New Agendas in Remote Sensing and Landscape Archaeology in the Near East

Studies in Honour of Tony J. Wilkinson

edited by

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Cover illustration: Palaeochannels and archaeological sites north of Nasiriya, Iraq. A. SRTM image B. Landsat Image C. Features visible on SRTM D. Features visible on Landsat. For full explanation see Chapter 18

Contents

Social Life and Social Landscapes Among Halaf and Ubaid Communities: A Case Study from the Upper Tigris Area

Marco Iamoni

Settlement patterns and related types of investigation (e.g., site densities, site dimensions and land-use) have in the last 50 years shed light on a number of archaeological issues previously underestimated or ignored by archaeologists. By means of survey projects it has been possible to reconstruct several crucial aspects of the archaeology of the Ancient Near East. A major consequence has been a growing awareness of the landscape as a fundamental subject for modern archaeological research, of great significance for understanding ancient complex societies, especially from the 3rd millennium BC onwards (Adams 1981; Adams and Nissen 1972; Smith 2014; Wilkinson 2003). Pre- and proto-historic periods have received somewhat less attention, probably due to the absence of solid and well-established human communities that acted on the surrounding landscape by exhibiting the traditional markers of 'complexity' common in later periods, e.g., hierarchy, power, and prestige, (Smith 2014; Wilkinson *et al.* 2005)[1].

Using the Upper Tigris as a case study and investigating it by means of statistical analyses I intend to explore the possible occurrence of a 'social landscape' as far back as the 6th and 5th millennium BC, in this area associated with the Halaf and Northern Ubaid Periods. I propose that societies with a lower level of socioeconomic complexity still had an impact on the territory and worked, perhaps unintentionally, to modify it. The outcome of such modifications might have been different and indeed visually less clear and direct than those created by later and more complex entities, but were likely perceived by the inhabitants of the landscape and are still visible today, though their identification requires a more subtle investigation of the evidence still visible in the landscape.

Two opposite types of society? Chronology and socioeconomic dynamics during the Halaf and Northern Ubaid

The Halaf and Northern Ubaid are the periods commonly adopted to describe the types of settlement, economy, and social structure that characterise the late Neolithic and early Chalcolithic in Upper Mesopotamia between the 6th and the mid-5th millennium cal. BC. Both have reasonably well-defined traits that are especially evident in their ceramic material culture (Akkermans and Schwartz 2003: 101), and actually, as has been already observed, they might perhaps be more adequately referred to as ceramic traditions, rather than real 'cultures' (Campbell 2007: 104–105). Their origin from old assumptions (ultimately depending on an outdated culture historical approach) has been rightly criticised as bearing little relation to the real social developments of the Late Neolithic and Chalcolithic (Akkermans 2013c; Campbell 2007). As a consequence, the Halaf/Ubaid periodisation may even represent, to some extent, an obstacle in our attempts to comprehend the phenomena characterising Upper Mesopotamia throughout the 6th–5th millennium BC.

Yet, despite this criticism, the absence of a proper counter-proposal for a new periodisation, such as that proposed for the Late Chalcolithic and Uruk Period (see Rothman 2001), makes it necessary for the present work to retain the classic Halaf and Ubaid subdivision, where the Halaf is characterised by the well-known decorated pottery and typical *tholoi* architecture (Bernbeck and Nieuwenhuyse 2013) and the Northern Ubaid, a late development of the Southern Ubaid culture (Akkermans and Schwartz 2003: 154; Stein 2010: 33–34), features the classic monochrome painted pottery as well as domestic architecture with tripartite/cruciform planning.

The Halaf Culture spread into Upper Mesopotamia at the turn of 7th–6th millennium BC (Bernbeck and Nieuwenhuyse 2013: fig. 1.3) and covered a very large area extending from the Western Taurus, where it coincides with the Amuq C and D phases known from the excavation at Tell Kurdu (Braidwood and Braidwood 1960: 137–138; 157–158), to the Tigris and Euphrates river basins. Despite significant internal differences in access to technological knowledge, notably evident in pottery production (Campbell 1995: 74–75), as well as of clear indices of craft specialisation and/or limited access to stored goods, the most recent studies based on updated research suggest that Halafian societies were largely egalitarian (Akkermans 2013c: 29; Akkermans 2013a: 72). Similarly, Halafian settlement does not seem to show any clear evidence of hierarchy

[1] For a clear case study, see the systematic and strategic manipulation of the landscape carried out by the Assyrian kings during the 1st millennium BC with the carving of monumental reliefs such as Khinis and Maltai, typical of the imperial propaganda (Morandi Bonacossi 2018; Reade and Anderson 2013).

(Akkermans 2013a), with a striking majority of the Halaf sites showing a general tendency to be of small dimension (1–2 hectares). The evidence is admittedly inconsistent, since a few sites, such as Takyan Hoyük, Nisibin/Qamishli and Domuztepe (Algaze *et al.* 2012: 15; Campbell *et al.* 1999; Nieuwenhuyse 2000), apparently reached considerable size (10 hectares or more). This has been suggested to represent settlement hierarchy (Campbell and Fletcher 2013; Iamoni 2016; Watson 1983), perhaps emerging at the end of the Halaf Period (Akkermans and Nieuwenhuyse 2019). It is possible that such hierarchies may have characterised specific sub-regions of Upper Mesopotamia, in a landscape otherwise dominated by small rural settlements.

The Northern Ubaid culture dates from 5300 to 4500 BC (Stein 2012). Although in its primary and most essential classification it can be considered as the result of the diffusion of a ceramic tradition developed in Southern Mesopotamia, in Upper Mesopotamia this has occurred together with the emergence of clear traces of socioeconomic complexity exemplified in the presence of a hierarchical society with an elite 'ruling' the settlement (Carter and Philip 2010: 10–13). Further innovations suggest the existence of more stable long-distance contacts and the clear presence of two-tier settlement hierarchy, as well as an intensification in the exploitation of domesticated animals and plants (Stein 2012: 128–129), though at present there is no clear evidence of irrigation systems for farming activities (Akkermans and Schwartz 2003: 173).

The two periods seem to be contrasting in many respects, yet the most recent investigations do not suggest any abrupt change and point to the occurrence of a smooth transition, the so-called Halaf–Ubaid transition, henceforth HUT (Karsgaard 2010), exemplified in the Tepe Gawra sequence (Stein 2010: 34–37; Tobler 1950). The emergence of the Northern Ubaid in Upper Mesopotamia has been seen as a peaceful expansion of Southern Mesopotamian cultural identity into pre-existing local Halafian communities (Breniquet 1987). However, the dynamics and processes that led to the spread of the Northern Ubaid are still in many respects a *terra incognita,* and it is to be hoped that the HUT will be a research subject of major importance for the next archaeological projects in the region.

Much archaeological research has, to some extent reasonably, focused on excavated site sequences (e.g., Tell Sabi Abyad for the Halaf and Tell Zeidan for the Ubaid Periods) as the main source of information for understanding Halafian and Ubaid societies. Less attention has been given to the different modes of land exploitation as well as to the distribution of sites and the possible relationships of the latter with the different types of societies and economies that characterise the Halaf and the Northern Ubaid.

