limbers across marsh	Q106217
Kut–Amara	Troop camp	Pastures, reed village	Q71327
Kut–Amara	Troop camp	Limbers ankle-deep in mud	Q71324
Kut–Amara	Bullock wagon	Ankle-deep in mud	Q27324
Kut–Amara	Photographer's car	Axel-deep in mud	Q24528
Amara	Fahala Creek "flows out of the Tigris and disappears in a marsh"		Q27334
Qurna	Brick kilns	Stabilized road bed along marsh rim, desiccated marshland	Q24210
Qurna	Entrance to Euphrates	Reed marsh	Q27303
Qurna	Ft. Snipe at Tigris bend	Reed marsh	Q60255
Qurna	Bedouin skin tents	Marsh grass pasture	Q24218
Amara–Qurna	Qurna–Amara railway	Desiccated reed-bed	Q25661
Basrah–Ma'qil	Marsh Arab reed village	Bulrush pastures	Q15337
		Reed Construction in Villages	
Amara–Qurna	Woman spinning	Reed house walls, mat roofs, bundle doorposts, scattered fodder or flooring	Q25662
Basrah–Ma'qil	Riverside dwellers	Reed bundle houses with reed mat roofs	GOI
Basrah–Ma'qil	Marsh Arab reed village	Reed cattle byres, kilns	Q15338
		Reed Constructions in Towns and Cities	
Kara Tepe	Troops entering	Reed roof filler	Q24513
Baghdad	British troops, 1917	Reed mats in roof fill	Q24168
Baghdad–Tigris	Troops cross Kotah Bridge	Reed mats in roof fill	Q24172
Baghdad–Tigris	Lower bridge of boats	Reed mat bumpers, willow gufa	Q27343
Kut	Sappers having meal	Reed mat awnings	Q27320
Amara–Qurna	Arab village	Reed byres, lean-tos alongside mud-brick buildings and palm groves	Q27292
Qurna	Scene with cobbler	Reed bundle posts, mat awning, basket	Q25695
Qurna	View	Reed-walls, reed thatch warehouses	Q25664
Qurna	View from river	Reed mat quayside awnings	Q27294
Qurna	Mahailas on river	Reed mat quayside awnings	Q27300
Nasiriya	The Sisters' Quarters	Reed mat awnings on upper balconies	GOI
Basrah–Ashar	Ashar Creek	Reed mat quayside awnings	GOI (X3)
Basrah–Ashar	Opposite IWT docks	Reed mat quayside awnings	GOI
Basrah–Ma'qil	IWT Craft re-erection yard	Reed mat screens, roof shades, and shades	Q15304–6
Basrah	Date factory	Reed thatch, matting	GOI
Basrah	View from roofs	Reed mat beds, lean-tos, roofs; thatch	GOI
Khorramshar?	A Model Dairy	Reed mat roof, woven reed walls	GOI
		Reed and Rush Products and Packing Materials	
	British artillery	Reed mat sun shades	Q24343
Babylon	Girl winnowing	Rush winnowing tray	Q24839

Amara–Qurna	Women selling fruit	Rush basket	Q24186
Amara–Qurna	Bellum at Ezra's Tomb	Reed punts	Q24571
Amara–Qurna	Reed craft	Barge of reed mats	Q25646
Qurna	Women washing, cleaning and drying fish	Reed mats, punts, scaffolds, bundles; willow baskets, poplar poles	Q25715–9
Shatt al-Arab	Hospital huts	Reed mat awnings on boats	Q27331
Basrah–Ashar	Loaded bellums	Reed: rolled mats, packing, bundled	Q24592
Basrah	Robat Creek	Reed mat awnings on boats	GOI
Basrah	Date collecting	Reed mats, baskets	GOI
Basrah	Date sale	Reed baskets	GOI
Basrah	Date packing	Reed matting	GOI
Basrah	Zahroon, a silversmith	Reed mat flooring	Q24601
Basrah	Potter and wares	Stacked reed mats, rush shipping baskets	GOI
Basrah	Grain merchant	Reed mat shade, reed baskets	GOI
Basrah	Bread vendor	Reed oven fuel (bundled), reed baskets	GOI

*GOI: Government of Iraq 1919. Q#: Imperial War Museum Mesopotamian campaign 1915–18

less directly illustrated reed house walls, reed mat roofs, reed bundle doorposts, reed scattered as fodder or flooring, reed cattle byres, and reed stacked to fuel kilns. But triumphal records of British troops entering Baghdad, views along docks and quaysides, and snaps of artisans at work in towns also showed ubiquitous reed construction in towns and cities, including: reed mat bumpers on bridge piers; reed roof thatch, reed mats in roof fill, reed mat roof covers and shades, reed-mat and woven reed walls, reed-bundle door and support posts, reed byres and lean-tos alongside mud-brick buildings and in palm gardens, reed sleeping shelters on rooftops, and reed mat screens, shades, and awnings on storefronts, upper balconies, and quaysides. Reed and rush baskets and winnowing trays, reed mat sun shades and work surfaces, reed poles used as punts and scaffolds, reed bundles and mats stacked and rolled for transport, and an entire barge constructed of reed mats populated this working public sphere.

A unique set of records, keyed to and annotated upon the very maps that they helped to refine, show that British Army logisticians well understood the potential

centrality to the Ottoman war effort of the reed beds on both sides of the Tigris between Kut and Amara, and not just in terms of their barrier to mobility (Table 2). Sent aloft to scout and record troop movements, supply bases, and potential for provisioning, for nearly a year Royal Air Squadron observers recorded, often meticulously and nearly daily, the locations of thousands of reed shelters, sheep, cattle, and stacks of "boosa" or hay made of primarily of reeds, opportunistically mixed with rushes and other wetland grasses, as well as agricultural activities and grain harvests.

Summarized in Figure 3, these observations document a cycle of agro-pastoral production, centered on Kut at the head of the inner Mesopotamian delta, wherein the marshes and their products are central, not peripheral, to agricultural life. In early January, rain waters flooded Lake Suwaiqiya; later that spring water poured through Tigris flood splays, inundating wetlands to the south such as Sa'adiya marsh (**Error! Reference source not found.**) and Lake Gussab, which also received high water outflow from the Shatt al Gharraf. By late May, when detailed records begin, clusters of 20–100 reed mat "shelters"—some of these substantial constructions up to 70 m^2—lined the shores of lakes and marshes varying in diameter from "only" a kilometer, to the 250 km^2 sheet of water that was Lake Suwaiqiya itself. The shelters and their accompanying flocks remained permanent fixtures for months on end. Two similar populations and settlement schema may be distinguished; the first, and ongoing, activity undertaken by both was "boosa" harvest.

North of Lake Suwaiqiya, (Figure 3: 1) grain planted along the alluvial fan

southwest of Baghi Shahi was harvested in early June and piled in stacks for several miles along the riverbank. However, this activity ended as quickly as it began.

