Neolithic Archaeology in the Khabur Valley, Upper Mesopotamia and Beyond

edited by

Yoshihiro Nishiaki, Kaoru Kashima
and Marc Verhoeven

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Preface

The ongoing archaeological and palaeoenvironmental research in the Khabur Valley in northeast Syria has yielded new and important information on the surroundings and way of life of prehistoric people. In particular, the site reconnaissance surveys being conducted by international teams since the 1990s and the excavations at Neolithic Tell Seker al-Aheimar by the University of Tokyo have contributed significantly to our knowledge of the area that was, for a long time, prehistoric *terra incognita*. The Neolithic is slowly unveiling some of its secrets. The time has come to review old and new data pertaining to the ancient Khabur Valley in order to present the state of research, discuss problems and ideas, and look for possible new research directions.

On recognizing this, an international symposium with lectures and discussions related to the Neolithic of the Khabur Valley was organized at the University of Tokyo on July 8 and 9, 2005. Apart from data collected by experts through surveys and excavations in the Khabur Valley, special attention was paid to the environment and the wider geographical and cultural contexts. Thus, it aimed to place the Khabur Valley research in the wider contexts of the Neolithic research of in the Middle East. This volume publication is the outcome of this symposium, and contains selected papers presented there and a few contributions collected later. Despite the time that has passed since the conference, we believe that the papers, which have been updated for this volume and supplemented by invited papers, make a significant contribution to the Neolithic research in this region.

We are deeply grateful to the staff for their help in organizing the symposium, particularly, Sofie Debruniye, Tomoyasu Kiuchi, Hiroko Mikuni, Yayoi Ogawa, and Kazuya Shimogama. We would also like to acknowledge the financial support given to us by the Mitsubishi Foundation and the Japan Society for the Promotion of Science in organizing the conference and for the subsequent work on the publication.

Yoshihiro Nishiaki Kaoru Kashima Marc Verhoeven

Neolithic Archaeology in the Khabur Valley, Upper Mesopotamia and Beyond

Part 2 Neolithic Archaeology of the Khabur Basin

Part 3 Neolithic Archaeology in Upper Mesopotamia and Beyond

CHAPTER 1

Introduction

Yoshihiro Nishiaki

Progress in the research of West Asian Neolithic has been remarkable in recent years. This progress has helped archaeologists to begin not merely to pinpoint when and where the domestication of plants and animals occurred, but also to identify what prompted those biological and socio-economic changes, and how human society developed as a result. Other issues also being disputed include the spread process of food-producing economies to surrounding regions, the relationship of such a spread to climatic change, theoretical models to better understand the processes of Neolithisation in general, and so on. Most of the data on which the recent research is based has been obtained from sites in the Levant, along the Mediterranean coast, or from southeast Anatolia (e.g. Coqueugniot and Aurenche 2011; Goring-Morris and Belfer-Cohen 2011 and references therein). By contrast, Upper Mesopotamia, the subject of this book, is rarely the focus of discussion.

Upper Mesopotamia, which in this book refers to the areas of northern Iraq and northeastern Syria today, boasts a long history of Neolithic research. Pioneering examples include the excavations of Tell Halaf, at the beginning of the 20th century, and Tell Chagar Bazar in the 1930s. They began in what today is part of Syria, but the developments that followed were mostly accomplished in modern-day Iraq. The Pottery Neolithic site of Tell Hassuna was excavated in the 1940s, while work on an innovative, interdisciplinary research program, called the Jarmo project, was started in earnest in the 1950s by Robert and Linda Braidwood; this project encompassed not just plain sites such as Matarrah and Ali Agha but also made inroads into the foothills of the Zagros Mountains. This resulted in the discovery of Pre-Pottery Neolithic sites such as Jarmo and Karim Shahir, enabling the development of an anthropological account for the background to the appearance of Pottery Neolithic settlements in the plains of Upper Mesopotamia. Following this ground-breaking work, Neolithic investigations in Iraq progressed in leaps and bounds, with a series of excavations over the following decades by Japanese, Soviet, British, and Polish archaeological missions, to mention but a few. The protracted sequence of transition between the beginning of the Pre-Pottery Neolithic and the Pottery Neolithic was thus documented, by the onset of the 1990s, in the Iraqi part of Upper Mesopotamia (cf. Matthews 2000). Despite this, there has been little opportunity to insert data obtained or add more in this newly established framework of transition due to political instability in the region over the past two decades.

From the 1980s onwards, the Khabur Valley, namely the western part of Upper Mesopotamia, has become a major focus of Neolithic research in the region. Until that point, fieldwork in the area had made little progress, but this has changed considerably in the last twenty years. Evidence of the Proto-Hassuna culture of the Pottery Neolithic, previously only found in Iraq, was

uncovered in excavations at Tell Kashkashok II (Matsutani 1991) and Tell Khazna II (Munchaev and Merpert 1994) in the late 1980s. In the 1990s, two survey projects, led by Frank Hole (2002-2003) and Bertille Lyonnet (2000), produced remarkable results: aside from Tell Fakhariyeh, for which a specific site location was not identified (Braidwood 1958), the first incontestable Pre-Pottery Neolithic sites were located. Of these, Tell Feyda was subject to an exploratory excavation (Hole 1994), and from 2000 onwards, a full-scale excavation was launched at Tell Seker al-Aheimar (Nishiaki and Le Mière 2005). The results have enabled an initial attempt at defining the transition from the Pre-Pottery to the Pottery Neolithic. The excavation of Tell Boeid II, at the downstream Khabur Dam construction site, also revealed how the Sammara culture, an entity dating to the Pottery Neolithic and characteristic of Central Mesopotamia, came into in the Khabur Valley (Suleiman and Nieuwenhuyse 2002). In more recent years, fieldwork has continued to produce important site-based reports. High-resolution surveys in the areas of Tell Brak, Tell Beydar, Tell Leilan, and Tell Hamoukar, all part of giant ancient civilization sites, are identifying Neolithic sites as well (Wright 2005; Nieuwenhuyse and Wilkinson 2008; Ur 2011).

Figure 1 shows all the sites dating to the Neolithic period recorded in the Khabur basin until this point. It should be clear that many more sites have in fact been found than recent site maps (Anastasio *et al.* 2004) might suggest. This book—and the 2005 symposium that preceded it—represents our preliminary attempt to pull together the knowledge gathered from the Khabur basin thus far. We are attempting to insert this new data into the framework of our current knowledge on the Neolithic of the Fertile Crescent. Rather than the theoretical or model-building research on the Neolithisation itself mentioned earlier, however, this book is committed to taking a bottom-up approach. This is surely the best option possible for this region, for which there is not yet enough data for more advanced discussion.

The book starts with an overview on the formation processes of Neolithic society in response to area-specific environmental conditions (Chapter 2). This introductory chapter is followed by the presentation of new data on palaeo-environmental research and archaeology in the Khabur Valley, and a comparison of these sites with Neolithic sites in other regions. Papers on the palaeo-environment consist of a general account of the geology of Upper Mesopotamia (Chapter 3), and reports of geomorphological (Chapter 4) and boring investigations (Chapter 5) conducted in the Khabur basin. The second group of papers is concerned with Neolithic archaeology of the Khabur: analyses of flaked stone industries (Chapter 6), gypsum white ware (Chapter 7), and pottery (Chapters 8 and 9) are presented. The next part focuses on recent research trends in the areas surrounding the Khabur Valley, from the

Balikh (Chapter 10) and the regions of the upper Tigris (Chapter 11) to the Levant (Chapters 12 and 13). Finally, in Chapter 14, a synthesis is made of the various theories on economic development in Neolithic societies as well as the development of inter-community exchange as multiple communities developed, with a focus on cases of the Upper Mesopotamia.

It has already been mentioned that the number of excavations on the Khabur Valley has considerably increased over the past twenty years. Still, the fact remains that the current level of data available is insufficient to answer a number of cultural-historical issues; the details of the beginnings of Neolithic of the Khabur Valley, for example. Sites dating back to the oldest phase—such as those identified in northern Iraq including Quermez Dere, Nemrik, and M'lefaat—have yet to be excavated in the Khabul Valley; at present, explorations have only identified some potential sites (Wright 2005). Nor have any Natufian sites, which date to the period immediately before the Neolithic, or other sites from corresponding periods been excavated as yet (cf. Hole 1994). It is unclear whether the earliest communities present in these sites continued to develop into the Pottery Neolithic period, during which Neolithic societies are assumed to have developed considerably (Chapter 2).

Meanwhile, it is possible to discuss societies of the late Pre-Pottery Neolithic period onwards, and indeed this is an issue upon which this book focuses. There are two particular points of debate. The first is the issue of why, as fieldwork thus far indicates, the number of sites increases so drastically with the transition to the Pottery Neolithic period, despite there being so few Pre-Pottery Neolithic sites (Fig. 1). Plenty of Pre-Pottery Neolithic sites have been discovered in the Balikh and the Euphrates basins to the west, and the Tigris basin to the east and north, and yet the situation in the Khabur Valley is very different. What could the reasons be? Particular attention should be paid to the possibilities that the level of fieldwork conducted in the Khabur Valley is as yet insufficient, and that old sites have been buried as a result of alluviation.

It is still difficult to believe, however, that the findings of fieldwork in recent years suggest that continuing fieldwork in the area will somehow result in a large number of sites being suddenly discovered (Chapter 2). Perhaps there are hints to be gained from palaeo-environmental research? As geomorphological research suggests, erosion of the terraces of the Khabur had stopped in the Holocene period, which then provided favorable conditions for the establishment of settlements (Chapter 4). The diatom analysis in Chapter 5 is even more detailed. Based on core drilling on Lake Khattoniyeh, on the Syria-Iraq border, it suggests that there was a shift from a dry to a humid climatic condition at the beginning of the 7th millennium

BC.

This corresponds to the period in which the number of the Neolithic sites begins to increase. What is required to resolve this issue is fieldwork designed to produce results that can test or back up the hints gained from these palaeo-environmental investigations. Further research is needed to place the evidence from the Khabur in the wider or even the global context of the climatic changes in the early Holocene. It is also a question of how well we can ascertain the technological developments and adaptability of the Neolithic society in this process, in other words, how people were able to exploit the rather monotonous, flat plain of the Khabur basin, an environment quite different to those of the Euphrates basin and southwest Anatolia. Moreover, precipitation levels on the Khabur are at the very limit required for rain-fed agriculture. In more arid areas to the south, the Syrian Desert, apart from areas located on or near oases, it is known that full-scale exploitation began in the final Pre-Pottery Neolithic B of the early 7th millennium BC, contemporaneous to the early Pottery Neolithic of the Khabur. It seems likely that the lands of the Khabur Valley might also have required subsistence strategies comparable to those used for deserts.

The other subject discussed in this book centers on the cultural geography of the Khabur Valley during the Neolithic period. Just as multiple societies existed in each local community (Chapter 2), so recent research indicates that a number of cultural regions, encompassing wider areas, existed in the Neolithic, maintaining interaction with other distinct regions. The Eastern-Western Wing theory proposed by Kozlowski and Aurenche (2005) is of particular interest, as it surmises that some of such cultural regions existed over long periods, prior even to the beginning of the Neolithic period. The Khabur Valley is the middle point of the Eastern and Western Wings. The upstream areas of the Tigris are in the Eastern Wing (Chapter 11), while the northern part of the Levant is clearly in the Western Wing (Chapter 12). Fieldwork in the Khabur Valley is an excellent opportunity to determine more precise boundaries and the formation processes of these large scale cultural provinces.

Some authors surmise that the barren plateau between the Khabur and the Balikh, in which the watershed of a few wadis (valleys) is situated, formed a natural division; this may have caused geographical obstacles difficult to overcome, and prevented interaction between the two areas (Chapter 6). It is also likely that differences in soil conditions played a part (Chapter 7). In pottery analysis, also, a similar demarcation has been drawn (Chapters 8 and 13). Things are less clear for the Balikh basin area, however (Chapter 10). Some hold that the situation in the Balikh area would not have been

significantly different from that of the Khabur Valley in the Pottery Neolithic period (Chapter 9). The two regions indicate differing traditions in the earlier period (Chapter 6), so there is the possibility that the border between sections shifted over time. Discussion on these cultural regions should not be considered merely a reconstruction of the local history of the Khabur basin. A better understanding of regional history, including both historical and ecological conditions, can doubtless contribute to an understanding of the process by which the overall framework of the Neolithic societies in the Middle East was formed.

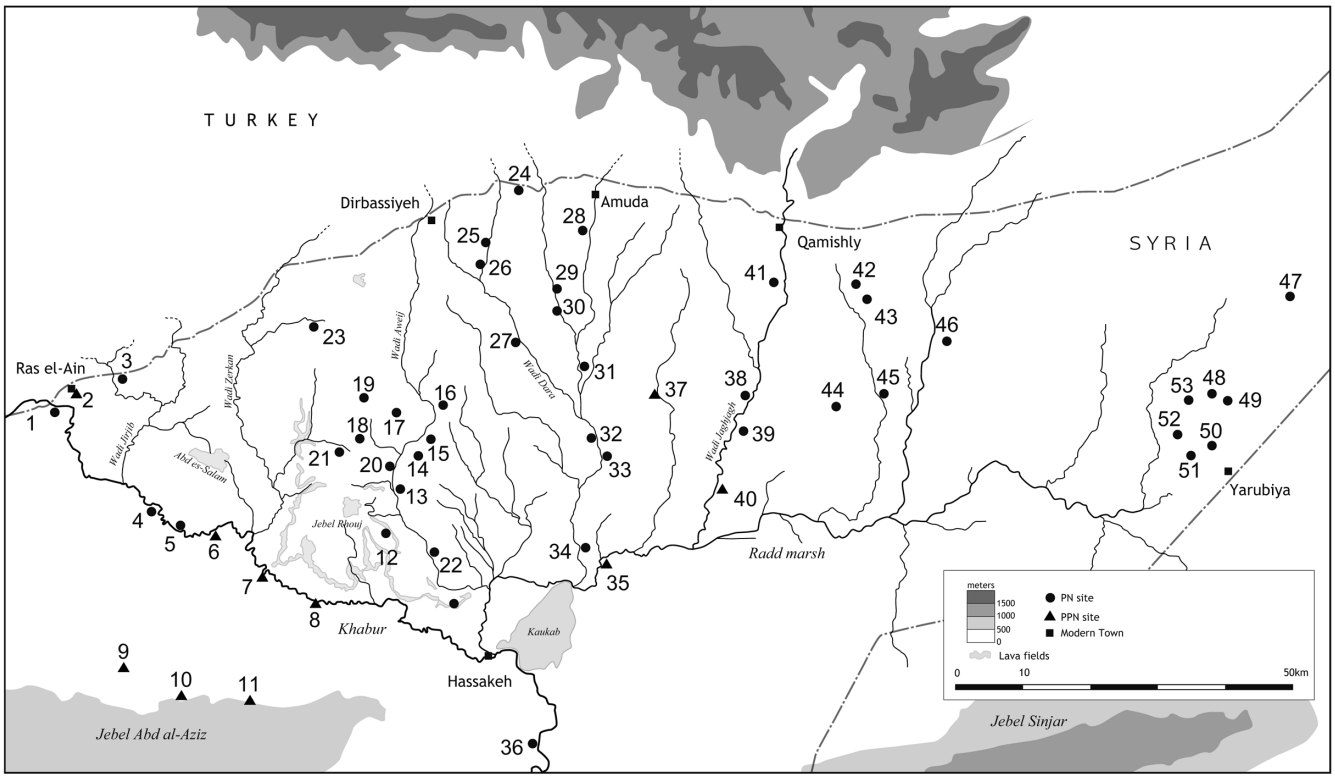

Fig. 1. Neolithic sites known in the Khabur basin.
Note that Pre-Pottery Neolithic (PPN) occupations are rather limited to the Khabur Valley itself, and the northern foothills of Jebel Abdul-Aziz.

No	Site	Period	Investigation	References
1	Halaf	PN	survey	Nishiaki 2000
2	Fakhariyeh	PPN	excavation	Braidwood 1958
3	Aalouq Charqi	PN	survey	Nishiaki 2000
4	Atchashi South	PN	survey	Nishiaki 2000
5	Tawil	PN	survey	Nishiaki 2000
6	Seker al-Aheimar	PPN, PN	excavation	Nishiaki and Le Mière 2005
7	Feyda	PPN/ PN?	excavation	Hole 1994
8	Baluka	PPN, PN	survey	Nishiaki 2000
10	K164	PPN/ PN?	survey	Hole 2002-2003
11	Khazne cave I	PPN	survey	Hole 1994
9	K260	PPN	survey	Hole 2004
12	Omm es-Mssamir	PN	survey	Nishiaki 2000
13	TBS 5	PN	survey	Nieuwenhuyse & Wilkinson 2008
14	TBS 26	PN	survey	Nieuwenhuyse & Wilkinson 2008
15	TBS 34b	PN	survey	Nieuwenhuyse & Wilkinson 2008
16	TBS 38	PN	survey	Nieuwenhuyse & Wilkinson 2008
17	TBS 40d	PN	survey	Nieuwenhuyse & Wilkinson 2008
18	TBS 50d	PN	survey	Nieuwenhuyse & Wilkinson 2008
19	TBS 54c	PN	survey	Nieuwenhuyse & Wilkinson 2008
20	TBS 81	PN	survey	Nieuwenhuyse & Wilkinson 2008
21	TBS 65	PN	survey	Nieuwenhuyse & Wilkinson 2008
22	Kashkashok II	PN	excavation	Matsutani 1991
23	Dabach	PN	survey	Nishiaki 2000
24	Khaneke	PN	survey	Nishiaki 2000
25	Raheke	PN	survey	Nishiaki 2000
26	Moutassalem I	PN	survey	Nishiaki 2000
27	Jhach	PN	survey	Nishiaki 2000
28	Habach	PN	survey	Nishiaki 2000
29	Cheikne	PN	survey	Nishiaki 2000
30	Sorhane Tahtani	PN	survey	Nishiaki 2000
31	Chagar Bazar	PN	survey	Nishiaki 2000
32	Farho	PN	survey	Nishiaki 2000
33	Guir Bejnik Faouqani	PN	survey	Nishiaki 2000
34	Khazna	PN	excavation	Munchaev & Merpert 1994
35	Khirbet Mustariyya (BKS 138)	PPN	survey	Wright 2005
36	Boeid II	PN	excavation	Suleimand & Niewenhuyse 2002
37	Arbid	PPN?	survey	Nishiaki 2000
38	Mazraat Tuwayyim (Site 242)	PN	survey	Meijer 1986
39	Shaykh Nims (Site 282)	PN	survey	Meijer 1986
40	Tuwaim (BKS 241)	PPN	survey	Wright 2005
41	Site 170	PN	survey	Meijer 1986
42	Khazna Kabira (Site 63)	PN	survey	Meijer 1986
43	Site 68	PN	survey	Meijer 1986
44	Site 197	PN	survey	Meijer 1986
45	Abu Khazaf (Site 96)	PN	survey	Meijer 1986
46	Farsuk (Site 106)	PN	survey	Meijer 1986
47	Mir Azaziat (Site 42)	PN	survey	Meijer 1986
48	THS 4	PN	survey	Ur 2011
49	Al-Asila (THS 12)	PN	survey	Ur 2011
50	THS 39	PN	survey	Ur 2011
51	Khirbet Taif (THS 44)	PN	survey	Ur 2011
52	THS 49	PN	survey	Ur 2011
53	THS 56	PN	survey	Ur 2011

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CHAPTER 2

Environment, economy and social territories in the Neolithic

Frank Hole

■Introduction

When I was in graduate school in the late 1950s, my professor, Robert Braidwood, who was intrigued with the origins of agriculture, focused on what he thought to be the essential elements, namely the biogeography of the relevant species and the ability of people, through technology and knowledge, to exploit them. He conceptualized a period during which late Paleolithic hunters began to experiment with harvesting and cultivation of cereals, and then moved out of caves and rock shelters onto arable land. He characterized this as a period of incipient cultivation; what we now commonly call the late Epi-Paleolithic to the Pre-Pottery Neolithic A. In Braidwood's scheme, this early experimentation was followed by fully sedentary early village farming communities like Jericho and Jarmo (Braidwood and Braidwood 1953). Needless to say, his ideas are now regarded as simplistic and in some cases just wrong, as when he identified the "hilly flanks of the Fertile Crescent" as the homeland of domestication. We now know vastly more about the transition to agriculture than Braidwood did, but some of the misconceptions that antedate even Braidwood are still influential, particularly in secondary publications: that domestication followed a single evolutionary trajectory; that it was an economic transition; and that sedentism followed agriculture.

My goal in this paper is to look at the Neolithic, not as Braidwood did in terms of agriculture alone, but in ways that introduce a broader spectrum of concepts and data bearing on the communities that composed the Neolithic.[1] First, I shall discuss the concept of Neolithic society; then I will make some comparisons between regions and finally, make some general concluding remarks.

■Neolithic societies

We do not know and perhaps cannot know the ways that Neolithic people were organized. However, in the influential book, *Man the Hunter* (1968), there was discussion of group sizes and composition among living hunter-gatherers. Hunter-gatherers tended to live in local groups of 25 persons or more, and their social universe had a modal value of about 500 persons, with a very wide variance. Using evidence from ethnography, as well as from linguistics and biological anthropology, anthropologists determined that 300-500 persons commonly compose a viable social and linguistic community ("dialectical tribe") (Birdsell 1968: 232-235; Lee and DeVore 1968: 245-249). This size has to do with biological reproduction, fertility, mortality and the availability of mates – however, a breeding population of <200 may be viable (Birdsell 1968: 238) – as well as with protection and support during

1. Braidwood objected to the term "Neolithic," because it had too many connotations to be useful. In its stead he advocated the terms, "Era of Incipient Cultivation," and "Era of the Early Village Farming Community." These terms shifted the focus from New Stone Age polished stone tools to economy.

times of environmental or other stresses. In native terms the people within such a group would share a dialect and be known generically as "we," while those outside are "they." I take this to be a reasonable point of departure for a consideration of what I will term Neolithic societies, a term more neutral than "tribe" (Service 1962). A Neolithic society is composed of a number of settlements each of which has a resident population that exploits the territory surrounding it (Fig. 1). Interaction among the settlements and any dispersed seasonal camps, is maintained through marriage, rituals and exchange and, in some cases, cooperative hunts and harvest of crops, and defensive activities. The members of a society may also share a distinct dialect. The advantage of thinking in terms of societies is that it gives us a metric that is tied to space and resources and has implications of contemporaneity.

To judge from settlement sizes, typical Neolithic sites might have populations of a few dozen to a hundred or more, implying that a single site is probably not the entire social and biological universe in which the people lived. It also implies consistent interaction among groups of sites. We should think, therefore, more widely than the single site and attempt to discover other sites that may have been in the same society. For many cases, a spatial range of half-a-day to a day's walk probably encompassed the social universe

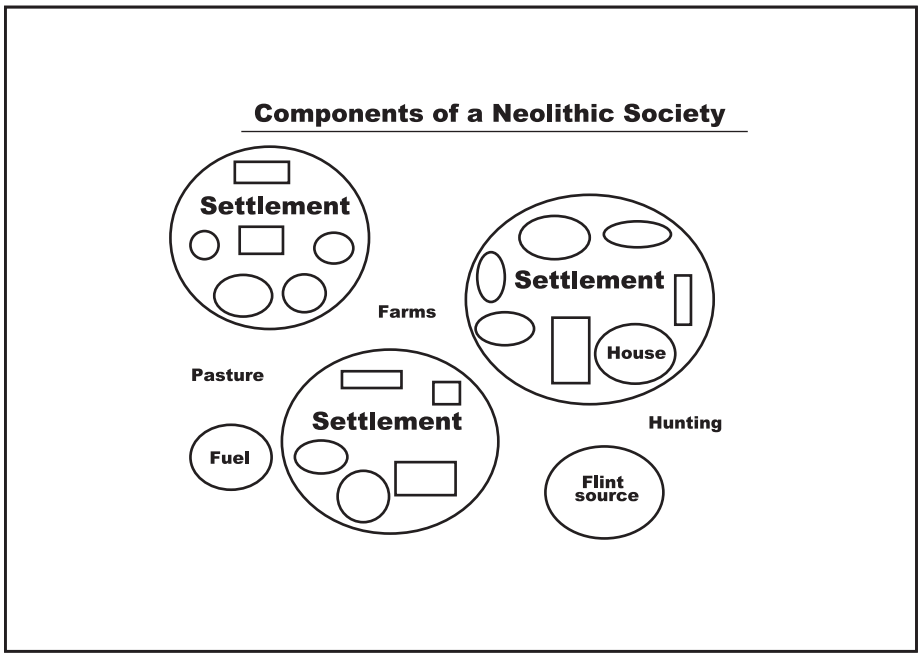


Fig. 1. *A Neolithic society is composed of a number of settlements, each of which has a resident population that exploits the territory surrounding it. Interaction through trade, marriage and rituals is expected among the settlements and between societies.*

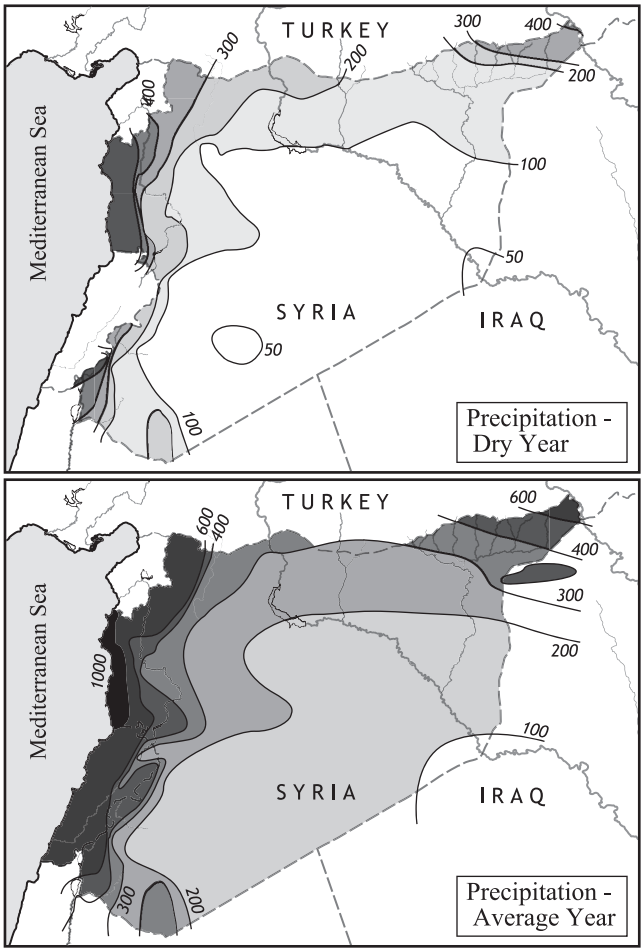
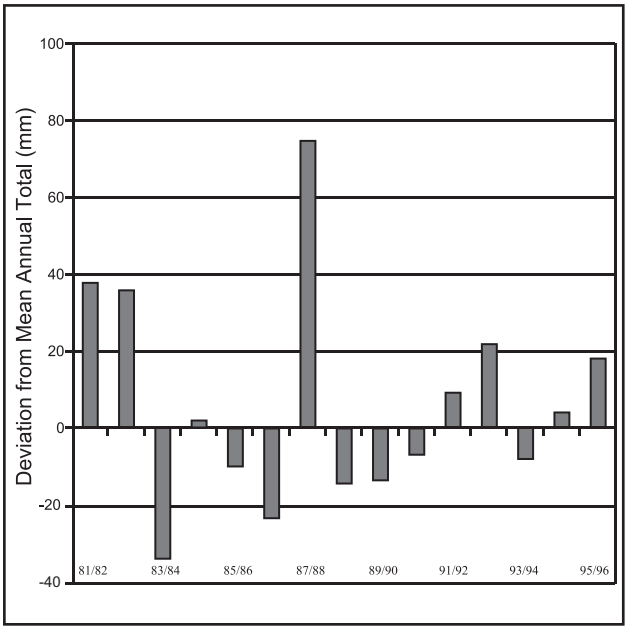


Fig. 2. *Both the Khabur and Balikh valleys lie in a part of the Near East where agriculture is especially sensitive to changes in precipitation (Precipitation maps from Wirth 1971: Map 4).*



Deviation from mean precipitation in northeast Syria for the years 1981-1996.

for the smallest agrarian societies – in other words, 15-30 km, a range that corresponds to the distance that a person can walk and return home in a day. When Higgs and Vita-Finzi began to employ the notion of catchment areas[2] they drew circles around agrarian sites, using the principle that farmers cultivate fields within 1-4 km of home, and make less intensive use of fields farther away (Higgs and Vita-Finzi 1972). However, the "catchment" for all of a group's needs may be very much larger and include distant resources such as obsidian or sea shells (Flannery 1976: 109). Whatever the maximum extent of the putative territory may be, if a single site could intensively exploit only a fraction of it, there would be room for the many settlements that are needed to comprise a viable society.

Another way to calculate the potential carrying capacity and potential existence of sites is to calculate the number of people that had to be fed. With some knowledge of available natural resources and productive capacity, we can estimate how large an area would have been needed for subsistence.[3] It is often the case that the potential of the land appears to be much greater than people can utilize, and this raises the question, "why did settlements not grow to meet the resource"? This leads to further considerations, perhaps unknowable, but relevant, such as social values and intergroup relations. More practically, however, we can ask how thoroughly the area has been investigated for the presence of sites. Is the lack of evidence, evidence of absence? Such questions put us on notice that what we see is not necessarily what we should believe. Apart from sites, what do we really know about the environment? How has it changed over the millennia? How productive was it when the sites were occupied? How much did it vary from year to year? (Fig. 2) We might discover, for example, that because of extreme interannual variability, people could not count on optimum

2. While strict adherence to geometric catchments has long gone out of fashion, it is undeniable that people do exploit the territory immediately around them. Territories vary in quality of their resources as well as in their extent. An empirical way to determine the reach of a territory is in Flannery's The Early Mesoamerican Village *(1976: 103-117).*

3. An excellent example of how to calculate potential yield of a territory is Wilkinson (1997).

yields, and their population was therefore regulated by periods of scarcity, whether short and expected, or long and unbearable. Environments where the essential qualities for subsistence can vary may show periods of growth as well as reduction and even abandonment. Such changes may be reactions to varying degrees of environmental stresses although it is also the case that stresses reflect the inability of the social system to cope (van der Leeuw 2001). Indeed, stresses brought about by the social system itself, such as degradation of the land, might appear to have resulted from purely natural climate or other environmental change. While the causal factors are not always evident or even discoverable, settlement changes reflect a combination of human responses to both social and natural factors. The message is clear: if we want to understand the similarities and differences among Neolithic societies, we must devise ways to either exclude or to verify potential causal interrelationships.[4]

Like settlements, societies do not exist in isolation; therefore we should conceive of sets of local societies linked through trade, travel and the search for raw materials and even conflict with similar groups in the region. Topography and water sources often determine the location of routes between societies and resources, and those used in the Neolithic may still be in use. In the Neolithic, people were pedestrian and limited in the distances they could routinely travel in a day so that it was imperative that there be resources necessary for survival at distances not much father than a day's walk. In the arid Near East this can be especially critical in the dry season and this makes routes along rivers or between oases attractive. Where conditions allowed settlement, sites occur along the routes and they may have become larger than normal owing to economic activity or have special facilities, such as shrines or storage areas. Andrew Sherratt's Oxford team believes that the so-called PPNB megasites in the Levant are nodes on such a trade line and, moreover, today's King's Highway in Jordan follows the same route.[5]

The remainder of this paper will briefly review the settlement histories of the Deh Luran plain, the Balikh and the Khabur to suggest ways that we might use the notion of societies to advance our understanding of the Neolithic by looking beyond the site to the local region.