The Upper Tigris is a suitable case study to begin such an investigation. Broadly speaking, this region extends west to east from the Jebel Sinjar to the Jebel Bashikah and north to south from the area of Mosul to the lower fringes of the Zagros mountains (see Figure 3.1). The region has been the subject of several survey projects (in particular the North Jazira Survey, henceforth NJS, carried out by Tony Wilkinson and David Tucker) as well as salvage excavations: taken together these provide a large and valuable corpus of information. Tony Wilkinson's activities in the area make it a fitting choice for this volume, and our article here represents a thank you for the availability of information that Tony has given to the scientific community with his many projects in Upper Mesopotamia.

The Upper Tigris areas: source of data

The Upper Tigris received only occasional attention from archaeologists until circa 40 years ago (Iamoni 2014a) when the construction of the Saddam Dam Basin — since renamed the Eski Mosul Dam — threatened to flood a number of sites located along or next to the river course. Despite the high number of sites involved, these salvage excavations (Iraqi Minister of Culture and Information 1986) produced a patchy array of data, due to the lack of final and adequate publications of the excavation results in many cases. Previous research demonstrated the relevance of the area for archaeological investigations of pre- and proto-historic periods (e.g., Arpachiyah and Gawra, excavated during the 1930s); however, the presence of the great Assyrian capitals (Khorsabad and Nineveh above all) attracted the archaeologists' attention and left the Upper Tigris area in a marginal position with respect to the excavation projects. With regard to survey activities, the rich archaeological potential preserved in the area has been investigated only on the western side of the Tigris, thanks to the above mentioned NJS, as well as to the investigations carried out by the University of Edinburgh in the region of Zammar and the Tigris Euphrates Reconnaissance Project (henceforth TERP) directed by Guillermo Algaze. Pioneering investigations had been carried out by Seton Lloyd in the late 1930s with the Sinjar Survey (Lloyd 1938), whose results, though based on a limited knowledge of the material culture of the area (especially with regard to the Late Chalcolithic and 3rd–2nd millennium BC), offer good evidence for the Halaf and Ubaid Period. The greater reliability of the latter periods was possible thanks to a better knowledge of the ceramics — defined in the report as Group II and III (Lloyd 1938: 132) — derived from the almost contemporary publications of excavations results at Arpachiyah and Nineveh (Campbell Thompson and Mallowan 1933; Mallowan and Rose 1935).

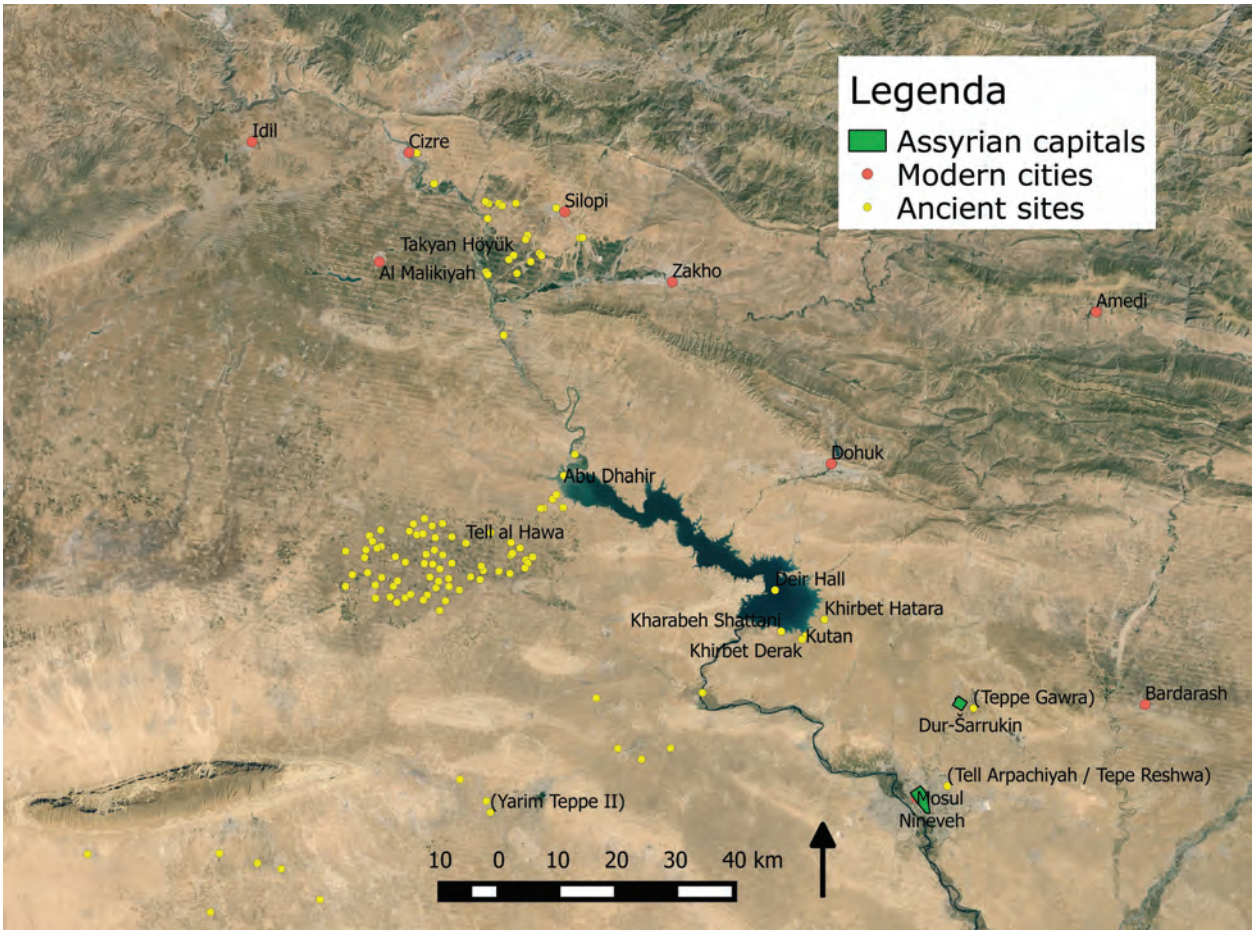

Figure 3.1. The Upper Tigris Basin with the sites mentioned in the text. Basemap created by the author with QGis, using Google Earth satellite images.

Iraqi investigations have also been undertaken, especially after the salvage excavations for the Eski Mosul Dam: unfortunately the two Iraqi wars have seriously hampered the progress of the research in the area and only partial summaries of the achieved results have been published (Altaweel 2006; 2007).

The combination of the survey data (NJS, TERP, Zammar area and Sinjar Survey) makes a corpus that, although derived from a discontinuous and patchy coverage of the area, from preliminary publications of the results and, last but not least, from investigations that differ sometimes significantly in methods and techniques, offers a consistent starting point to carry out a regional analysis of settlement patterns in the Upper Tigris basin. The area is suitable for undertaking such a comprehensive research study due to the relative homogeneity of the physical landscape and environmental conditions: it falls well above the 200 mm rainfall isohyet and is characterised by a flat and fertile plain crossed by regular seasonal *wadis* (Wilkinson 2003: 17). It therefore offers good conditions for stable human settlement.