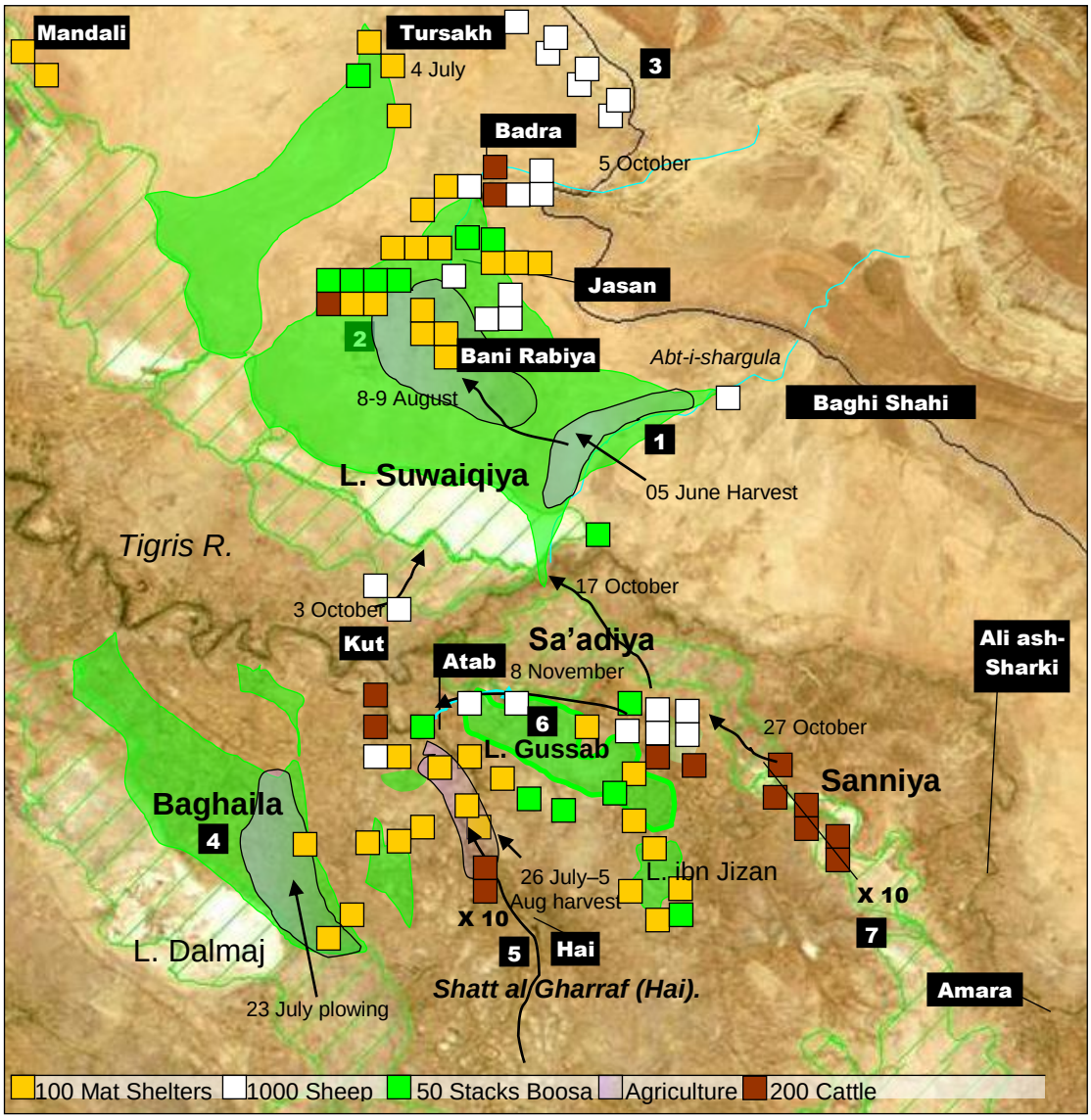

Figure 3: Air observations over Kut–Amara marshes, May–December 1916. Thousands of reed mat shelters and sheep cluster in this landscape. Production zones may be grouped into two similar settlement schema north and south of Lake Suwaiqiya. See page 230.

Thereafter, (2) as the waters of Lake Suwaiqiya receded, plowing in the soggy basin began in early August. Thousands of sheep grazed the marsh's north rim, while

intensive boosa harvest continued. By early October, (3) thousands more sheep began moving down the piedmont, grazing their way toward the late summer pastures left by the receding waters.

South of Lake Suwaiqiya (4) and east of the Shatt al Gharraf (Hai), the basin edges were plowed and planted in late July as waters receded around Baghaila marsh. From late July–early August, (5) grain was quickly harvested along the Shatt itself between Atab and Hai, and grain harvested from surrounding areas was moved to threshing floors there. Thereafter, thousands of cattle from more southerly wetlands were penned in the drying riverbed. (6) Boosa was intensively gathered around Lake Gussab and surrounding marshes while several thousand more sheep grazed its northeast rim. As flows through the Gussab canal dropped, sheep also grazed the canal bed. In mid-October, the flocks begin to split up, spreading northward across Saadiya marsh, across the Tigris to the south shores of Lake Suwaiqiya, and along the north rim of Gussab toward the Shatt. By late October, (7) 12,000 cattle moved north along Sanniya marsh into the Gussab basin.

It is important to note that what cultivation took place was not dependent upon irrigation engineering, except for some channeling of the alluvial fan. Farmers clearly took advantage of the high soil moisture available from flood basin recession, but a minimum of work went into planting, harvesting, and threshing; a maximum into boosa harvesting. It is also important to note the territorial fixity of the settlements and flocks. Clusters of up to 5,000 sheep, in flocks of 500–1500 animals (along with a few hundred cattle), grazed within single basins for up to half the year, in addition to

which thousands of stacks of boosa were stockpiled. The “shelters”—if not, indeed, permanent villages—were stationary throughout this period. Only during the brief harvests, as grain was stacked and threshed along the Shatt and Abt-i-shargul, were up to several hundred smaller, temporary mat shelters, in clusters of 20–50, added to these work areas; they disappeared as quickly. Although not recorded by the air observers (who were intent on movement of materiel), many mud-brick villages in the same areas as where these reed shelters clustered, along with a mud fort near each flood basin can be seen in later photos. Except around the smallest, most temporary basins there is no appreciable change in the number or distribution of reed dwellings—not even when, in autumn, the residents were joined by pastoralists moving 7,000 sheep south from the piedmont into the Suwaiqiya basin, and 17,000 cattle north into the Shatt and Gussab.

And yet, the lessons learned over these years of direct military experience were not fungible across institutional boundaries. As noted earlier in this chapter, civil administrators may have been willing to toy with the profit potential of mulberries and silk worms, but there was no place in their landscape for a marsh-centered view. Kut was, to them, a locus of military failure, bombed to rubble, dusty in summer and chocked with mud in winter, where besieged troops had starved in sight of plenty. Fed by an archaic and inappropriate agricultural scheme that did not include technocratically-engineered, surveyed, irrigated, and properly cultivated croplands, it was for the moment best forgotten. The reeds that had produced every strand of wool, bowl of yoghurt, and spit of meat so desperately craved by their own troops lay utterly

beyond their ken. At the war's end, one of the first endeavors of civil–military affairs officers was to invite the dignitaries of Amara and Basrah to a proper, British livestock fair and show, where sepoys displayed the massive, "improved" specimens of sheep, cattle, and horses bred in India alongside "model" practices of farriery, dairy herd management, and cart drayage turnout. Grandstands were erected for thoroughbred horse races and an air show. Separate classes and races were organized for desert Arab horses and camels, and the entire event was commemorated with a glossy book of photographs showcasing the region, which ran to several editions (GOI 1919).

Within two decades, the first-hand knowledge gained at Kut and Amara seems even to have dropped from the military sphere. Although chronicling the 1915–16 campaigns to capture those cities, and elsewhere noting camel thorn, lentils, and even date stones as sources of fodder, the nearly 700-page thick 1944 Naval Intelligence Division Geographical Handbook to Iraq—a masterly compendium of maps, photographs, statistics, history, ethnography, economic studies, and the like that still stands as a basic reference for the delta and Gulf—includes only one index entry for reeds: "used by the Arabs for their huts. It is easy to become lost in these marshes; the solitude is intense, there are few landmarks, and the *mashuf* leaves no track…". (NID 1944: 64, 187, 458, 461, 277–79).

The romance of the seeming remoteness of these reed beds south of Amara must have been acutely felt by local British officials. Two of these, writing pseudonymically as "Fulainan," relate time spent in the company of one Haji Rikkan (Hedgecock and Hedgecock 1927). Rikkan became an agent supervising cultivators

sent by Salim al Khaiyun, a Muntafiq sheikh seeking to extend clan holdings from their stronghold on the lower Euphrates northeastward into the western Tigris marshes, where tremendous profits were to be had growing rice. British Administrative Journals record that "Salim's only object in thrusting a few undefended cultivators into [the Albu Mohammad lands of the Amara] Division [from Nasiriya], could have been to attempt Sikar into making an attack of which he could take advantage," and, eventually, a skirmish did occur, "with a few casualties on both sides."[4] Such was the administrative view from the perspective of Amara; the Hedgecocks romanticized this story, portraying Rikkan as a simple canoe-peddler, caught up in forces beyond his control, in a tribal war set off by the dislocations of World War I and waged in the personal terms of tit-for-tat revenge killings and fierce contention for every small patch of muck extending above the waterline. This tale was the first of several attempts by British observers to chronicle marshland life-ways, but it did so in a manner that did not make apparent to the reader the specificity of what was described. As a morality tale of clan and tribe, *set* in the reed-, buffalo-, and-rice-land of the marshes southeast of Amara, it seemed to stand for all those who lived away from the substantial towns and cities of the lower Tigris. Several decades would pass before more, and more scholarly, studies laid out practices and products in other wetland ecotones (see Table 3, Figure 4).

The Hedgecocks had even noted Rikkan's own keen sense of taxable marshland produce moving along the Tigris—at one point, Rikkan was appointed as a

[4] British Administrative Report Amara 1919, cited in Westphal-Hellbusch and Westphal 1962: 106–7.

sergeant in command of six men at Kassara, near Qalat Salih,

> just where a stream of clear blue water from the marsh flows into the Tigris…Opposite the mouth of the stream stood Haji Rikkan's mud fort, or rather his toll bar; for no *danak, birkash, mashuf, torrada,* or *challbiyah*[5] did he allow to issue from the marshes until its owner had paid a tribute. If it was bringing fish for sale, the Haji demanded a fifth of their value; reeds, feathers, mats, wild-fowl, all were estimated by his ruthless eye, and on all the toll was levied."(116–117)

But, as noted, British agricultural administrators were otherwise preoccupied. Not until the 1950s would a British-trained social anthropologist, originally from Amara, in a classic study of one town on the lower Euphrates, put reeds and mat-weaving at the center of the local economy, and relate the reed harvest cycle to livestock production, mat sales and canoe trading with entrepreneurs from Nasiriya and Amara, and annual labor migrations to harvest grain along the Shatt al-Gharraf, pack dates in Basra, and fish in Lake Hammar (Salim 1962).