■Deh Luran

Deh Luran is a small, isolated alluvial plain in southwestern Iran flanked by rivers flowing from the Zagros Mountains and bordered by stretches of arid steppe (Fig. 3). During the Neolithic the plain was rapidly aggrading through a network of braided channels that distributed water and sediment across the

4. This is easier when we have historical records, but inevitably any analysis will select from available evidence those factors that accommodate the historical situation. An example of how prolonged droughts in Europe led to both demographic and social changes is in Pfister (1996).

5. http://athens.arch.ox.ac.uk/ArchAtlas

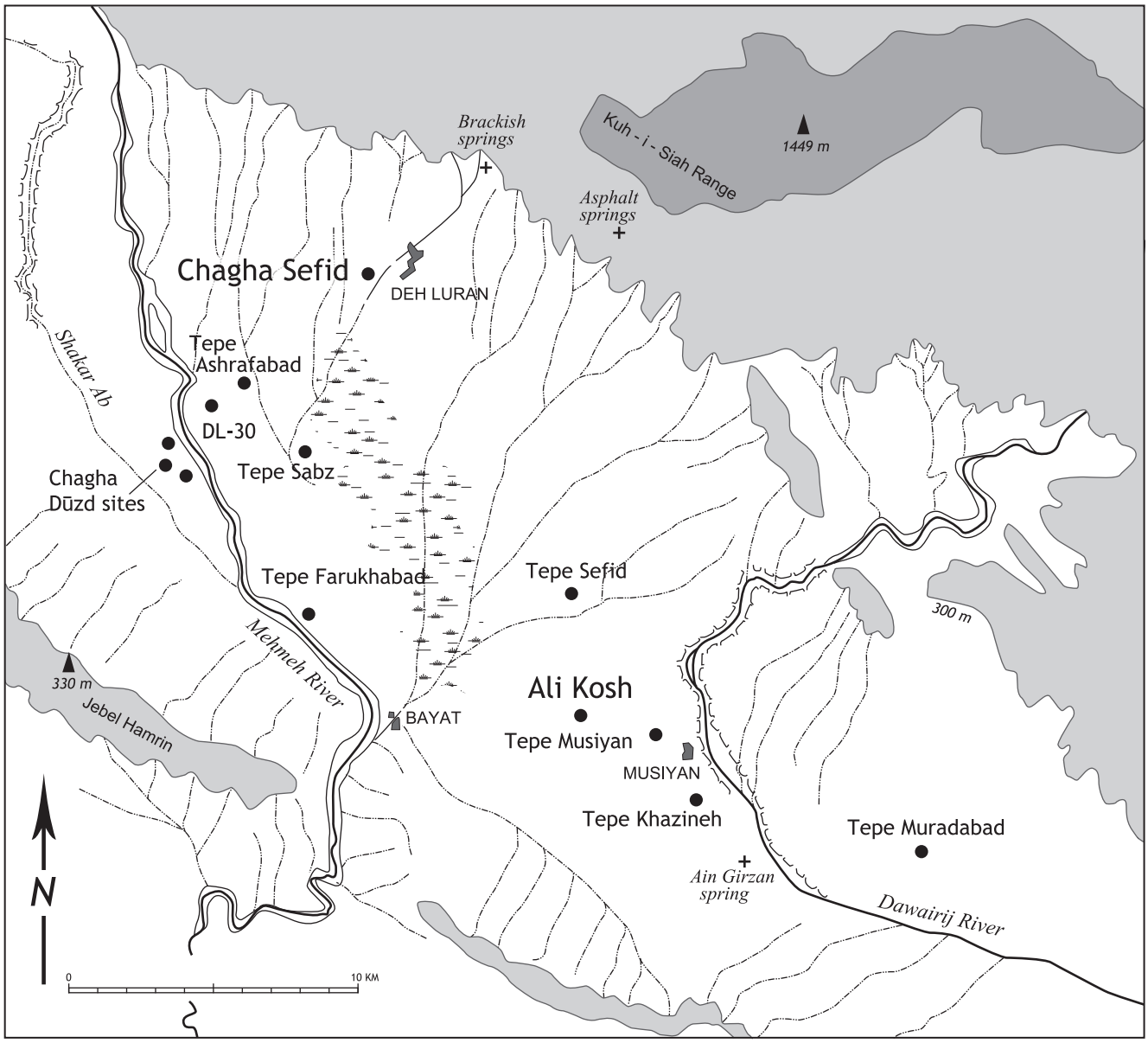


Fig. 3. *Neolithic and other sites on the Deh Luran plain of Iran (Hole* et al. *1969: Fig. 3).*

plain. The rivers would have flowed essentially at plain level then, whereas today they are deeply incised into the accumulated fluvial deposits. The flood water accumulated in depressions around which the early sites were placed. Here, the people were able to make use of aquatic resources, migratory birds, gazelle and onager on the surrounding steppe. Crops were planted on the margins of the playa lakes where ground water was high, and herds were grazed on the steppe and mountain pastures. The oldest settlement at Ali Kosh occurred about 7000 cal BC (Zeder and Hesse 2000), but with a shift in hydrology or change in the precipitation regime, the lake at Ali Kosh dried and the site was abandoned about 6200 cal BC, approximately simultaneous with the widespread abandonment of sites across the Near East (Hole *et al.* 1969: 394; Kirkby 1977).

The Deh Luran Plain was settled long after the first permanent agricultural villages of the middle Euphrates and Levant. As much as 1700 years had elapsed after the inception of the Pre-Pottery Neolithic B, before we can confidently claim settlement in Deh Luran.[6] Nevertheless, both Ali Kosh and Chagha Sefid have Aceramic components, followed by early Neolithic pottery (Hole 1977). Intensive survey of the plain has failed to reveal additional Neolithic sites, perhaps because their basal levels lie some four meters below the modern surface (Neely and Wright 1994). Assuming that the local society comprised some hundreds of persons, it follows that these two sites represent only a fraction of a society. We cannot tell whether other sites are buried or whether a substantial segment of the population was mobile, practicing transhumance into the mountains. In the recent past when transhumance was the pattern, the population during the winter was large but the plain was nearly vacant in summer, for Deh Luran grows unbearably hot in the summer, but relief is only a short vertical distance away.

We should also ask whether the effective social space was much larger than the Deh Luran plain itself. While Deh Luran is flanked by stretches of steppe that are not arable, there are a series of small, similar plains along the Iraqi border, including Mehran and Mandali that are within reasonable distance for interaction. Thus we might visualize a linear pattern of settlements at several nodes where small streams enter the Mesopotamian plain, rather than concentrated settlement on a single plain. Evidence that this may have been the case is in three forms: first, lithics at Tamerkhan in Mandali are like those in Deh Luran (Oates 1967: 3). Second, as discussed below, Mandali is a probable source for immigration into Deh Luran during the Chogha Mami Transitional Phase (Hole 1977). Third, in historic times, the Achaemenid Royal Road from Susa to Ecbatana, via Khanaqin ran through Deh Luran and these other nodes. These facts lend support to the idea that there was an adaptation to the intersection of lowland plain and Zagros Mountains that

6. Chia Sabz, a recently excavated site in the foothills above Deh Luran has radiocarbon dates that place it about 8000 cal BC (Hassan Fazeli Nashali, personal communication).

may have stretched as far northward as M'leffat in northern Iraq (Kozlowski 1998). Lithics along this stretch are closely similar and suggest interaction, but just how this long transect might have been divided into societies remains to be determined.

One could also argue that the two pre-ceramic sites in Deh Luran merely represent the first wave of demographic expansion from another region. While this may have been true for the initial Aceramic components, it is hard to explain why it took several hundred years and the introduction of a new economy before the number of settlements grew. We are faced here with a glaring absence of evidence, but with the expectation that the local society was more extensive than evidence now shows. What seems clear, however, is that a principal axis of potential interaction was along the front of the mountains. This inference is supported by the absence of sites throughout much of the adjacent mountain valleys (Hole, 2007).

Through the various Neolithic phases in Deh Luran there had been incremental changes in grinding stones, the development of hoes for cultivating fields, the use of ceramics, and an increasing proportion of domestic livestock (Hole 1977). Seemingly these had little impact on the health of the society as measured by the number of settlements. This apparently stable situation was interrupted during the last stage of the ceramic Neolithic when a new group moved to Chagha Sefid, bringing irrigation, free-threshing wheat, cattle and a new type of ceramics. We can readily identify the source of the newcomers – the Mandali Plain of Iraq, which had little room for demographic expansion. These innovations in agriculture led to increases in production, a concomitant decline in hunting and the abandonment of Neolithic technology. Such changes imply a fundamental reorganization of the economy whose result is seen in the increasing number of sites: from 5 in the early Chalcolithic Chogha Mami Transitional Phase to 20 in the Khazineh Phase (Hole 1987: 37, Table 4; Neely and Wright 1994). In short the agricultural carrying capacity of the land had increased several times. It is not surprising that by the time of the Khazineh Phase a distinctive ceramic style had developed, implying a self-contained system. Unfortunately the ceramic evidence for the Neolithic is neither distinctive nor abundant enough to show similar potential sub-regional clustering.

Khuzistan, the closest neighboring plain to Deh Luran, but many times larger and more productive, was home to thousands of sites over the millennia, but Chogha Bonut is the only Aceramic Neolithic site that has been discovered. As in Deh Luran the site was slightly elevated in a wet, marshy environment (Alizadeh 2004: 21), where geography favors seasonal

movement with winter agriculture and summer migration to the mountains. Apart from Chogha Bonut, the oldest remains are of later ceramic Neolithic and include camps of herders (Hole 1974). The Khuzistan plain has undergone enormous geomorphological changes, including burial of some surfaces and removal of others, as the rivers have meandered across the plain (Alizadeh *et al.* 2004) Conditions would seem to have been favorable for Neolithic settlements in both regions, particularly during the Climatic Optimum, but there is a lot of work to do before we can understand the belated appearance of the Neolithic and its relatively static nature in the eastern arm of the Fertile Crescent. The contrast with the dynamic societies of the Levant and upper Euphrates is stark.

■The Balikh

We turn now to the Jezirah, the focus of this conference. The best example of a Neolithic society is found in the Balikh where the Sabi Abyad cluster of tells (I-IV) provides the proto-typical settlement within this society (Akkermans 1996; Verhoeven and Akkermans 2000). Owing to intensive surveys and the long duration of well-focused excavations of Late Pre-Pottery Neolithic B Sabi Abyad II and Pottery Neolithic Sabi Abyad I, we know more about this circumscribed locale than of any other in the west (Fig. 4). While the Balikh survey (Akkermans 1993) has been carried out in Syria, the river actually heads in the large, fertile Harran plain which must have comprised part of the environmental, if not social, universe for the people of the Balikh. Precipitation is greater the farther north one goes so that the conditions for rain-fed agriculture are good in the Harran Plain and one would therefore expect to find many early Neolithic sites on the Turkish side of the border.

Some 24 Pre-Pottery Neolithic B sites are known in the Syrian Balikh, seemingly enough in close proximity to comprise a viable society. Unlike Deh Luran or the Khabur, the Balikh valley generally is a narrow strip of arable land on either side of the little river, enclosed by semi-arid steppe. I know of no other region with such a concentration of known Pre-Pottery Neolithic B sites, even allowing for the probability that not all of them were occupied at the same time. It seems that there was no substantial settlement of the Balikh before the mid-late Pre-Pottery Neolithic B (early 8th millennium BC), although some traces of earlier lithics have been recovered (Copeland 2000).

There are probably several keys to the late settlement and concentration of sites. First, settlement may have occurred relatively rapidly through demographic expansion from the Harran or middle Euphrates, due to

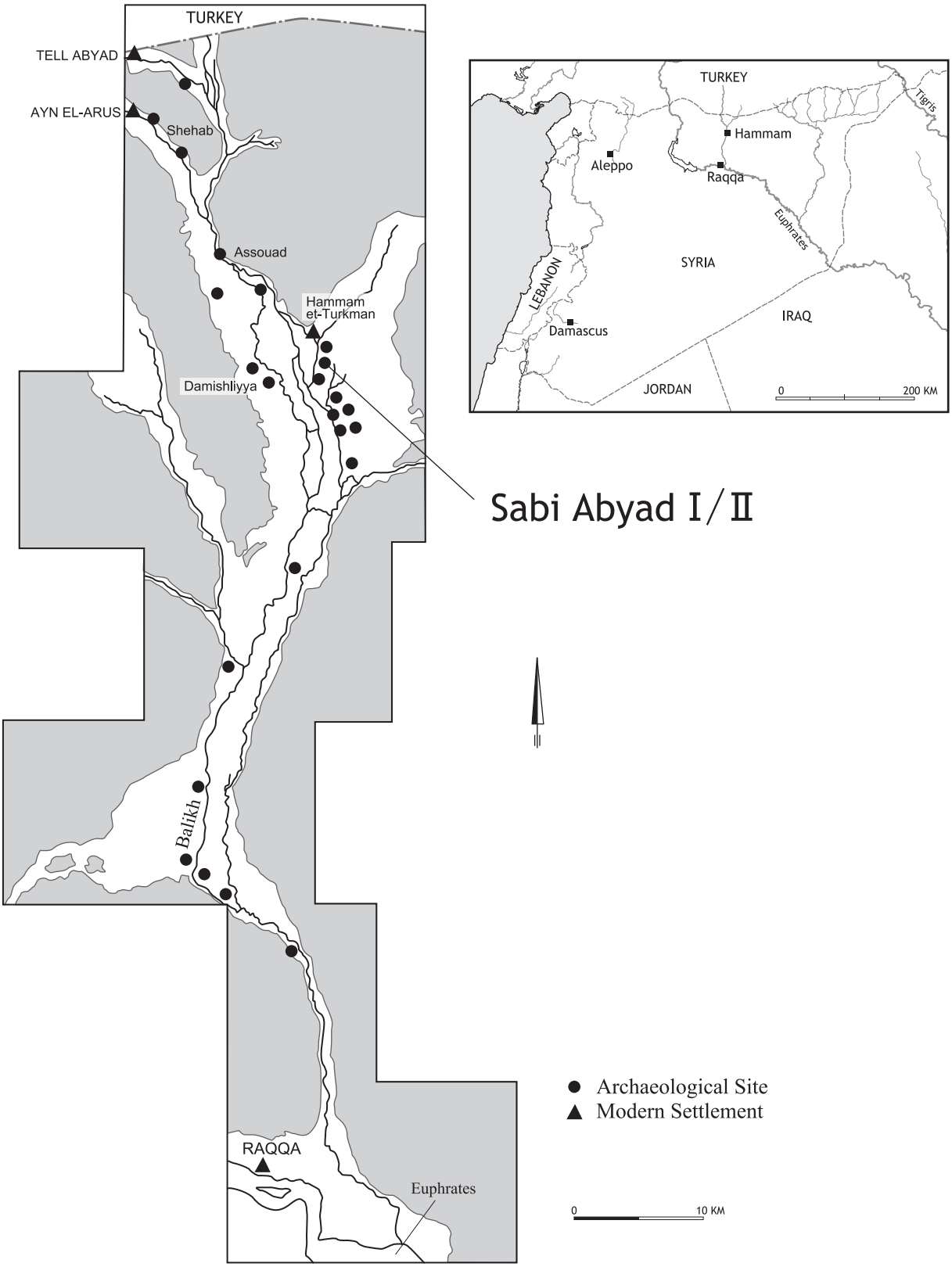


Fig. 4. *Neolithic sites along the Balikh River (Verhoeven and Akkermans 2000: Fig. 2.1).*

growing dependence in the region on a combination of agriculture and caprine herding. The Harran seems more likely as a source in view of its proximity, whereas there is a substantial stretch of semi-arid steppe that lacks sources of surface water between the Balikh and Euphrates. This land, well suited to seasonal grazing, corresponds with a "boundary" between the Euphrates and Balikh identified by Kozlowski and Aurenche (Kozlowski and Aurenche 2005: Fig. 0.13). Second, the concentration of small settlements is confined to the river valley and its tributaries, which are surrounded by steppe. Therefore, a rich, low gradient, alluvial valley for agriculture, and unlimited steppe for pasture made for ideal conditions in which to amass a large number of settlements within a circumscribed region. That none of the settlements grew to large size may have to do more with a pastoral emphasis and type of social organization, than on intrinsic quality of the land for agriculture. Nevertheless, current evidence may not be a good guide to the eighth millennium BC, because some sites may have been buried by alluvium. At Sabi Abyad I, the deepest levels were buried as much as four metres below modern field level (Verhoeven and Kranendonk 1996: 25), and around Sabi Abyad II about two meters have accumulated (Verhoeven 2000: 5). This blanket of deposition means that very small sites may be entirely buried, and it is all the more remarkable that so many Pre-Pottery Neolithic B sites have been discovered.

An important question about the Balikh is how it relates to the rich Harran agricultural plain. Unfortunately there were no archaeological surveys there before massive irrigation works were installed so that it may now be impossible to recover representative evidence. A critical issue is whether there were streams crossing the plain or whether it was largely a rich steppe suitable for hunting or grazing, but less desirable for early settlement or agriculture. According to Rosen (1997: 402), in the early Holocene there were "well-sustained, gently flowing streams with a perennial or semiperennial flow." This favorable environment, coupled with the finding of early Neolithic pottery at the hundred-hectare third millennium site of Kazane Höyük, as well as an obsidian bladelet in a Holocene terrace, indicate the possibility of extensive Neolithic settlements (Bernbeck *et al.* 1996).

Because of the size and potential of the Harran plain to support early agricultural settlements, one is justified in questioning whether the Balikh sites were part of a larger constellation of societies to the north, or whether they were independent. At the very least, because of the flat terrain, villages on both sides of the present border would have been mutually visible.

While this paper has focused on small agro-pastoral settlements, on the limestone hills surrounding Urfa there are a number of PPNB sites with

circular structures whose roofs were supported by massive T-shaped pillars, many of which are carved with images of wild animals. According to Schmidt (2006), Göbekli, the only excavated example, was a temple center serving a wide region (Curry 2008). This suggestion is reinforced by the fact that, unlike most Neolithic sites, Göbekli is atop a prominent peak in the Taurus foothills, distant from surface water, but overlooking a broad expanse of hills and plains (Schmidt 2000). The site was optimized for visibility and visual command over a huge stretch of land with abundant game and no doubt stands of wild cereals. Moreover, the site is composed of a series of pillared round buildings that seem to be individually identified with different species of wild animals (Peters and Schmidt 2004). This site and others with T-shaped pillars in the same region (e.g. Karahan Tepe: Çelik 2000a, b) are unique for the Pre-Pottery Neolithic A and Pre-Pottery Neolithic B.

If these sites were ceremonial centers one might envision a similar number of Neolithic societies surrounding them. What has not yet been determined, however, is the pattern of settlement around these sites. Do they stand in isolation or in the midst of "normal" settlements like those in the Balikh?

The enormous effort to build these sites is unprecedented and can scarcely have gone unnoticed in the Balikh if there were contemporary settlements there. However, it seems that Göbekli and other similar sites were abandoned about the same time as Sabi Abyad II was first settled, and only further research will help us understand whether there is a connection between these two events. If there is it may be as simple as the establishment of fully functional agriculture that replaced the hunting-gathering emphasis at Göbekli Tepe. Rosen's reconstructed environment with abundant rainfall and high water table seems well-suited to primitive agriculture (Rosen 1997). In such a case, as farming took hold and expanded, people moved from the foothills around Sanliurfa to the fields near Harran and thence to the upper Balikh whose little springs and river recapitulated the Harran environment. Whatever the source of the immigrants was, by the time the Balikh was settled, the use of pillared buildings had gone out of fashion.

Even without considering the Harran plain, Balikh presents us with a different geographic model of a society from that of Deh Luran. Unlike the Deh Luran situation with separated nodes along the mountain front, the Balikh has a series of settlements along the river without significant spatial gaps. Here the society was encompassed within a linear length of some 65 km, with the tightest cluster spread along 35 km. We should not forget, however, that a substantial population of attached herders may have occupied the adjacent steppe.

■The Khabur

The apparent late appearance and paucity of Neolithic sites in the Khabur is puzzling. If for every small Neolithic site there should be 5-10 more comprising a local society, why are there so few Aceramic or even early Pottery Neolithic sites? (Fig. 5). The first reported and possibly oldest Neolithic site is Fakhariyeh at the headwaters of the Khabur (Braidwood 1958). The enormous spring there, and further downstream at Seker al-Aheimar and Feyda (Hole 1991, 2001), the river must have been the principal attractions. If the situation had been like it was on the Balikh, there would be many such sites along the river but survey has failed to find them. Similarly, few Neolithic sites, whether Aceramic or Pottery Neolithic, have been found during surveys off the river (Hole 1994a, 1994b, 1995; Lyonnet 1996; Meijer 1986). As the example of Feyda shows, some sites are buried under flood deposits, but this would apply principally to those that happened to be affected by a river meander and/or lacked substantial architectural remains. An early ceramic Neolithic site K-260, known only from surface indications, sits in a most unpromising locale on the Jebel abd al-Aziz, perhaps a signal that resources of the mountain figured in the settlement system (Hole 2004).

According to Nishiaki's technological and stylistic analysis of the lithics, "The Khabur basin was also populated by groups with a localized cultural tradition, but they apparently kept closer ties with that of northern Iraq or north-eastern Mesopotamia than with the west in the late Neolithic period" (Nishiaki 2000: 91). This was also my impression when I considered the relationship between the lithic traditions of the Zagros, the Khabur and the Levant (Hole 1996), and it corresponds with Kozlowski and Aurenche's (2005) assessment as well.

Let us assume that the Khabur was settled only belatedly from the east, perhaps toward the end of the Pre-Pottery Neolithic B or even early Pottery Neolithic. Are there good reasons why this may have been the case? An explanation would have to account for the fact that the middle Euphrates has a long sequence from late Epi-Paleolithic; and the Balikh has Pre-Pottery Neolithic B as well as a continuous sequence of Pottery Neolithic phases; and the northern Jezirah of Iraq has substantial Pre-Pottery Neolithic sites, followed by Pottery Neolithic sites in apparent sequence. Why then, should the Khabur have only ephemeral traces of Aceramic periods, sparse early Pottery Neolithic, and finally good representation of later Pottery Neolithic? One might expect that the Khabur would have a set of sites during the Pre-Pottery Neolithic B similar to those of the Balikh, especially around the tributary streams that flow out of the headwater springs of the Khabur River or the major wadis that drain the Tur Abdin in Turkey above the plains of

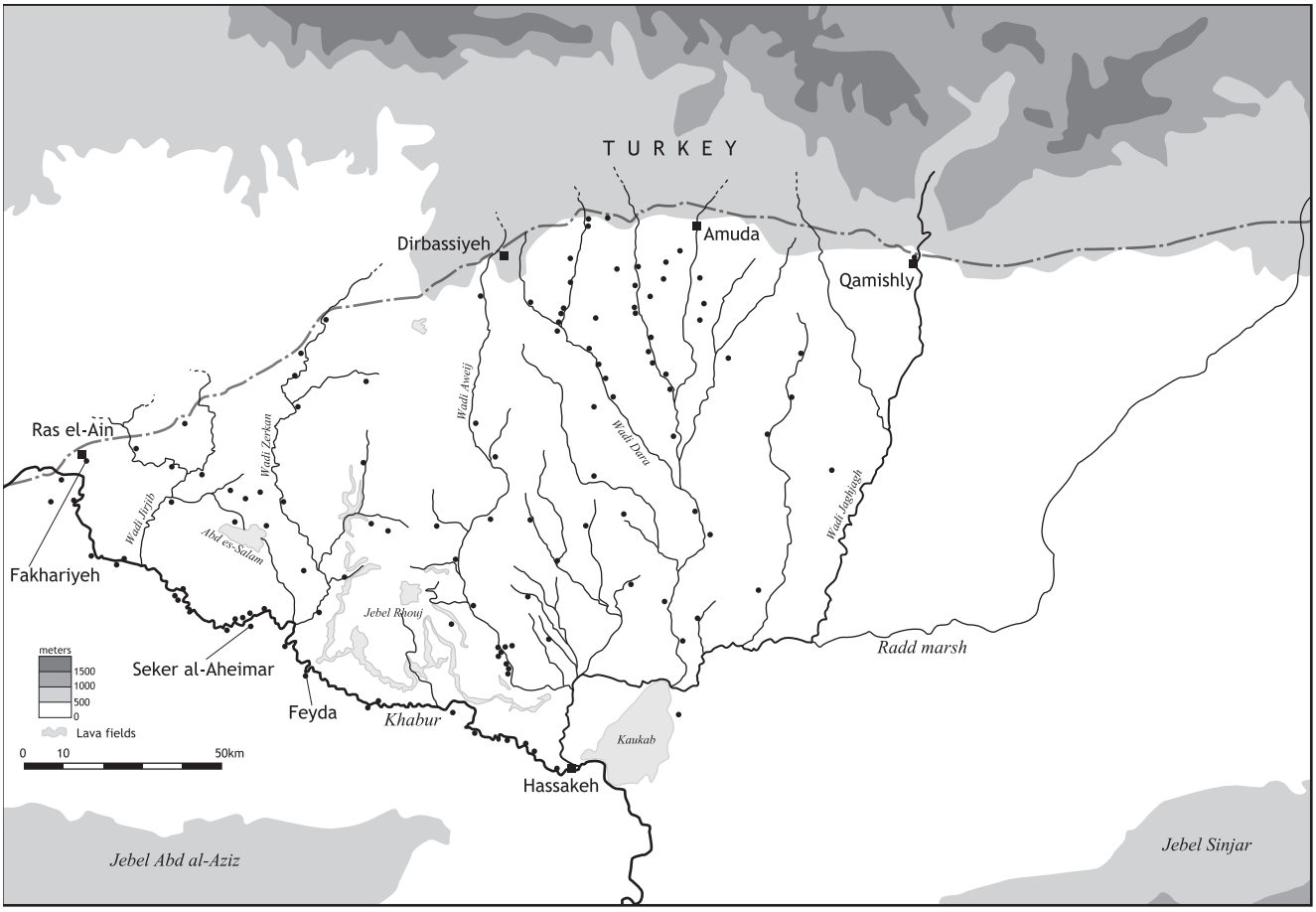


Fig. 5. *Location of the principal early Neolithic sites in the Khabur basin (Lyonnet 2000: Fig. 1).*

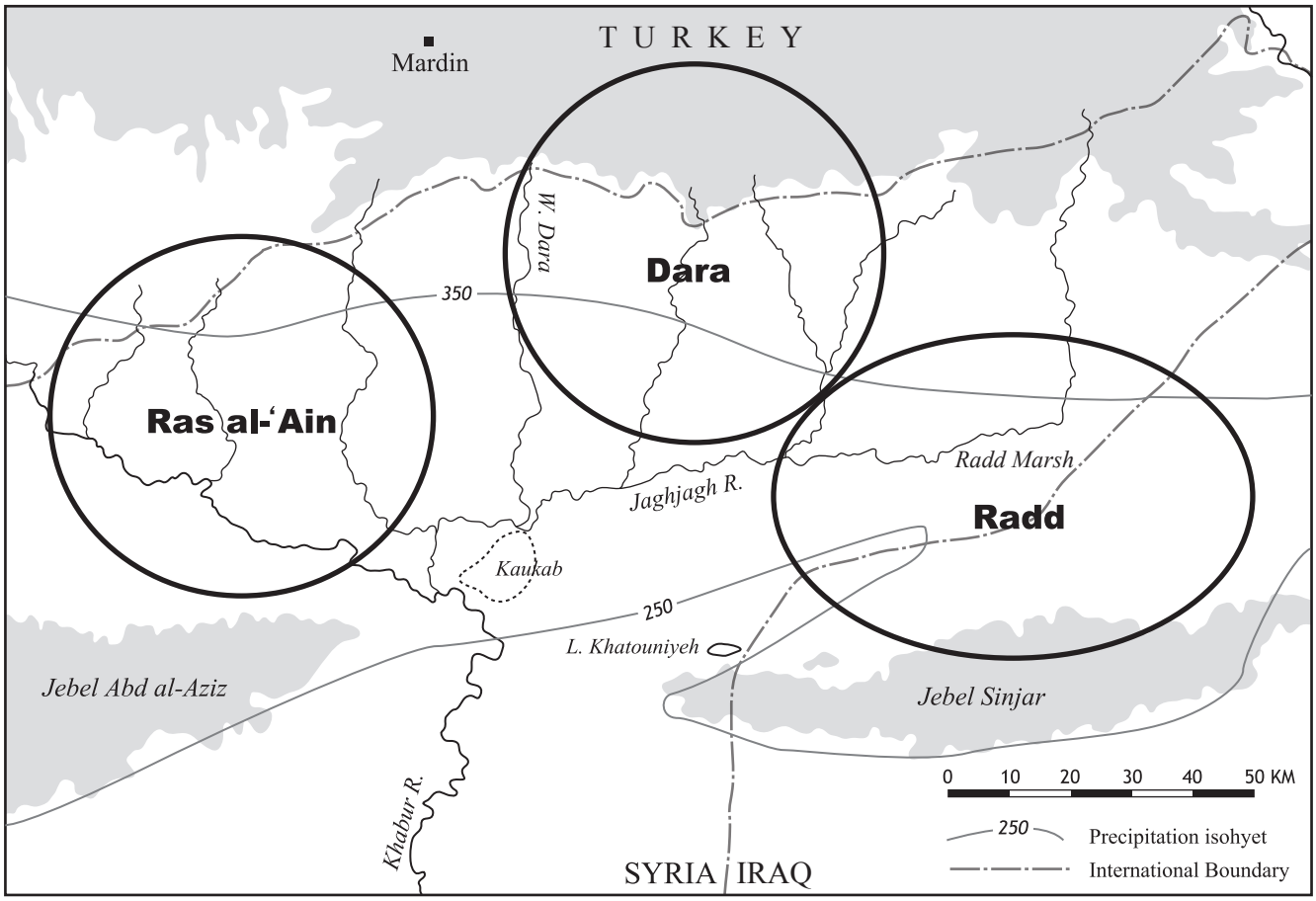


Fig. 6. *Suggested locations of Neolithic societies within the Khabur drainage, modeled as 30 km circles.*

the northeastern Khabur.