The dataset includes 162 prehistoric sites, of which 112 were occupied during the Halaf and Northern Ubaid phases. This forms the key dataset for the settlement analysis; information from single excavation sequences (e.g., Gawra) will be occasionally used to integrate the results achieved. As will be shown below, this investigation can provide an alternative insight on territorial settlement throughout the Halaf and Northern Ubaid Periods, thus roughly across a thousand year period (mid-late 6th and mid-late 5th millennium BC). It will also further help in understanding the HUT phenomenon, which, as said above, is of crucial importance in the changes that eventually led to the full explosion of socioeconomic complexity during the Late Chalcolithic with the rise of urban societies.

The Upper Tigris area during the Halaf Period

The sites occupied during the Halaf Period are 60 in total. The regional settlement shows a slight increase if compared with the previous periods (Iamoni 2014a), but no site hierarchy emerges clearly. Although the emergence of sites of remarkable dimensions during the

Halaf Period has been proposed at sites like Domuztepe, Kazane, Mounbatah, and Tell Badan/Nisibin (Campbell and Fletcher 2013: 42–43) and in the Beydar Survey (Nieuwenhuyse 2007a: 294), this has been contested (Akkermans 2013a: 71; Bernbeck 2013: 57) and it seems that the real extension of the Halaf settlements is still a matter of debate.

In the Upper Tigris, the only site that has apparently provided a significant occupation is Takyan Höyük, whose 10 hectare size and central position with respect to a series of 'minor' settlements (Algaze *et al.* 2012: 15) allows us to hypothesise the existence of some kind of predominance in the territory. Yet Takyan Höyük is an exception in the area under examination, with the above-mentioned large Halaf sites lying further to the west, from the upper Syrian Jazira to the southern edges of the Taurus Mountains. This fact is quite significant since relevant Halaf sites are also found in the Upper Tigris area, such as Arpachiyah (Mallowan and Rose 1935) or Tepe Gawra (Tobler 1950), and these do not seem to cover extensive areas: none of them reach more than 2 hectares. The small size of these settlements is somewhat striking, especially if one considers the role that Arpachiyah might have had in the light of the considerable wealth of finds retrieved during the excavation. The amount of polychrome pottery, seals, obsidian artifacts and pendants found during the excavation of the Burnt House of level TT6, the last level before the Ubaid occupation of the area (Campbell 2000), suggests that the residents of Arpachiyah had developed a high level of craftsmanship, which, in turn, is difficult to explain with the socioeconomic model of a small village (but see for a similar evidence from a small settlement the case of Sabi Abyad, Akkermans 2013b; Akkermans and Duistermaat 1997).

If Arpachiyah was a centre of some importance, its nature had to be different from the big sites of Southeast Anatolia/Northern Syria (Campbell 2000: 25). Its small dimensions suggest a minor relevance as 'reference' centre for the surrounding territory. At the same time, the presence of high value artifacts in its Halaf assemblages suggests that settlement size might not be directly correlated with the degree of labour specialisation. This is not the place to tackle this topic in more detail, which would require a dedicated work based on significant evaluation of excavation data: a preliminary consideration, however, suggests that small site dimensions may not necessarily imply absence of significant technological complexity.

At the same time, it is interesting to observe that the large Halaf settlement at Takyan Höyük, if confirmed, finds significant parallels in other large concentrations of Halafian population located further west, such as Nisibin (Nieuwenhuyse 2000), and thus may support the idea of large settlements starting to rise already during the early and mid-6th millennium BC. Further, Takyan Höyük suggests that these big Halaf sites were not restricted to the central and western regions of Upper Mesopotamia but occurred also in the eastern area as well (e.g., the Tigris Basin).

The striking majority of the Halaf sites are, however, of small dimensions. In the NJS these range from 1 to 2.5 hectares (Wilkinson and Tucker 1995: fig. 32) whereas in the TERP they are even smaller, with an average size of 1 hectare (Algaze *et al.* 2012: 15–16).

The Halaf settlement pattern is quite important, as it is the first time that there is consistent evidence of sites being located far from watercourses. This is particularly clear in the NJS areas (a rough estimation based on Wilkinson and Tucker 1995, fig. 36, suggests a maximum distance of about 1 km for both Hassuna and Halaf sites), whereas in the Northern Tigris valley they continue to occur in well-watered areas, though also there they are apparently less dependent on stable rivers (Algaze *et al.* 2012: 16; Wilkinson and Tucker 1995: 40). The latter aspect is of particular relevance for two reasons. First, it highlights the capacity for accessing water independently from the direct availability of natural sources (e.g., through the construction of water wells). Secondly, it may imply an element of continuity with the previous Neolithic settlement pattern: a few NJS sites are located far from water sources as well (although see the TERP evidence where such pattern has not been identified: Algaze *et al.* 2012: 13–14).[2] This will be an important point for future research, as it further reinforces the interpretation of the Halaf culture as a direct continuation of the preceding ceramic Neolithic (Akkermans 2013c) and not as an innovation generated by the arrival of new people (Mellaart 1975).

The most interesting information comes from the distribution of the Halaf settlements in the area. Contrary to previous observations, where a general dispersion of sites had been proposed as the main trait characterising the Halaf settlement pattern (Akkermans and Nieuwenhuyse 2019; Wilkinson and Tucker 1995: 40), the wider picture emerging from the integration of more survey data suggests some clustering of sites in specific areas. The best evidence comes from the NJS area, thanks to the higher number of surveyed settlements, but similar evidence can also be seen in the TERP and, to a much lesser extent, in the excavation carried out in the salvage projects around the Eski Mosul Dam.

[2] It must not be forgotten that, despite the regional general homogeneity above stressed, there might be local geographical differences that have affected the settlement patterns and brought about these differences between the NJS and TERP.