Salim himself was very careful to note that he dealt specifically only with the lower Euphrates delta; that not all inhabitants are Ma'adan, or deep-water buffalo breeders; nor are all inhabitants Arabs, or, if Arab, necessarily affiliated with desert-based tribal heads. He particularly notes that, for town-dwellers, "Ma'adan" is merely a perjorative referent to any non-urban person, that is, any "hick" from beyond the civil pale. By deconflating the images and terminology attaching to essentializing terms like "Ma'adan" and "Marsh Arab"—too often used interchangeably, and universally, to describe all wetland inhabitants—Salim's study makes possible a more integrated picture of the productive zones of the inner and outer deltas, built from

[5] Types of local watercraft.

more particular (and more general) studies. Such a picture is extremely important for

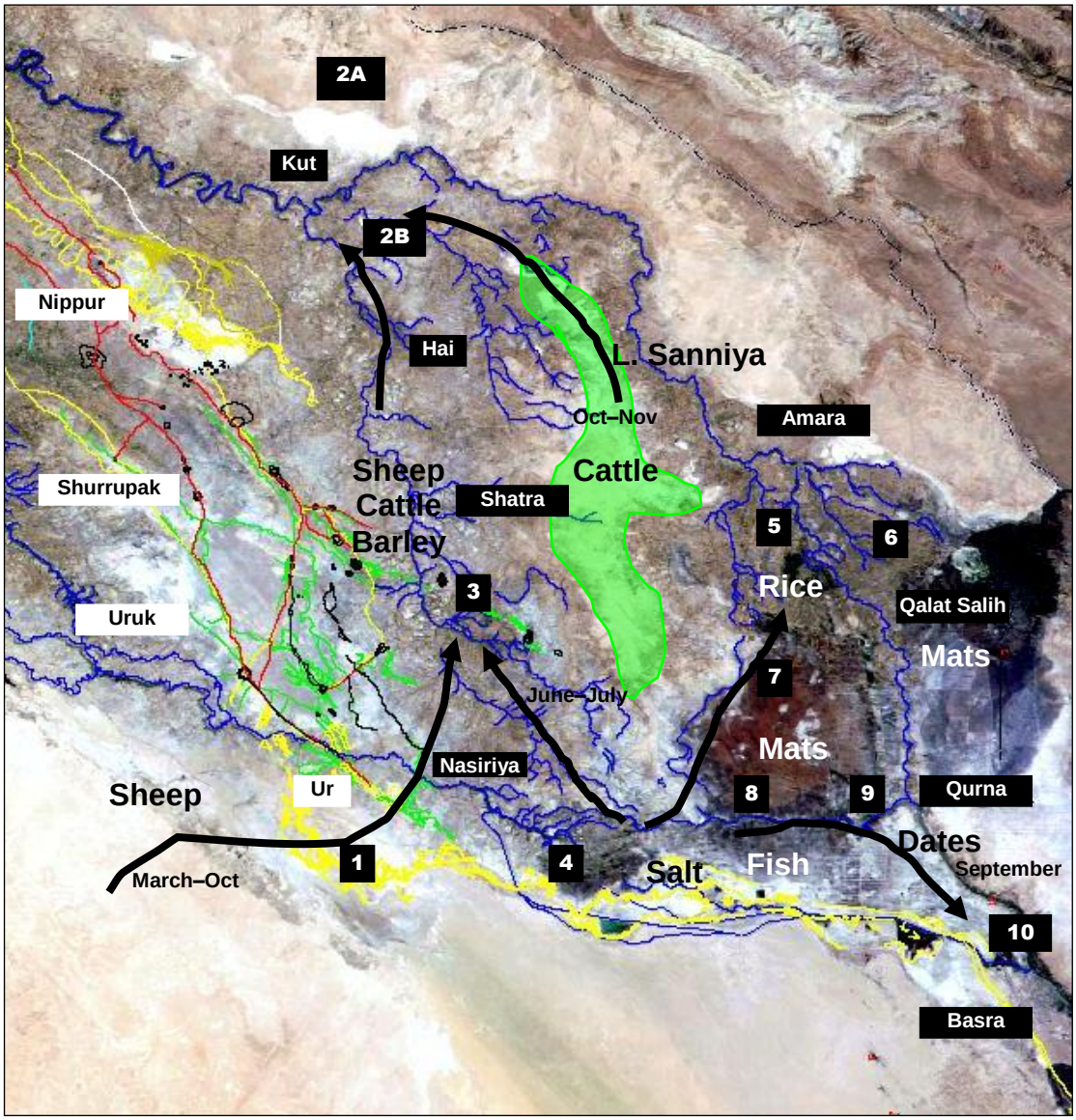

Figure 4: 20th-Century Geographies and Ethnographies of the Tigris–Euphrates Delta. 1. Late winter rains flood the Ur basin; pastoralists from the Arabian shield graze flocks on spring pastures, crossing the Euphrates and on up the Gharraf after May floods. 2. See Figure 3. 3. Mid-Gharraf barley cultivators keep flocks for carpet production, exchanging these for cloth produced by pastoralists who arrive in October to graze receding lake pastures. 4. Residents of the southern Hammar belt produce salt and fish, migrating in September to Basra for the date harvest, and up the Gharraf and to the Amara districts for the winter grain harvests. 5. Rice cultivation and buffalo breeding is–for the town-dwelling sheikhs who control it–extremely profitable southwest of Amara. 6. True Ma'adan–breeders of water buffalo–inhabit the deep-water marshes to the south and southeast. 7. Following WWI, competing attempts to extend rice cultivation along the prograding delta resulted in clashes near Saigal. Thousands of cattle graze Lake Sanniya's reed pastures, moving north in late October to graze the riverbeds at low water, and to market at Kut. 8. Ech-Chubayish, at the transition from inner to outer delta, straddles

several agricultural economies. 9. Cattle graze salt pasture near Qurna; residents maintain palm gardens. 10. Dates, watered by tidal flushing, are packed and shipped from Basra. See Table 3.

completing a reconstruction of lower Mesopotamian landscape of 4000 BCE.

The wetlands of the southern delta may be broadly divided into several distinct zones. In all of these, the predominant activity is reed-cutting for construction, fodder, fuel, basketry and reed matting produced for barter or sale. The harvest cycle begins in January, when soft growing rushes emerge near the settlements and are cut for cattle fodder; this continues through August, following new growth ever-further from the permanent communities. In mid-August, though still green and soft, some reeds have matured sufficiently to be cut for mats; their leafy portions also serve as sheep fodder, and reed-seeking begins in earnest. Reed-cutting and mat-weaving continue through November. By December, the reeds, now thick, yellow, and dry (called *jinuba*), are at their prime for mat-making. Come January, fodder may once again be sought close to home, but *jinuba* is available farther away, and people may migrate to islands deeper in the marsh to continue its harvest. By the time reeds are 18 months old, they are too tough for mats, but ideal for fuel. Thereafter, left to themselves reed stands become increasingly tatty and wind-battered; reed-beds are at this point burned off to accommodate new growth. In general, men do the cutting and weaving, while women and children measure, tie, and bundle reeds according to length and stem thickness (Salim 1962: 105).

Only the true Ma'adan–water buffalo breeders –dwell permanently in the deep-water marshes and lakes to the south and southeast of Amara (Thesiger 1964, Maxwell 1957, Hedgecock 1927). There, their inaccessible, floating dwelling platforms,

constructed of reeds and muck to give nightly haven to their animals, were at times a place of refuge for those fleeing predatory sheikhs and various government officials. To the southwest of Amara, rice cultivation and buffalo breeding is—for the town-dwelling sheikhs who control it—extremely profitable, and following WWI, competing attempts to extend rice cultivation along the prograding delta resulted in the clashes near Saigal (Westpahal-Hellbush 1962). But a more traditional occupation on the western marsh rim is cattle-breeding. As discussed above (page 230), thousands of cattle graze the seasonal reed-beds surrounding Lake Sanniya, moving north in late October into the low-water riverbeds, and, in some cases, to market at Kut.

A second annual transhumence is associated with the recessional pastures along the Shatt al-Gharraf. After late winter rains flood the Ur basin, pastoralists from the Arabian shield graze flocks on spring pastures, crossing the Euphrates to head up the Gharraf after May–June floods (UK NID 1944). Mid-Gharraf barley cultivators keep their own herds and flocks for carpet production (Wirth 1962), exchanging these for cloth produced by pastoralists who arrive in October to graze receding lake pastures. Because this arrival of thousands of sheep from the south significantly stresses emergent grasses, the bulk of the barley harvest is used for supplemental sheep fodder over the winter (Ochsenschlager 1993b).

At the the Tigris-Euphrates junction near Qurna, levees are sufficiently developed to provide a belt of salt grass pastures, used by nomads to graze cattle. The (slightly) heightened levees create a well-drained root zone, enabling settled communities to maintain palm gardens, with vegetable crops grown in the understory

(Westphal-Hellbush 1962). A line from Nasiriya to Qurna demarcates the northern border of the Hammar marsh belt, where the Euphrates bed is lower than that of the Tigris, and hence receives water drained through the Tigris marshes. Its southern boundary lies at the transition between the inner (fresh) and outer (estuarine) deltas. Here, residents produce salt from deep wells, and fish from Lake Hammar (Salim 1962: 19). Finally, the tidal flushing that sends twice-daily surges into side canals waters thousands—at one time, over a million—dates palms along the Shatt al-Arab as far as Basrah, where they were packed and shipped for world export (Wirth 1962). Southeast of Basrah, to the Gulf at Fao, smaller communities grazed animals on salt pasture, erected miles of fish-traps on the mud flats and smaller estuarine streams, and sailed down the Gulf for fishing and shell-diving (Hassan and Criddle n.d.: 2:59–7:33).

Ech-Chubayish, like other communities of the Hammar belt at the transition from inner to outer delta, therefore straddles several agricultural economies. Its 1,600 man-made islands were often too wet to maintain palm gardens, though some were kept with varying success. To supplement their diet (if not their income), many residents migrate in September to Basra for the date harvest, and in winter up the Gharraf and to the Amara districts for the winter millet and rice harvests. But these activities must be (and are) viewed as supplementary; in 1952, 862,000 reed mats were produced by the 11,000 residents of ech-Chubayish alone. “had it not been for the reed, all the people would have left” (Salim 1962: 94, 108–109).