While the Khabur has not been as intensively surveyed as the Balikh, results do not suggest that a large number of Pre-Pottery Neolithic B sites will be found, although some 20 early Pottery Neolithic sites are known. It is well to consider that the Khabur, unlike the Balikh, is a broad agricultural plain. The headwaters of the Khabur River emanate from karstic springs that coalesce in the single river a few kilometers downstream. Eastward there are a series of wadis that drain the foothills of the Taurus at approximately the Turkish border. The map (Fig. 5) shows a dense network of these wadis in the center of the plain. While none of these is perennial today, historically some were and all are still subject to seasonal flooding. Recent studies of the fluvial geology indicate that there has been substantial deposition along these wadis, potentially burying small sites (Deckers and Riehl 2007). A limiting natural factor in the upper Khabur may have been that the well-drained soils in this region, while rich, support dense native vegetation that would have been more difficult to cultivate than the finer alluvial soils along the gently meandering Balikh.

Another potentially promising area in the Khabur is the Radd marsh where Harvey Weiss reports (personal communication) finding both Aceramic and Pottery Neolithic sites. The Radd drains many of the wadis in the eastern Khabur as well as some run-off from the Jebel Sinjar. It is possible that this seasonal playa lake or marsh would have provided aquatic resources, and arable land with a high water table suitable for agriculture. Similar wet settings were exploited in Deh Luran and Khuzistan, as well as Neolithic sites elsewhere (Sherratt 1980). In any case this region would have comprised a distant and probably different society from that along either the northern or western parts of the Khabur.

Despite the apparent potential of the Khabur for Aceramic Neolthic settlement, I see reason to doubt that it will be found. As compared with the Balikh, the Khabur is more remote from dynamic population centers, such as the Euphrates, Harran or the Iraqi Jezirah. Once settlements were established, it seems as if there was no major increase in sites until the Halaf period which, incidentally, is contemporary with population growth in Deh Luran. The upper central Khabur Basin is the location of the modern large towns Amuda and Qamishli, which lie along a major route into the mountains. These factors, coupled with rich agricultural potential, gave rise to the modern city of Qamishli/Nisibin which lies over a large Neolithic site. Apparently this favorable location has sustained settlement for millennia.

I see the developments in the Balikh and Khabur valleys as being somewhat different although the economies, based on mixed farming and herding may have been similar. While settlement on the Balikh was essentially linear along the river and its tributary wadis, that of the Khabur was more extensive because of the broader distribution of surface water. Based on inferred potential, at least three distinct societies may have emerged (Fig. 6). While these could have formed during the Aceramic Neolithic, there is insufficient evidence to support such an hypothesis. Rather, it is probable that it was only in the Pottery Neolithic that there were sufficient numbers of settlements to sustain viable, distinct societies. One was based on the headwaters of the Khabur and included Seker and Feyda, with K-260 a possible seasonal component of this early society. A second society, so far undiscovered, would have emerged in the central northern sector along the Turkish border in the vicinity of Amouda (the Dara society). A third society would be found around the Radd Marsh. Each of these regions has a different mix of potential resources that would allow for regional adaptations and interactions. Such a geographic subdivision is also suggested by stylistic variability in Chalcolithic and Bronze Age ceramics. It may not be a surprise then that this postulated distribution of Neolithic societies parallels the recent Christian, Kurdish, and Arab settlements, each of which has its own adaptation to agriculture and herding.

■Conclusions

By reviewing Neolithic settlement in three regions of the Near East I have identified three different spatial arrangements of what I have termed Neolithic societies. Each society was composed of many separate settlements and perhaps pastoral camps, collectively holding some hundreds of people who were in face to face interaction and thought of themselves as a coherent social entity. The spatial extent of any society consisted of the settlements and their surroundings as well as distant resources and interactions with other societies. While people in all the societies probably lived in similar ways farming, herding, collecting and hunting, owing to unique geographic factors, they were expressed in different settlement patterns. The Deh Luran case is one of separated nodes formed at small alluvial plains along the front of the Zagros Mountains. Movements and interaction would have occurred in a north-south direction, with seasonal forays into the mountain pastures. The lack of evidence for substantial clustering of sites at each node may result from burial of sites, although demonstrated interrelations among sites along this front suggest a more open than a closed system. In the case of the Balikh, there is also a linear distribution, but of sites along the river and its tributaries. Here, within a short distance, there are enough sites to comprise a viable society with potential interactions to similar clusters on the Harran

plain and to the south at the Euphrates River. The Khabur case, with its much broader arable land surface could easily hold at least three societies, each of which could exploit resources outside its immediate territory.

A second conclusion from this review is that there were significant differences in the timing of Neolithic settlement in each region. I see this as related primarily to history. That is, the first agrarian communities gradually spread into favorable contiguous regions, a process that took variable lengths of time and no doubt involved indigenous hunter-gatherers who might have welcomed or impeded the introduction of agriculturalists. Both Deh Luran and the Khabur were settled relatively late, perhaps because of their remote location from the sources of agricultural innovation. The reasons why neither region experienced the kind of dynamic developments that occurred during the Pre-Pottery Neolithic B in the Levant cannot be determined with available evidence.

This review has pointed up some problems that must be overcome if we are to truly understand the nature of Neolithic societies. First and foremost, regions must be more intensively surveyed. Even when, as in the Balikh, surveys have been intensive and backed up by good stratigraphic excavations, there remain questions about how the geomorphic changes have affected the visibility, or even the existence, of sites. A similar situation exists for Deh Luran where we have discovered essentially all sites that are exposed at the surface, but we know nothing about what lies under some four meters of alleviation. Surveys for Neolithic sites in the Khabur have barely scratched the surface and I hope this paper will stimulate further work, especially in the areas where I postulate the existence of Neolithic societies. Finally, we need more radiocarbon dates on well-excavated strata and sites in critical locales to enable determination of contemporaneous occupations and the sequence of developments among sites and between regions.

We have a long way to go before we understand the way societies advanced across the Near East, adapting to new circumstances of local environments, as well as to episodic climatic or other environmental changes. The different histories and developmental trajectories experienced in each region can only be understood when we take into account the both the environmental potential and the wider sustaining and cultural areas. I have focused in this paper on the interactions between landscapes and human economic adaptations. Clearly, however, "man did not live by bread alone" and food is seldom the main topic of conversation in any society. Rather there is a world populated by people, spirits, gods, and a host of life forms in a landscape that cycles through daily and seasonal changes. How the people apprehended such matters undoubtedly influenced their lives on the land, but I remain

convinced, like Braidwood, that the ways food was acquired provided the starting point for any subsequent social and cultural developments.

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CHAPTER 3

Geological and geomorphological features of the upper drainage areas of the Euphrates and Tigris

Hakan Yigitbasioglu

■Introduction

In this brief paper a general outline of the geological and geomorphological context of Neolithic sites in Southeastern Anatolia is provided. Attention is paid to: geology, volcanism, paleoclimate, and the setting of Neolithic sites.

■Geology

The upper drainage systems of the Euphrates and Tigris Rivers developed in the complex geological and geomorphological structure of Eastern Anatolia. During the Lower Pliocene (3.4-1.6 million years ago) the tectonic Africa Plate was slowly moving to the north, and the landscape was marked by large lakes. In the Middle Miocene (15.9-11.6 million years ago) the Arabian Peninsula collided with a part of the African Plate. This collision was the beginning of a new era: the Neotectonic. Now, Anatolia's landscape changed totally. Due to tectonical compression and uplift, Eastern Anatolia was turned into a very mountainous region, marked by intramontane basins and faults. Important faults are the North Anatolia Fault (NAF), and the East Anatolia Fault (EAF). Both faults still have a very high earthquake potential. In the Southeast, however, Anatolia was marked by plains. The clash of the African and Eurasian continents caused a contraction of the Tethys Sea, resulting in a depletion of atmospheric moisture (Bozkurt 2001). Thus, rainfall was significantly reduced.

■Volcanism

Volcanism started in the middle Miocene, and continued up to the Middle Ages. Many high volcanic mountains can still be found in Anatolia, e.g. Agri Dağı/Ararat (with 5,137 m the highest mountain of Turkey), Tendurek (3542 m), Suphan Dağı (4,058 m) and Nemrut Dağı (3,050 m). The obsidian flows of these and other volcanoes were intensively exploited by Neolithic people (Fig. 1). The obsidian from northeastern Anatolia was part in both local and regional exchange networks, having been transported as far away as the southern Levant and the Persian Gulf.

■Paleoclimate

Just after the Last Glacial Maximum (LGM), approximately 20,000 years ago, climatic conditions in the Near East were still quite unfavourable, and characterized by an arboreal vegetation. Summers were short and cold, and rainfall was insufficient to support rich vegetation. It seems that the Anatolian Plateau, however, remained inhabited. During the Bölling-Alleröd phase (12,000–11,000 cal BC) thermic and luviometric conditions improved.

A severe deterioration set in during the Younger Dryas (11,000–10,000 cal BC); the climate became arid and cold, even more so than it had been during the LGM. In the Near East, the Younger Dryas (at the end of the Epi-Paleolithic period) was characterized by a general decline in the cultural development and by a return to mobility. After the Younger Dryas, in the Early Holocene, humidity and heat again increased. Oak forests were re-established, first in the western Taurus Mountains, later extending to the east and south (oak needs summer rains and an average minimum amount of precipitation of 600 mm/yr). In the most ecologically most favourable regions (e.g. the Euphrates and Tigris valleys) permanent settlements were now established. From 8000 cal BC onwards mild winters and humid summers, resulting in a temperate/warm arboreal vegetation characterized the Near East. This was a phase of a Climatic Optimum which lasted for nearly 3000 years, with short fluctuations around 7200 cal BC (Gérard and Thissen 2002).

Fig. 1. *Obsidian flow at Nemrut Daǧ.*

■The Euphrates and the Tigris

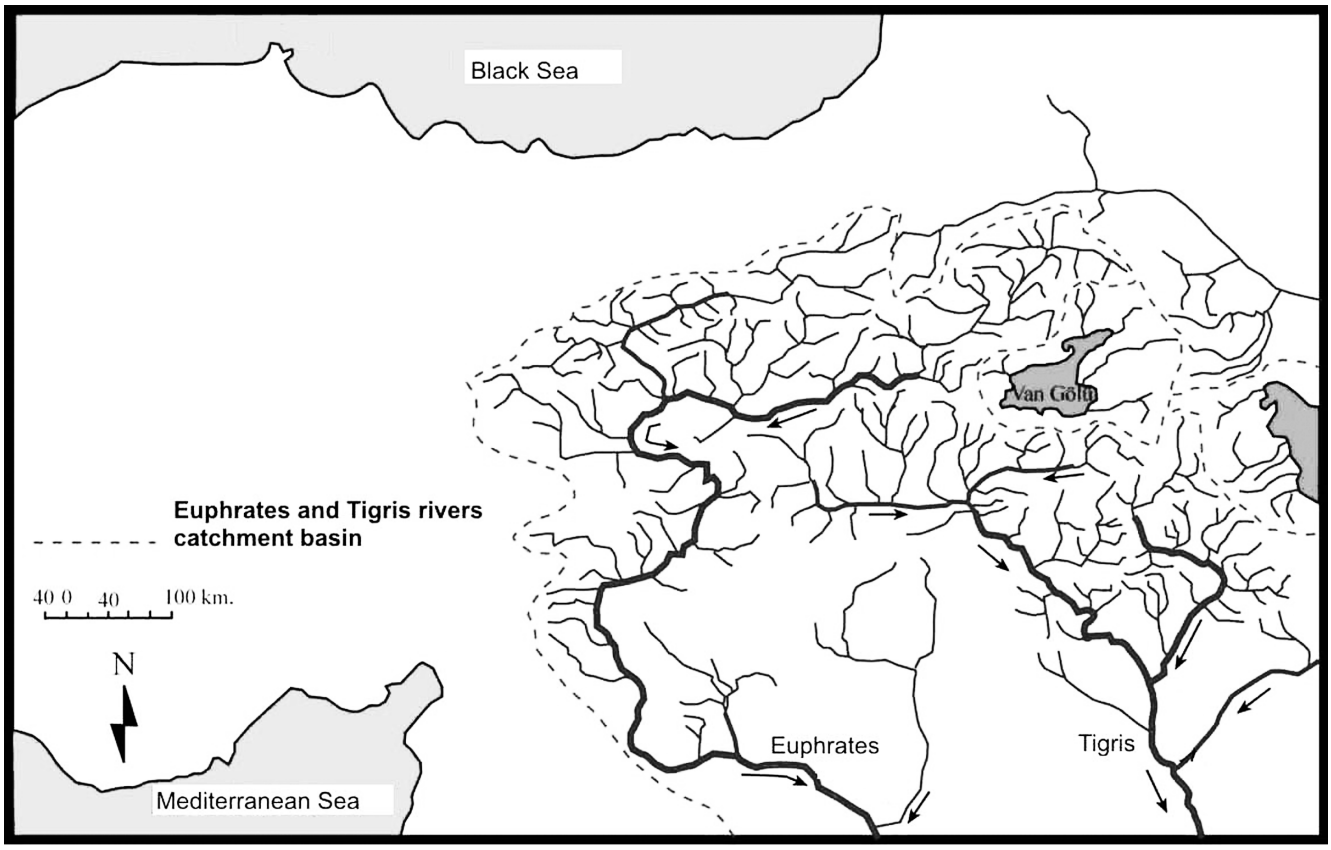
The Euphrates originates in the high plateaus of East Anatolia (ca. 94% of the river's water originates in this area). Its catchment area in Anatolia is approximately 101,000 km^2. The river is 2,700 km long and drains an area of 444,000 km^2 (Fig. 2). The Karasu, the Murat, and several other Turkish rivers join near Elazıg, in eastern Turkey, to form the upper Euphrates. The maximum discharge of Euphrates is 5,374 m^3/sec and minimum discharge is 113 m^3/sec. The river flows through steep canyons and gorges in its upper drainage area. This is the reason why big dams are built in the Anatolian Euphrates.

The Euphrates (and the Tigris) receives winter rains, which combine with spring snow-melt to produce maximum river discharge in April and May. The winter crop is planted when the rivers are at their lowest levels. The rivers rise towards harvest time. Thus, it seems that simple floodwater farming involving use of residual soil moisture had been part of Neolithic agriculture in the Near East from the very beginning (Roberts 2002: 173).

The Euphrates was meandering through large plains at the beginning of the Pleistocene, when these large plains had developed under humid-warm conditions. However, during the Late Pleistocene the Euphrates cut itself into these plains and bed rock. Thus, deep gorges occurred which some gorges used building for dams. Today, there are four Euphrates terraces. The oldest terraces (T1 and T2) are situated respectively 100-80 and 70-50 meters above the present river level. T1 is especially large near Samsat, and traces of Upper Paleolithic occupation have been found here. The younger terraces T3 and T4 terraces are situated respectively 30-25 and 15-10 m above the river. In this period Euphrates deep gorges were shaped. On T3 and T4 many Neolithic settlements have been located.

The Tigris also originates from in the high plateaus, more in particular it stems from Hazar lake. The catchment basin of the river is 38,280 km^2. The average discharge is 629 m^3/sec. The Upper Tigris valley has been intensively inhabited since the Neolithic period. One reason for this may be that the Upper Tigris valley is a natural passageway between Anatolia - with its rich natural resources (e.g. obsidian) - and Mesopotamia (including Eastern Syria), with its limited resources.

The 4-5 m high terrace of the Upper Tigris valley was formed as a result of three cycles. The first one resulted in the formation of Late Pleistocene-Early Holocene channel and floodplain materials composed of coarse gravel and sandy silt layers. At ca. 6000-5500 BC Late Neolithic settlements



were founded on this floodplain. The second cycle occurred during the Early Chalcolithic (5500-4000 BC), and Early Bronze Age (4000-2650 BC), as indicated by archaeological sites of these periods. The third and final cycle is represented by 1-2 m thick yellowish-orange flood deposits which can be dated to the end of Early Bronze Age (2800-2650 BC). Floods which took place in this last cycle eroded earlier occupation mounds (Dogan, 2004).

Fig. 2. *Catchment areas of the Euphrates and Tigris.*

■Neolithic sites

An especially well-known Neolithic site in the Tigris region is Çayönü (e.g. Özdoğan, 1999). This site is located on the north bank of a small tributary (Boğazcay) of the Upper Tigris. More in general, the site is situated in the Ergani Plain, which is part of the foothills of the Taurus Mountains. This area is part of the northern arc of the so-called Fertile Crescent.

Çayönü was occupied from approximately 7250 BC to 6750 BC, i.e. throughout the Pre-Pottery Neolithic B period. At the time of habitation, the site was surrounded by steppic forests of oak and pistachio trees. A small stream and a low eroded limestone ridge separate Çayönü from the neighbouring village of Hilar. This perennial stream, a tributary of the upper Tigris, drains the small plain of Ergani, and it would have been an important water and fishing source for the inhabitants of Çayönü.

Çayönü and other aceramic sites (e.g. Aşıklı Höyük, Nevalı Çori) provide evidence for extensive use of wood, as indicated by burnt fragments of wooden construction material (posts, roof poles, ladders, furniture, etc) (Kuniholm 1997).

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CHAPTER 4

Fluvial surfaces along the Khabur River near Tell Seker al-Aheimar and their palaeoenvironmental implications

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Takuya Watanuki
Chiaki T. Oguchi
Junko Komatsubara
Yuichi Hayakawa and
Manoj K. Jaiswal

■Introduction

Tell Seker al-Aheimar in northeast Syria is an archaeological site along the Khabur River, a major tributary of the Euphrates River. The site is located about 25 km southeast of the Syrian/Turkish border (Fig. 1), adjacent to one of the distinct meander bends of the Khabur River (Fig. 2). In general, the landscape around the tell is flat and can be regarded as an alluvial plain formed by the Khabur River. This landscape can be divided into a series of fluvial surfaces.

Tell Seker al-Aheimar is located in a semi-arid environment with a mean annual precipitation of about 300 mm (Evans and Greeken 2004) and a mean annual temperature of about 18°C (Kattan 2001). The area around the tell is underlain by Quaternary alluvial and lacustrine deposits mainly from Cretaceous to Pliocene limestone and marl bedrocks (Kattan 2001). Small-scale fissure eruptions in the Quaternary also account for the exposure of basaltic rocks to the east of the tell (Fig. 1).

In this paper, fluvial landforms around Tell Seker al-Aheimar are classified on the basis of geomorphological and sedimentological surveys, and the palaeoenvironment responsible for their formation is discussed.

■Classification of fluvial landforms

In order to understand the basic structure of fluvial landforms in the study area, ten topographic cross sections perpendicular to the course of the Khabur River near the tell were constructed, using a hand level and a measuring tape. One section (L5) goes through the tell; four sections (L1 to L4) are located upstream of the tell; and five sections (L6 to L10) are located downstream of it (Fig. 3). Some section lines are not straight due to inaccessibility of private lands and buildings. The topographic sections are depicted in Figs. 4 and 5. As the origin of the graphs corresponds to the central point of the river bed, the graphs illustrate the relative height from the river bed. As illustrated in Fig. 5, three geomorphological levels, characterized by the frequent occurrence of relatively flat surfaces, can be detected at heights of respectively (1) ca. 2-3 m; (2) ca. 4-5 m; (3) ca. 9 m above the river bed. The lowest level can be regarded as a floodplain, as its surface still may be inundated. The other two levels represent river terraces. Minor surface undulations reflect their non-cyclic formation processes, as well as the effects of soil erosion after terrace formation. The formation processes are indicated by the occurrence of palaeomeander channels near the tell, showing the northward migration of the meander bend of the Khabur River to the northeast of the tell (Fig. 2). The floodplain and terraces

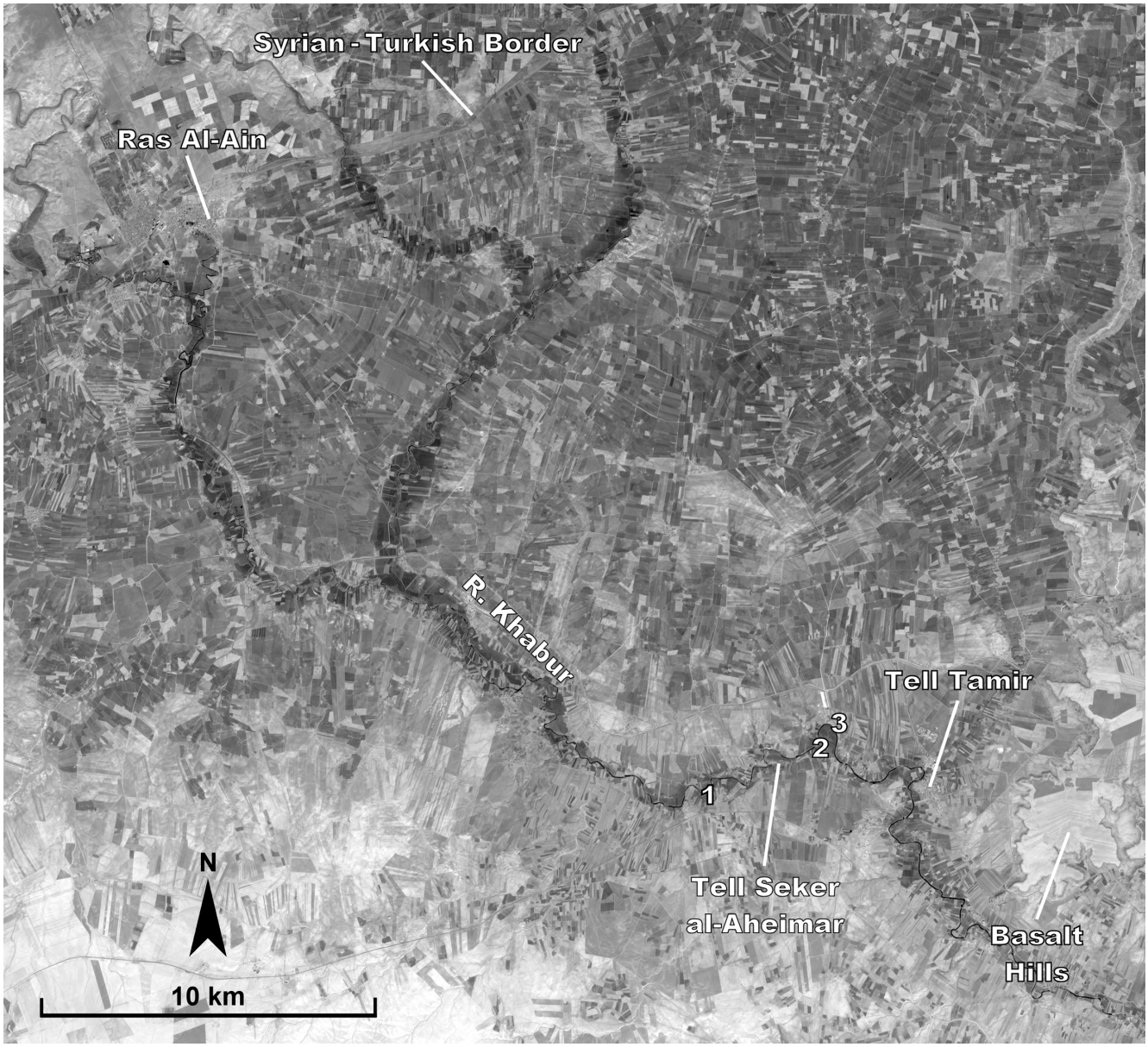


Fig. 1. *Aster satellite image showing the Khabur River and the location of Tell Seker al-Aheimar.*
1-3: Location numbers (see text).

can be widely observed in the field (Figs. 6 and 7). Higher terrace surfaces, ca. 15 m above the river bed, also occur (Fig. 8), although they have a limited distribution.

From the above observations, river terraces in the study area can be divided into three levels: High (relative height of ca. 15 m), Middle (9 m) and Low (4-5 m). The Low terraces commonly occur along the Khabur River, and their width perpendicular to the river is usually a few hundred meters. The Middle terraces occupy a much larger area (usually more than 500 m in width), although parts of their surfaces have been lowered by few metres due to soil erosion.

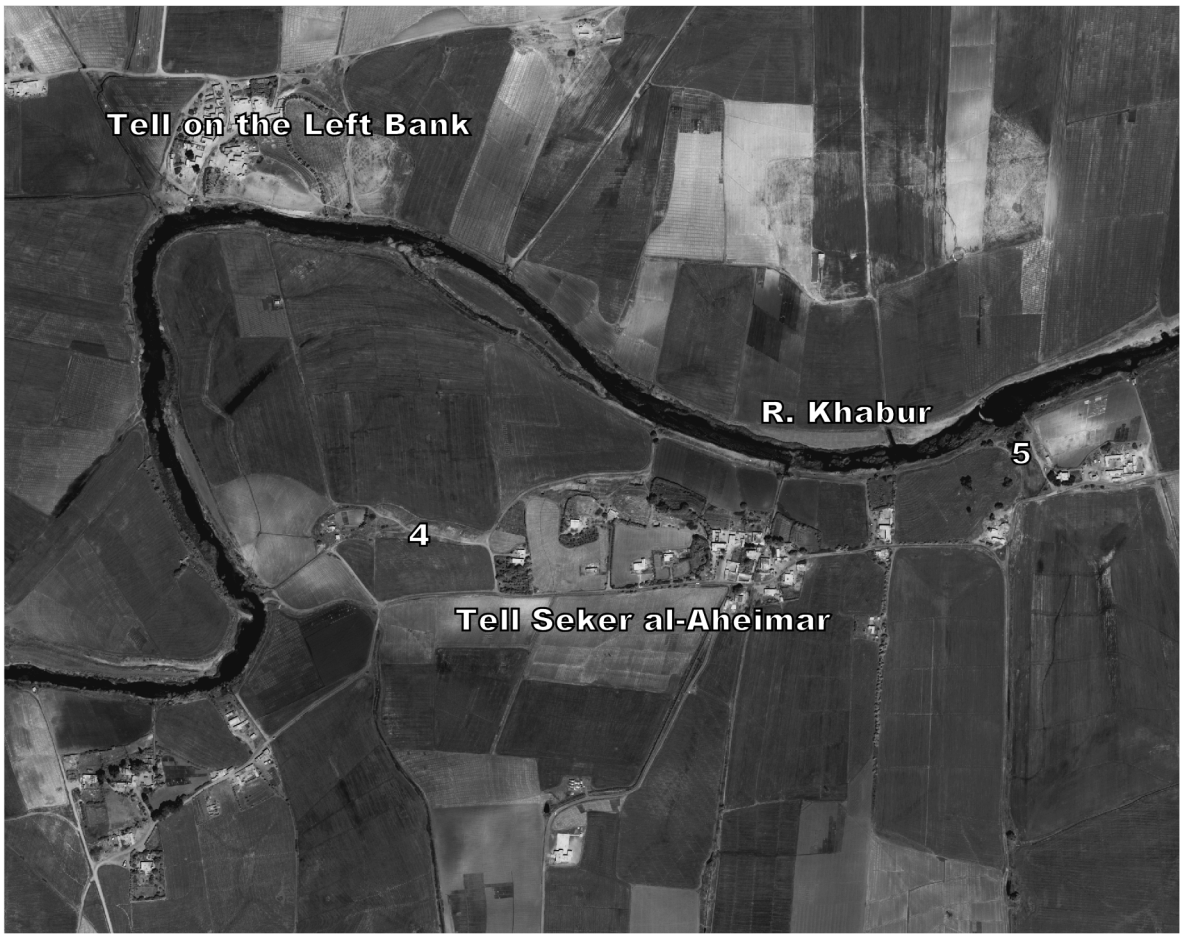


Fig. 2

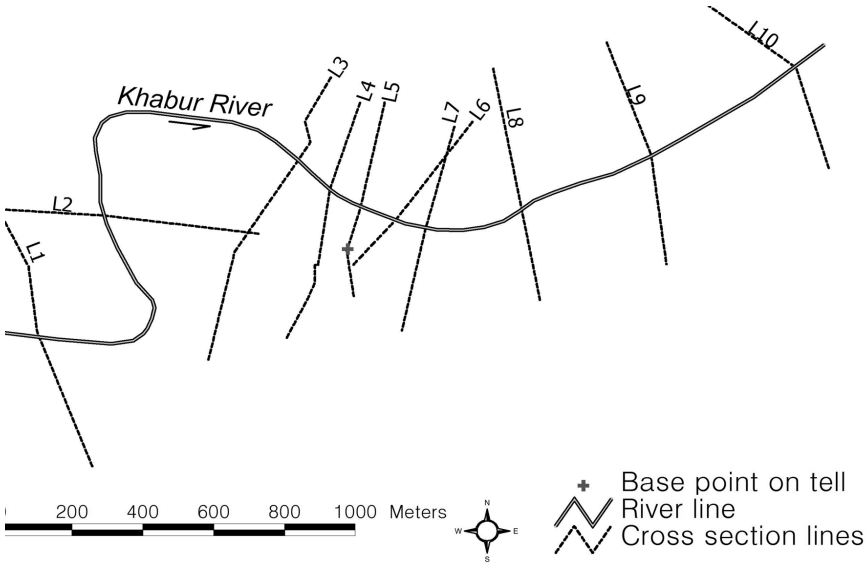


Fig. 3

Fig. 2. *Quickbird satellite image showing the area around Tell Seker al-Aheimar. 4-5: Location numbers (see text).*
Fig. 3. *Location of ten topographic sections.*

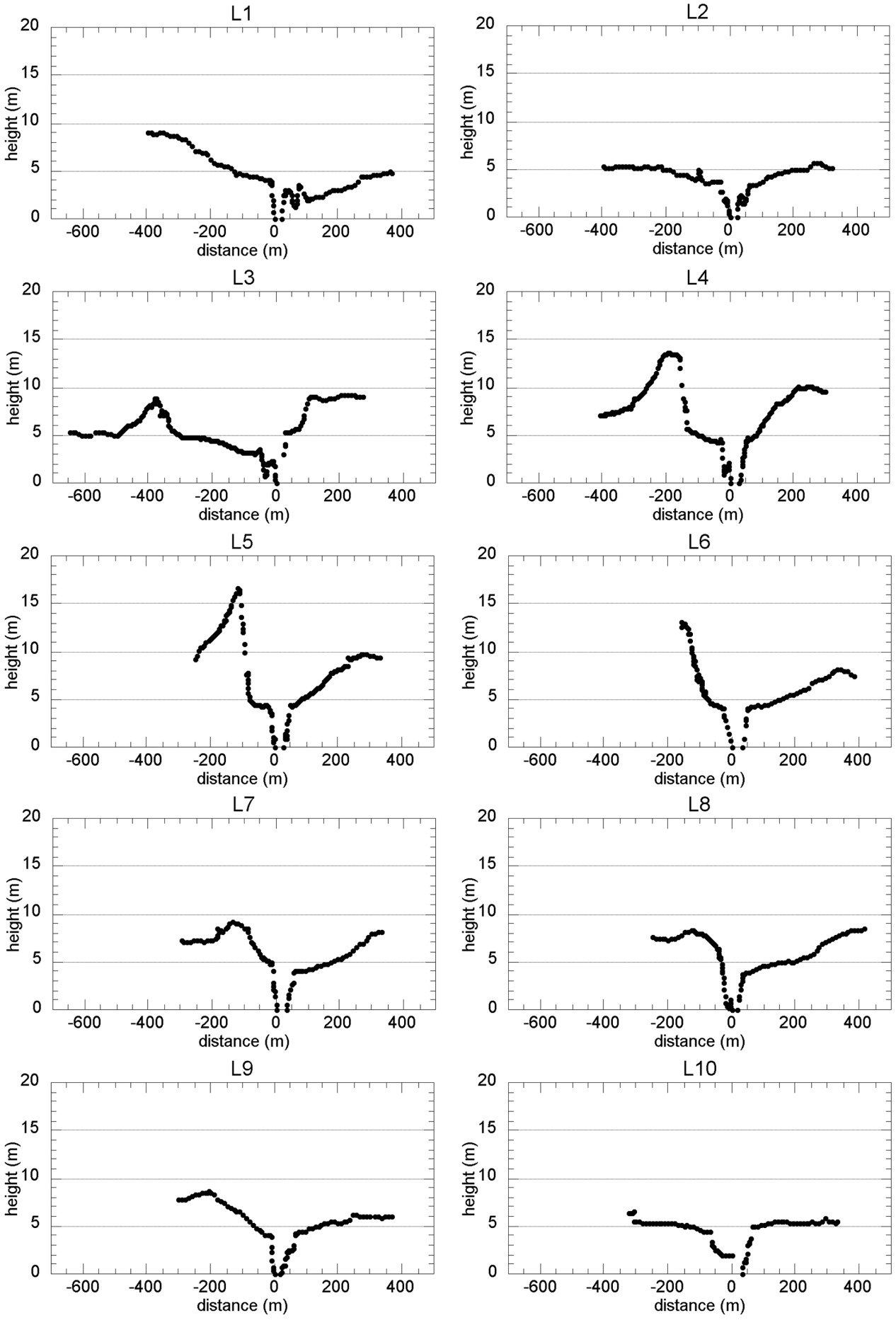


Fig. 4. *Topographic cross sections.*
Viewed from downstream. The origin is the central point of the river bed.