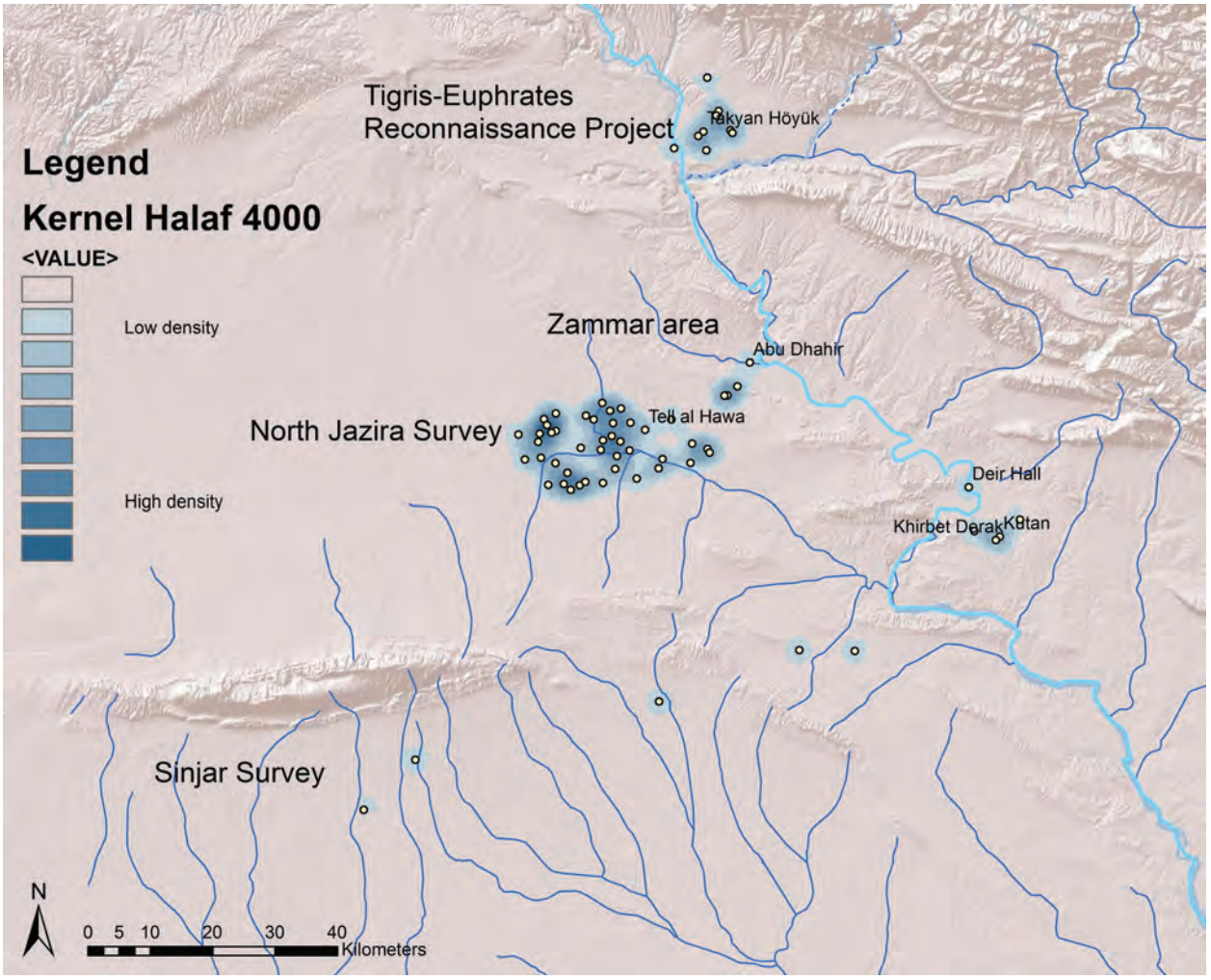

Figure 3.2. KDE with a radius set at 4000 m of the Halaf settlement in the Upper Tigris region. Basemap by the author, using ESRI Topographic Data [Creative Commons]: World Shaded Relief and World Linear Water. Shape file of the Iraqi rivers freely downloaded from www.diva-gis.org/gdata/.

The relevance of such clustering can be evidenced via a statistical test, the so-called Kernel Density Estimates (KDE). The latter is a test of density of points, which uses a specific function, the 'kernel' (Baxter and Beardah 1997), to evidence areas of increasing site concentration and consequently settlement aggregation (Conolly and Lake 2006: 175–177; Wheatley and Gillings 2002: 166). KDE is particularly useful in GIS applications, since it is able to visualise the density estimation sometimes hidden by large numbers of sites (McMahon 2007). Due to the impossibility of knowing the exact amount of retrieved pottery in each body of data, for the following analysis the dataset has been 'synthesised' into a simple presence/absence of ceramic assemblages dating to the relevant periods, so as to make the sample analysable. This is not the ideal situation for KDE, which works better with quantitative sources of data (Shennan 1997: 29–30). However, the latter method has the benefit of focusing the analysis on the sites themselves, rather than on the quantity of surveyed pottery, the occurrence of which, especially in pre- and proto-historic periods, can be substantially altered by later occupation and re-deposition (see below for a more detailed discussion of this issue).

The results obtained by KDE analysis are very promising (Figure 3.2), since they highlight the occurrence of quite clear groups of sites: the darkness of the colour is created by the so-called 'bumps' (Wheatley and Gillings 2002: 166) of the kernel function, which is based on a radius in this case of 4 km, corresponding to a circa one hour walk, though the latter can be specified with a higher or lower number according to the level of detail that one aims at investigating. Darker colours indicate a higher density level.

The area shows the occurrence of diverse Halaf 'clusters' of population, each of which is composed by different number of sites (this is affected by the number of surveyed Halaf sites in each area). The best evidence

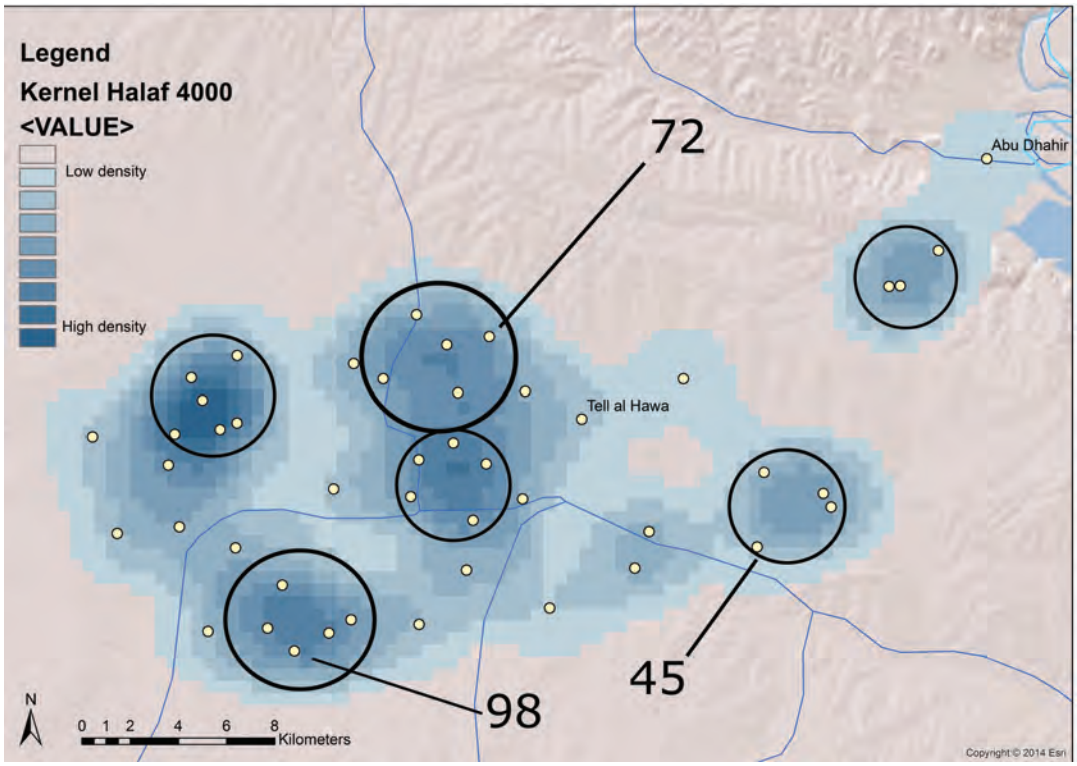

Figure 3.3. Close-up of the KDE of Halaf settlements in the NJS area with the site clusters highlighted by the author with black circles. NJS site numbers with relevant Halaf occupation, i.e., with early and late occupation, are indicated. Basemap by the author, using ESRI Topographic Data [Creative Commons]: World Shaded Relief and World Linear Water. Shape file of the Iraqi rivers freely downloaded from www.diva-gis.org/gdata/.

comes from the NJS thanks to its higher number of Halaf settlements, but interesting results also come from the TERP area as well as from the Eski Mosul dam.