As shown in overview at Figure 88, to complete the picture laid out in Chapter

Four, this productive system may with some success be mapped onto the Uruk countryside. At 4000–3000 BCE, this is a younger delta; a smaller delta, compressed by rising sea levels, and without the conjoined input of the Kurun. The rivers' placement, as we have seen, is only approximate, but sufficiently known to delineate fresher (more blue) and saltier (more green) zones of inundation. The winter cattle pastures at the head of the inner delta north of Hai (Figure 3) may be compared to flood basins formed below nodes of avulsion above Nippur (Figure 4), with, for example, Shurrupak corresponding to Hai on the Shatt al-Gharraf. The cities—such as Umma—clustered at the Karkar splay then lie in a setting similar to that of Amara, but much closer to the salt pastures of the lower estuaries. The transition zone from the southern Hammar belt to Fao on the Gulf coast may be compared to the transition zone south and east of Warka, with Uruk in the position of Qurna (or, through time, Nasiriya) and Ur in the position of Fao or, in time, Basra. While coring would be required to establish definitive boundaries for salt and fresh marshes, as discussed in Chapter Four the direction of water flow, in conjunction with natural boundaries reinforced by the accumulation of substantial southeast-trending levees, probably resulted in a belt much like the Hammar district in the Eridu basin, with tidal flushing as far inland as Uruk.

As we have seen, the preceding Ubaid periods, and especially the Ubaid 2/3–4 (pp.**Error! Bookmark not defined.**–**Error! Bookmark not defined.**), were all about rising sea levels. This was a slow progression, lasting on the order of two millennia, with a lot of intermediate variation, especially during the Ubaid 2/3, when fishing

camps such as that at H3 (**Error! Reference source not found.** and ff.) trading with appeared all along the Gulf coast. As sea levels rose through ‘Ubaid 4, the lower delta no doubt comprised many little “Bubiyan” and “Falaika” islands with fish traps in the flats. Certainly we see a slow consolidation of institutional structures on turtlebacks above the flood, with an emphasis on storing dried fish. At the sea level maximum, the lines of communication opened by earlier fishing routes had been carried all the way to Ur’s doorstep. [6]

As discussed above (page **Error! Bookmark not defined.**), while sites become increasingly visible from the Early Uruk onward, we still know very little about the period. Nevertheless, the site distribution we can see suggests a visible reliance on reed pastures in the Dalmaj basin, and (probably mixed reed and salt) pastures at the head of the Warka basin. It also suggests the increasing importance of control of the avulsive fans that are the gateways to these environs. No doubt this will one day prove true at Warka; other locales, such as the node south of Shurupak, may prove to carry less overburden and be more amenable to excavation.

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[6] Several measures could be taken to test this notion. As I indicated in Chapter Three, the old shoreline should be examined with higher resolution imagery, and a ground inspection done to determine precisely what phenomenon is detectable on MODIS. Because Roux’s only survey of the Hammar district was undertaken at a time when traficability made examination of all but the most visible mounds possible, a new survey along the old shoreline, with the express aim of locating Ubaid sites, should be undertaken. The new highway, which runs parallel to this line, should provide good accessibility. Obviously, additional cores taken from within the Warka and Eridu basins would be highly desireable; absent this, analysis of any extant unbaked mud fragments from early strata for phytoliths and other residues would help establish the prevalence of hydrophytic or halophytic plants. Finally, much might be learned from further examination of sickles for plant residues, and to establish periodized typologies.

But from the Late Uruk, our visualization of this landscape is aided by the imagery and ideograms used by an emergent class of increasingly professional administrators (see page **Error! Bookmark not defined.**). Commodities tags included fresh fish (Englund 1998: 60), and among the most frequently used Uruk IV-III signs, along with cattle are dried fish, fresh fish, snake, pig, and bird (Englund 1998: 70-71). Fish are noted in as many Uruk III texts as cattle (Englund 1998: 88). In a toponymic representation of the outer delta, an ideogram for "sea," in the form of a fish trap, becomes associated with both household and ten city names, including Ur (with reed finial), Larsa (with sheep), and Uruk (filled with hachures) (Englund 1998: 69, 81, 91, 93). The ideograms for a number of other cities included reeds, bitumren-coated reed mat doors, and reed finials, while archaic signs for temple households included reed houses with attached reed finials or the finials alone with various attached standards, which seem to have represented city gods and, specifically, Inanna (Steinkeller 1998). Administrators (*En*) were represented by more substantial, long reed buildings with high-peaked fronts (and the finials) (Englund 1998: 69, 91, 102). Cylinder seals depict a plethora of reed byres with emergent livestock (Amiet 1960: pl. 17). Reeds are often depicted with hunting scenes, especially with wild pigs (Amiet 1961: pl. 40 no. 609; Englund 1998: 45). And, as mentioned above, direct evidence that reed mats were produced even then is their impression on the backs of gypsum and clay tablets (Englund 1998: 51, fig 14; Boehmer 1999).

In this landscape, livestock grazed on spring and summer salt pastures at the marsh rims would have moved northward toward Shurrupak and Nippur in autumn.

While cattle certainly were not new to the landscape, it would seem that cattle-keepers gained ascendancy over the interests—or representations—of fishers. The basis for this flourishing dairy-and-wool production was not, however, irrigated agriculture: it was mastery of the productive potential of the wetlands, and other glyptic representations reinforce the sense that Uruk elites were well aware of this dependence.

The most blatant expression of this is the so-called Warka vase, recently (and thankfully) recovered in Baghdad. At its bottommost tier, encircling the vase, lies water. Above this, a prominent circle of reeds. Then, a band of sheep and cattle. Above them, a band of naked men bearing filled bowls. Finally, surmounting this hierarchy, the en in his skirt, and more bearers and retainers, meeting the goddess Innana, represented by her two reed bundles. Or, again, on a cylinder seal, as big as a man's two thumbs, carved on soapy Euphrates limestone, an inch-high montage was carved depicting a new vision of authority. Eyes forward, seeing beyond the high prow of his canoe, accompanied by a spear-fisherman a man wearing a net skirt, ostensibly the *en,* is poled though towering reeds by a second, naked man. His image is surrounded by stacked accoutrements: a cow statuesquely posed; beside her, a pair of storehouse doors; on her back, an altar. Surmounting this is the reed bundle finial used to demarcate households and gods. As a human bridge from fish to cattle; a fisher of men bearing cattle, storehouse, and altar, carved into the stone (obtained across the water) used to build the white temple at Uruk, one cannot help but imagine him posing the question: "What if we looked at the world as one giant farm field?"

But the question, stripped of its European wasteful/useful dichotomy; stripped of turn-of-the-century prejudice against wetlands, carries variant intonations. I must first explicitly emphasize that the shift in temple offerings from fish to cattle and dairy products of itself shows a remarkable remaking of ideology: it is as great a change as the shift in the later Roman realm from reading a sheep's entrails to passing wine and bread. But what is revealed in the suppression of fish from the archaeological record, concomitant with an emphasis on dairy herds in the epigraphic record, is not an explicit recognition of that shift and its importance. Instead, it reflects a peculiar kind of empathy of the excavator with imagined ruling and administrative classes. The envisioning of Uruk (large and small) cattle barons risks echoing European reception of the peculiarly American vision that captured generations of imagination from the 1920s to the 1960s. Hollywood's representation of an egalitarian cattlemen's code as the successor to a putative egalitarian expansion across the American West—a "cattle culture" deemed alien to European urban experience—nonetheless came in some sense to stand for that experience. By a kind of hat-trick, the cattle-political experience of a moneyed elite was universalized as total experience, and cattle wealth (or lack thereof) became linked to cattle finance. To characterize the "style" or hallmark of a civilization as cattle-political, assert that the civilization does not exist until the arrival of cattle-lords, and thus conclude that conditions imagined to be hospitable to cattle must pre-exist their arrival, is to construct a tautology that neither fully investigates nor accounts a complex social experiment.

This criticism is not a cultural materialist one: quite the opposite, and it hinges upon the very definition of urbanity and civil-ization, as opposed to complex, ranked, differentiated, but somehow not quite urban towns.

We might well first ask: What is a city? Although much hyped in poplar discussions ("bigger than Classical Athens"; "unequalled until Rome at the peak of empire"), size of itself is a poor measure. Four hundred hectares may represent the urban cradle of Western philosophy; it may also represent the dust-choked streets of modern Shatra. Both have religious, political, administrative, domestic, warehousing, market, and harbor precincts interconnected by planned roads, congested alleys, and engineered waterways, but they hardly conjure the same image of urbanity.

While, from the late fifth millennium BCE onward, throughout Mesopotamia urbanizing tendencies become apparent, even estimating city size poses considerable difficulties. First is that of contemporaneity. Periodic habitation of extra-urban environs tends to build up broad, shallow, overlapping horizontal deposits that can mimic urban sprawl. Second is that of determining what portion of the urban catchment–including suburbs or near satellites–to include within the "city" boundary. Extramural suburbs and satellites of late-fifth–early fourth millennium BCE Syro-Anatolian cities are often included in total area estimates even where discontinuous or, if continuous, comprising a number of discrete mounds quite different in plan from later cities of the southern alluvium. Lastly is the difficulty of ever recovering these environs. *Least* amenable to recovery are shallow sites (including suburbs and

satellites of large, deep urban centers) situated at points of effluence where rivers emerge from deeply incised channels into alluvial fans and floodplains–as for the upper Tigris–Euphrates alluvium. These become quickly and deeply buried under deposits of sufficient thickness that they are unlikely to be revealed by later deflation of the plain surface. Early sites, and especially early, shallow, extra-urban deposits, are only rarely recovered at all from the heavy sediments of the northern alluvium, and where recovered are not included in site area totals unless dense, contiguous, and apparently contemporaneous with urban cores.