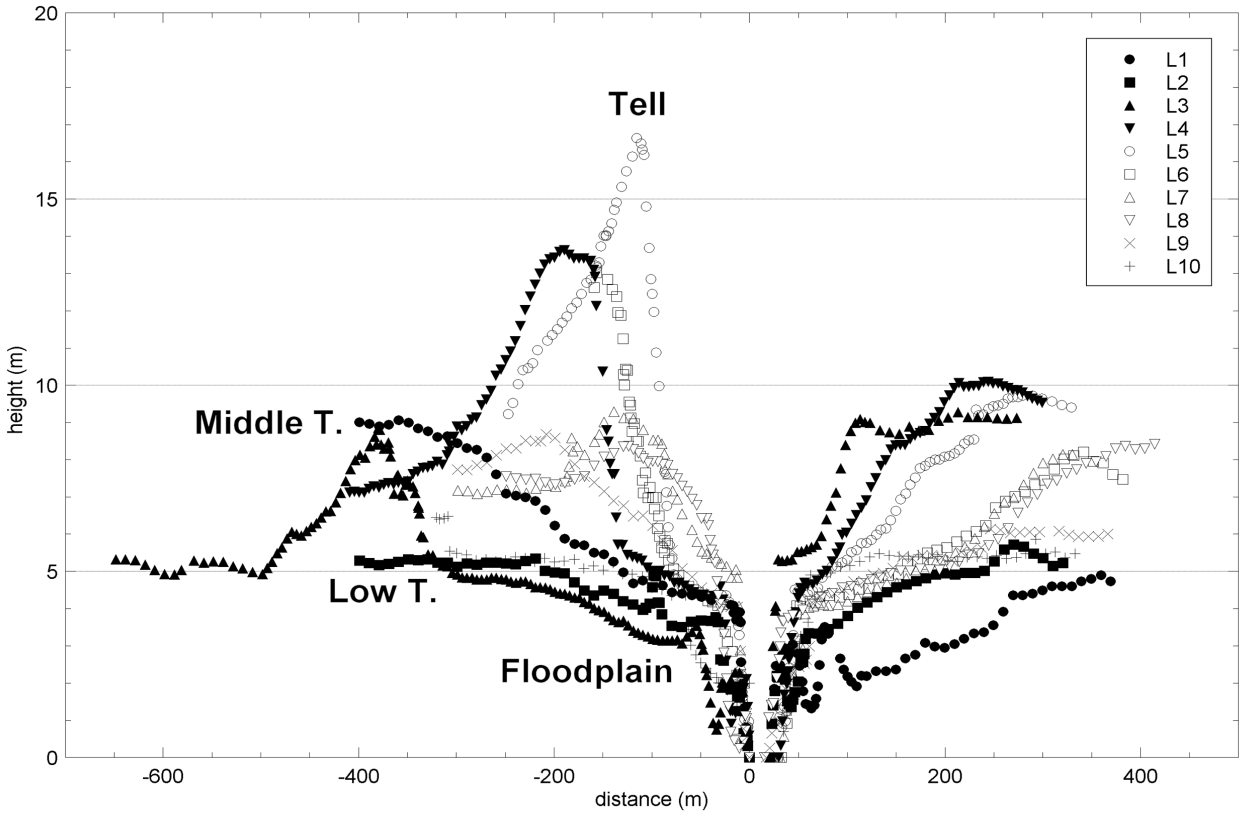


Fig. 5

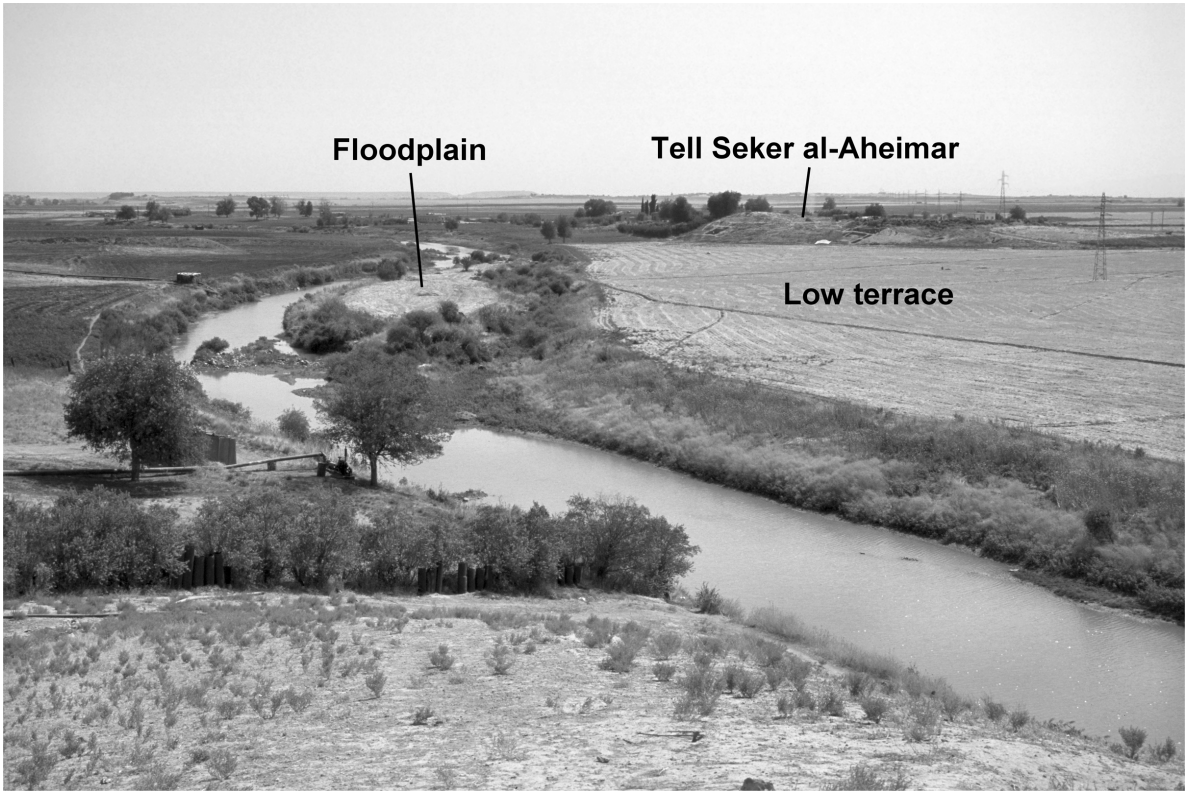


Fig. 6

Fig. 5. *Composite diagram of topographic cross sections. Viewed from downstream. The origin is the central point of the river bed.*
Fig. 6. *Floodplain and Low terrace near Tell Seker al-Aheimar. Viewed from another tell on the left bank (see Fig. 2 for location).*

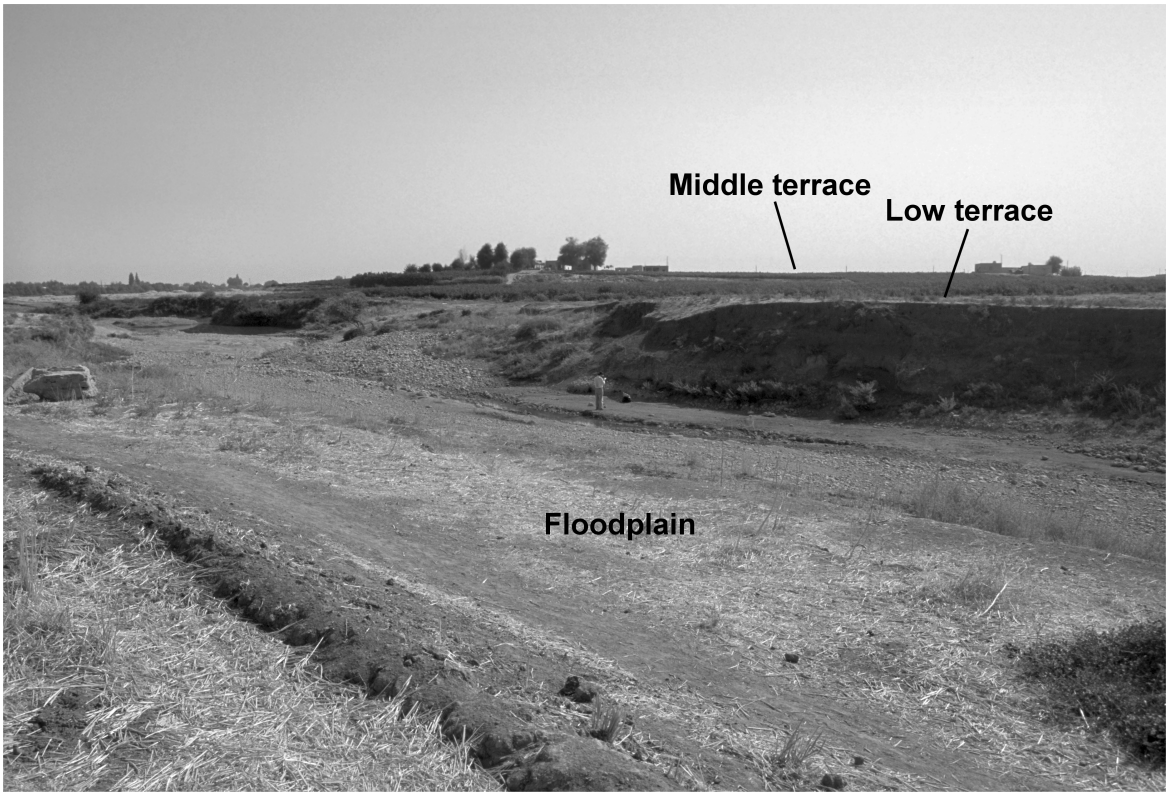


Fig. 7

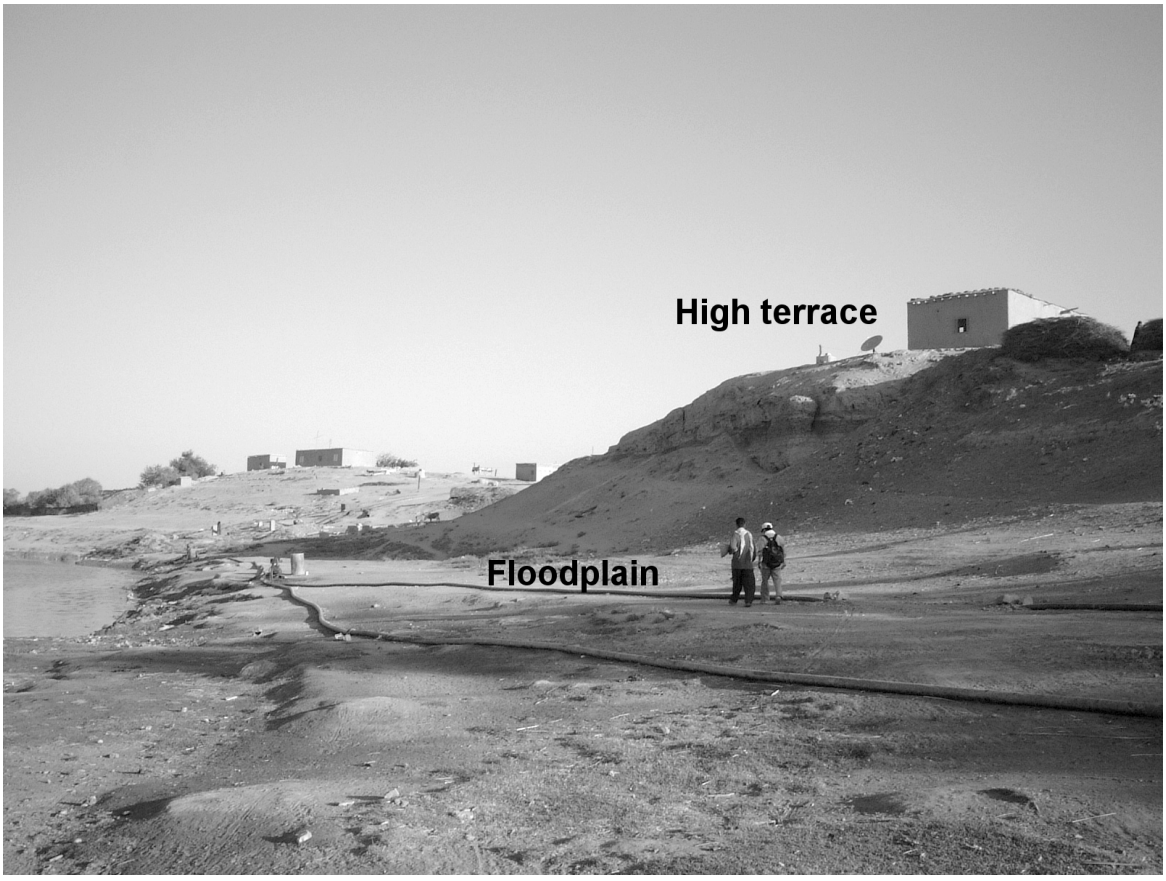


Fig. 8

Fig. 7. *Middle terrace, Low terrace and floodplain at ca. 2 km upstream from the tell (Loc. 1). See Fig. 1 for location.*
Fig. 8. *High terrace and floodplain at ca. 2 km upstream from the tell (Loc. 3). See Fig. 1 for location.*

Fig. 9

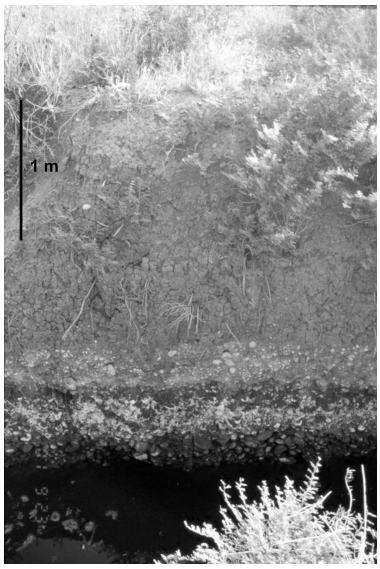


Fig. 10

Fig. 11

Fig. 9. *Outcrop of deposits of Low terrace at Loc. 1.*
See Fig. 1 for location.
Fig. 10. *Floodplain deposits exposed along an artificial trench at Loc. 2.*
See Fig. 1 for location.
Fig. 11. *Interior of an oncoid exposed on the river bed.*
The particle consists of a small core (flint), surrounded by concentric calcite layers.
Fig. 12. *XRD charts of coating layers of an oncoid.*
C: calcite, G: gypsum. Samples were taken from inner, middle and outer layers.

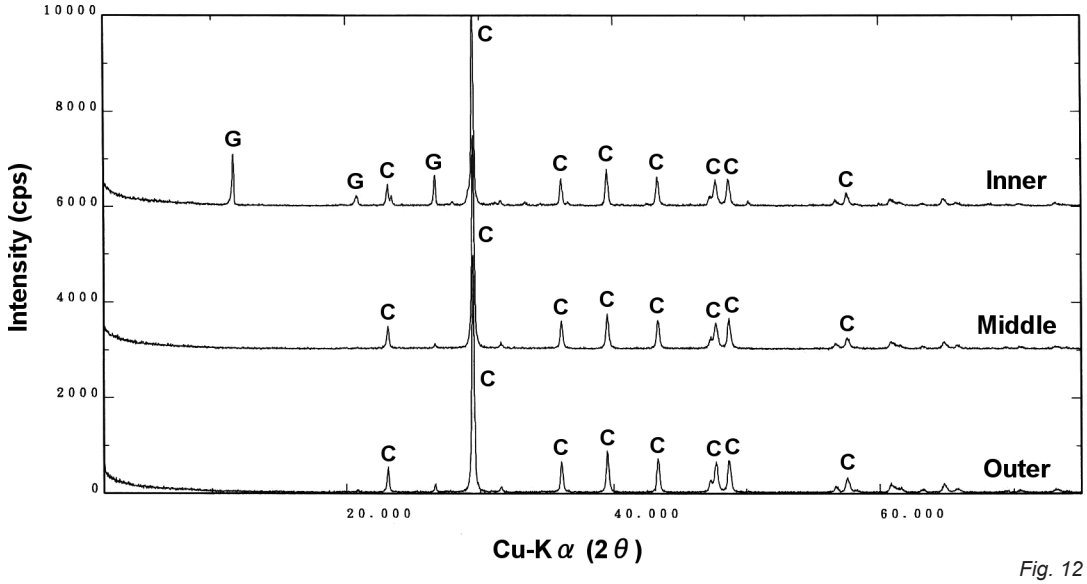


Fig. 12

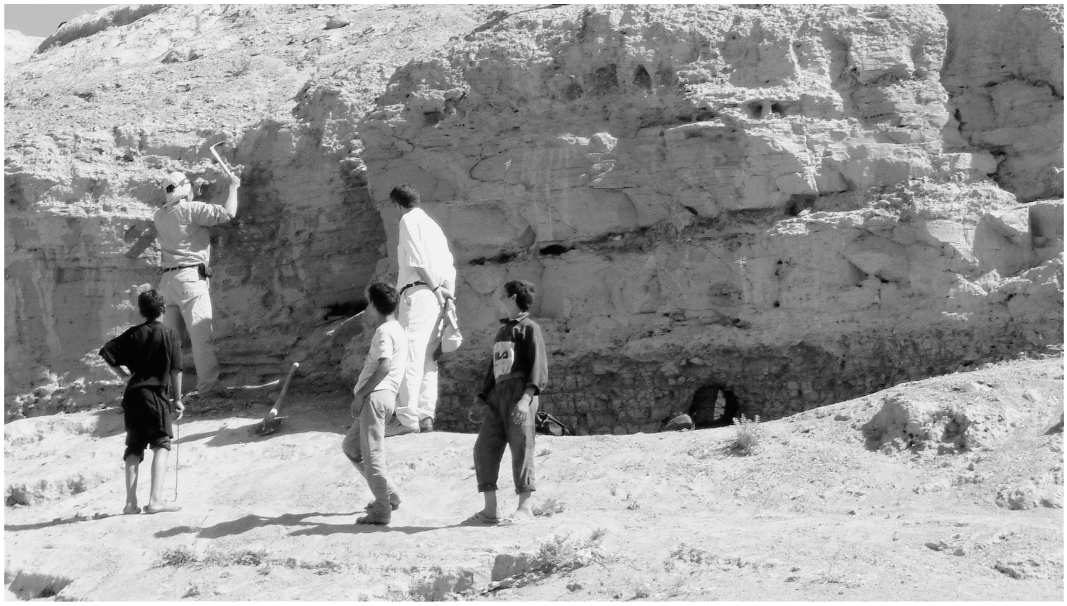
■Fluvial deposits

The deposits that form the fluvial landforms in the study area were investigated in the field. Fig. 9 shows deposits exposed on the scarp of the Low terrace about 2 km upstream from the tell (Loc. 1; Fig. 1). The uppermost 1.5 m of the deposit consists of non-bedded or weakly-bedded fine material, which can be regarded as flood loam. Below the uppermost layer we observed more bedded deposits with a thickness of ca. 1.5 m and gravel of ca. 5 cm in diameter. These deposits are further underlain by bedded layers of coarser gravel with diameters of ca. 10-20 cm. An artificial trench cut into a floodplain about 1 km downstream from the tell (Loc. 2; Fig. 1) revealed a similar stratigraphic sequence (Fig. 10). Although we did not find a good outcrop of deposits of the Middle terraces, observations at several wells excavated from the terrace surfaces indicate that these deposits are similar to those of the Low terraces and the floodplains.

The observed deposits appear similar to those shown in sedimentological models of fluvial deposition by a meandering river (e.g. Fraser 1989) in that lower, relatively coarse and bedded lateral accretion deposits are overlain by upper, finer flood loam with less distinct bedding. However, the observed gravel size, typically 5 to 20 cm, is too large for low-gradient meandering rivers like the Khabur. Therefore, we investigated the gravels in these deposits as well as those exposed on the modern river bed in detail.

Although the gravel appear to be rounded particles of limestone, their interiors show that most of them consist of several concentric layers which developed around a core, such as a piece of flint or a shell (Fig. 11). XRD (X-ray diffraction) analysis of the coatings of one of the gravel particles indicated that they mainly consist of calcite although the outer coating includes gypsum (Fig. 12). Therefore, the gravel particles are so-called oncoids, a type of tufa formed in a shallow-water environment due to the alteration of wetting and drying (Pedley *et al.* 1996; Carthew *et al.* 2006). The occurrence of gypsum in the outer coating indicates that the oncoids in the study area formed in the past because at the final stage of their formation, slower development of calcite coating permitted inclusion of precipitated gypsum. The core materials of the oncoids are small and were originally transported by the river. Therefore, the original deposits of the Middle terraces and lower surfaces are regarded as typical deposits of a meandering low-energy river.

The deposits of the High terraces differ significantly from those of the lower surfaces. An outcrop of the deposits at ca. 2 km northeast of the tell (Loc. 3; Fig. 1) shows that they consist of well-bedded thick sandy sediment without



typical reddish flood loam and oncoids (Fig. 13). The facies of the deposits are analogous to those of sandy braided rivers (e.g. Bristow 1993). The entire thickness of the sandy deposit is unknown but observations at Location. 3 suggest that it is more than eight meters thick.

■Chronology of fluvial surfaces

Eight sediment samples were collected from fluvial deposits in order to estimate their ages, using optically stimulating luminescence dating (OSL). Two samples were taken from the High terrace (Loc. 3), three from the Middle terrace (about 200 m west from the western edge of the tell; Loc. 4 in Fig. 2), two from the Low terrace (about 400 m from the eastern edge of the tell; Loc. 5 in Fig. 2), and one from the floodplain adjacent to Location 2. Quartz grains (on which OSL dating is usually based) in the sediment were analyzed at Department of Geosciences, National Taiwan University, using Risoe TL/OSL-DA-15 and the SAR protocol (Murray and Wintle 2000). So far, two samples have been dated: one from the floodplain, and the others from the High terrace. Both the samples were taken from the uppermost part of deposits close to the surface. The former yielded an equivalent OSL dose of 0.25 ± 0.1 Gy, and the obtained annual dose rate (1.61 mGy yr^{-1}) yielded an age of 200 ± 100 years ago. This age, close to the present, points to the optical resetting of quartz grains, meaning that OSL technique can be applied to fluvial sediments in the study area. One of the other samples yielded an equivalent dose of 44.4 ± 7.9 Gy and an age of 27,600 ± 4,000 years ago. This age is considered to be a minimum date because some of the aliquots used showed dose values somewhat larger than the average. The other sample yielded an age of 37,000 ± 4,000 years ago, supporting the above inference. As the samples were taken from the uppermost part of the deposits, the accumulation of sand to form the High terraces can be correlated with Marine Isotope Stage (MIS) 3 (ca. 30,000 to 60,000 years ago).

A surface of the Low terrace is located between the northern part of the tell and the Khabur River (Fig. 6). The topography of the tell indicates that part of it was lost due to lateral erosion by the Khabur River. Moreover, an excavated area at the northeastern part of the tell suggests that the accumulation of the Low-terrace deposits was ongoing during PPNB occupation, as indicated by interfingering of tell deposits and fluvial layers. Therefore, the age of the Low terraces can be correlated with the period of

Fig.13. *Outcrop of deposits of High terrace at Loc. 3. See Fig. 1 for location.*

tell occupation, i.e. MIS 1 (Holocene).

The inferred ages of the Low and High terraces suggest that the Middle terraces were formed in MIS 2, including the Last Glacial Maximum (LGM). Although this inference needs to be verified by additional dates, it is presented here as a hypothesis for the palaeoenvironmental reconstruction.

■Palaeoenvironment

On the basis of the geomorphological and sedimentological characteristics of the fluvial surfaces and their inferred ages, the following palaeoenvironmental reconstruction is offered.

During MIS 3 (ca. 30,000 - 60,000 years ago), the Khabur River in and around the study area was braided with abundant sandy sediment, leading to fluvial deposition of at least several metres. This sedimentary environment reflects a large sediment supply from the upstream area, as well as abundant water supply which allowed for sediment transport.

During MIS 2 (ca. 10,000 - 30,000 years ago), the river condition changed from braided to meandering and fluvial erosion took place to form the Middle terraces. The erosion was severe, as indicated by the current limited distribution of the High terraces and the extensive distribution of the Middle terraces. Lateral erosion by the meandering river was pronounced, although the scale of river incision was only about six meters (from 15 m to 9 m above the present river). The extensive erosion seems to reflect the high availability of water but the lack of thick sedimentation and the change from braided to meandering conditions indicate significant decrease in sediment supply from the upstream area.

The oncoids in the study area seem to have been formed in MIS 2. As noted, they are thought to be formed in the past and do not occur in the deposits of the High terraces. Oncoids were regularly found during the excavations at the tell. It seems that in the Early to Middle Holocene people brought oncoids to the tell where they used them as part of buildings, indicating that oncoids formed before the early Holocene. Thus, oncoids found in the Holocene fluvial deposits can be regarded as "lag-deposits" originally derived from the deposits of the Middle terraces. The formation of oncoids in MIS 2 indicates high water availability at that time, which agrees with the above inference from landforms. Stagnant water seems to have been present on the wide floodplain provided by lateral erosion.

In MIS 1 (since 10,000 years ago), further erosion resulted in the Low

terraces and the floodplain, but the scale of erosion was much smaller than that suggested for MIS 2. This observation indicates that the erosive power of the Khabur River decreased significantly. Especially in the Late Holocene, after the formation of the Low terraces, fluvial erosion was fairly limited. The decreased fluvial erosion in MIS 1 seems to be related to decreased surface water availability due to increased evaporation as well as increased vegetation cover that protected river banks.

The above reconstruction is in line with a number of previous palaeoenvironmental studies in areas adjacent to the Khabur valley. High humidity in Syria during MIS 3 has been inferred from pollen analysis, zoological studies and sedimentological analyses (e.g. Niklewski and Van Zeist 1970; Akazawa *et al.* 1999; Oguchi and Fujimoto 2002). These wetter conditions correspond well with the large sediment transportation and deposition by the braided Khabur River during MIS 3. During MIS 2 the Near East was generally arid (e.g. Van Zeist and Bottema 1982; Baruch 1994). However, it also was characterized by occasional high water levels in lakes, especially in Anatolia (e.g. Kuzucouglu *et al.* 1999; Roberts *et al.* 1999). This suggests that reduced evaporation under a cold climate in and around the LGM led to the presence of surface water. Such conditions may have facilitated continuous fluvial erosion and oncoid formation, while reduced flood intensity may have led to the disappearance of sand deposition and channel braiding. The passing of storm tracks and resultant increase in rainfall at the end of MIS 2 (Henry 1989) may also have facilitated fluvial erosion. The weaker fluvial processes in the late Holocene, compared to the early to middle Holocene, agrees with changes in rainfall intensity suggested by previous studies in the Near East (e.g. Bull 1991; Wick *et al.* 2003).

The beginning of human settlement at Tell Seker al-Aheimar in the Early Holocene (PPNB) may have been related to the amelioration of the climate which increased the availability of natural resources such as plants and animals. However, decreased fluvial erosion in the Holocene must have been another important factor, permitting long-term settlement at the tell. Although part of the tell was eroded during the period of occupation, people were able to live on the tell for thousands of years because of limited erosion.

As noted above, our research, including the further dating of the sediment samples, is still ongoing. The palaeoenvironmental reconstruction offered here is a first preliminary assessment. On the basis of more data, we plan to provide a more complete scenario of the palaeoenvironment in the study area.[1]

1. We would like to thank Dr. Michael Grossman, Southern Illinois University Edwardsville, for his review and editing of a draft of this paper.

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CHAPTER **5**

Climatic events during the Neolithic in central Turkey and northern Syria

Kaoru Kashima and Kotaro Hirose

■Introduction

Konya Basin and Lake Tuz (Fig. 1)

The Younger Dryas, a world-wide cold epoch, about 11,000-10,000 BC, was a major threshold for both climate and human societies in the Near East. Just after the Younger Dryas, the climate ameliorated, and the Neolithic way of life was gradually implemented. As it is well-known, the Neolithic was marked by important developments, such as the cultivation of plants, domestication of animals, sedentism, and production of ceramics. Moreover, the natural environment, including precipitation, temperature, groundwater, vegetation, fauna *etc.*, also drastically changed.