In the latter two areas, site clustering is recognisable around Takyan Höyük (though the site does not seem to be at the centre of the area) and in the Khirbet Derak/Kutan area. The Halaf Period is consequently characterised by an apparent tendency to form clusters of settlements in selected zones.

It is unclear at present whether any specific site might have been an original centre around (or maybe from) which Halaf communities spread and settled. Yet it is worth noting that among the four NJS sites with long Halaf occupation, i.e., with early and late Halaf sequences (Wilkinson and Tucker 1995: 40), only one of these (n. 98) seems to be positioned in a quite central location with respect to the cluster highlighted by the KDE analysis, whereas two (n. 45 and 72) are part of the groups of sites (Figure 3.3). In the TERP region a similar case of site-centrality from which smaller Halaf settlements might have spread could also be seen in the above-mentioned case of Takyan Höyük, which also features earlier substantial occupation (Algaze *et al.* 2012: 13). In this picture we miss completely the role of the two main NJS mounds, Tell al Hawa and Tell Samir, whose major later occupations (with thick levels dating to the 3rd millennium BC–1st millennium AD) have entirely obscured prehistoric settlements, a well-known survey problem for earliest settlement. Tell Samir in particular, might have been of some relevance due to its position next to one of the Halaf groups of sites.

Similarly, Halaf pottery is present in residual contexts at other large mounds such as Tell Brak (Mallowan and Rose 1935: 244–248; pl. LXXIX): this might suggest the presence of further large Halaf settlements obscured by later phases of occupation.

The Upper Tigris area during the Northern Ubaid Period

The Ubaid settlement of the area under analysis shows traits quite different from the previous period (Figure 3.4).

The number of settlements shows an increase with a total of 83 sites now settled, which is especially evident in the TERP area, whereas the NJS shows a similar trend though with smaller proportions (Algaze *et al.* 2012: 16–

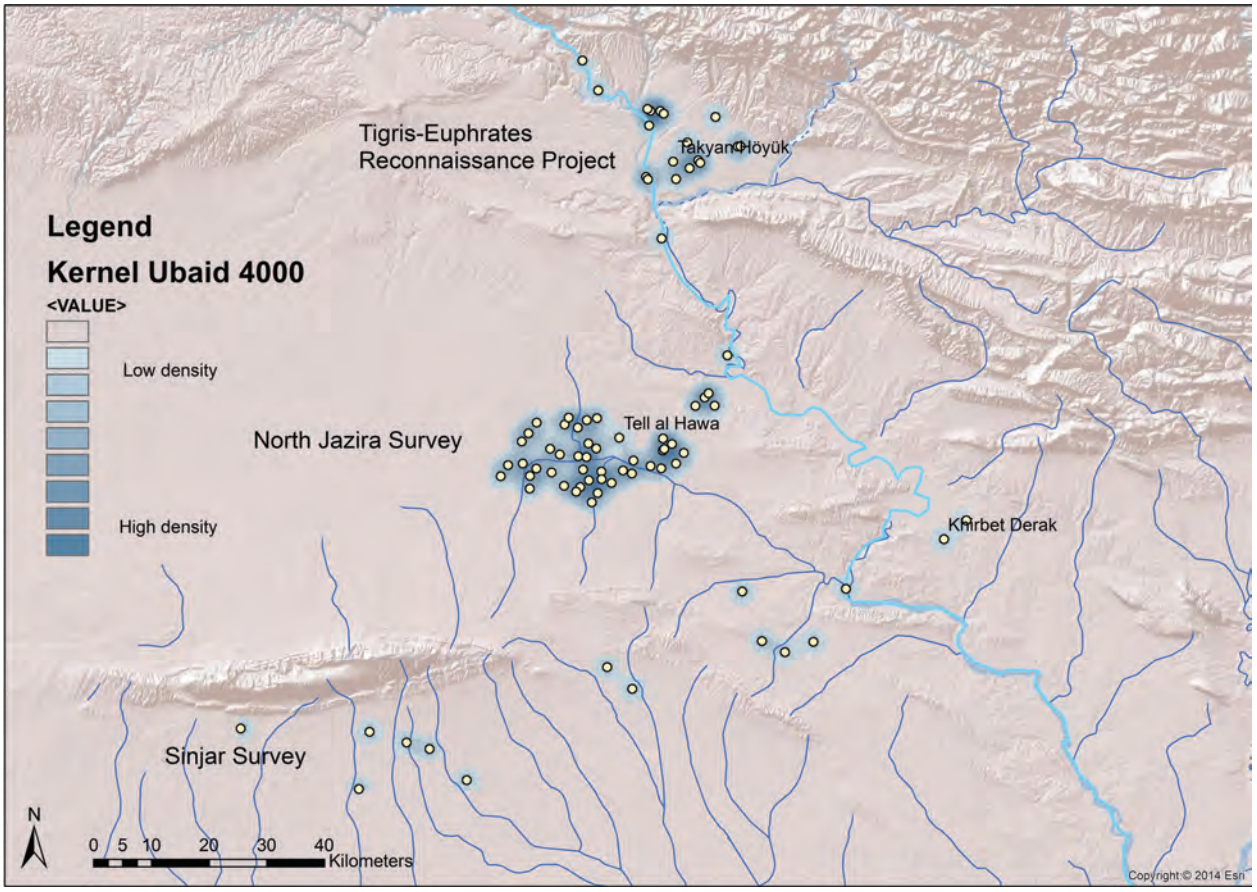

Figure 3.4. KDE with a radius set at 4000 m of the Ubaid settlement in the Upper Tigris region. Basemap by the author, using ESRI Topographic Data [Creative Commons]: World Shaded Relief and World Linear Water. Shape file of the Iraqi rivers freely downloaded from www.diva-gis.org/gdata/.

18; Wilkinson and Tucker 1995: 40). There is also a clear increase in the number of sites south of the Jebel Sinjar, with a wider coverage of the region that goes from the southern foothills of the mountains to the western edges of the Tigris valley.

Site dimensions are somewhat similar to those of the Halaf Period, with only a few sites reaching 5 hectares in the NJS (Wilkinson and Tucker 1995: fig. 32) whereas in the TERP area no site emerges as major centre of the region. Excavations and survey along the Zammar and Eski Mosul Dam basin have revealed significant Ubaid occupation at Khirbet Hatara and Abu Dhair (Fiorina 1997; Simpson 2007), but none of them revealed the presence of large settlements. On the contrary the excavated structures were domestic and similar to those identified at Arpachiyah (Mallowan and Rose 1935: 11–16) and Tepe Gawra (Tobler 1950). The landscape seems thus to be occupied by a number of small villages of more or less similar dimensions; a noticeable exception is the case of Tell al Hawa, which emerges as a likely major centre of the NJP area with a settlement covering an area of 15 to 18 hectares (Ball 1990; Ball *et al.* 1989: 31; Wilkinson and Tucker 1995: 40, 78–79).

Apart from the Tell al Hawa case, it has been observed that this pattern of small sites does not match with evidence from neighbouring regions, where major sites emerge during the Ubaid Period (Algaze *et al.* 2012: 18). If this holds in part true, a closer look at the parallel case studies suggests that only Tell Brak is possibly a site with an extensive area settled during the late 6th and early-mid 5th millennium BC — an assumption based more on the results of archaeological excavations than on survey investigations (Oates 1987; Ur *et al.* 2011: 4). Further evidence is required before we can make firm size assessments for Tell Leilan, Hamoukar/Khirbet al Fakhar (Ur 2010) and Hammam et Turkmam (Akkermans 1988: 181).