More important than size to urban definition is boundary definition, or, rather, hinterlands definition. That is, somewhere outside the conceptual borders of truly urbanizing zones—even very small ones not enclosed by city walls—exists a landscape that has become subordinated to supplying urban needs, even at the expense of its own. Mapping such a landscape vision onto an imperfectly visible, and no doubt imperfectly visualized terrain is obviously problematic. Nevertheless, in this sense, a study of Uruk period marshland resource administration is by definition not a mere addendum to a better-studied agro-pastoral irrigation economy. The managerial origins of later irrigation hydrostrategies were *a priori* dependent upon a wetland landscape that endured in various forms for seven millennia, and one that only during the twentieth century CE finally was dammed, diked, distributed, drained, and managed to extinction.[7]

[7] From 1976–2000, at least 7,600 km^2 (85%) of the *permanent* wetlands in alluvial Iraq disappeared, partly as a result of hydroelectric flood control and irrigation projects on the upper Tigris and Euphrates. Upstream damming reduced or eliminated

Adams has long noted the role of marshlands as a place of flight from predatory rulership, and never discounted their supplemental subsistence importance (Adams 1981, 2002). However, for the southern alluvium during the crucial fifth and fourth millennia, wetlands must be at center stage of any nuanced discussion of adaptability and constraint. If adaptive flexibility explains the long history of cycling between urban agglomeration and ruralization in the southern alluvium, the "third leg" of littoral resources must be carefully more considered. Proxies for specific "processes" of social organization and control are open to reinterpretation.

As we have seen, Early Dynastic foundations were, from a geographic perspective, well-laid during the 'Ubaid 4. The institutional foundations for subsequent management, replication, and intensification of marshland production (as distinct from marsh products and canal technologies per se) were laid during the Uruk. Both were predicated and dependant upon littoral communications with their hinterlands. Agricultural colonization of the southern Mesopotamian alluvium was made enduringly possible through exploitation by specialized communities of marsh

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seasonal flood pulses and made possible a concerted drainage effort in southern Iraq leading to drastic changes between 1991 and 1995. As a result of the drainage program, the Central and al-Hammar marshes have been eliminated save for water and reeds left standing in drainage canals. Al-Hawizeh, on the Iranian border, has been reduced by two-thirds, leaving just over 1,000 km^2 of intact, permanent wetlands. An additional 11,000 km^2 of *seasonal* wetlands are no longer subject to periodic inundation as a result of the combination of upstream damming and the explicit re-engineering of downstream flows (Partow 2001, Brasington 2003). Demographic impacts were considerable. As a direct result of the drainage program, the UNHCR estimates that at least 40,000 marsh dwellers sought refuge in Khuzestan, with another 200,000 internally displaced, for the most part to the outskirts of major cities (Iraq 1956; Koucher 1999; Partow 2001, Brasington 2003).

fowl, fish, bitumen, shell, and reeds; by grazing herds on and cutting fodder from salt pastures; and by exchanging boat cargoes with near-neighbors. Sixth and fifth millennium settlements initially took localized advantage of productive littoral ecotones. By practicing local, small-scale damming and diking to build up permanently habitable platforms and to control the rate and progression of flooding and runoff, they accumulated "hydrologic capital" that gave them possession of the most suitable landscapes, led to the invention of technologies for flood and irrigation control, and developed institutions for labor mobilization.

During early urbanization and state formation, these wetlands—now almost fully destroyed and therefore difficult to imagine in their former extent—would have acted as an almost inexhaustible agro-pastoral buffer. Complementarity of resources would of course have provided local resiliency; but just as important would have been the replicability of these small, bounded, managed ecosystems at each sinuous loop; on each turtleback, and at each levee junction, where locally shifting plans brought minimal acreage into well-drained cultivation. Specializations and complementarities could thus have been placed beyond the reach of any locally destructive flood or drought. Communities sustained by marshland biomass and fed by the combination of farming-fishing-husbandry could produce sufficiently consistent agricultural surpluses and sufficiently robust trade networks to tilt the balance toward consolidation of local management structures. This preceded the work of straightening and regularizing channels and building new canals that came to characterize and fuel urban growth during the third millennium.

Insightful Mesopotamianists have already speculated about the contribution of wetlands and water transport to pre-urban southern Mesopotamian material culture.[8] However, only over the past decade has sufficient data accumulated to support the proposition that alluvial Mesopotamian cities grew from ‘Ubaid precursors heavily participant in and reliant upon littoral subsistence and exchange. Probably therefore, Mesopotamianists have not collectively considered the implications of those data. Algaze's import substitution model, discussed in Chapter One (page **Error! Bookmark not defined.**) must in this context be understood as a first outworking of the regional economic ramifications of this fundamental reassessment: a twofold “southern advantage” that may have overwhelmed the stability of supra-regional uniformity (or even advantages) in other social institutions.

The first is the inexorable advantage of the riparian environment: that it is simply easier to move bulky cargoes downstream than up, opening the possibility of (from the southern Mesopotamian perspective) downstream imports of bulk commodities in exchange for upstream exports of manufactured goods. The second is the inexorable advantage of the marsh, which exponentially compounds the transportation advantage by opening pathways across the southern alluvium. To be sure, Uruk’s (and its sister cities’) location would have conferred significant transportational advantage. This advantage would have been further compounded by the great reliability of wetlands renewed by annual floods in their fertility, by which is

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[8] Notably Woolley (1929, 1955, 1956); J. Oates (1960, 1969); D. Potts (1997); and S. Pollock (1999).

meant the greater biomass productivity of renewable, easily manipulated construction materials (reed, riparian woods),[9] easily gathered or readily hunted protein foodstuffs (fish, shellfish, fowl, pig), easily gathered carbohydrate foodstuffs (roots, tubers), and—significantly—reliable fodder (reeds, sedges). More importantly, in littoral ecotones, intensification of natural resource collection, hydrologic management, and cultivation are the primary mechanisms for *both* generating agronomic surplus *and* buffering against its failure.

The greater resilience of southern cities here described is not, therefore, a result merely of more varied resources (Wilkinson 2001), but, put simply, more resources—and, to return to my comments in Chapter One (see page 17), it is in this sense that Algaze's reference to "greater fertility" should be understood. Syro-Anatolia may or may not have been positively affected by generally wetter mid-Holocene climate (Weiss and Bradley 2001; Cullen et al 2000; Bar-Matthews, Ayalon, and Kaufman 1997; Lemcke and Sturm 1997) or a summer monsoon effect deduced from paleobotanical data for the Arabian Peninsula and (by extension) southern Iraq (el-Moslimany 1994). But it was precisely at the time of increased local precipitation variability, and during the general drying of the later fourth millennium BCE, that the alluvial "Mesopotamian advantage" of higher resilience became crucial. Here the marsh littoral provided both a sustainable resource base and a model for hydrologic

[9] *Phragmites* and *Arundo* are so invasive and resistant to extermination by chopping or uprooting that one must posit them as invasive commensals, adapted to millennia of ethnographically attested overcutting for construction, matting, fodder and flour manufactured from their tubers (Salim 1962, Thesiger 1964, Ochsenschlager 1993).

management, sustaining experiments in intensification that may well have sought to recreate and preserve previous natural conditions.

These compounded geographic advantages fueled Algaze's "synergistic cauldron" and favored accelerated urbanizing processes. In the rain-fed north, under climatic stress *ex*tensive ruralization—not *in*tensive urbanization—optimally supports both higher overall population and agrarian surplus production (Wilkinson 1994, Algaze et al 2001). This could help account for the undifferentiated sprawl of large, precocious settlements noted by Oates surrounding Brak. There, dry land was not a scarce commodity, and under optimal conditions rural settlements could have proliferated even as urban centers expanded. However, during periods of poor harvest, Syro-Anatolian polities would have been more constrained in their ability to overcome local or regional crop failures, since accessibility to the products of arable land would have been limited to the mobility of foot and hoof.

In the marshy alluvium, the situation of 'Ubaid towns, villages, temples, and associated temple economies on levees, turtlebacks, and marsh rims within the vast littoral created a kind of geographic circumscription-within-plenty. The high, dry ground itself, as well as associated permanent structures (temples, docks, ferries, kilns, dwellings), could have become contested, but the resource base supporting them remained readily accessible. In keeping with Oates' perceptive and foresightful 1960 conclusion, Ur's "flourishing in the same geographical position for some 5,000 years" (Oates 2001) is attributable to its situation in marshlands, its status therein repeatedly rejuvenated by the re-digging of canals.