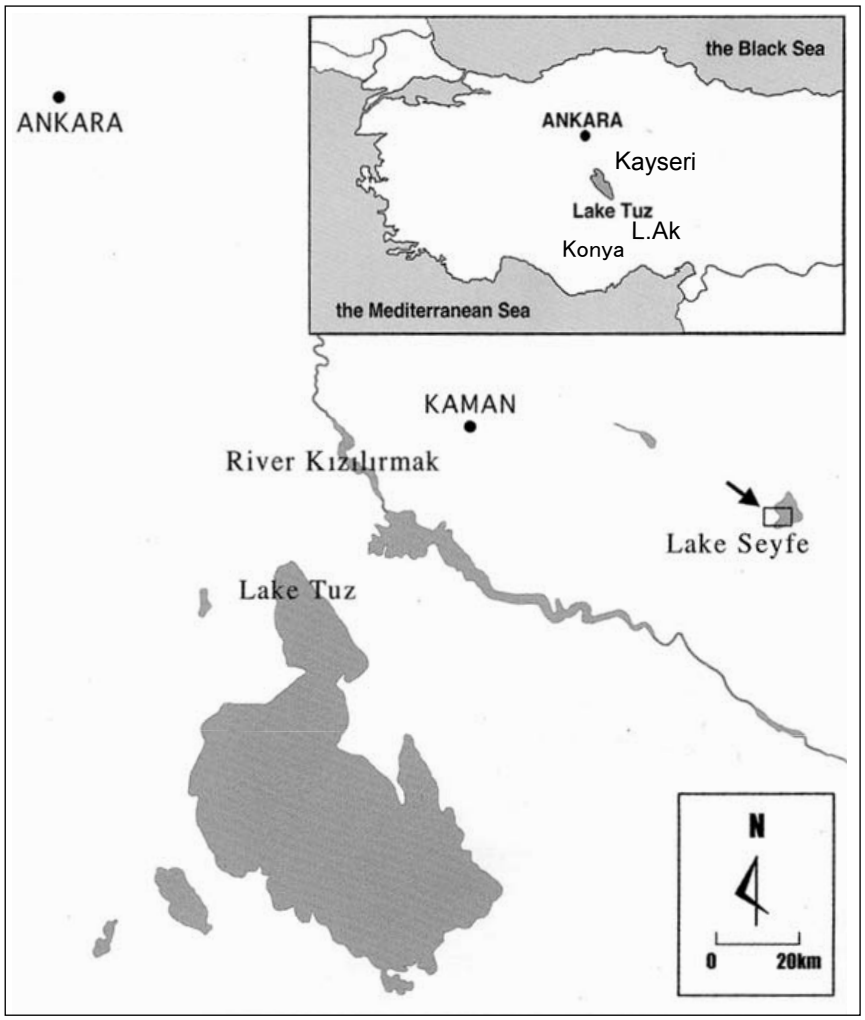


Fig. 1. *Research area in the central part of Turkey.*

After the Younger Dryas, the climate was presumed to be warm and stable. However the ice-drilling cores in Greenland and Antarctica since 1990's revealed the drastic global cooling occurred during the Neolithic. It stared about 6,600 years BC, and became the coldest epoch at about 6,200 years BC. After then it turned to be warm again about 6,000 - 5,800 years BC (Alley *et al.* 1997; Rohling and Pälike 2005). It was a global climatic event, and was reported from a lot of areas, including oceans surrounding the Middle East (Meyers and Negri 2003; Sperling *et al.* 2003).

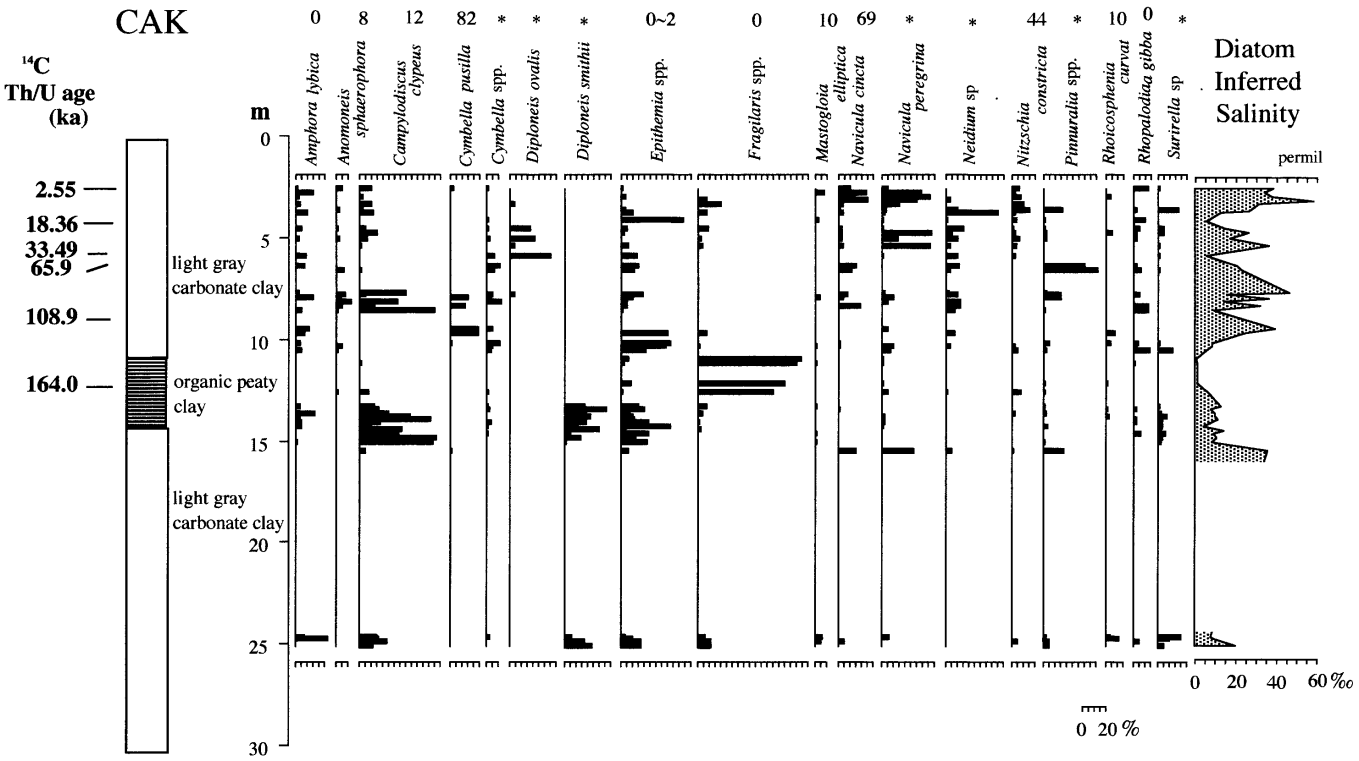
In 1991 a geo-archaeological research project in Turkey and Syria was started. The project is part of the excavation of Kaman-Kalehöyük by the Japanese Institute of Anatolian Archaeology, and the excavation of Tel Seker al-Aheimar by the University of Tokyo. The project is a multidisciplinary research program, focused on the environmental history of the Neolithic and later periods in this region. More in detail, our research is aimed at a high resolution environmental reconstruction for central Turkey and northern Syria in order to make clear the climatic development during the Neolithic, and its impact on human societies. We undertook field surveys at inland lakes and marshes surrounding archaeological sites in the Konya basin in central Turkey (Lake Tuz, Lake Ak, Lake Seyfe, Kayseri and Kaman Kalehöyük), and Lake Khatouniyeh in northeastern Syria.

■Paleo-environmental changes in central Turkey

The Konya basin is located in the southern part of the Anatolian Plateau. A huge lake once covered almost all of the basin, but this has completely disappeared now. Eroll (1978) presumed that the lower terrace group that included three terraces of this lake was formed by lake level fluctuations during the Holocene. However, C^{14} dates from the terrace deposits made it clear that they were formed during the Pleistocene, the youngest one having been formed during the Younger Dryas period (about 11,000 years BP; Roberts 1983)

In 1991, we made a drilling in the center of the basin, ca. 20 km east of the city of Konya. Successions of diatoms and chemical components seem to indicate glacial and inter-glacial changes during the Late Quaternary, but we could not recognize clear Holocene lake deposits (Kitagawa and Yasuda 1997). We dated the terrace deposits by means of shells found in them. On the basis of the resulting twelve C^{14} dates we distinguished 6 terrace levels, with the lowest terrace dated at 10,950±460 years BP (non-calibrated), which can be correlated to the Younger Dryas period (Naruse *et al.* 1997).

Subsequently, in 1995-1997, we took drillings at Lake Tuz. This is a shallow



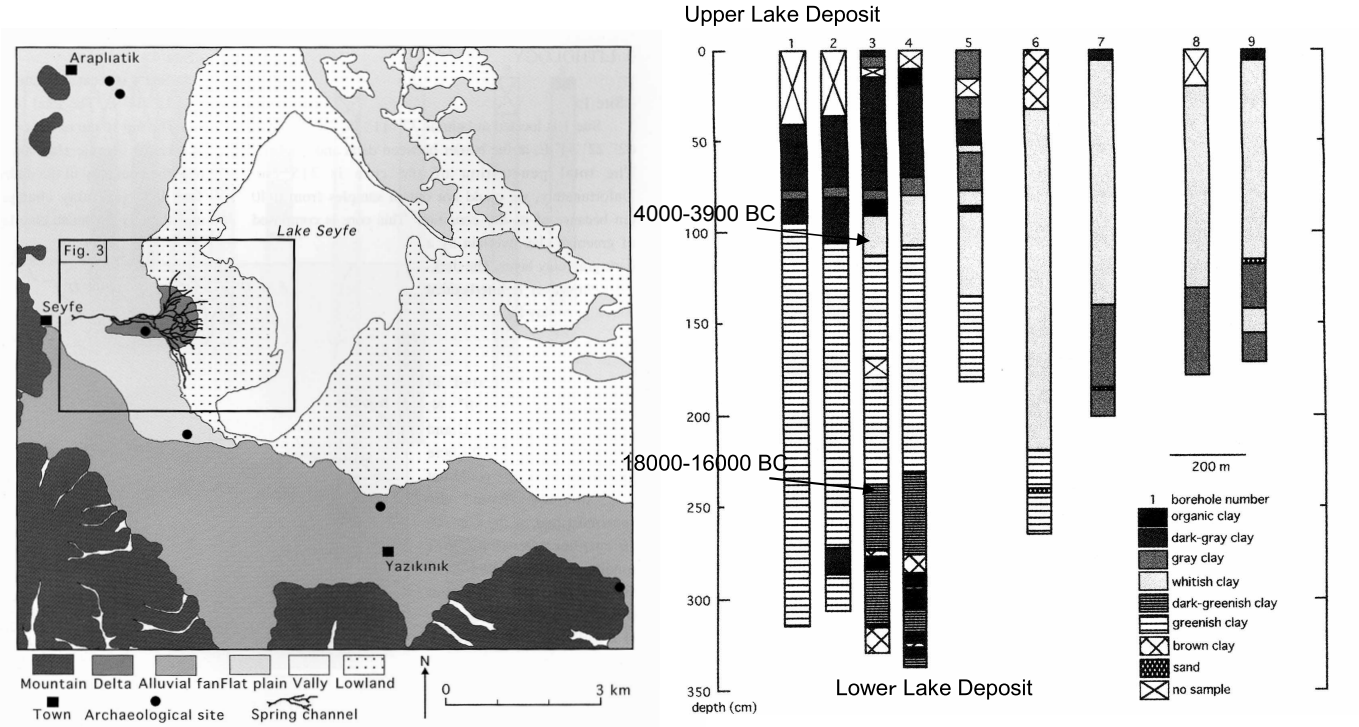
salt lake, the second largest lake in Turkey, located northeast of the Konya basin. We took eight drillings in Aksaray, northeast coast of Lake Tuz, where Eroll (1978) traced lake level fluctuations during the Holocene. We identified three layers of lake deposits, dated ca. 11,000-20,000 years BP. These layers were deposited due to cyclic lake level changes at the final stage of the Pleistocene. We could, however, not trace lake level changes after 11,000 years BP (Kashima 2002).

The results of our drillings in the Konya basin and in Lake Tuz indicate that the peaks of lake levels in both basins occurred during the Late Glacial Maximum (LGM, about 20,000 years BP, non-calibrated) to the Younger Dryas period (about 11,000 years BP, non-calibrated). Lakes were much larger and about 30 m higher than at present. After the Younger Dryas, water levels decreased, and the lakes became much smaller. Expansion of lake areas did not occur during the Holocene.

Lake Ak and Lake Seyfe

Lake Ak is located about 150 km east of Konya. Almost part of the lake was dried, and changed to be marsh. Kuzucuoglu *et al.* (1999) took two drillings in the marsh, in order to establish environmental changes during the Late Quaternary. The diatom assemblages taken from the cores made it clear that the lake salinity changed as a reaction to glacial and inter-glacial climatic fluctuations. Lake salinity was low in the Last Glacial period (Kashima 2003) (Fig. 2).

Fig. 2. *Diatom assemblages at CAK core at Lake Ak, east of Konya, Turkey.*



(Ishimaru and Kashima 2002)

Fig. 3

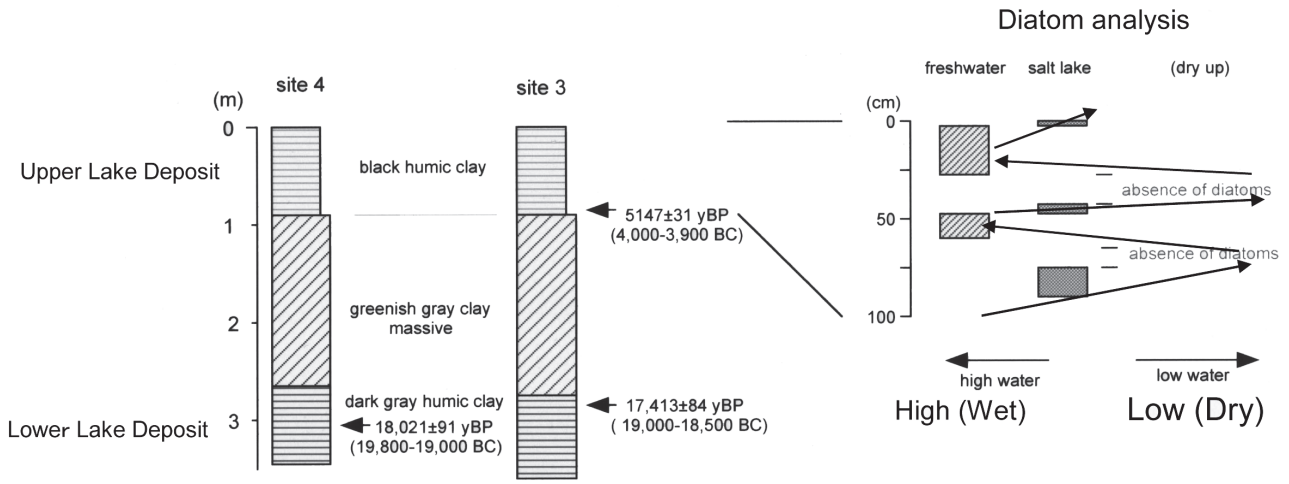


Fig. 4

Fig. 3. *Drilling sites at Lake Seyfe, central Turkey.*
Fig. 4. *Diatom assemblages at Lake Seyfe, Turkey.*

In the upper parts of the cores we identified lake deposits dating after the Younger Dryas period. Diatom assemblages taken from the cores indicate a salty marsh which changed to a fresh water lake between 5,900 and 4,600 years BP (non-calibrated; about 3,500-4,500 BC calibrated). The diatoms indicate fluctuations in lake environment from salty (dry) to fresh water (humid) after 4,600 years BP. However, we could reconstruct details of environmental fluctuation, due to several sedimentary hiatuses in the upper part of the cores (Kashima 2003).

Lake Seyfe is located about 200 km northeast of Konya and about 100 km north of Lake Ak. It was a salt lake, that has now been taken into cultivation. In 2001, a series of drillings were placed at a transect running from the shore to the center of the lake. It appeared that there were two lake deposits consisting of organic sandy clay with a large number of diatoms. The lower lake layer was dated at 17,000 -18,000 years BP (non-calibrated), i.e. immediately after the Last Glacial Maximum when huge lakes were formed in the Konya basin (Ishimaru and Kashima 2002) (Figs. 3 and 4).

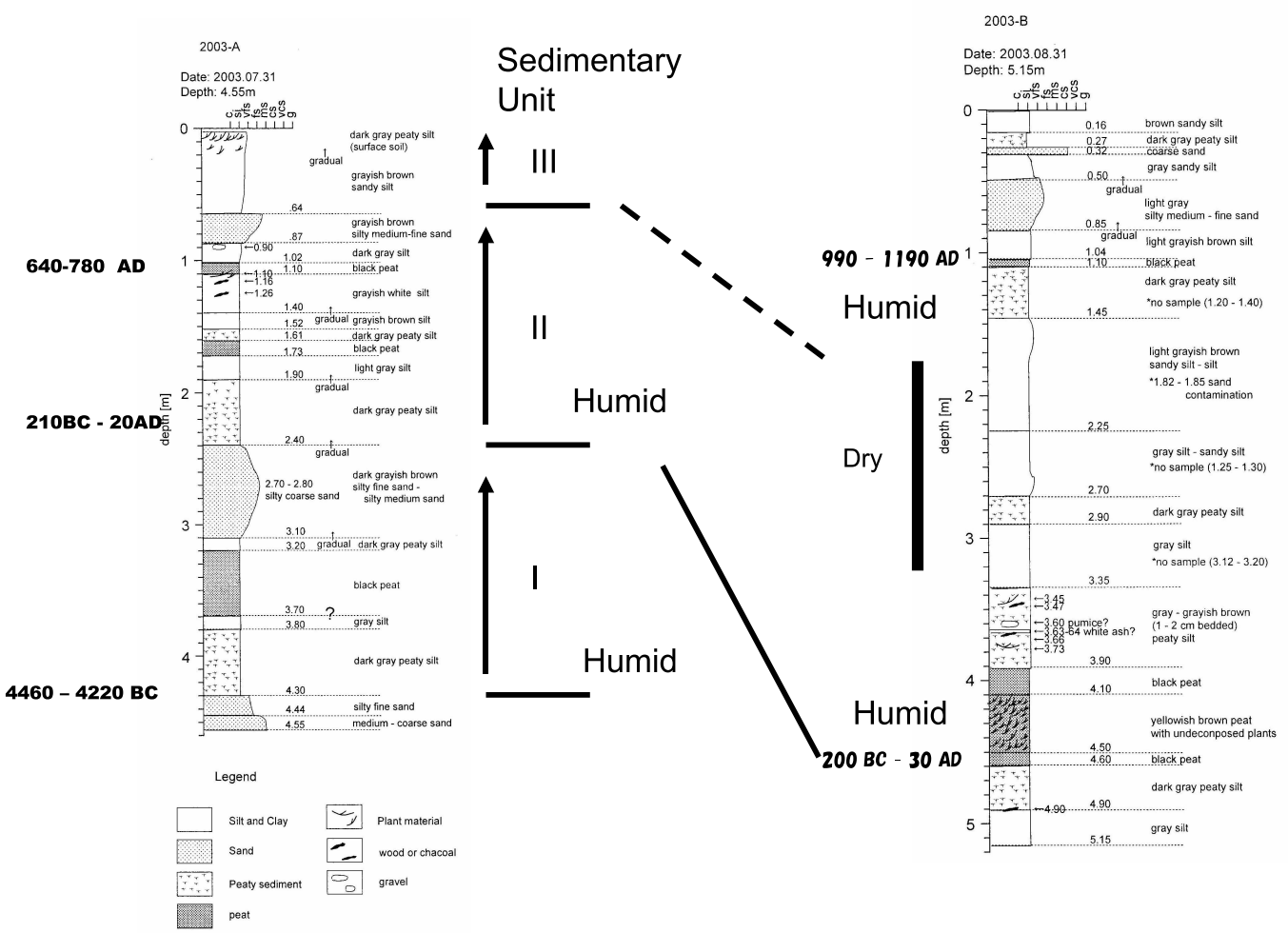
The deposition of the upper lake layer started about 5,000 years BP (non-calibrated), about 4,000 BC (calibrated). During this time diatoms from the marshes of lake Ak indicated fluctuations of the lake environment from salty (dry) to fresh water (humid). However, because the sedimentary rate was very slow, it was not possible to establish the age of each of these environmental fluctuations (Figs. 3 and 4).

Kültepe and Kaman Kalehöyük

Similar water level changes were observed at ponds and marshes near archaeological sites in central Anatolia. Kültepe is one of the most important archaeological sites of the Middle Bronze Age in this area. The site is located in a small basin 20 km northeast of Kayseri, about 200 km northeast of Konya. It mainly consists of an extended palace (*Kanis*) and a lower town for merchants (*Karum*). Kültepe prospered as a trade center between Anatolia and Mesopotamia in the Middle Bronze Age. It was destroyed in the early part of the Late Bronze Age, probably by rulers of the Old Hittite Kingdom.

In 2003, we made two drillings at the marshes surrounding Kültepe, which were former lakes. The samples reached the bottom of the marsh sediments. A lithologic (grain size) analysis and micro-paleontological analyses (diatom and pollen) made it clear that there were three cyclic changes of water levels at the marshes (Kashima *et al.* 2005) (Fig. 5).

The peaty clay of the base of the lowest marsh deposit was dated about 4,500



BC (calibrated). After that period, the initial lake was buried by fluviatile sediments. The second lake was formed about 2,000 BC (calibrated). This lake gradually dried up again. The most recent lake deposition was dated about 1,000 AD (calibrated) (Kashima *et al.* 2005) (Fig. 5).

Kaman Kalehöyük is a large archaeological site which is located 100 km southeast of Ankara. It was an important city in the Bronze Age and the Iron Age. Near the site there was a small lake, which is now buried. Drillings in the former lake indicated two periods of high water. The youngest high water level was dated at 2,000 BC (calibrated) by C^{14} dates, while the older level was pre-Early Bronze Age, considering the archaeological remains. The lake was buried artificially after the Roman Period (Kashima 2006).

Fig. 5. *Paleo-environmental changes at Kültepe archaeological site, Kayseri, Turkey.*

■Paleo-environmental changes in northeast Syria (Lake Khatouniyeh)

Lake Khatouniyeh is located about 50 km east of Hassake in the Khabur region in northeastern Syria. It is a small lake with slightly salt water. A large terrace surrounds the lake. The terrace is more than 10 m higher than the present lake level, and the terrace area is much wider than the present lake. The terrace was probably formed during the Late Quaternary (Fig. 6).

We took two drillings at the north side of the lake, and reached the base of the deposits at 6.3 m below the present lake level. Two C^{14} dates were obtained from lake deposits. The most recent lake deposition started about

Fig. 6. *Location and drilling views at Lake Khatouniyeh, East Syria.*

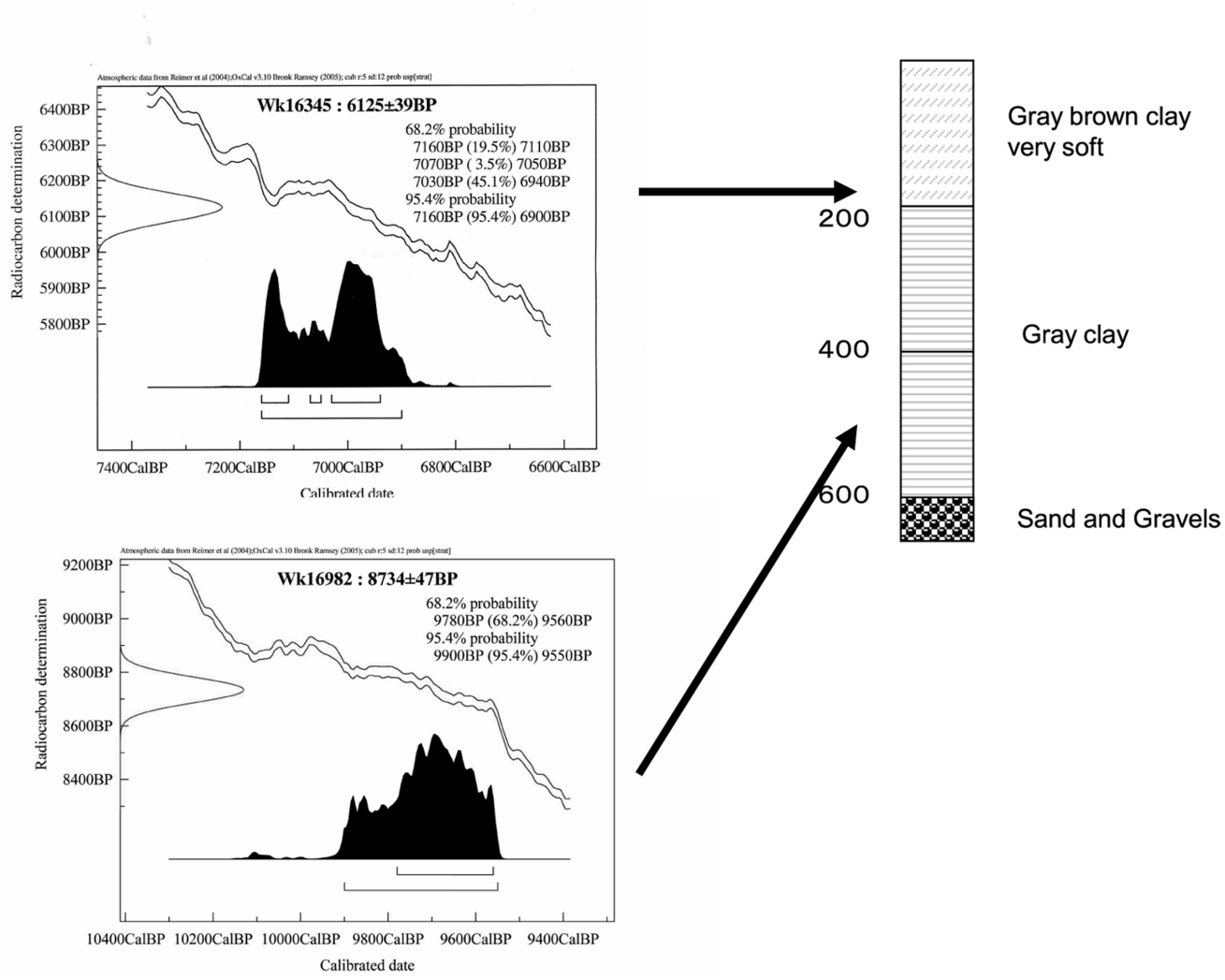


Fig. 7. *Drilling core and radiocarbon datings at Lake Khatouniyeh, East Syria.*

8,500 BC, i.e. at approximately the beginning of the so-called Climatic Optimum in the Near East (Fig. 7).

The sediment of the most recent lake contained a large number of diatoms, ostracods, and seeds of water plants. Diatoms were particularly abundant in the sediment between 0.0-3.2 m depth. The dominant diatoms were *Cymbella microcephala, Cymbella pusilla, Fragilaria pinnata, Mastogloia elliptica,* and *Synedra ulna.* These diatoms are typical of inland saline and freshwater lakes in Turkey and Syria. In the deposits between 3-6 m diatoms decreased, but were still enough to reconstruct the paleo-environment (Figs. 8 and 9).

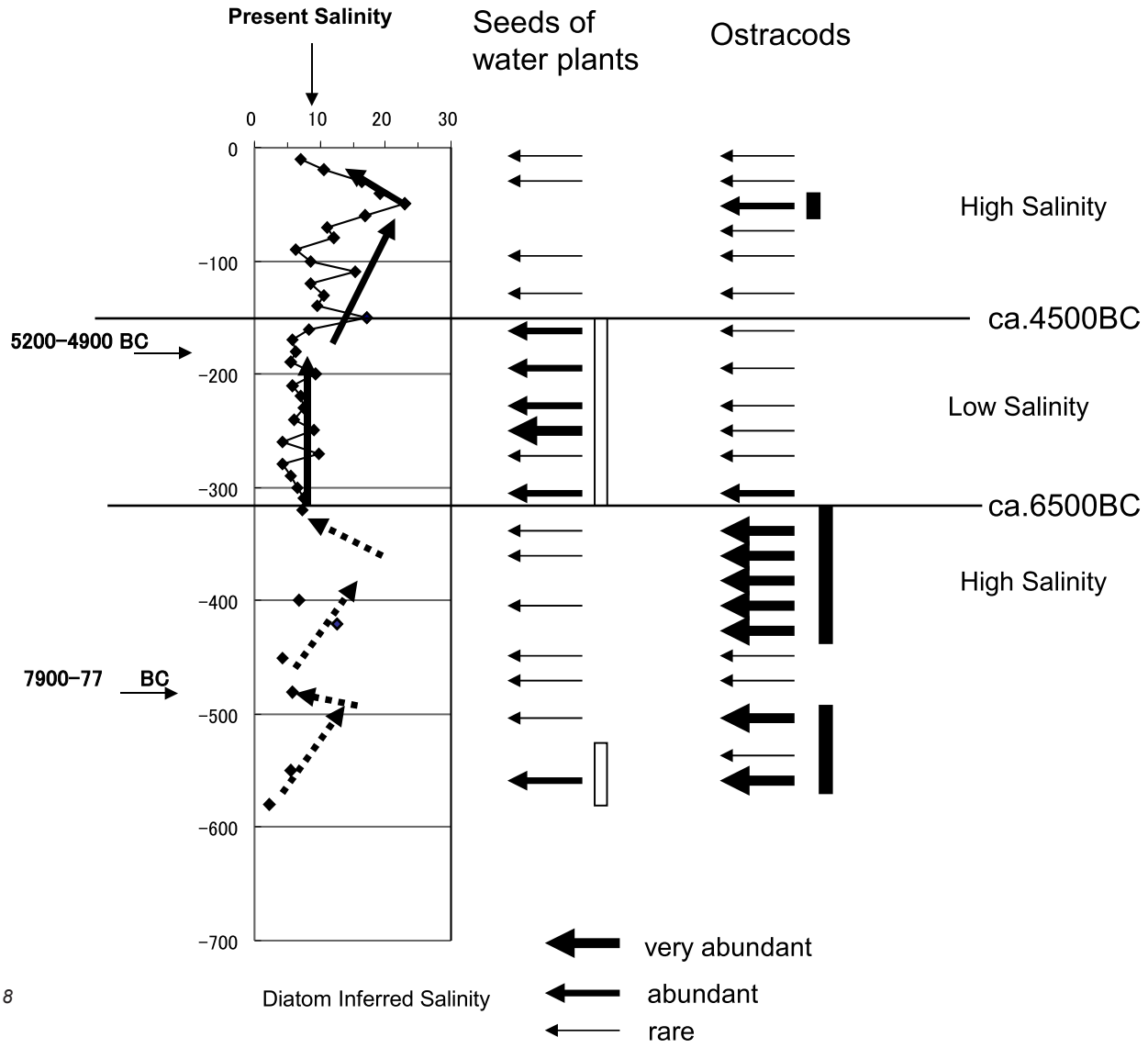


Fig. 8

Fig. 9

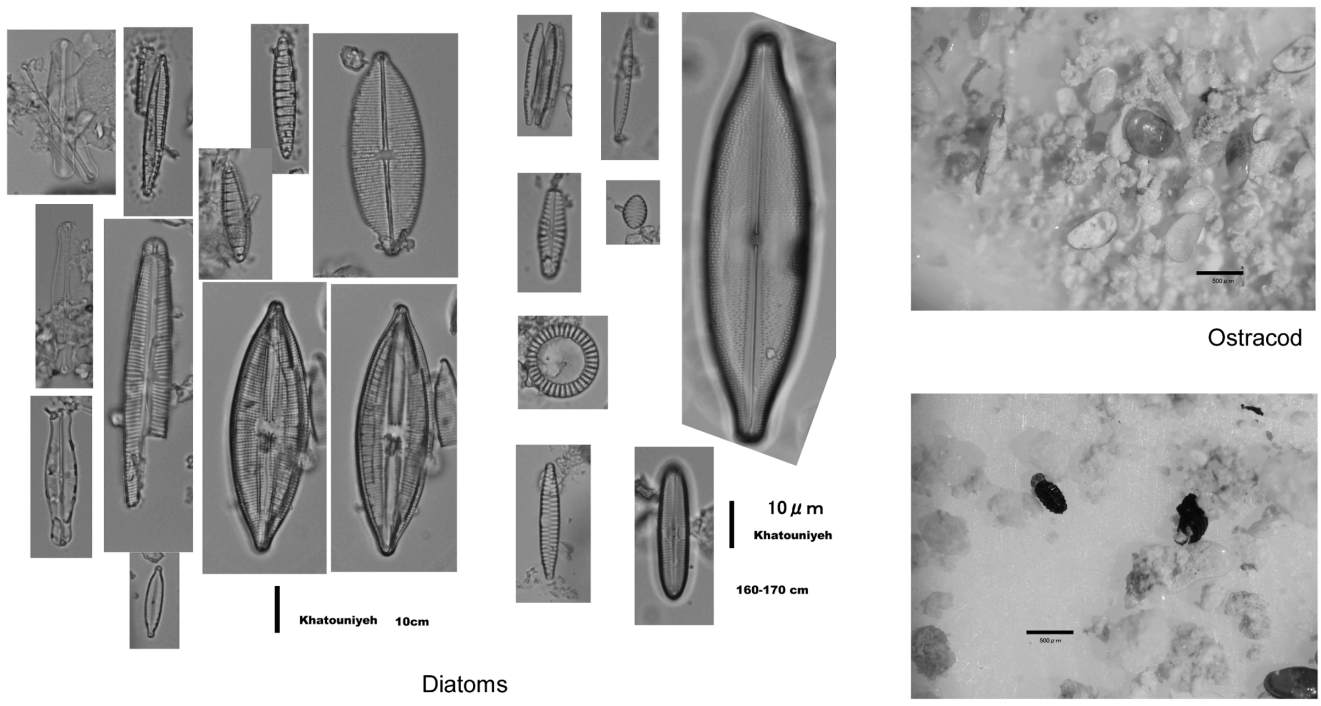


Fig. 8. *Fossil assemblages and environmental changes at Lake Khatouniyeh, East Syria.*
Fig. 9. *Small fossils taken from lake deposits at Lake Khatouniyeh, East Syria.*

Ostracods were quite evenly distributed in all samples. The dominant species were *Cyprideis* sp., *Darwinula stevensoni*, and *Limnocythere* sp., all indicative of salt water. The number of ostracods from sediments fluctuated, with peaks at -0.5 m, -2 to -4.25 m, -5.0 m and -5.5 m. Seeds of water plants were found in most of the sediments. They were especially abundant at depths of -1.8 to -3.2 m, and at -5.5 m (Figs. 8 and 9).