More reliable evidence has been retrieved in the Balikh Survey (Trentin 2010), where a two-tier site hierarchy has been identified, with Tell as-Sawwan and Tell Zeidan (Stein 2012: 129; Trentin 2010) as the largest Ubaid sites, with a likely settled area of about 10/12 hectares each. However, both sites are multi-mounded occupations and may therefore represent the above-mentioned cyclical or sequential occupations (see

below), again hampering the real understanding of settlement's extension (Trentin 2010: 334).

The question concerning the existence of a widespread two-tier hierarchy of Ubaid sites in North Mesopotamia — with settlements of considerable dimensions controlling areas occupied by smaller sites/villages — is still open and the real occurrence of very large Ubaid settlements in Upper Mesopotamia seems to depend more on assumptions rather than on real and solid survey data. Concentration of population is likely to have occurred during the Ubaid Period, although it is difficult to identify large sites in the archaeological record. In many cases pre- and proto-historic levels are hidden — if not entirely 'transformed' through the re-deposition of earlier materials (Ball 1990: 14; Nieuwenhuyse 2000: 183) — by later phases of occupation. The only concrete evidence seems to be at present Tell al Hawa and, possibly, Tell Brak (Oates 1987). Furthermore, it should be stressed that one of the most important Ubaid sites in Northern Mesopotamia — Tepe Gawra — with clear traces of socioeconomic complexity such as the 'Temple' of Level XIII or the occurrence of artifacts made up of exotic materials (Tobler 1950) measures probably only 2 hectares.

The site distribution seems to be more even than before; in this case the KDE analysis provides particularly useful insights for recognising underlying pattern (Figure 3.4). Although a general clustering is still present the pattern is rather different, with the previous circular-like agglomerations of sites now replaced by a shallower and more linear distribution (Figure 3.5). Some site groupings are still present both in the NJS and TERP areas, though they seem to be less marked than those observed during the Halaf phase. In general, Northern Ubaid sites are distributed along major watercourses (Akkermans and Schwartz 2003: 159; Trentin 2010; Ur and Wilkinson 2008: 306–307) but the linear distributions discussed here do not follow any specific watercourses or topographic features.

Rather, the linear proximity of the sites located at a few kilometres from each other suggests concern with contact between sites. The linearity of site locations might thus reflect the occurrence of a more solid and probably wide-ranging network of interconnections. The most widely exploited surface evidence to identify routes/paths among sites are the so-called 'hollow ways' (Branting *et al.* 2013: 141–143; Ur 2010: 76–80), but these start to occur consistently in the 3rd millennium, when dynamics of urbanisation 'explode' in Upper Mesopotamia with the emergence of giant sites like Hamoukar, Tell Brak, Tell al Hawa, and, probably, Nineveh (Ur and Wilkinson 2008: fig. 6; Wilkinson *et al.* 2013; Stronach 1994).[3]

[3] Hollow ways may have formed as early as the late 4th millennium, since there is a broad correlation between their pattern and the position of some major Late Chalcolithic sites (Wilkinson and Tucker 1995: 47). However, unequivocal archaeological evidence in support of Late Chalcolithic hollow ways is still missing.

The above-described pattern dates much earlier and is thus likely to be affected by other factors (e.g., natural resources); further, it seems to still be affected by the previous Halaf settlement pattern as the persistence of a few site clusters testifies. Nevertheless, the change is quite neat and, as will be discussed below, its nature (depending on economic or social factors or maybe both) might reflect a crucial stage in the processes of ancient human communities towards the emergence of urbanisation.

Social landscape as a reflection of social life?

The pattern emerging through the KDE analysis opens up a new insight into different types of settlement within Halaf communities. Much has been said about cyclical occupation during the Halaf Period, thanks in particular to work at Tell Sabi Abyad, where excavations have brought to light a sequence of occupation, abandonment, and re-occupation that demonstrates the continuous shifting of inhabited areas within a single site. This has been used in particular to argue against the existence of large Halaf settlements (Akkermans 2013a: 70), and to demonstrate the formation of multiple areas of settlement within a single site. Similar arguments have also been put forward for Yarim Tepe I–III and Fıstılı Höyük (Bernbeck 2013; Frangipane 2013: 92). The interpretation of these multi-mounded settlements has been the subject of recent studies, with some archaeologists arguing that Halaf communities were engaged in a highly mobile form of existence resulting in repeated but impermanent occupation at a range of different locations (Bernbeck and Nieuwenhuyse 2013: 31–32). The Burnt House of Sabi Abyad, though dated to the transition between the Late Neolithic and the Halaf Period, (Akkermans 2013b) is a likely example of this, with a multi-roomed building dedicated to communal storage of private goods, as the retrieval of several sealings (but no seals) in its rooms testifies (Akkermans and Duistermaat 1997; Duistermaat 2013). The latter would have been used to protect personal property during periods of absence derived from this adaptable subsistence strategy based on long/short term mobility (Duistermaat 2013: 319)

The site clustering visible in this study seems to mirror at a much higher scale that identified at micro level. The presence of groups of sites covering an area with a diameter of about 3.5 km and characterised by a varying number of sites might be seen as analogous to the multiple mounding of the larger sites but spread over a larger area. The NJS and TERP datasets, the most reliable sources of information, provide evidence that