I do not imply by this a crude environmental determinism. As Gil Stein eloquently summarizes:

> Culturally specific factors allowed for and encouraged the production and centralization of surplus crops, pastoral products, and aquatic resources from the south Mesopotamian ecological system. The ideological and economic role of temples in Mesopotamian culture is particularly important in this regard. Temples provided a ritually-based ideological focus that could mobilize labor and tribute from a social sphere far wider than that of a small set of resident patrilineages… Neither factor—environmental potential nor the temple-based ritual system—would have been sufficient *in and of itself* to explain the development of Mesopotamian urbanism. We can see this clearly by comparing the impact of temples in northern and southern Mesopotamia in the fifth millennium BCE, immediately before the development of the Uruk states. In the later fifth millennium, small-scale 'Ubaid chiefdoms spread from the south to the north, bringing a temple-based form of ritual organization into the dry farming zone (e.g., at Tepe Gawra). However, in the centuries that followed, these Northern 'Ubaid polities did *not* increase in scale, complexity, and integration. This stands in marked contrast to the rapid development of the *southern* 'Ubaid temple-towns into large-scale urban settlements in the early fourth millennium. This is because the northern 'Ubaid temples had the organizational technology to extract large-scale surpluses, but lacked the necessary resource base. Temples were thus a historically (or culturally) contingent factor critical factor in the development of Mesopotamian urbanism, but *only* when planted in the rich and diverse alluvium of the south. (Stein, personal communication to Algaze 2001, emphasis added.)

I stress here the first of these factors: *rich*. While Chip Stanish, following Murra's (1980) ethnographic focus on vertically stratified ecosystemic complementarity in the Andes emphasizes the latter—"a mosaic of ecological niches" (Stanish 2001)—without diminishing the importance of cultivation and ovicaprids pastoralism, I must reemphasize in this case the comparative primacy of the former.[10]

[10] Moseley (1975) argues the primary role of complementarity among maritime, irrigated coastal, cloud forest, and cordilleran resources in Andean state formation.

This point is particularly relevant in response to the questions:

> Why would not random dramatic change…from the environmental advantages enjoyed in the fourth m BCE at least sometimes and in some areas have resulted in social homogenization and a heightened emphasis on subsistence production? Additionally, where adjacent areas with comparable resources show very different developmental trajectories, might not greater emphasis on historical contingencies explain inter-regional variation? (McCorriston 2001)

In the "balance" between "geographic predictability and dramatic climate and environmental change," the disadvantages of both the general fourth millennium trend toward a (modern) regime of decreased and seasonalized annual precipitation and unpredictable (and to date not specifically characterizeable) inter-annual variation would have fallen disproportionately on the Syro-Anatolian plains. Within the delta, it the biggest, earliest, and most differentiated cities are also the "wettest" cities, linked (as McCorriston notes) by a "wet" trade in water-dependent plants, dyes, and products. While subject to unpredictable, destructive floods, they were (within limits) nonetheless, in the context of then-littoral landscapes, the better buffered from precipitation vagaries. They were, in short, given high inter-annual climatic variation, *less* risky places than the rain-dependent north—and sudden climatic variations would only have contributed over the short term to population infalls *toward* the marsh zones, allowing a deepening and institutionalization of Mesopotamian trade in, e.g., dyes and dyed stuffs.[11] Fish, shellfish, turtle, waterfowl, and pigs; reeds, sedges,

[11] Interannual variability assessment of rainfall, water flow, and flooding is essential to understanding cultivation, storage, and transport decision-making and strategies. Downstream water flow and flood levels for the mid-fourth millennium BCE (c. 3700–3350) may at this point be roughly inferred from unpublished dendrochronological data recovered near Anatolian Euphrates/Tigris headwaters, such as the five-species

tubers, and seasonal grasses sustained human and animal populations and provided massive quantities of handicraft and construction material. Littoral ecotones constrained habitation; annual floods replenished marshes and recessional gardens; the watery environment provided lines of communication that ensured rapid transmission of technologies, trade goods, and peoples themselves—even as these factors concentrated resources, produce, institutions, and know-how into the hands of the few, setting the stage for hierarchy and heterarchy.

A crucial aspect of the associated ideational flourit was the way in which it mediated and institutionalized built structures related to use of wetlands and, especially, the transitional zones on and along crucial, contested high ground. Rene Dittman argues that "the contents of the iconography of the Uruk period became an essential part of the Greater Mesopotamian symbolic context," (2001: 218) and a significant proportion of that content characterizes the wealth and diversity of marsh resources. There is here a corollary to Petr Charvát's invocation of the Mongongo nut mantra to argue that "a promising environment will hardly fulfill its potential if the humans living in it simply do not perceive its promise or prefer their traditional way of life…" (2001: 216), despite the fact that the situation of early fourth-millennium BCE estuarine farmers could not be less comparable to marginalized San foragers. What,

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sequence from Arslantepe, near Malatya (P. Kuniholm, personal communication). However, direct evidence with annual resolution for monsoonal effects on fifth–fourth millennium BCE rainfall in the southern alluvium is unlikely. A dendrochronology could perhaps be derived from dune burials of *Haloxylon.* Adams' use of modern records as an inter-annual proxy (Adams 1981)can only pertain to water flow and flood variations, as there is no modern monsoonal effect.

indeed, "would have induced the southerners to apply so much energy to embarking on a journey that is well known to us but absolutely original, new, and therefore potentially dangerous for them?" (Charvát 2001: 216) The answer may well be that, in the environmental sense, the journey was not so new, and not so original—giving wider play to social experiments that were indeed potentially dangerous, but more so for some than for others.

Sumerian administrators seem to have understood that productive wetlands were not just those areas delimited by permanent reed swamp, but included all that surrunding area, seasonally dry, "created" by farming and grazing, that revert to dust, mud, or water during a year's progress. While colonial administrators at the turn of the century could not help but see annual floods as destructive; as wasteful; as a time when nothing was planted, and nothing harvested, five thousand years ago, the floods began a kind of processional year. Boat travel became possible across wide reaches. Trading, raiding, and ritual cycles commenced. An assertion of land as political will; land as political instrument; a move from exploiting terrain as an assertion of political will, to creating landscape as an attestation of political will, became possible once again. The Boundary Commission surveyors *en procession*; the infantryman slogging through Mesopotamian bogs, resorting to a flotilla of boats and rafts enroute Nasiriya; the man in a net skirt, with his cow, his temple, his storehouse doors, and his spear-fisher, poled through the marshlands in an identical craft; are all kinds of ritual procession: at once politics and warfare, that unleash chaos, so that in its resolution anarchy does and must coalesce along political lines.

Such rituals provoke resistance and test loyalty; create memory and memorial; they require and display humiliation and subjugation for some; hope and acquisition for others. Most of all, they create, legitimate, and enforce social contracts regarding the use of space and resources. They are the means by which terrain becomes landscape. There, in the delta, as the rivers move, new lands (and opportunities) are ever re-created, and the ritual ever reinacted.

The gradualist innovative efficiency of Uruk elites was more encompassing than irrigated cultivation, agricultural accountancy, or industrial production. Important though these innovations may have been, they are both precursors and products of a broader conceptual transformation that, in the act of recognizing complementary obligations, enforced an enduring dichotomy between an urban core and a subjugated outland. The basis of the transformation of terrain outside cities from socially unranked, undifferentiated wetlands, into alienated, ranked, extra-urban hinterlands was not the totalizing economic vision of an extra-regional colonial administrator. This was no imperial imperative that sought to reshape entire regions to specified productive ends. Rather, the transformation was undergirded by a cosmology expressed as a landscape vision that promised divine beneficence, while recognizing the place of wetland residents' material contributions to the totality of an idealized good.

Table 2: Air observations over Suwaiqiya and Gussab marshes, May–December 1916

Date	Marsh	Mat Shelters	Stacks Boosa	Sheep (Cattle)	Grain	Pilot/Observer	Comments
1915–6	Suwaiqiya						Flooded in January, permanent but very brackish in autumn, where dry crusted with salt 1–2’ deep.
25 May	Gussab	400	Yes			Murray/Ortner	Shelters in groups of 20, 50, 60, 60, 70, 100.
25 May	Shatt al Hai	100		Huge flocks		Murray/Ortner	In flood. Shelters in groups of 40, 60.
5 Jun	Baghi Shahi			Large flock	Harvest	Rodney/Gluver	Cultivated area where grain is collected. Where old tracks strike edge of marsh where water is lying, bundles of grain along edge of marsh for three miles.
5 Jun	Mandali	150				Rodney/Gluver	
13 Jun	Baghaila						
4 Jul	Tursakh	200	Yes			Rodney/Ortner	Matting huts appear to be 15 yards long by 5 yards broad. Contain two doorways and have a pointed roof probably of reeds. Neat stacks of grass parallel to huts.
4 Jul	Kut					McCorindle/Bagnall	Much water SW of Suwaiqiya, S of Kut, and in Hor Gussab.
4 Jul	Kut					McCorindle/Bagnall	Much water SW of Suwaiqiya, S of Kut, and in Hor Gussab.
4 Jul	Kut					McCorindle/Bagnall	Lake to NW drying around edges
4 Jul	Suwaiqiya, ibn Jizan					McCorindle/Bagnall	1000 yards over bunds.
4 Jul						McCorindle/Bagnall	Ship canal: shallow water in strips from Hai; Nahr ibn Jizan: Dry. Mud bottom;; Hai Canal: deep enough for Mahaila traffic;Shatt al Hai: Nullahs S of ibn Jizan are dry for 12 mi.
4 Jul	ibn Jizan:					McCorindle/Bagnall	Green reedy marsh
4 Jul	Tel Thiak					McCorindle/Bagnall	series of small ponds connected by reeds
4 Jul	Basrahqiya, Baghaila					McCorindle/Bagnall	Lakes drying
4 Jul	Abadiyah					McCorindle/Bagnall	flood to N now pond 1 mile diameter—remainder marsh
4 Jul	Gussab			Few, (200)		McCorindle/Bagnall	Arabs collecting grass at reed edge. Cattle N of pond.
21 Jul	Gussab			1000		Rodney/Mitchell	Deshaila breeches flooded, flood S of Kut 1 km2, flood end of Basrahqiya ½ km2, Gussab flooded and edged with reeds.
22 Jul	Gussab		Yes	5800–6800		Rodney/Thompson	4–5000 NW of fort and 1800 along dry canal
23 Jul	Gussab			400 (200)		Swanson/Sanctuary	In dry bed