The above-indicated changes clearly indicate changes in water salinity of the lake. In short: the present lake formed at a depth of -5.5 to -6.0 m, and the salinity of the lake soon increased, as indicated by a dominance of saline water ostracods above -5.5 m. The situation quite suddenly changed at -3.2 m. According to the diatom assemblages, the salinity of the lake was estimated about 5 -10‰ in sediments of 1.8-3.2 m in depth, i.e. nearly the same as that of the present lake. Abundant seeds of water plants in these deposits supported the low salinity environment. Subsequently, salinity gradually increased to 25‰ in deposits at depths of -1.7 to -0.5 m. Ostracods were abundant at -0.5 m. Above -0.5 m, the salinity decreased to the present-day level of about 6‰.

Two C^{14} dates were taken from the drilling core. Presuming a constant sediment deposition between the dates, the layer indicative of the above-noted sudden environmental change at -3.2 m depth is provisionally dated at ca. 6,700 BC. The apparent sudden decrease of the lake level suggests that the lake level rose and that the climate became more humid. This trend continued until ca. 5,000 BC, after which it became dry.

■Climatic events during the Neolithic

On the basis of our drillings the following reconstruction of the climate during the Neolithic in northern Syria and central Turkey is offered.

At ca. 11,000 BC the climate improved after the cold event of the Younger Dryas. This global warming could be observed in the data from all our drillings. A more humid environment started during the Neolithic, as could clearly be observed in the drillings from Lake Khatouniyeh in northeastern Syria. Holocene sedimentation of the lake began at about 8,500 BC, and at about 6,700 BC a peak in humidity was evident.

In contrast to this, a dry environment continued during the Neolithic in central Turkey. In the area about 150-200 km east or northeast of Konya basin humidity increased at ca. 4,500 BC, as marked by small lakes and marshes, and globally temperatures became more stable. However, a dry climate continued in the Konya basin and the area of Lake Tuz in the central

and southern part of the Anatolian Plateau.

Recent drillings in deep sea sediments indicate that environments in the eastern part of Mediterranean Sea changed significantly at ca. 8,500 BC, 6,700 BC and 4,500 BC. They were influenced by changes in temperature and changes of water flow from the Nile River and Black Sea into the Mediterranean Sea (Meyers and Negri 2003; Sperling *et al.* 2003). Our drillings strongly suggest that the influence of the oceanic environmental changes could also be felt in inland regions. These interactions between oceanic environment and inland ecosystem were not uniform, as indicated by a distinct difference of environmental changes between Turkey and Syria.

The climatic changes probably had significant impacts on Neolithic communities, especially with regard to water availability. In central Anatolia, for instance, the distribution of Neolithic sites was limited to the southern part of the plateau (e.g. Çatal Höyuk). However, since the Chalcolithic period the distribution of archaeological sites expanded to the central and northern part of the plateau (e.g. Omura 1995). The above-noted recovery of humidity in central Anatolia at about 4,500 BC presumably was one of the major causes for this expansion.

In northeastern Syria, the excavations at Tell Seker al-Aheimar in the Khabur valley have provided valuable information concerning the transition from the Pre-Pottery to the Pottery Neolithic. The oldest Neolithic pottery has been dated at ca. 6,900-6,600 BC (Nishiaki and Le Mière 2005). This date, it is recalled, is very close to the date of the climatic change from dry to very humid, as obtained in drillings at Lake Khatouniyeh (i.e. 6,700 BC). The humid climate probably allowed for an increase in settlement and population in this area. This increase, on its turn, would have stimulated new technical and cultural developments The relationships between environment and society were complex, within the framework of this paper it has not been possible to discuss such interdependencies in any detail. Future research of climatic and environmental changes in Turkey and Syria will undoubtedly result in a more complete picture.

In contrast to those surveys in glacial areas and oceans, the surveys in inland regions in the Middle East have not been enough for discussions, yet. The most distinct climatic episode in the Middle East during the Neolithic was the so-called Climatic Optimum, by which is meant a warm and humid period, which had a major impact on topography, water balance, vegetation, and fauna. Previous studies have made it clear that pluvial conditions were not uniform during this period, as it was marked by large diversities in duration and magnitudes of precipitation (Butzer 1995).

In low altitude regions (less than 22°N), such as the Sudanese desert and Arabia, the duration of the pluvial period was short, and it changed into a complete dry environment. In the regions located 22-34°N, such as the Levant, on the other hand, the pluvial conditions continued until today, with the several peaks in rainfall during the Holocene (Butzer 1995).

In central Turkey, located in 35-40°N, pluvial events occurred during glacial periods. The final pluvial event in Konya basin was dated about Younger Dryas. After then, a drier climate developed and continued into the Holocene, in contrast with climatic trends in the Levant and other regions (Butzer 1995; Roberts 1983). Therefore, we presume that a major climatic boundary during the Neolithic period was located between northern Syria and central Turkey.

■Acknowledgements

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CHAPTER 6

PPNB flint blade production at Tell Seker al-Aheimar, Upper Khabur, Syria

Yoshihiro Nishiaki

■Introduction

The excavations of Tell Seker al-Aheimar in the Upper Khabur basin have provided us with a unique opportunity to investigate the Neolithic cultural occurrences prior to the Proto-Hassuna phase in northeast Syria (Nishiaki and Le Mière 2005). One of their most important contributions is that they document a local cultural development from the Late PPNB to the Proto-Hassuna, which had long been thought in the literature to represent the oldest full-fledged Neolithic society in Upper Mesopotamia. The discovery of the PPNB and the earlier Pottery Neolithic occupations in a single uninterrupted stratigraphic sequence at Tell Seker al-Aheimar allows us to examine issues related to the Neolithisation processes of Upper Mesopotamia, including the origin of the first established Neolithic society and its interaction with contemporary societies in the surrounding regions. In this paper, I would like to refer to the flint blade production technology of the Late PPNB period at Tell Seker al-Aheimar, in order to address the cultural affiliation of the first inhabitants who settled this mound, that is, the oldest farmers thus far documented in the Upper Khabur basin.

Kozlowski and Aurenche (2005; Kozlowski 1999) recently published a series of insightful archaeological maps concerning the changing cultural territories and boundaries during the Neolithic period of the Fertile Crescent. In an extensive review, they defined two major Neolithic cultural provinces, referred to as the Eastern and the Western Wings respectively, suggesting that these were derived from the different historical backgrounds and interaction patterns of the societies in the Fertile Crescent. The main boundary was, however, considered to have remained over the millennia between the Balikh and the Khabur valleys of North Syria, or along the Middle Euphrates valley for some elements of cultural items (Kozlowski and Aurenche 2005: 48). In terms of PPNB blank production technology, the Eastern Wing was characterized by the use of conical, pressure-flaked cores, and the Western Wing by opposed-platform cores of the Naviform type.

While the cartographic analyses by Kozlowski and Aurenche were based on an exhaustive survey of the literature and the extant collections, the evidence from the ongoing excavations at Seker al-Aheimar, supposedly to be encompassed in the west end of the Eastern Wing group, were incorporated only to a limited extent. In the following, the new flint material from the Late PPNB contexts is presented to demonstrate that the pressure debitage of conical bullet cores typical of the Eastern Wing were indeed predominant in the Upper Khabur during this period. In addition, the analyses will show that the Late PPNB society of the Upper Khabur maintained steady contact with the societies in the Western Wing group as well as those in the East.

This contact is indicated by the presence of exotic flint raw materials, which were brought into the settlement of Seker al-Aheimar in the form of either finished tools or cores that retained technological traits indicative of their origins.

■PPNB flint technology at Seker al-Aheimar

The Neolithic site of Tell Seker al-Aheimar is situated on the right bank of the Khabur River, approximately 45 km northwest of Hassake, Syria (Fig. 1). It is an oval-shaped mound covering an area of ca. 4 ha, with a height of 11 m from the nearby field. The excavations have been conducted in five major areas, Sectors A to E, which are distributed mainly along the northern edge of the mound (Fig. 2). All of the areas contained Neolithic deposits starting from the PPNB and ending with the Proto-Hassuna phase of the Pottery Neolithic. Particularly rich in PPNB deposits were Sectors C and E.

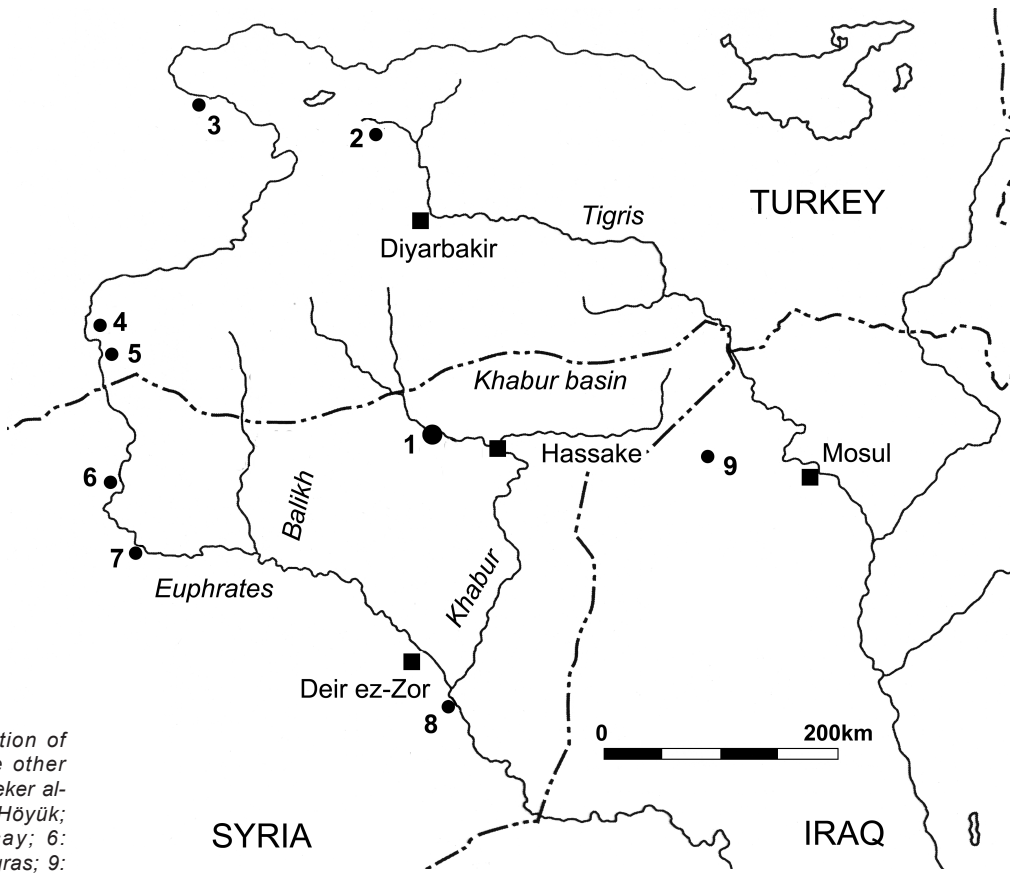

Fig. 1. *Map showing the location of Tell Seker al-Aheimar and the other sites mentioned in the text. 1: Seker al-Aheimar; 2: Çayönü; 3: Cafer Höyük; 4: Mezraa-Teleilat; 5: Akarçay; 6: Halula; 7: Abu Hureyra; 8: Bouqras; 9: Maghzaliyah.*

The lithic industries of these periods were outlined elsewhere (Nishiaki 2007, 2011). The analyses and field survey indicate that flints of at least five different types, hence different sources of flint, were utilised by the Neolithic inhabitants at Tell Seker al-Aheimar: bluish gray flint available in the vicinity of the settlement; spotted brown flint probably originating from the mountain of Jabal Abudl Aziz, located approximately 20 km to the south; and at least three kinds of flint from unknown sources, i.e., dark brown, pink, and yellowish brown flints. Procurement and reduction strategies evidently differed by these flint types. The local bluish gray and the semi-local spotted brown flints were brought into the settlement as pebbles, and were reduced on site to produce mostly flake tools. On the other hand, the other three non-local groups of flint were introduced almost exclusively in the form of blade blanks and blade tools. The presence of a small number of cores of yellowish brown flint indicates that some local debitage was carried out, but no evidence of on-site core reduction was identified for the dark brown and pink flint specimens. The yellowish brown flints displayed pressure debitage

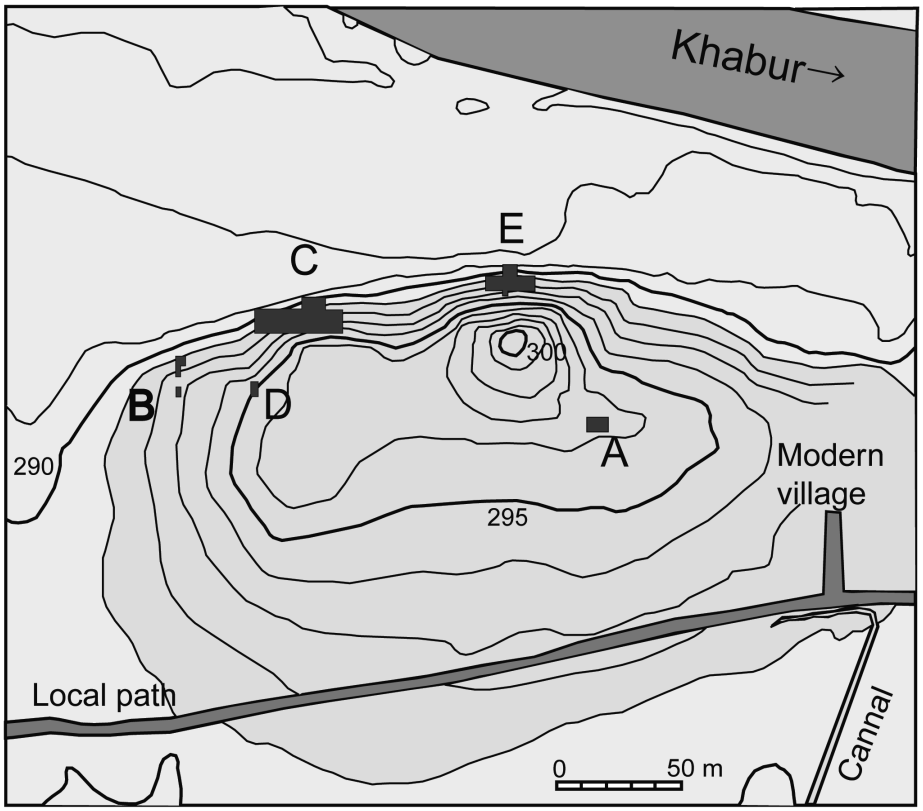

Fig. 2. *The excavated areas of Tell Seker al-Aheimar.*

using single-platform cores, while the blades of the other two showed the use of Naviform opposed-platform technologies. The dark brown flint blades were produced from twisted Naviform cores typical of the Douara method (Nishiaki 1994, 2000a), and the pink flint blades were detached from symmetrical Naviform cores such as those known in southeast Anatolia (Nishiaki 2000a: 93). The differing technological traditions expressed in these three groups of imported blades should certainly reflect the technologies of their original source regions (Nishiaki 2007).

The above is summarized in Table 1, which shows that the PPNB flint artefacts from Tell Seker al-Aheimar consist of several groups of artefacts, each produced from different technological backgrounds corresponding to particular raw materials. Accordingly, in order to elucidate the local blade production technology practiced on site, which is the main subject of this paper, the artefacts made of bluish gray, spotted brown, and yellowish brown flint should be examined.

Table 1. *Summary of the patterns of exploitation and use of flint and obsidian from Tell Seker al-Aheimar (Nishiaki 2007).*

Flint type	Bluish gray flint	Spotted brown flint	Yellowish brown flint	Pink flint	Dark brown flint	Obsidian
Quality	Medium-A grained; small	Medium-grained; large	Fine-grained; large	Fine-grained; large	Fine-grained; large	Fine-grained; large
Quantity	Abundant	Common in PN	Common in PPNB	Common in PPNB	Common in PPNB	Common in PPNB
Supposed source	Local	Semi-local?	Non-local	Non-local	Non-local	Non-local
Procurement form	Non-worked pebbles; semi-flaked cores	Semi-flaked cores?	Prepared cores & finished products	Unmodified blanks & finished products	Finished products	Prepared cores & finished products
Core reduction	On-site	On-site	On-site & off-site	Off-site	Off-site	On-site & off-site
Technology	Single-platform	Single-platform	Single-platform (with pressure debitage)	Opposed-platform	Opposed-platform (Douara type)	Single-platform (with pressure debitage)
Blank and tool form	Flake	Flake	Blade	Blade	Blade	Blade

■Blade production at Seker al-Aheimar

The selected samples of Sector C constitute the material for the present analysis. Flint artefacts from the PPNB levels of two 10 × 10 m squares in Sector C were studied. A series of radiocarbon dates for these levels (Levels 9–18) indicates that they belong to the final phase of the Late PPNB, approximately dated from 7200/7100–6800 cal. BC. A total of 6735 flaked stone artefacts were recovered, including 3449 pieces made of flint. The proportion of blades in the flint assemblages is very low. They occupy only 2.3% of the debitage category. However, the proportion jumps to 44.5% in the retouched tool category, reflecting the strong preference of blades for tool blanks. Table 2 shows the number of unretouched and retouched blades by flint types. Since there is no evidence of local blade production with dark brown and pink flints, and the blade elements of the spotted brown flint are extremely few, analyses of the bluish gray and yellowish brown flints will be presented here.

Table 2. *The use of blade blanks from the PPNB levels of Squares E10/11 by flint types.*

Flint types	Bluish gray	Spotted brown	Yellowish brown	Pink	Dark brown	Total
Unretouched cortical blades	19 (36.5)	1 (12.5)	1 (0.5)	0 (0.0)	1 (0.6)	22 (4.9)
Unretouched non-cortical blades	10 (19.2)	2 (25.0)	17 (8.6)	6 (26.1)	5 (2.9)	40 (8.8)
Retouched cortical blades	11 (21.2)	4 (50.0)	4 (2.0)	2 (8.7)	5 (2.9)	26 (5.7)
Retouched non-cortical blades	12 (23.1)	1 (12.5)	175 (88.8)	15 (65.2)	162 (93.6)	365 (80.6)
Total	52 (100.0)	8 (100.0)	197 (100.0)	23 (100.0)	173 (100.0)	453 (100.0)

Raw material

The Late PPNB levels of Squares E10/11 yielded 231 flint cores, excluding simple splits and non-flaked pebbles. As Table 3 shows, most of them were made of bluish gray flint. They contained a relatively large number of semi-flaked or test-flaked cores, as expected by the local procurement and reduction of this raw material. Removal scars on those cores indicate that the main target was flake production, along with a lesser amount of blade production. Blades were detached by either percussion or pressure debitage (Fig. 3: 8). Cores of the spotted brown flint were also reduced for flake production. Probably reflecting the more remote location of outcrops, they

occur in a smaller number without semi-flaked or test-flaked pieces. Cores of yellowish brown flint, another non-local raw material, are also found only occasionally. However, the applied technology is radically different: cores of this flint were exclusively utilized for blade production by pressure flaking (Fig. 3: 1–7; Fig. 4).

Core preparation

Regardless of the flint types, all of the blade cores retain a single-platform at one end (Table 3). The complete absence of opposed-platform cores is a striking feature of the flint technology at Tell Seker al-Aheimar. Also characteristic is the more common occurrence of blade cores reduced with pressure flaking than with percussion. The percussion and pressure cores show different core preparation processes. Cores with percussion scars, which generally take a roughly prismatic form, show no traces of systematic preparation before the blade removal. As a matter of fact, the artefacts of bluish gray flint, which is the single raw material for percussion blade cores, include only one irregular crested blade, even though a full range of core reduction was obviously carried out within the settlement. The percussion

Table 3. *Cores from the PPNB levels of Squares E10/11 by flint types.*

		Bluish gray	Spotted brown	Yellowish brown	Pink	Dark brown	Total
Semi-flaked		73	0	0	0	0	73
Blade cores	Single-platform, flat	1	0	0	0	0	1
	Single-platform, prismatic	6	0	0	0	0	6
	Bullet core, pressure	3	0	8	0	0	11
Flake cores	Single-platform, flat	33	0	0	0	0	33
	Single-platform, prismatic	12	0	0	0	0	12
	Opposed-platform, flat	1	0	0	0	0	1
	Change-of-orientation	68	3	0	0	0	71
	Multiple-platform	7	0	0	0	0	7
Exhausted		2	1	0	0	0	3
Fragments		13	0	0	0	0	13
Total		219	4	8	0	0	231

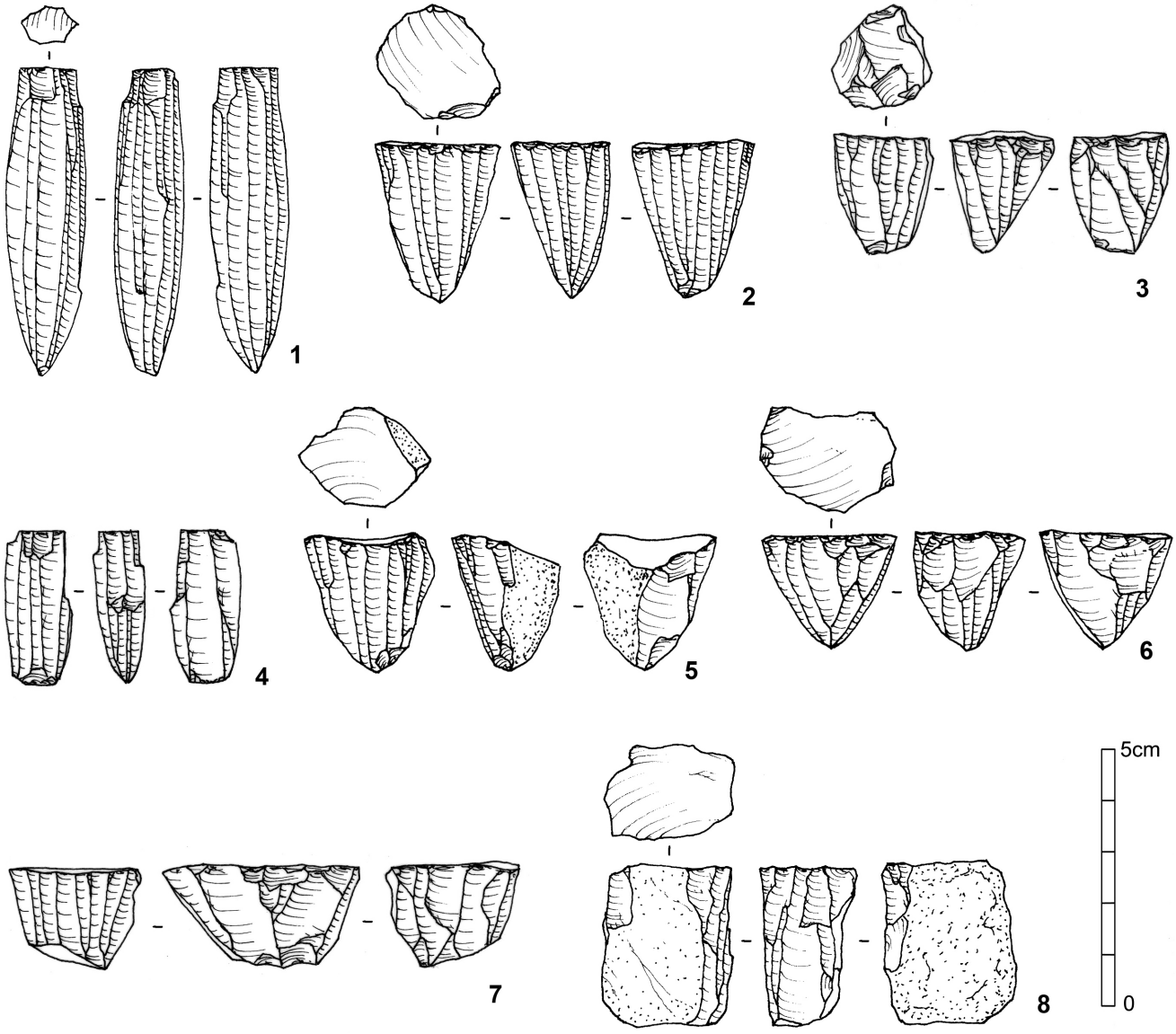

Fig. 3. Late PPNB flint blade cores from Tell Seker al-Aheimar. 1–7: Bullet cores of yellowish brown flint; 8: Pressure-flaked bladelet core of bluish gray flint.

blade cores and flake cores, whose forms closely resemble each other, seem to belong to the same reduction system in which the final removal scars alone distinguish these two categories of core forms (see Fig. 5 in Nishiaki 2007).

Cores with pressure-flaked blade scars were reduced to a highly small size, thus making it difficult to identify the preparation strategies in the earlier stages. Further, their main raw material is the yellowish brown flint, the initial flaking of which was conducted outside the settlement, leaving almost no direct evidence of its core preparation strategies. Nevertheless, the limited available information suggests the following. First, at least small pebbles were utilized for core blanks (Fig. 3: 5 and 8). Whether or not thick flakes were also used remains uncertain. Second, at least some of the core preforms seem to have taken a bifacial form. A few cores with lateral preparation scars on the back have been noted (Fig. 6: 2 in Nishiaki 2007). Third, the use of the cresting technique is indicated by the presence of crested blades in the

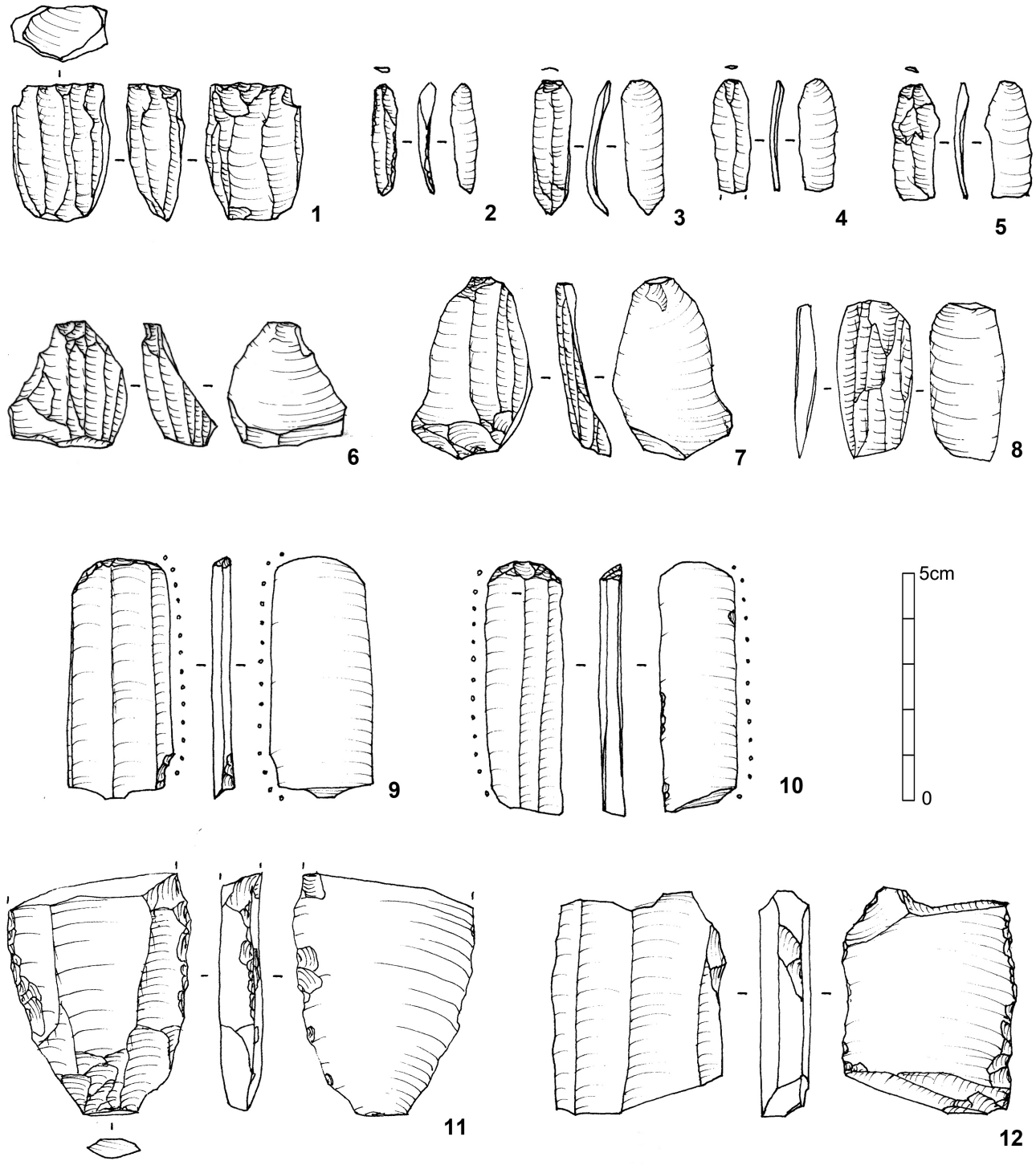

Fig. 4. *Late PPNB flint blades and related artefacts from Tell Seker al-Aheimar. 1–5: Bullet core and bladelets recovered* in situ *from a concentration; 6-8: Core-front flakes; 9–12: Blades used for tools. All made of yellowish brown flint.*

assemblages of the yellowish brown flint. Fourth, the platform was created mostly by a single blow at one end. Only one core had a faceted platform (Fig. 3: 3). The angle between the platform and the main working surface is not acute, but close to 90 degrees in both cases (Fig. 3). Fifth, core edge abrasion was a common practice for the platform preparation (Fig. 3: 2–6). Sixth, the bottom of the cores was occasionally flaked by transversal blows. Accordingly some of the cores at the final stage take a rectangular form (Fig. 3: 4 and 7), while many have a conical form. In general, the pressure blade cores of yellowish brown flint seem to have been prepared better than the bluish gray flint cores, which include specimens showing no preparation except for the platform making (Fig. 3: 8).