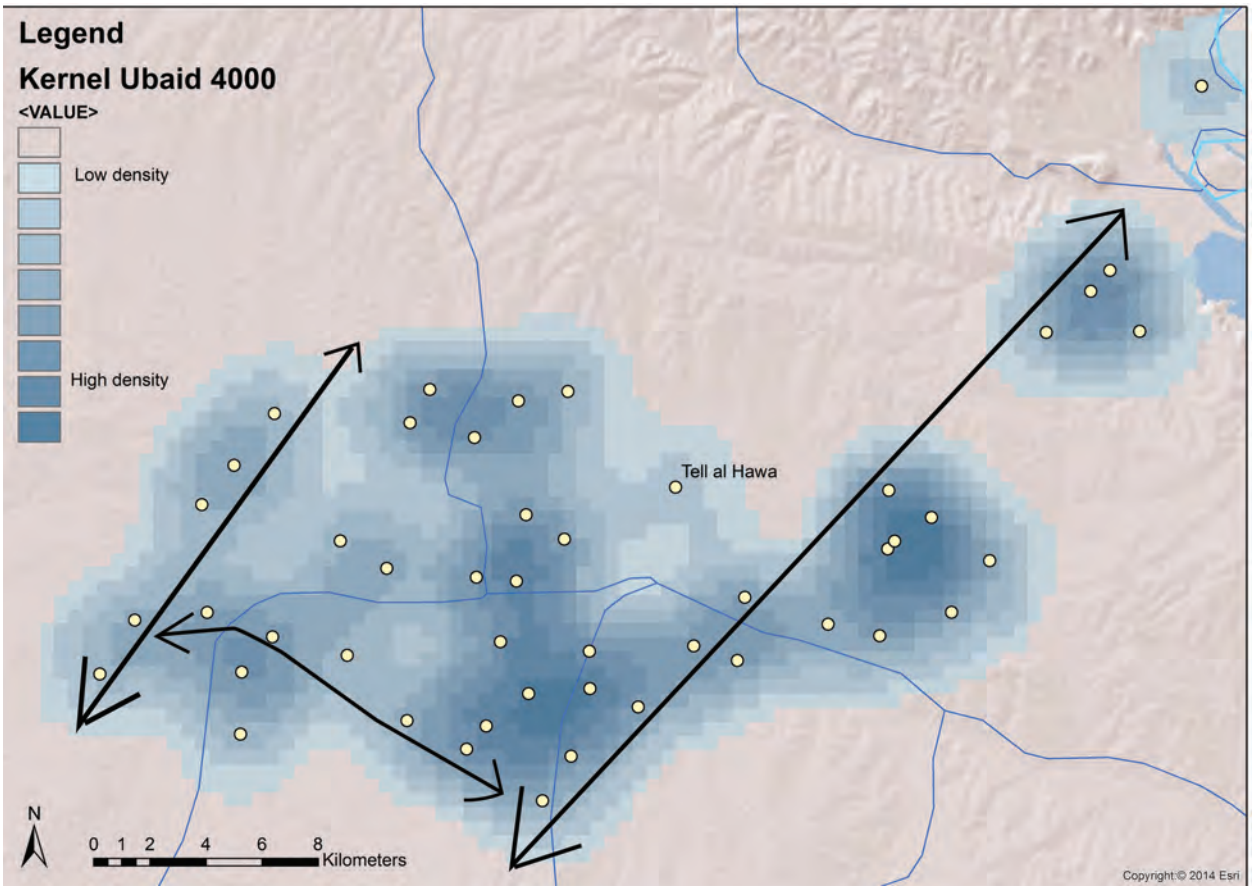

Figure 3.5. Detail of the KDE analysis of Ubaid sites in the NJS area, with the linear distributions indicated by the black arrows. Basemap by the author, using ESRI Topographic Data [Creative Commons]: World Shaded Relief and World Linear Water.

goes from a minimum of 4 to a maximum of 6 sites per cluster. Yet other case studies from the Eski Mosul Dam, though taken from salvage excavations and not of survey projects, reflect this pattern. A series of survey projects currently in progress in Iraqi Kurdistan — for the first available reports see those from the Erbil Plain Archaeological Survey/EPAS and the Land of Nineveh Archaeological Projects/LoNAP (Morandi Bonacossi and Iamoni 2015; Ur *et al.* 2013) — will provide significant evidence over large areas of the region that may help to further investigate this trend.

The multi-mounded site pattern has been also interpreted as evidence of some kind of internal cohesion based on kin related groups that may have occupied (and abandoned) each of these areas (Akkermans 2013a: 69; Frangipane 2013: 92). The Halaf is seen as a period characterised by great cultural homogeneity, thanks to a widespread occurrence of common elements in the material culture, among which the painted pottery is indeed the most famous, but definitely not the only one (Akkermans and Schwartz 2003: 150–151; Forest 2013; Nieuwenhuyse 2013; 2007b). Social activities like feasting have been advocated as major forces influencing the rise of a common ceramic tradition (Nieuwenhuyse 2008) for a largely egalitarian society (Frangipane 2002: 155–164), but with nascent elite groups likely based on age and kinships. These latter (kinship and lineages) may have been the basis of community segmentation but also at the same time of ancestral cultural unity, whose strength is reflected *inter alia* by wide sharing of decorated pots with similar patterns (Akkermans 2013a: 72; Akkermans and Schwartz 2003: 152–153).

This mechanism, identified at single Halaf sites, also seems to be evident in the KDE analysis. The site distribution, previously assumed to be randomly dispersed in the plains and regions of Upper Mesopotamia, shows a pattern that reflects the intra-site mechanisms of settlement formation. It is thus reasonable to think that the mobility and cohesion that resulted in settlements located within tens or hundreds of metres away from one another might have been responsible at a wider level for the creation of site aggregation. Halaf sites in the KDE analysis show a mean distance of less than 3 km, which is well below the hour-walk mark and correlates with 'home range'

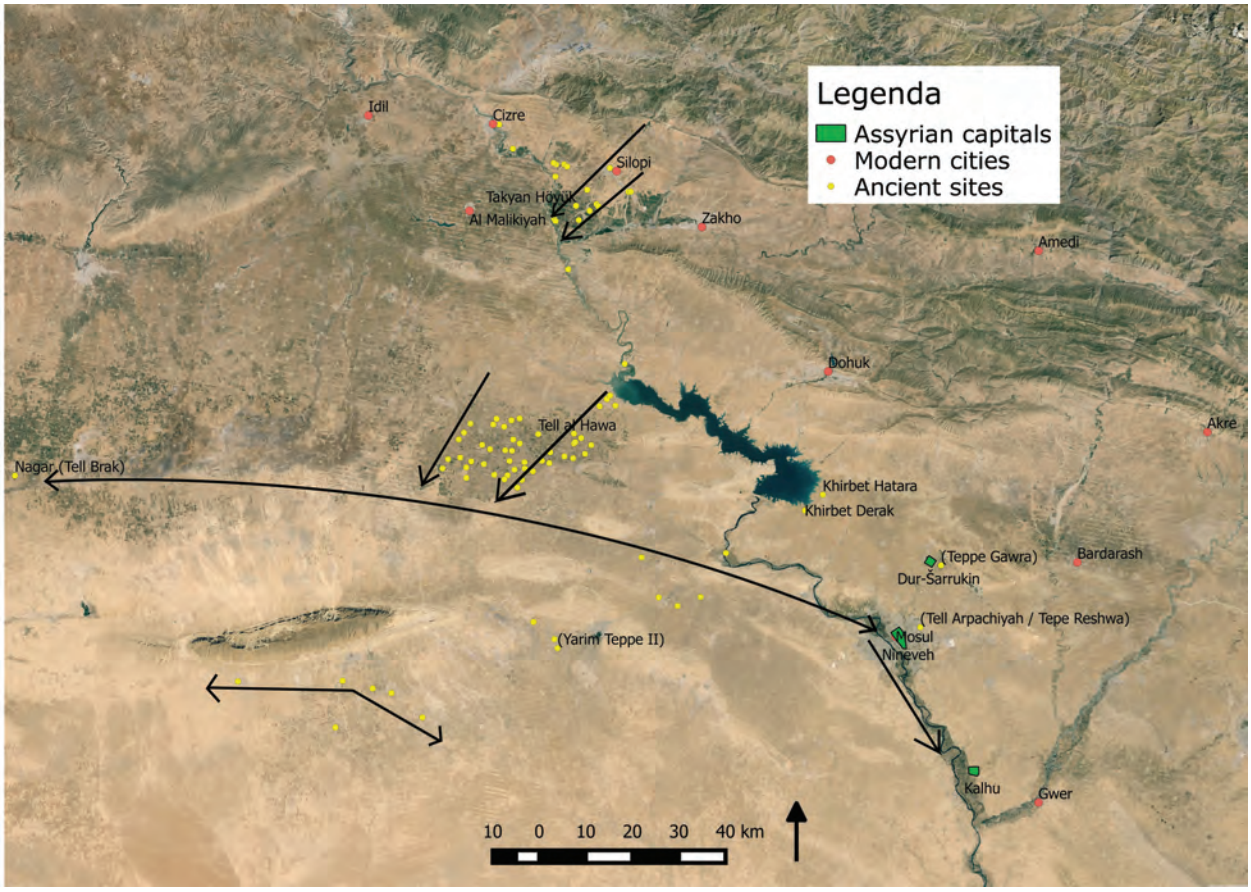

Figure 3.6. Upper Mesopotamia with the Ubaid sites and possible major routes across the region marked by black arrows. Basemap created by the author with QGis, using Google Earth imagery.

movement, and therefore with the occurrence of circumscribed networks of sites (see Niknami *et al.* 2009 for a similar case study from Urmia Lake).