Date	Marsh	Mat Shelters	Stacks Boosa	Sheep (Cattle)	Grain	Pilot/Observer	Comments
23 Jul	Baghaila				plowing	Swanson/Sanctuary	Agriculturalized areas along banks of drying bunds
23 Jul	Shatt al Hai			150 buffalo (200)		Swanson/Sanctuary	
25 Jul	Gussab			5800–6800		Swanson/Sanctuary	4–5000 NE of fort and 1800 along dry canal
26 Jul	Gussab	95	40	5800–6800	Harvest		Men working among boosa stacks, half carted away; boosa harvest, grain harvest, stibble grazing
26 Jul	Baghaila	560					Groups of 30, 40, 50, 100, 50, 100, 100, 50, 40. Agriculture where drying; ponds forming along N bund.
28 Jul	Shatt al Hai			300–400	Threshing		E Bank 22 stacks grain; pack ponies carrying grain to threshing areas. Grazing to W. Shatt shallow.
29 Jul	Shatt al Hai	many		many	Stacks	Horstius/Sanctuary	
29 Jul	Gussab	Ring lake		3000 (200)		Horstius/Sanctuary	Flocks of 1500, 1000, 500
30 Jul	Shatt al Hai			3000			Crossing west-to-east over ford to Gussab
31 Jul	Shatt al Hai			1000			Crossing west-to-east over ford to Gussab
1 Aug	Shatt al Hai	240	30			Chabot/Barr	E. side of Basrahqiya marsh and near Zarabiya
2 Aug	Shatt al Hai	Dug-in				Chabot/Cochran	20’ long and covered w/ matting
2 Aug	Suwaiqiya					Chabot/Cochran	Running N–S, 5 mi wide in center and 3 mi at edge
3 Aug	Gussab		Yes	1000		Windsor/Browning	Large boosa supply, vic. of reeds dotted with stacks
3 Aug	Suwaiqiya					Browning/Mitchell	Sheep tracks running down to water in N.
	Shatt al Hai		Much				Vic ford. Vegetables are being grown along river bed as it dries.
4 Aug	Tigris	60		1000		Hayword/Orton	West of Kut at Shumrain and Dahran breeches
	Shatt al Hai		Much				S. of Zenubiya; canal shallow. Baghla breech dry for 5 miles.
5 Aug	Shatt al Hai	0					New shelters gone.
6 Aug	Shatt al Hai					Windsor/Creswell	Crossing Basrahqiya ford W–E.
6 Aug	Gussab		20	1800		Windsor/Creswell	Shatt almost closed. Lakes drying. Sheep still in damp canal bed.
9 Aug	Shatt al Hai		50	(Penned)		Chabot/Bagnall	Large solid mud flat on which are a number of cattle pens, divided from one another by a brush-wood hedge. Started on other flats as they become dry.
8 Aug	Bani Rabiya	390			Yes		Shelters in nine camps
9 Aug	Badra			4000		Haviland/Browning	4.5 miles downstream., in several flocks. Foothills watercourses dry.
11 Aug	Suwaiqiya					Lander/Forsyth	Edges drying quickly
11 Aug	Gussab	same	80	2000		Lander/Forsyth	Considerable amount of boosa lying about; reed lake
12 Aug	Gussab		80+80			Gresswell	

Date	Marsh	Mat Shelters	Stacks Boosa	Sheep (Cattle)	Grain	Pilot/Observer	Comments
13 Aug	Shatt al Hai					Bagnall	Channel width 3', ¼–1/2 bed, no place is dry bank to bank
14 Aug	Sanniya			(12,000)		Rodney	Vic. Ali Ash Sharki
17 Aug	Gussab					Windsor/Bagnall	Water rapidly drying; now two small lakes (remainder marsh)
18 Aug	Gussab			5,000			Continues drying through 25 August
17 Sep	Suwaiqiya						Edges slightly receding
17 Sep	Gussab	remain		gone			
26 Sep	Gussab						same
1 Oct	Jassan	200	much	(100)		Chabot/Bluso	Stacks of boosa at each shelter
1 Oct	Suwaiqiya					Hopkins/Hudson	Slightly brackish but drinkable. Depth at center unknown but edges shallow. Bottom is generally firm and walking comparatively easy. Shoreline withdrawn by 2 km. average. Innundation from Tigris breeches at Kut now dry except for scattered lakes 6 km X 1 km.
1 Oct	Gussab			3,000		Hopkins/Hudson	Sheep remain near fort.
1 Oct	Shatt al Hai			(200)		Hopkins/Hudson	
3 Oct	Suwaiqiya			2,000			Moving NE from SW corner
5 Oct	Jassan	600	Yes	4,000	Yes	Chabot/Bluso	
5 Oct	Badra	190		4,000		Chabot/Bluso	
5 Oct	Tursakh	375				Chabot/Bluso	
5 Oct	Bani Rabia			4,000			
5 Oct	Badra			3,000			
				(400)			
5 Oct	Gussab			1,000			At fort
				(500)			
9 Oct	Jassan						No changes
9 Oct	Badrah	150		7,000			Sheep feeding along foothills
9 Oct	Madali	100					23 rows of long mat shelters 40' long in rows of 2–7'
9 Oct	Bani Rabiya	500	much				At marsh rim
12 Oct	Gussab			dispersed			To north in flat, open plain
17 Oct	Suwaiqiya			2–3,000			Sheep moved to north of Tigris
19 Oct	Shatt al Hai			(4,000)			In bed below Gussab ford
20 Oct	Shatt al Hai			2,000			At Gussab ford
21 Oct	Shatt al Hai			200 cattle			Watering at ford
27 Oct	Gussab			10,000 cattle			
27 Oct	Shatt al Hai			2,000			At Atab

Date	Marsh	Mat Shelters	Stacks Boosa	Sheep (Cattle)	Grain	Pilot/Observer	Comments
28 Oct	Shatt al Hai			3,000			At Atab
2 Nov	Gussab			1,000			To north
2 Nov	Shatt al Hai			2,000			Watering
6 Nov	Shatt al Hai				cultivation		
8 Nov	Shatt al Hai			4,000			Grazing at Atab
11 Nov	Shatt al Hai			800			At Atab
13 Nov	Jassan			3,000			
14 Nov	Kut			(5,500)			In bed of Tigris
15 Nov	Shatt al Hai			5,000			Water flowing to Atab, sheep to south
25 Nov	Baghi Shahi						Abt-i-shargula brackish but drinkable
26 Nov	Suwaiqiya						Lake down about 2 k m from margins.
1 Dec	Shatt al Hai			1,000			No water flowing. Sheep at ford N. of Atab.
2 Dec	Gussab			1,000			
8 Dec	Shatt al Hai						Fordable every few hundred yards. Ground swampy. Bed used for watering livestock and as roadway.

Sources: PRO KEW MR 1/1028 [Maps, formerly AIR 1/440}, 30 Squadron Aerial Reconnaissance reports. MFQ 363, Parts I/2, 4, 7, 9, 11; II/24, 27, 34, 39, 49, 67, 85 III/98, 117, 123, 130, 133, 149, 159, 160; IV/188, 193, 200,209, 223, 270, 235, 238, 241; V "Aeroplane reports for December 1916 I Branch 1st Indian Army Corps/251, 254, 259, 261, 267; VI Jessan Bedrah. MFQ 364 Parts I/8, 14–16, 39; II/57, 60, 63, 69, 71, 75, 80, 83, 85, 86, 90, 94; III "Aeroplane Report Book August 1916"/98, 106, 109, 111, 116, 120, 121, 122, 125, 127, 131, 140, 149, 155, 159, 161, 170; IV/178, 192; V; VII; VIII;X/447

*Reference: Map, series: Persia and Turkey in Asia 1914/1915, sheets: TC 2G, 2H, 2K, 2L, scale: 1"=1/4 mile or 1:253,440. Published by Survey of India , directed by Col. Sir S.G. Burrard.; Pusht-i-Kuh 1916, sheets TC 41, 63, 64, scale: 1"=2 miles .

Table 3: 20th-Century Geographies, Ethnographies, and Travelogues treating the Wetlands of Southern Iraq. See Figure 4.