Blade removal

The detachment of pressure blades must have been involved with more complicated strategies than that of percussion blades. Although the details – for instance, the possible employment of heat treatment and metal point – have yet to be elucidated, I would like to point out that there seem to have been at least two types of pressure techniques according to blade/ core size.

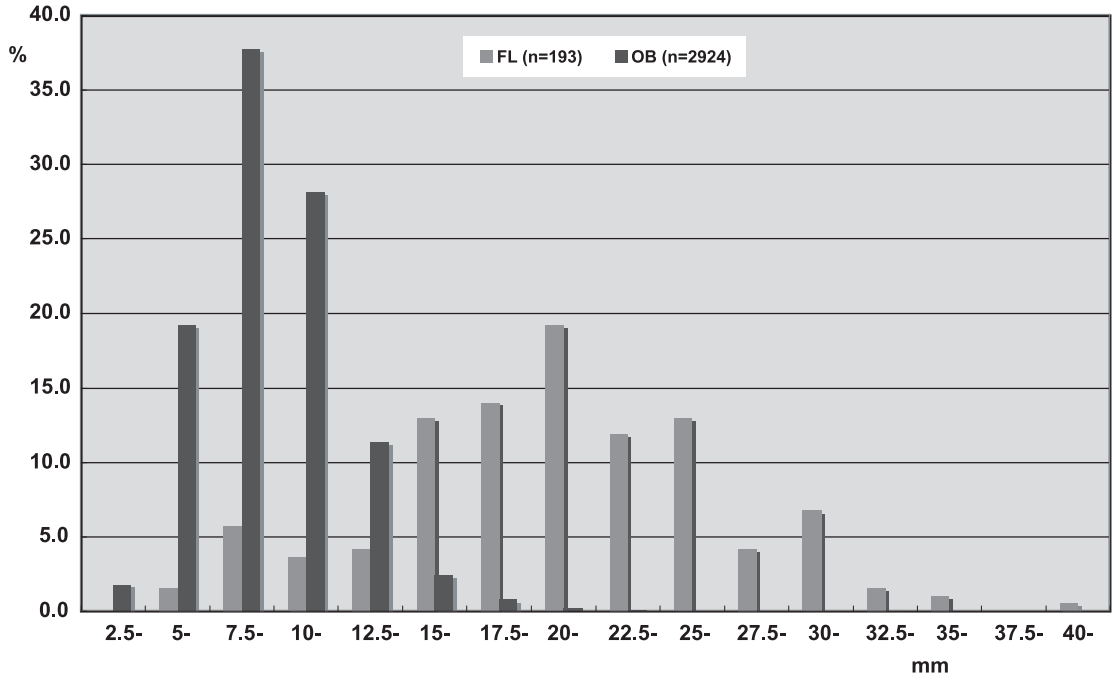

Fig 5. *Distribution of width of the Late PPNB pressure blades from Tell Seker al-Aheimar. Gray: yellowish brown flint; Black: obsidian.*

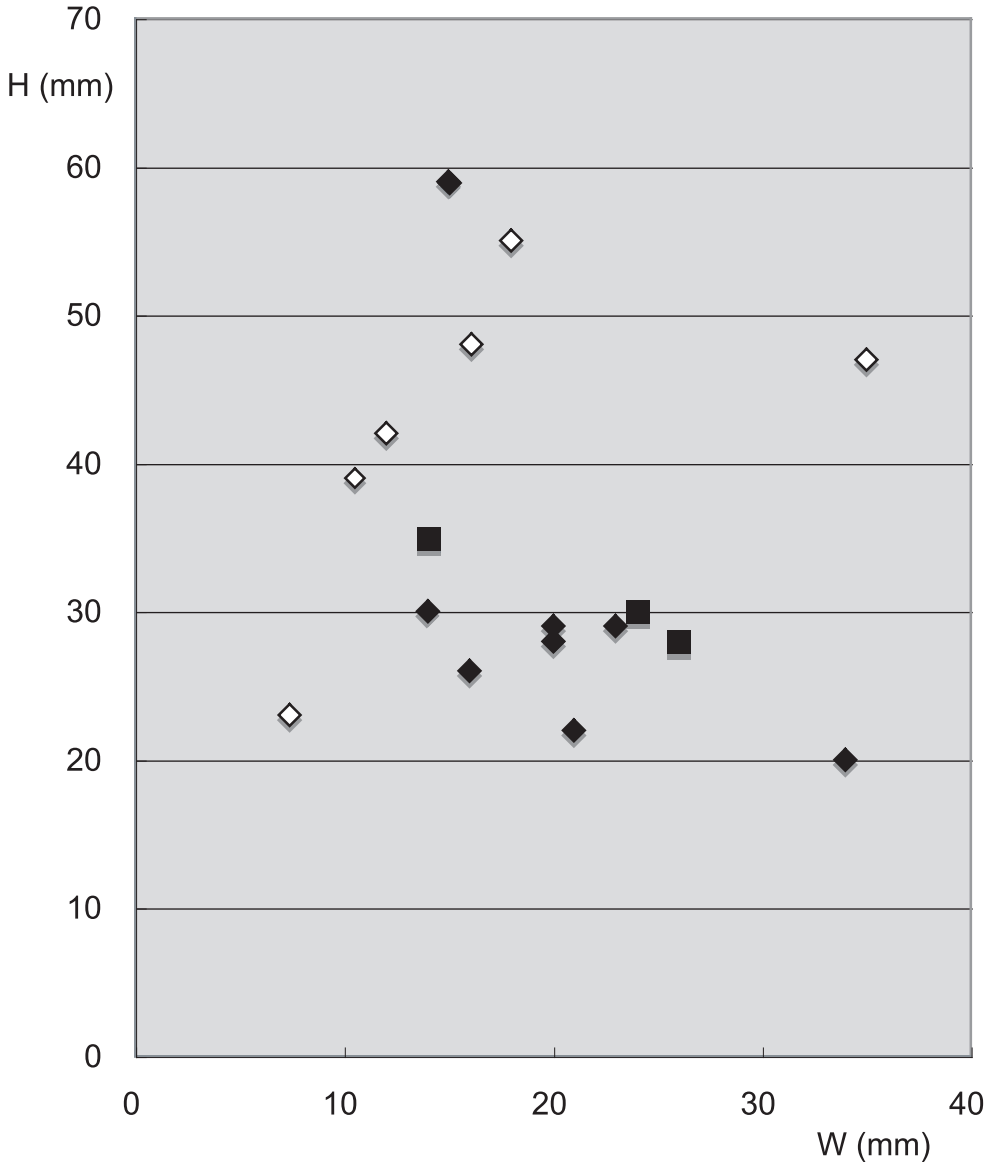

Fig 6. *Height and width of the Late PPNB blade cores from Tell Seker al-Aheimar. Closed squares: Bullet cores of bluish gray flint; Closed diamond: Bullet cores of yellowish brown flint; Open diamond: Obsidian bullet cores.*

Fig. 5 shows the distribution of the width of the blades of yellowish brown flint, which was the main raw material for pressure blades. Apparently a bimodal distribution is indicated, the smaller one having an average width of approximately 7.5–10 mm, and the larger one concentrated in the width range of 15–25 mm (cf. Fig. 4: 2–5 and 9–12). The width of the smaller group, that is, bladelets, matches with that of the tiny blade scars on the pressure-flaked cores (Fig. 3). The discovery of a concentration of bladelets with a small core in a courtyard of PPNB architecture (Fig. 4: 1–5) attests to their association as well as reduction within the site. Moreover, it resembles the width of obsidian bladelets abundantly recovered from the PPNB

contexts of this settlement (Fig. 5). Considering the similarity of the size and morphology of cores as well (Fig. 6), the flint bladelets were detached within the settlement probably by means of a similar technique to that of the obsidian bladelet production, most likely with a light device as suggested at Çayönü, southeast Anatolia (Didier 2005: 239). The possible use of a hand-held anvil is indicated by a series of tiny abrasion and counter-flaking scars seen along the core bottom edge (Fig. 3: 3–5 and 7).

On the other hand, the larger group of blades, which includes very large pieces over 10 cm long even in broken status and up to 4 cm wide (Fig. 4: 9–12), could not have been detached with a light hand-held device. The use of indirect percussion may have allowed for their production (Pelegrin 1988). However, I would rather suggest pressure debitage. If so, in view of the large size, the marked morphological standardization, and the consistent dorsal ridge-pattern (trapezoidal section), the use of a lever device for pressure is likely to have been the case (Didier 2005; Pelegrin 2002). As a matter of fact, these large blades show a highly standardized shape, resembling that of the third millennium Canaanean blades whose production is considered to have depended on lever devices (Chabot 2002). The absence of comparably large core-rejuvenation flakes and management pieces does not point to the possibility that the small bullet cores mentioned above were final residues of the intensive reduction of larger cores within the settlement. The large pressure blades were probably produced elsewhere and brought into the settlement of Tell Seker al-Aheimar in finished form.

Core management

The studied sample includes a small amount of core management pieces related to bullet cores. Interestingly, many of them are pieces detached from the frontal part, rather than the platform, of bullet cores with direct percussion (Fig. 4: 6–8). Due to their small size, they are unlikely to represent core-rejuvenation activities, but seem to show intentional destruction of bullet cores. The fact that some of the bullet cores retain hard-hammer-struck scars before the abandonment (Fig. 3: 6 and 7) could support this preliminary interpretation. Similar possible destruction has been suggested for obsidian bullet cores as well (Kadowaki *et al.* in press).

■Discussion

The aforementioned observations focused on core reduction technologies applied to local bluish gray and non-local yellowish brown flints. The results revealed that two kinds of blades were locally produced. One group consists of blades manufactured with a percussion technique on bluish gray flint,

and the other one of bladelets detached by means of pressure flaking on both bluish gray and yellowish brown flint. In both cases, blade production was conducted exclusively with single-platform cores. This is an obvious indication that the technological tradition of Tell Seker al-Aheimar is placed outside the Levantine PPNB Naviform cultural sphere.

Single-platform blade production with a percussion technique is widely known to have occurred at Neolithic settlements during the period in question. Accordingly, it is the pressure blade production using bullet-shaped cores that characterizes the major debitage technology at this PPNB settlement. Pressure blade production is considered to have originated from the Upper Palaeolithic of Siberia, and to have appeared in Upper Mesopotamia during the end of the 10th millennium BC, with the earliest examples at M'lefaat and, slightly later, at Nemrik in northern Iraq (Binder 2005: 236). This technology remained common in the eastern part of the Near East, including the Zagros Mountain flanks (Hildebrand 1994), throughout the Pre-Pottery to Pottery Neolithic periods. Examples chronologically comparable to those of Seker al-Aheimar are known in Upper Mesopotamia as at Magzaliyah in northern Iraq (Bader 1979) and at Tell Bouqras in eastern Syria (Roodenberg 1986). The published drawings from these settlements indicate that the cores for this debitage technology are similar to each other in taking a conical bullet-shape and having either a plain or a faceted platform. The discovery of bullet cores at Tell Seker al-Aheimar demonstrates that this eastern technological tradition was distributed in the PPNB as far west as the west end of the Upper Khabur basin (Kozlowski 1999; Kozlowski and Aurenche 2005: 144). Tell Bouqras on the Lower Khabur marks the western border to the south. However, Naviform-type opposed-platform cores were also used along with bullet cores at Bouqras. This is probably a result of interaction along watercourses penetrating into what is otherwise the steppe: Bouqras is situated at the confluence of the Khabur and Euphrates Rivers.

The region of Southeast Anatolia on the Upper Tigris also seems to have shared the bullet core tradition while maintaining the use of opposed-platform technologies as well. The long stratigraphic sequence at Çayönü has enabled it to monitor the development of the pressure debitage technology. According to Binder (2005), pressure debitage for bladelet production with conical cores first appeared in the Early PPNB (the late 9th millennium BC) and became associated with the use of flat cores with an oblique platform during the Middle PPNB. Further, in the Late PPNB period, the technology developed into a more standardized one, which then accommodated another strategy for the production of very long (over 15 cm) and wide (over 3 cm) blades. Binder (2005: 239) suggested the introduction of a lever technique for the production of the latter in this period. In light of this framework,

the technology at Tell Seker al-Aheimar matches that of the Late PPNB of Çayönü very well. The bimodal production systems of bladelets and large blades are the most impressive similarity. Yet, a difference is also notable. It is the practical absence of pressure debitage with oblique platform cores at Seker al-Aheimar, while it was common in the Late PPNB at Çayönü (Binder 2005: 239).

Recent discoveries at Akarçay in the Upper Euphrates Valley of the Turkish territory showed the common occurrence of oblique platform technology even to the west in Anatolia (Borrell 2007). This technology is reported to have appeared in the mid-8th millennium BC or at the end of the Middle PPNB. The cores for pressure debitage apparently consisted of those for bladelets and blades, but both reportedly show a more or less similar shape and technological strategy. Cores were generally flattened with an acute angle between the working surface and the striking platform. They rarely took a conical or bullet shape. Borrell (2007) further reviewed the literature and stated that this technique was practiced at other Late PPNB settlements of the same or later chronological range in the upstream region of the Euphrates valley, such as Cafer Höyük, Hayaz Höyük and Mezraa Tleilat, but not in the downstream region, Syria, where numerous settlements such as Tell Halula and Tell Abu Hureyra were situated. He surmised that the pressure debitage technology using oblique platform cores was diffused from the even more upstream region of the Euphrates, where Çayönü is situated, to the northern Levant, bypassing the Jazireh plain of Syria.

The predominance of conical bullet-shaped cores at Seker al-Aheimar is incontestable, and this fact suggests that the tradition of the Upper Khabur was indeed separated from that of southeast Anatolia and the western regions. However, it should be mentioned that a small number of oblique platform cores are present among the PPNB *obsidian* cores and Proto-Hassuna *flint* cores of Seker al-Aheimar (cf. Fig. 53: 1 in Nishiaki 2000b). Whether or not these cores point to some link with the Upper Euphrates is presently unknown, since the variability of the pressure blade core forms in the Eastern tradition has not been fully explored. In the meantime, it should be safe to state that the Upper Khabur has stronger affinities with the east (Hildebrand 1996).

The next issue to be discussed is the social contexts of the flint pressure debitage. It is interesting to note that the local practice of pressure debitage represents only a part of the entire blade technologies known from the studied sample. I presented a model to summarize the relationships between raw material types, core reduction technologies, and on-site/off-site production (Table 1; Nishiaki 2007). On the basis of the present analysis,

which focused on the technological types of the blades, we are able to elaborate the model as follows:

- Single-platform percussion blades – Local bluish gray flint – On-site production
- Single-platform pressure bladelets – Local bluish gray (few) and exotic yellowish brown flints – On-site production
- Single-platform pressure blades – Exotic yellowish brown flint – Off-site production
- Opposed-platform percussion blades – Exotic pink flint – Off-site production
- Opposed-platform percussion blades of the Douara type – Exotic dark brown flint – Off-site production

Only the first two groups of flint blade/lets were produced within the settlement. The production of single-platform pressure bladelets deserves more attention, because it was practiced on both locally available bluish gray flint and imported yellowish brown flint, whereas the manufacturing of the other types of blades was almost exclusively dependent on one of the different raw material types. It also deserves attention because the local use of yellowish brown flint for pressure debitage was limited to bladelet production, while the same flint was used for larger blade production outside the settlement. This distinction may relate to the differentiated technological skills possessed by the local communities. Regarding this, the core assemblages from the PPNB levels of Bouqras are noteworthy. They include large pressure-flaked bullet cores up to 22 cm long (Roodenberg 1986: 14). My personal observation indicates that the raw material for these is yellowish brown flint, which is virtually indistinguishable from that of Tell Seker al-Aheimar. The large pressure-flaked blades and prepared cores for the bladelets of Tell Seker al-Aheimar were probably imported from a contemporaneous community that had the skill of lever use, which was apparently not available to the inhabitants of Tell Seker al-Aheimar.

I surmised that the pressure technology employed at Tell Seker al-Aheimar was involved with a light hand-held device. Although this technology is less complicated than that which uses a lever, it is still more specialized than the expedient percussion blade technology, and the social context of the manufacturers and users of the pressure bladelets will be an interesting issue to investigate. We have partly examined this issue for the pressure debitage applied to obsidian, whose resultant bladelets and cores exhibit very similar sizes and morphological features (Fig. 6). The spatial analysis of the distribution patterns of the obsidian refuse and the discard behavior itself suggests that obsidian pressure bladelets were produced in domestic

contexts rather than in specialized workshop areas (Kadowaki *et al.* in press). A similar analysis of the flints, as well as other analyses for the distribution from manufacturers to users, will be useful for understanding the social organization surrounding the blade production at Seker al-Aheimar.

■Conclusion

The flint blade production technologies of the Late PPNB at Tell Seker al-Aheimar were examined. The common occurrence of pressure-flaked bullet cores and the complete absence of Naviform opposed-platform cores demonstrate their affiliation with the Eastern Wing group of the Fertile Crescent. At the same time, the analyses revealed consistent contact with the Western group and with other communities in the Eastern group. The contacts with the West are indicated by imported Naviform blades and blade-tools, and those with other Eastern communities by large pressure-flaked blades also imported to the settlement. The situation of the latter is more complicated: the large blades made with more specialized techniques and devices were probably brought in together with prepared core blanks, which were then reduced within the settlement of Tell Seker al-Aheimar for manufacturing much smaller bladelets with a different pressure technique. The resulting picture may reflect the geographic position of the site, situated at the western periphery of the Eastern Wing group. Unequal distribution of technological knowledge and skill among the contemporaneous village societies may also explain this phenomenon. Yet, it may simply reflect the particular raw material environment of the Upper Khabur basin, where no high-quality flint of a large size is locally existent. A further pursuit of this pattern should contribute to a better clarification of the regional and internal structures of the PPNB society of Upper Mesopotamia.

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CHAPTER 7

Gypsum plaster manufacturing in northeast Syria: An ethnographic case study

Shogo Kume

■Introduction

The beginning of the Pre-Pottery Neolithic B (PPNB) period in the 9th millennium BC in the Near East involved transformations of nearly every aspect of human society. One of the essentials of the 'Neolithization' process was the introduction of new interactions between 'nature' and 'human' (Belfer-Cohen and Groring-Morris 2009). Domestication of plants and animals are obviously pushed forward, but various new manipulations of 'nature' were additionally introduced. Landscape modifications like the construction of wells provide a fine example of the phenomena (Peltenburg *et al.* 2000; Nishiaki 2009).

The extensive developments of 'pyrotechnology' (fire manipulation for craft production) in the PPNB period are also situated on the same line of the new 'nature'-'human' interactions (e.g. Kume 2008). Before the developments resulted in the appearance of fired ceramics during the Pottery Neolithic (PN) in the 7th millennium BC, gypsum and lime plaster prepared by heating gypsum stones or limestone have been well attested in the Levant and Anatolia during the PPNB period. For example, the massive production of plastered floor represents a significant characteristic of the period. So-called 'white ware' containers are often cited as the forerunner of the fired ceramics (e.g. Moore 1995). In addition, plaster was used as raw materials of some symbolic objects, such as plastered skulls and plaster statues (e.g. Kuijt 2000).

For this reason, several studies focused on the manufacture and use of gypsum and lime plaster has been conducted (Aurenche 1981; Kingery, Vandiver and Prickett 1988; Miyake 1994). In particular, archaeological records of lime plaster manufacturing processes in the Neolithic Near East have already been published and discussed in detail elsewhere (Lechevallier ed. 1978; Banning and Byrd 1987; Garfinkel 1987a, 1987b; Goren and Goring-Morris 2008). However, sparseness of archaeological evidence of the contemporary gypsum plaster manufacturing has disturbed to document details of the processes. Perhaps so far, only Umm Dabaghiyah, a Proto-Hassuna site in Iraq, has produced the evidence of the manufacturing, uncovering kilns and heaps of burnt gypsum debris (Kirkbride 1973: 208-209).

The on-going archaeological excavations at a PPNB-PN site of Tell Seker al-Aheimar, the Upper Khabur Valley, northeast Syria, yielded the massive use of gypsum plaster for surfaces of architectures, 'white ware' containers and other forms of artefacts since the 2000 season (Nishiaki and Le Mière 2005). However, no evidence of gypsum plaster manufacturing processes, such as firing facilities and heaps of raw materials, has thus far been discovered.

Where did the inhabitants produce such large amounts of gypsum plaster? In addition, the gypsum plaster artefacts included a wide range of colour variation from whitish or greyish to pinkish or brownish. How was the variability of colour generated? These simple but possibly significant questions led me to conduct an ethnographic research of gypsum manufacturing in a village of the Jebel Abd al-Aziz area around the site.

■Previous ethnographic descriptions of gypsum plaster manufacturing

Ethnographic descriptions of gypsum plaster manufacturing in the Near Eastern regions have been sparse so far. Wulff (1966: 125-127) reported a case in the Khorasan region of east Iran, where quarried gypsum rocks are burnt in kilns for 12 to 24 hours using shrubs as fuel. Chardin (1997: 254), a French merchant who travelled over Iran during the 17th century, also described gypsum manufacturing. Although his descriptions might be ambiguous, the manufacturing practiced at that time appears comparable to that of modern Iran. Youkana (1997: 45) interviewed the inhabitants of Samarra, Iraq, where raw materials were outcropped on the ground surface. The inhabitants of this area fired them overnight on the spot in order to produce gypsum plaster. He also suggested that similar activities have been practiced throughout north to central Iraq. Copeland observed a village near Bouqras, Syria, where inhabitants were 'making gypsum plaster by burning dung and brushwood on top of a pile of gypsum rocks in a stiff breeze' (Copeland 1979: n. 19).

Instead of these brief descriptions or observations, Aurenche and Maréchal (1985: 221-222) conducted an ethnographic research at Qdeir, Syria, describing the manufacturing sequence in detail. The village of Qdeir has been surrounded by gypsiferous soils (see below). Thus, the raw materials can be obtained through just digging an oval shallow pit, c. 150-200 cm wide and c. 5-10 cm deep, around the village. Once a pit is dug, the outcropped soil is burnt on the spot for 24 to 36 hours in order to obtain gypsum plaster, using a mixture of donkey, sheep and goat dung combined with straw as fuel. Aurenche and Maréchal also briefly mentioned details of the manufacturing, such as the amount of fuel and produced gypsum plaster, work schedules of individual pits, gender or organizational aspects of the work, and distribution of the products. In conclusion, they suggested a possibility that the process for manufacturing gypsum plaster observed at Qdeir could have been practiced during the Neolithic period as well, considering the favourable environments for the manufacturing and simple tools involved within the process.

Based on these ethnographic reports, traditional gypsum plaster manufacturing processes can be grouped into two categories; 1) kiln firing of quarried gypsum rocks in Iran and 2) open firing of outcropped soils containing sufficient quantities of gypsum in Iraq and Syria, although the example observed by Copeland might suggest an intermediate form of these two categories.

Brief extensive surveys conducted by car in 2001 and 2002 revealed that the open firing method of gypsum plaster manufacturing was also observed throughout north-eastern part of Syria, such as the vicinity of Raqqa and Hassake, the Lake Khatouniye area, the Jebel Abd al-Aziz area, and the El Kowm basin in which the village of Qdeir is situated. Among those, the Jebel Abd al-Aziz area was selected as study area, considering accessibility and similarity to the environment of Tell Seker al-Aheimar.

My ethnographic research was not isolated from the pioneering work of Aurenche and Maréchal (1985) mentioned above. Instead, I intended to develop the previous study in some details. Aims of the research included: 1) description of the manufacturing sequence and 2) description of behavioural patterns involved in each manufacturing stage in detail, in attempts to provide some archaeological insights into the invisibility of firing facilities of gypsum plaster manufacturing, taphonomy of colour variability of gypsum plaster, and a facet of 'nature'-'human' interactions involved in the manufacturing during the 'Neolithization' processes.

■Chemical background of gypsum plaster

The details of the chemistry of gypsum plaster in archaeological context have already been published elsewhere (e.g. Gourdin and Kingery 1975: 135; Maréchal 1982: 219; Kingery *et al.* 1988: 221; Rehder 2000: 46-47. See also Nakahara *et al.* eds. 1972; Arai *et al.* eds. 1995). Thus, only a brief summary of these studies will be mentioned here.

Natural gypsum can be decomposed into main two compounds: calcium sulphate dihydrate ($CaSO_4 \cdot 2H_2O$) and calcium sulphate anhydrite ($CaSO_4$). Gypsum plaster or plaster of Paris is principally prepared by heating calcium sulphate dihydrate at a temperature[1] of 130-190°C to form a hemihydrate ($CaSO_4 \cdot 1/2H_2O$), driven off three-fourths chemically combined water (first dehydration).

1. The appropriate range of heating temperatures varies with references. This paper followed Arai et al. *eds. (1995).*

The basic equation is:

$$\underset{\text{calcium sulphate dihydrate (pure gypsum)}}{CaSO_4 \cdot 2H_2O} \xrightarrow{\text{Heating (130–190°C)}} \underset{\text{calcium sulphate hemihydrate (gypsum plaster)}}{CaSO_4 \cdot 1/2H_2O} + \underset{\text{pure water}}{3/2H_2O}$$

When the hemihydrate is (pulverized and) mixed with water, it forms a smooth paste with an adherent consistency that hardens with time, thereby reverting to its original chemical composition by the reverse of equation. If the heating temperature exceeds 190°C, second dehydration occurs to form a soluble anhydrite or anhydrite III (III $CaSO_4$), driven off whole of chemically combined water. Anhydrite III can easily combine with the water vapour in air and revert to the hemihydrate. However, if the heating processes proceed at a higher temperature (over 400°C), anhydrite III is reverted to the insoluble anhydrite or anhydrite II (II $CaSO_4$), which is difficult to convert back to the hemihydrate. This result implies that gypsum plaster is not available if the heating temperature exceeds 400°C.

In summary, 1) relatively-low-temperature (130-190°C) heating processes are required to manufacture gypsum plaster; 2) if the heating temperature exceeds 190°C, ripening processes are induced; and 3) if the heating temperature exceeds 400°C, gypsum plaster may not be obtained.

***Fig. 1**. Map of the Jebel Abd al-Aziz area and archaeological sites in Syria mentioned in the text.*

■Ethnographic background of the study area

The research was carried out at a village in the Jebel Abd al-Aziz mountainous area of northeast Syria during October 2003 (Fig. 1). The study area is characterized by an arid environment with an average annual precipitation of only 200-300 mm. There are approximately 125 villages in this area (Darwich *et al.* 1995), populated by the *Baqqara*, an Arabic agro-pastoralist. The *Baqqara* were essentially pastoral nomads from the Arabian Peninsula, involved with sheep, goat, and camel managements. By the 1950s, however, part of the *Baqqara* settled around the Jebel Abd al-Aziz area, cultivating rain-fed barley as fodder for their flocks (Hirata *et al.* 1998: 320; Hirata *et al.* 1999: 261).

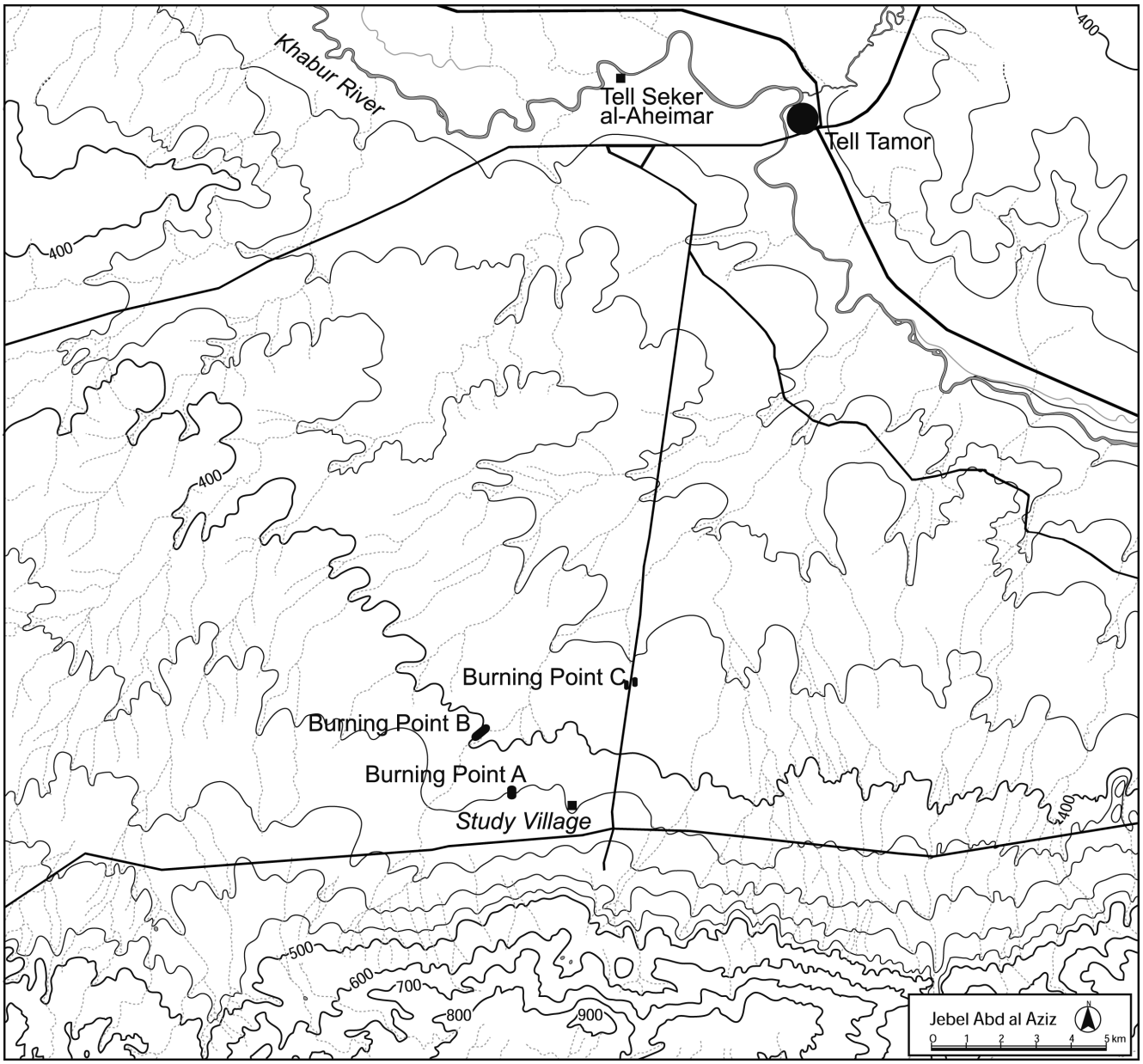

***Fig. 2**. Topographic map of the Jebel Abd al-Aziz area, showing the location of the study village, burning points and the archaeological site of Tell Seker al-Aheimar.*

The village is a small settlement situated in the Gharrah district in the northern plain of Jebel Abd al-Aziz (Fig. 2), including six to seven households. Primary subsistence of the villagers is also sheep and goat herding and cultivation of barley as fodder. Gypsum plaster is referred to as *juss* in this area and is used as mortar for rock walls of livestock housings or kitchen areas in mud brick houses.