Such short distances between the sites of each cluster suggest a strong integration between each community and reflect the social cohesion that, as seen above, is typical of Halaf societies. Assessing whether the formation of such groups of sites depends on single extended families/lineages whose growth has led to community segmentation and ultimately to the formation of new sites requires more evidence from key sites like Fıstıklı Höyük, where preliminary data point towards such interpretation (Pollock 2013). Leaving aside the origin of site clustering, the proximity of each group of sites (with one case of two groups almost melting into a single unity) is a further reflection at large scale of the strong level of social interrelation that must have characterised Halaf settlements.

The Ubaid Period (5300–4500 cal. BC: Stein 2012: 129, tab. 1), on the other hand, shows a substantial shift from the Halaf model. The latter shift looks to be of crucial importance, especially given the contemporary changes in socio dynamic complexities (Frangipane 2007; 2009: 135) that would form the basis for the phenomenon of urbanisation during the Late Chalcolithic (Carter and Philip 2010: 10–11; Stein 2010; 2012).

Among the many changes that occurred in the transition to Ubaid societies, of particular relevance is craft specialisation (Stein 2010: 28–29) in the production of common and prestige artifacts. At Tell Zeidan, for example, significant evidence for large-scale ceramic production has been excavated (Stein 2012: 130; see also Simpson 2007: 41 for wider references to ceramic kilns in Ubaid sites). In the same way, the working of exotic materials, e.g., lapis lazuli, turquoise, and carnelian, is extensively documented from the finds of Tepe Gawra, Level XIII (Tobler 1950: 192, 202). To these one must add obsidian, the relevance of which has been underestimated, but which occurred widely at the end of the Ubaid (Tobler 1950: 201) and in early LC contexts, such as at Khirbet al Fakhar (Al-Quntar *et al.* 2011). This suggests that it may have been of primary importance for ancient 5th millennium BC societies (Healey 2010). All these elements suggest the existence of a wider network of inter-regional exchange, which connected different regions throughout the late 6th and early 5th millennium BC (Stein 2010: 29; 2012: 130). Some

areas, such as the Khabur Valley, may have already experienced, during the preceding Halaf Period, a similar phenomenon (possibly involving not only flint and obsidian but also pottery, cf. Davidson 1977: 332–333; Watson 1983: 240–241; Hijara 1997: 92–93), thus providing the basis for the later success of a crucial component of the Chalcolithic societies' economic strategies.

The KDE result fits well with this picture, as it demonstrates a clear change in the settlement pattern: the linear alignment of sites may, in fact, represent one of the longer multiple connection routes that crossed the study area in a northeast–southwest direction (but note possibly the other pattern south of the Jebel Sinjar that seems to be southeast–northwest oriented)[4] and suggests that connection/contacts and communication played a relevant role in the Northern Ubaid settlement.

The patchy coverage of the area does not allow us to go further in this interpretation, but it seems possible that the target of these hypothetical routes was the lower plain at the fringe of the Jebel Sinjar, likely for the exploitation of some kind of natural resources. In the absence of a survey project aimed at investigating in detail the northern region of the Jebel Sinjar, this interpretation remains a simple suggestion. An alternative interpretation would be that this alignment represents the earliest manifestation of the main route that crossed Upper Mesopotamia east–west, visible in later settlement patterns (see below). If this pattern is corroborated by future analysis it might suggest an earlier origin for the development of stable settlement networks, perhaps as early as the 5th millennium BC (for a summary of further evidence for this proposal during the Late Chalcolithic, see Iamoni 2014a). One strange characteristic of the settlement lay-out is the apparently marginal position of Tell al Hawa, but this might be a result of the blank area around the site, a likely consequence of later occupation and/or land-use that might have erased traces of earlier phases (Wilkinson and Tucker 1995: 41).

Another interesting aspect is the persistence of some groups of sites, which might further reflect the smooth passage — the HUT phenomenon — from a society strictly based on kinship/family ties, and thus in itself conservative (Frangipane 2009: 135), into a society oriented towards the acquisition of new materials probably necessary for the production of elite goods destined for emerging elites in communities showing the first traces of social hierarchy (Frangipane 2009: 136; 2007: 171–172; Stein 2012: 128–129). This must have happened at different levels, with different regions — or interaction spheres as Stein has recently proposed (2010: 37) — involved in different ways and possibly competing with each other for the acquisition of raw materials and the production of prestige items. The latter process might have achieved its apex at the turn between the Ubaid and the Late Chalcolithic, with a strong level of competition that might have caused the success of some sites, such as Tell Brak (McMahon 2013; Oates *et al.* 2007) and the decline of others such as Khirbet al Fakhar (Al-Quntar *et al.* 2011; Iamoni 2014a).

The Upper Tigris, as defined in this work, might be one of these spheres, along a major network (Figure 3.6) that crossed the entirety of Upper Mesopotamia and extended from the Jazira to Nineveh and then downriver to South Mesopotamia, a well-known communication route during the 3rd millennium BC (Lebeau 2000). Alternatively, the Upper Tigris region could split into two or more spheres. Again, it is to be expected that the current ongoing survey projects in Iraqi Kurdistan will provide substantial evidence to deepen our understanding of the modifications undergone by ancient societies in Northern Mesopotamia.

Be that as it may, the available evidence (much of it gathered by Tony Wilkinson and generously shared with colleagues) has demonstrated a clear relationship between intra-site social dynamics and settlement patterns, thus permitting us to propose the occurrence of a social landscape that is significantly linked to processes occurring at smaller scales. The study of the landscape has been of major interest, especially in historical archaeology, due to the clear impact complex states had on it. In particular, the later territorial empires (e.g., the Assyrian empire) have been widely investigated thanks to the control they exerted on the region and their attempts to culturally and physically modify it for economic reasons, such as a better exploitation of the natural resources for sustaining a growing population, as well as for self-celebration and self-justification of elite power (Morandi Bonacossi 2000; Wilkinson *et al.* 2005).

The above discussed Halaf and Northern Ubaid case studies do not include evidence of landscape change on this scale, yet they show that pre- and proto-historic communities also had a significant impact on the landscape (as another example, megalithic graves like tumuli as elements of the cultural landscape: Bradbury and Philip 2011: 176–178; Iamoni 2014b: 56; Porter 2002), and that the reading of this evidence can provide us with a new and alternative key to the interpretation of the socioeconomic dynamics that affected ancient societies.

[4] A minor group of sites south of the Jebel Sinjar seems to be involved in a SE–NW axis of contact/communication, but the limited data (the sites are not the result of a systematic survey, rather of an explorative mission carried out during the 1940s) hampers a confirmation of this interpretation.

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