NO.	AUTHOR	DATE	MARSH REGION	DETAILED ENVIRONS	MAJOR CRPOS, PRODUCTS
1–10	UK NID	1944	All	Basra, Maqil	Nomads, fish, dates, barley, wheat, rice
2B–10	Wirth	1962	Euphrates	Diwaniya, Rumaitha	Palm gardens, rice
			Tigris	Amara	Rice, winter wheat
			Gharraf	Hai	Barley
			al-Arab	Zubair	Dates, vegetables
	Al Barazi	1961	Mid-Euphrates	Karbala–Diwaniyah	Grain
	Fernea	1965	Mid-Euphrates	Diwaniya (el-Nahra)	Rice
2AB	RAF	1916	N Tigris–Gharraf	Kut	Reed; winter pasture See Table 2, Figure 3.
3	Ochsenschlager	1993	Lower Gharraf	Shatra (al-Hiba)	Sheep, carpets, fish, barley
6	Hedgecock	1927	Upper East Tigris	Amara–Qalat Salih (Musaida),	Rice, water buffalo
6	Maxwell	1957	Upper East Tigris	Amara–Qalat Salih (Turaba)	Water buffalo. See **Error! Reference source not found.**.
5–6, 7 4, 8 9	Thesiger	1964	Tigris–Euphrates delta, esp. W Tigris	Amara (Qabab)–Saigal–Nasiriya (Ech-Chubayish)–Qurna (Howair); smaller villages in deep marsh	Buffalo, cattle, sheep. reed, mats, rice, fish, fowl, pelts, pigs. See **Error! Reference source not found.**.
5–7	Westphal-Hellbusch	1962	Tigris, esp. West	Amara–Saigal–	Cattle, reed, mats, buffalo, yarn, rice, fish, pelts
9			Lower T–Euphrates	Qurna (Birriz)	Palm gardens, reed, buffalo, rice
8–9	Salim	1962	Lower Euphrates	Ech-Chubayish	Reeds, mats, salt, fish, millet, cattle. See Figure 2.

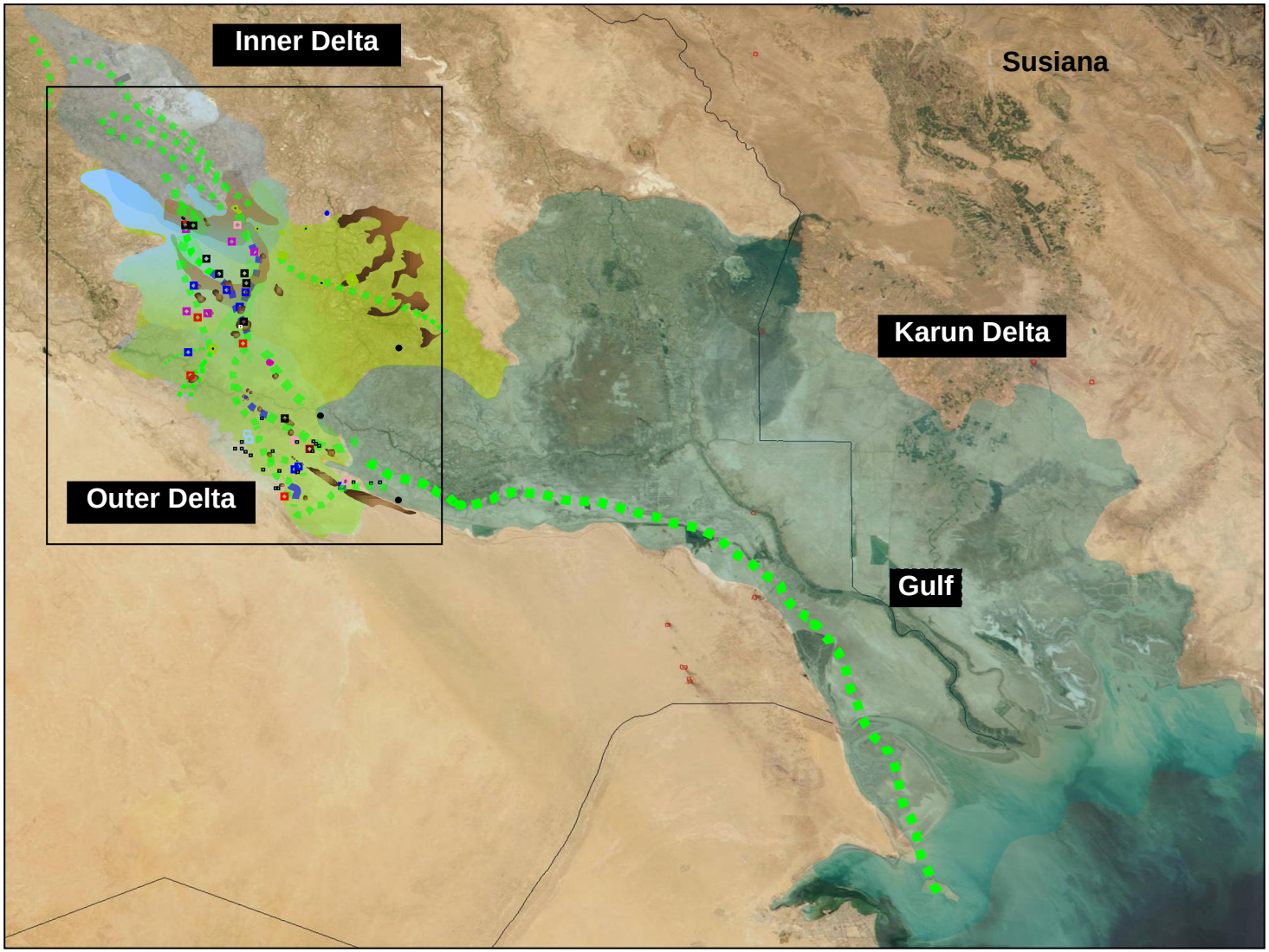

Figure 5: The Mesopotamian Delta, circa 4000 BCE. Maximum marine transgression coincides with the ‘Ubaid–Uruk transition. Imagery, geological, and archaeological evidence is consistent with the formation of a freshwater inner delta in the Nippur–Dalmaj region, transitioning to a fresh–brackish mixing zone and outer delta in the Warka, Eridu, and East Gharraf basins. Hypothetical waterways (dotted green) are based upon later levees, flood basin sediments, and site distribution. Boxed: Figure 6

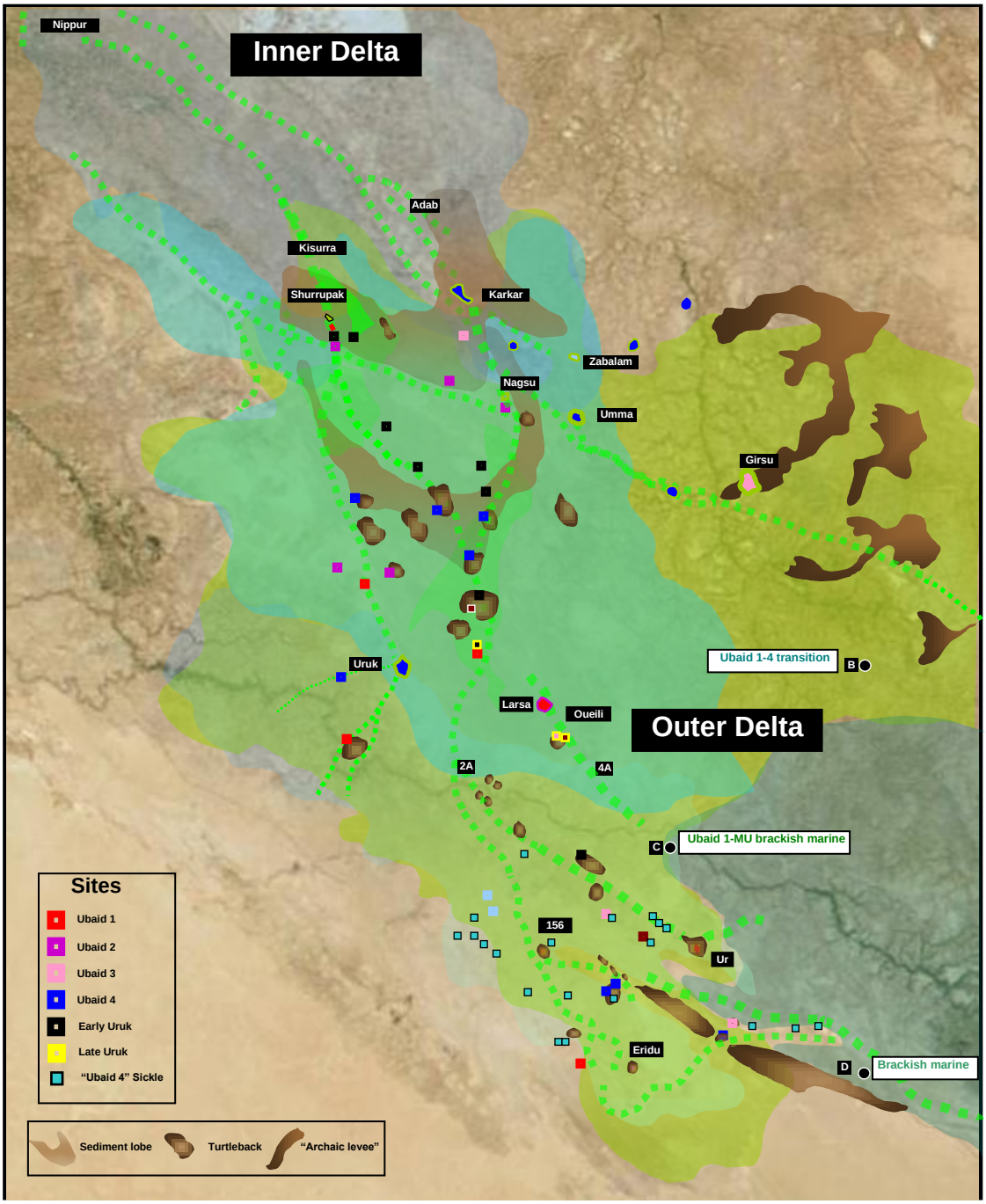

Figure 6: The Mesopotamian Outer Delta, circa 4000 BCE. Hypothetical waterways (dotted green) are based upon later levees, flood basin sediments, and site distribution.