Gypsum plaster manufacturing is quite common for most villagers in spite of age or gender. Although males usually practice the manufacturing in the area, it is also possible for females to practice the work.[2] Gypsum plaster is manufactured only during summer in order to avoid the rains. Manufactured gypsum plaster is used as household consumption. As a result, the works are conducted by members of a household according to their demands. The manufacturing cycle is approximately one or two times per year, but it depends on the demands of each household. For the purpose of this research, two 30s male practitioners demonstrated processes of gypsum plaster manufacturing.

■Overview of the gypsum plaster manufacture process

The first step of the process is collecting fuel. Sheep and goat dung (*doridge*) is used as fuel. Dung can be easily collected through picking, since the herds leave plenty of scattered pellets in the village. The amount equivalent to around three-fourths of a sack (c. 110 × 70 cm = c. 58 litters) was collected in a few minutes (c. 11 kg) (Pl. 1). According to the interviewed practitioners, 25 to 30 sacks of dung (300-400 kg) are required for each regular firing. The amount of fuel is essential, because the amount of acquired gypsum plaster depends on that of fuel. They also prefer old and dry dung because of efficiency of combustion. In addition to dung, an armful of straws was also collected as fuel.

Once the collection of fuel was completed, the practitioners made a trip to the firing point. This point was located at a distance of 1.7 km from the village, surrounded by barley fields (Fig. 2: Point A; Pl. 2). Although harvesting was completed, straws were sparsely scattered in the harvested fields. Gypsum plaster is produced from the soils deposited at the firing point. Raw materials used by the villagers have been identified in soil science as gypsiferous soils, containing sufficient quantities of gypsum (FAO 1990). Locals classify the soils as *kitthan*. In addition to the Jebel Abd al-Aziz area, gypsiferous soils are well developed throughout east Syria, such as theEuphrates Valley between Raqqa and Abu Kamal (Furley and Zouzou 1989: 30; FAO 1990: 73; Florea and Al-Joumaa 1998: 61; Samuel 2001: 352) and the Balikh Valley (Akkermans 1993: 19). According to FAO, 21.6% of the

2. For instance, I have observed that women or couples were involved in the manufacturing at a village near Lake Khatouniye. At Qdeir, women were involved in manufacturing gypsum plaster

***Pl. 1**. Collection of dung as fuels at the study village.*

***Pl. 2**. Burning Point A, containing around 90 firing pits.*

***Pl. 3**. Selection of raw materials. Thin topsoils are removed to examine the condition of deposited gypsiferous soils.*

***Pl. 4.** Excavation of firing pit, re-using a pit in which burnt before.*

***Pl. 5**. Fueling.*

***Pl. 6**. Firing.*

total area of Syria is covered by the soils (FAO 1990: Table 1.2). Apparently, the main reason of gypsum accumulation in the soils is its precipitation from underground and runoff waters as a result of intensive evaporation in the arid environment (FAO 1990: 2).

The burning point was an area of roughly 115 × 90 m^2, containing at least 90 firing features. These features were easily identified as oval or semi-square pits, measuring 3 to 4 m wide and 10 to 20 cm deep, since ashes and debris removed after combustion are banked like baulk at the rim of the pits. The interviewed practitioners suggested that this burning point has been exploited since 30 or 40 years ago. Individual features were used repeatedly if gypsiferous soils were deposited therein. As a result, the number of spots does not correspond to the count of firing. No information of the count of firing at each particular pit was available, because the burning point was shared by surrounding villages. However, it can be safely assumed that hundreds of firings were conducted at the point.

The interviews also revealed that two other burning points existed in the surroundings of the village. One (Fig. 2: Point B) was located against a wadi, 3 km apart from the village. This point contained over 100 firing pits. The other (Fig. 2: Point C) was located 4 km apart from the village, containing approximately 10 pits situated beside the main road between Jebel Abd al-Aziz and Tell Tamor. The villagers I interviewed have not exploited the other two burning points. They simply explained two reasons for their selection of Point A; the nearest burning point to the village and high-quality raw materials. However, their suggestions may require additional explanations, since it is fairly assumed that gypsiferous soils are well developed throughout the area. Most likely, locations of possible burning points are quite limited, because barley fields cover large part of the area. As a result, it might have been difficult to remove cultivated topsoil to access the raw materials. On the other hand, the referred 'high-quality' must have been related to geomorphological features, i.e., accumulation of gypsum in the soil due to its precipitation from underground and runoff waters.

Based on the interviews and observations, possible factors of the selection of the burning point are summarised as the distance from the village, the high degree of gypsum accumulation in the soils, and the area without cultivated topsoil. These factors also apply to Points B and C. Point B, which is set against the wadi, probably contains sufficient quantities of gypsum precipitated from the underground and runoff waters. Moreover, topsoil removal may be simplified because of the space located at the wadi bank. On the other hand, Point C is an artificial mound of soils after the road construction or the like. Thus, there is an advantage to directly access the raw

materials without topsoil removal.

During the initial stage of the manufacturing, selections of the gypsiferous soils were first performed upon arrival at the burning point (Pl. 3). When eolic thin sediments and straws were removed, pinkish-white gypsiferous soils (10YR7.5/4) were exposed. The same process was carried out at several spots. Finally, a spot, which was burnt before, was selected. The selection is based on observations of colour variability of the soils. Deep pinkish soils were avoided, for example. It seems that contamination by other soils is estimated from colour variability.

After the spot was selected, an approximately 10 cm deep pit was excavated. Using the tip of a shovel, the excavation was more likely to scrape or pound the soils than digging (Pl. 4). A 1 m wide oval pit was excavated for this research, but 3 to 4 m wide pits are generally dug as described above.

Subsequently, fuelling and firing was conducted. First, the pit was covered with straws. Next, dung was heaped on the pit at a height of approximately 30 cm (Pl. 5). Then, empty flax sacks for dung and straws were also laid on the pile as fuel. These sacks were used as fuel to accelerate the combustion of dung.[3] After fuelling, the straws at the bottom of the structure were fired (Pl. 6). The fire spread quickly, but additional fuelling was carried out in order to ensure the combustion of dung. The practitioners collected straws from the surrounding barley fields and added them on the pile (Pl. 7). This process was repeatedly conducted for around one hour. In general, firing continues approximately three days, although it depends on climatic conditions and state of dung (dry or moist). During this period, practitioners have returned to the village and left the firing to take it own course.

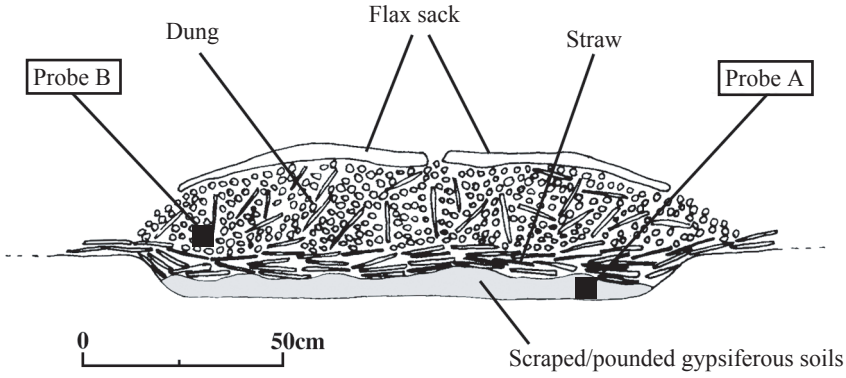

***Fig. 3**. Schematic section of firing pit, showing the location of probes.*

3. Similar behaviour is observed elsewhere. At a village near Lake Khatouniye, old tyres are used for the same purpose. In addition, oil is added to the pile of fuel to facilitate firing, as has also been described in the case of Qdeir (Aurenche and Maréchal 1985: 221).

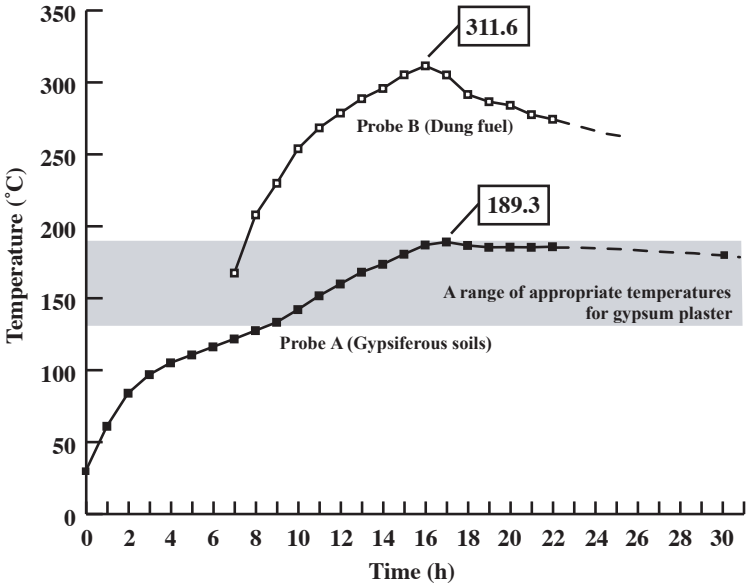

***Fig. 4**. Firing schedules of raw materials (Probe A) and fuels (Probe B). Shaded area indicates a range of appropriate temperatures for gypsum plaster manufacturing.*

***Pl. 7**. Combustion.*

***Pl. 8**. Removal of ashes and debris.*

***Pl. 9**. Extraction of burnt gypsum plaster.*

***Pl. 10**. Mixing of water with gypsum plaster.*

During the firing, temperatures were recorded sequentially using two probes equipped with a data logger (Yokogawa TM-20). Probes A and B were placed in the gypsiferous soils and the fuel, respectively (Fig. 3). Probe B started to collect the temperatures after seven hours of the process in order to avoid any unexpected fluctuations in temperature by accidental firing of the probe (Fig. 4). The temperatures of the gypsiferous soils (Probe A) rose sharply for the first three hours until it reached about 100˚C. After that, it continued to rise gradually. It is likely that the first dehydration occurred at around 100˚C (Arai *et al.* eds. 1995: 422). The maximum temperature (189.3˚C) was attained after 17 hours. In addition, the condition of over 180˚C continued for at least 15 hours. On the other hand, the temperature of the fuel (Probe B) reached the maximum (311.6˚C) after 16 hours and then fell gradually. These firing schedules indicate that the manufacturing process observed in the village corresponds to the modern scientific knowledge of temperature control, i.e., maintaining of the temperature between 130˚C and 190˚C (see above). Given the large number of ethnographic descriptions on pottery firings (e.g. Rye and Evans 1976; Tobert 1984; Arnold 1999; Sillar 2000), dung is widely used as fuel in the Old and New Worlds. One of the advantages of dung is that the ash acts as insulator for the firing structure after the combustion (Sillar 2000: 46). Although the interviewed practitioners have never been referred to temperature control, the recorded data implies that the characteristics of dung are practically applied to the manufacturing.

The firing continued for approximately three days. After 71 hours from the beginning of the firing, extraction of the burnt plaster was conducted. Although the dung had burnt out, the plaster had retained the heat at a temperature of approximately 65˚C. As has also been reported by Aurenche and Maréchal (1985: 221–222), extraction of plaster is often carried out after a few days or one week of the end of combustion, since a cooling period is required to extract the burnt plaster easily. In addition, it may also be possible that this interval is practically used to allow the ripening of the soluble anhydrate (III $CaSO_4$) to reform the hemihydrate ($CaSO_4 \cdot 1/2H_2O$).

Removal of ashes on the structure is the first step of the extraction of burnt plaster (Pls. 8 and 9). After the ashes are removed, the spot is occasionally swept in order to eliminate as much of the ashes as possible, although this process was not conducted during this study.[4] Then, the burnt gypsum plaster was filled in a sack by scooping it out with their hands. The amount of acquired plaster was approximately one-thirds of the sack (c. 18 kg). In general, four to five sacks of gypsum plaster (c. 200 to 250 kg) are acquired, excavating a larger pit. In spite of careful ash removal, the acquired gypsum plaster showed greyish in colour (2.5Y5.5/1) due to spontaneous inclusion of ashes.

4. Sweeping of the surface of burnt spot was observed at a village near Lake Khatouniye by the author.

The acquired gypsum plaster was then transported to the village. Actual use of the plaster was also observed. The practitioners used a part of the acquired gypsum plaster and stored the unused portion for future use. The plaster was heaped directly on the ground. Subsequently, the centre of the heap was hollowed and water was poured into the hollow, followed by mixing of them to acquire a pasty consistency (Pl. 10). Although no tempering materials were added during this study, sand and straw are occasionally used as tempers. The practitioners addressed that the acquired gypsum plaster was 'quite high quality because the plaster included few other soils.' Water was added to the plaster until it attained an adherent character similar to that of modern cement. The cementing material was then used as infilling for a doorway of a mud-brick house in this case. The applied plaster hardened in approximately 30 minutes.

■Discussion

Observations of the modern gypsum plaster manufacturing process described above provide some archaeological implications. The first concerns the invisibility of gypsum plaster manufactures in the archaeological record. In the case of the gypsum plaster manufacturing observed in this research, raw materials procurements and firing of the soils were conducted at the same spot. As a result, the manufacturing was entirely conducted outside of the settlement. The off-site activities might simply the reason of the invisibility of the traits of gypsum plaster manufacturing during the Neolithic period.

In the study area, the nearest outcrop of the raw materials was selected as the burning point (Point A). The point was located 1.7 km from the village, but the distance from a village to a burning point can be smaller if the outcropped gypsiferous soils are more closely situated.[5] Other factors might also be included in the reasons of the selection, such as outside of barley fields and convenience of transportation of fuels and the products, for example.[6]

The maximum amount of gypsiferous soils accumulate on the fringe of terraces, detrital cones and slope deposits that are bordered by hills, under the condition that a water table containing mineral water exists at a depth of less than 5 m (FAO 1990: 2). Thus, geomorphological investigations surrounding archaeological sites may be considerable in order to yield archaeological evidence of gypsum plaster manufacturing in antiquity, although questions like dating of the archaeological features may subsequently occur.

The second concerns taphonomy of colour variability of gypsum plaster.

5. I have observed that burning points were more closely located at Qdeir and a village near Lake Khatouniye. Distances between the villages and the burning points were approximately 200–300 m.

6. In addition, it may be necessary to maintain a certain distance to avoid harmful effects such as fire and fumes (Aurench and Maréchal 1985: 221).

Archaeological materials of gypsum plaster demonstrate a wide range of colour variation as mentioned above. For example, the gypsum plaster artefacts recovered from Tell Seker al-Aheimar are primarily grouped into three colour categories: whitish, greyish and brownish plaster.

This research revealed that two main factors defined the variability of the colour of the gypsum plaster, i.e. 1) choice of raw materials preceding firing, and 2) the spontaneous inclusions of ashes during extraction (Fig. 5). The practitioners selected 'high-quality' whitish gypsiferous soils, considering the proportion of contamination by other soils through colour variation. In addition, when water was added to the gypsum plaster, it was remarked by them that the acquired plaster had quality because of 'less contamination by other soils.' Thus, brownish colour of gypsum plaster in the Neolithic period might be due to selected 'low-quality' raw materials that include some amounts of other soils.

Furthermore, spontaneous inclusion of ashes was inevitable during extraction of the burnt gypsum plaster in spite of careful removal of the debris. Therefore, it is assumed that greyish colour of the gypsum plaster is derived from the spontaneous inclusion of ashes during extraction after firing rather than intentional tempering in the subsequent stage.[7] On the contrary, meticulous removal of ashes might have been required in order to obtain whitish gypsum plaster.

Other factors such as intentional inclusion of tempering materials, spontaneous inclusion of other soils when water is added to the plaster, placed directly on the ground as has been observed in this study, and post-depositional transformations might also be relevant to colour variability of the gypsum plaster artefacts in the Neolithic period.

7. Copeland (1979: n. 19) as well as Aurenche and Maréchal (1985: 222) have already suggested that ashes are the main reason for the greyish colour of the gypsum plaster. Considering their insights, this paper suggested that ashes were included 'accidentally' or 'spontaneously.'

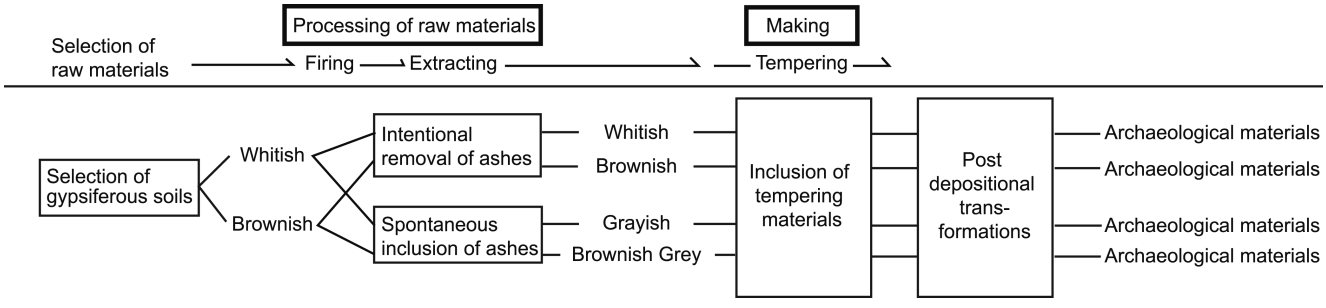

***Fig. 5**. Taphonomic processes of colour variability of gypsum plaster.*

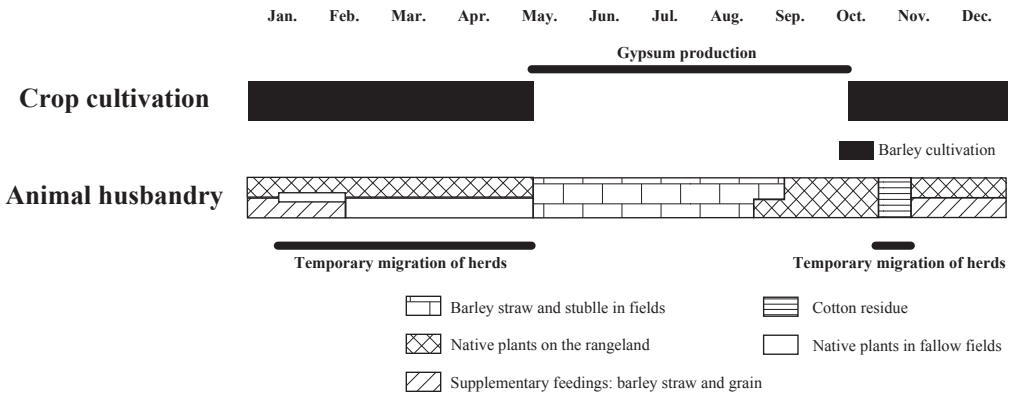

***Fig. 6**. Cycles of crop cultivation and animal husbandry in a village of the Abd al-Aziz area. Feed resources changes by seasons, involving temporary migrations of herds (adapted from Hirata* et al. *1998: Fig. 4).*

The last concerns insights regarding complex relationships between craft and subsistence activities developed during the 'Neolithization' processes. The manufacture of gypsum plaster in the area is a seasonal activity in summer, since the rains seriously disturb the open firings as described above. Obviously, summer is off-season of burley cultivation in the semi-arid environment (Fig. 6: top), suggesting more labour investments for other activities like the gypsum plaster manufacture.

In addition, the season might be reasonable in terms of fuel or dung collection. Hirata and his colleagues (Hirata *et al.* 1998) have documented herding patterns in the villages of the area in detail (Fig. 6: bottom). To summarise their results, the migration pattern of sheep and goat in the Jebel Abd al-Aziz area demonstrates two major seasonal variations, i.e., day-trip herding based on the villages during summer and winter, and short-distance pastoral migrations in spring. The former is significant in terms of dung collection, since the herds managed around the villages allow us to obtain piles of dung as fuel for the gypsum plaster manufacturing. Seasonality of dung collection has already been discussed in the case of the *Basboto*, cattle-pastoralists in highland Lesotho of South Africa (Huss-Ashomore and Goodman 1988). Among the *Basboto*, cattle dung is used as cooking fuel and collected only in winter when the cattle are managed in the village. Reddy (1998) also presents an example of Gujarat, northwest India, where dung is collected as fuel only in the dry season, since the wet monsoon months seriously disturb to collect moist dung.

Developments of agro-pastoral societies during the 'Neolithization' processes apparently involved efficient exploitations of alternative energy of dung as fuels and new resource of gypsiferous soils. As far as we know, the earliest evidence of gypsum plaster in the Near East have been discovered at Abu Hureyra Phase 2A (middle PPNB) in the Euphrates valley, Syria (Moore *et al.* eds. 2000).

■Acknowledgements

First and foremost, I would like to thank villagers in the Jebel Abd al-Aziz area. My thanks also go to many researchers that provided invaluable supports and suggestions, especially Kh. Ahmo, T. Fujimoto, K. Goto, M. Hirata, Y. Nishiaki, and T. Oguchi.

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CHAPTER 8

Neolithic pottery from the Khabur basin: A reassesment in the light of recent discoveries

Marie Le Mière

■Khabur Neolithic pottery: the previous situation[1]

Since the 1980's, Pottery Neolithic occupation preceding the Halaf period has been attested in the Khabur basin. But until excavations began at Tell Seker al-Aheimar, the earliest Neolithic pottery known there was a rather elaborated material corresponding to the previously determined third stage of pottery development (see below and Le Mière and Picon 1998). In other regions of the Jazirah, namely the Euphrates valley[2] and the Balikh valley,[3] the second stage was represented by pottery characterized by its simplicity, with one or two wares at most, a strong pre-eminence of plant temper which is often large in size, very simple shapes and little if any decoration. None of the surveyed sites in the Khabur basin produced such pottery and this is not due to the fact that this pottery is not very characteristic, because it has been identified as such in the survey material of several sites in the Balikh valley. This absence and the presence of a few PPNB sites found in this region, which prove an earlier Neolithic occupation, could suggest that pottery had been adopted much later there than in the Euphrates and Balikh valleys.

The Khabur pottery known earlier presented the characteristics of Proto-Hassuna pottery identified at northern Mesopotamian sites such as Tell Hassuna, Umm Dabaghiyah, Tell Sotto, Telul eth-Thalathat, among others (Le Mière and Picon 1998). Proto-Hassuna pottery is characterized by light coloured paste, mostly plant temper (around or more than 90% of the whole assemblage), closed carinated shapes with concave body and plastic or painted decorations. The Proto-Hassuna assemblage includes, together with the light coloured wares – plant-tempered ware and fine ware with small mineral inclusions – Grey-Black Ware and also some imported Dark-Faced Burnished Ware.[4]

Proto-Hassuna sites in the Khabur valley have so far been rather few and mostly only surveyed (Tell Raike, Tell Haneke, Tell Cheikhne and Moutassalem) or subjected to soundings (Tell Khazna 2), except Tell Kashkashok (Matsutani 1991) (Fig. 1). Nevertheless it was possible, by comparing their material with that of Sinjar sites (Tell Sotto, Kül Tepe and Yarim Tepe), to follow to a certain extent the evolution of the pottery, in the shapes and decoration and in the appearance of a new ware (Orange Ware), which would suggest an earlier Proto-Hassuna phase in Tell Kashkashok and a later one in Tell Khazna. Both phases have been tentatively recognized in the material of surveyed sites, the first in Raike and the second in Haneke (Le Mière 2000: 134-135).

1. In this paper I shall focus on the earlier Pottery Neolithic and will not take into consideration the later Pottery Neolithic, in particular the transition to Halaf.

2. At Kumartepe (Le Mière and Picon 2003).

3. At Tell Assouad, Tell Damishliyya, and Gürcü Tepe among others (Le Mière and Picon 2003).

4. For the definition of these two wares see Le Mière 2001: 180-181.

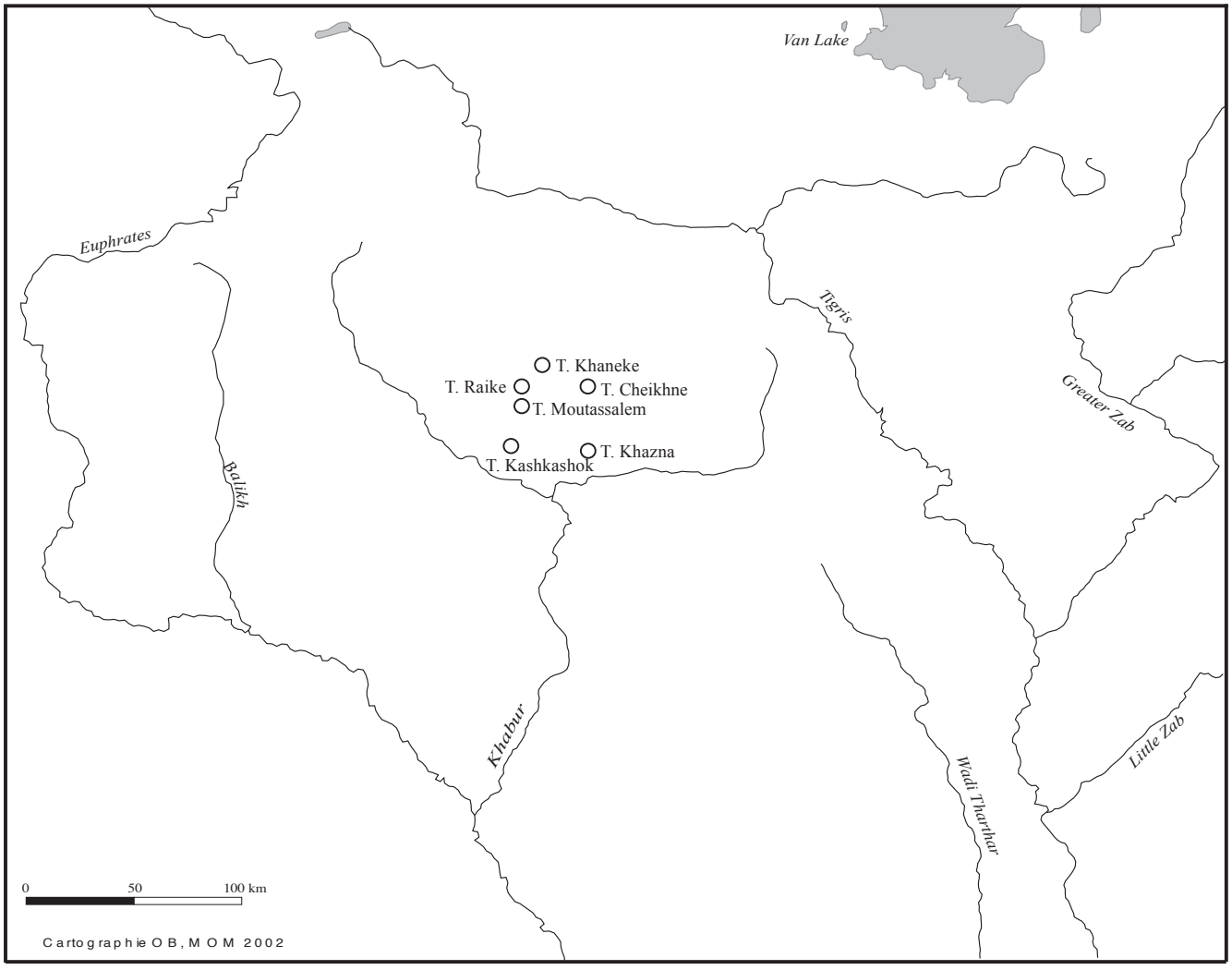

Fig. 1. *Previous distribution of Proto-Hassuna sites in the Khabur basin.*

■Neolithic pottery at Tell Seker al-Aheimar

The excavations conducted at Tell Seker al-Aheimar by the University of Tokyo under the direction of Y. Nishiaki (this volume) provided new data which considerably modify the picture of Neolithic pottery in the Khabur basin.

The earliest pottery found on this site is exclusively mineral-tempered and two different types of ware have been identified. The first one is rather dark, with a mostly grey or black surface and paste. The paste contains mainly white-coloured inclusions, which at first were suspected to be calcite, but examination of thin sections proved them to be mostly volcanic, in many cases a volcanic mineral containing carbonates and preliminarily identified as carbonatite, and also sometimes limestone and basalt. One of the main characteristics of this ware is variability in the types, the size and the quantity of inclusions. Whether these inclusions were naturally in the clay or intentionally added has still to be determined. This ware has been provisionally called Early Dark Ware (Nishiaki and Le Mière 2005). The surfaces are always burnished, sometimes intensively, and the shapes are very simple (Fig. 2: 1-3), mainly closed and hole-mouthed, sometimes vertical but never open, with convex bodies and large bases. Rims are often extremely regular with a flat top, and lugs occur. This ware is never decorated.

The second mineral-tempered ware ranges in colour from dark beige to dark brown with common occurrences of brown-reddish ware. The temper is also volcanic but in this case the inclusions are basalt, often abundant and quite large, which can make the pottery very heavy. This ware has provisionally been called Basalt Tempered Ware (Nishiaki and Le Mière 2005). The question of intentional additions will be studied further, but it seems probable that, in at least several cases, basalt has been added to the clay. This ware, like Early Dark Ware, is always burnished and often intensively. The shapes (Fig. 2: 4-9) are very similar to those of Early Dark Ware, but there are some pierced lugs and also, later in the sequence, some concave bodies and carinations. In the earliest layers there is no decoration but, later in the sequence, painting appears on this ware.

Plant temper is not present in the pottery from the earliest layers, but appears soon afterward, frequently associated with mineral temper; this is basalt and not carbonatite, as far as can be confirmed. In fact Early Dark Ware disappears soon after plant temper begins to be used. The plant temper is usually not abundant at first and is large in size. Whether this pottery containing basalt and plant temper is a ware in itself or only a development of Basalt Tempered Ware is still under discussion, although I shall refer

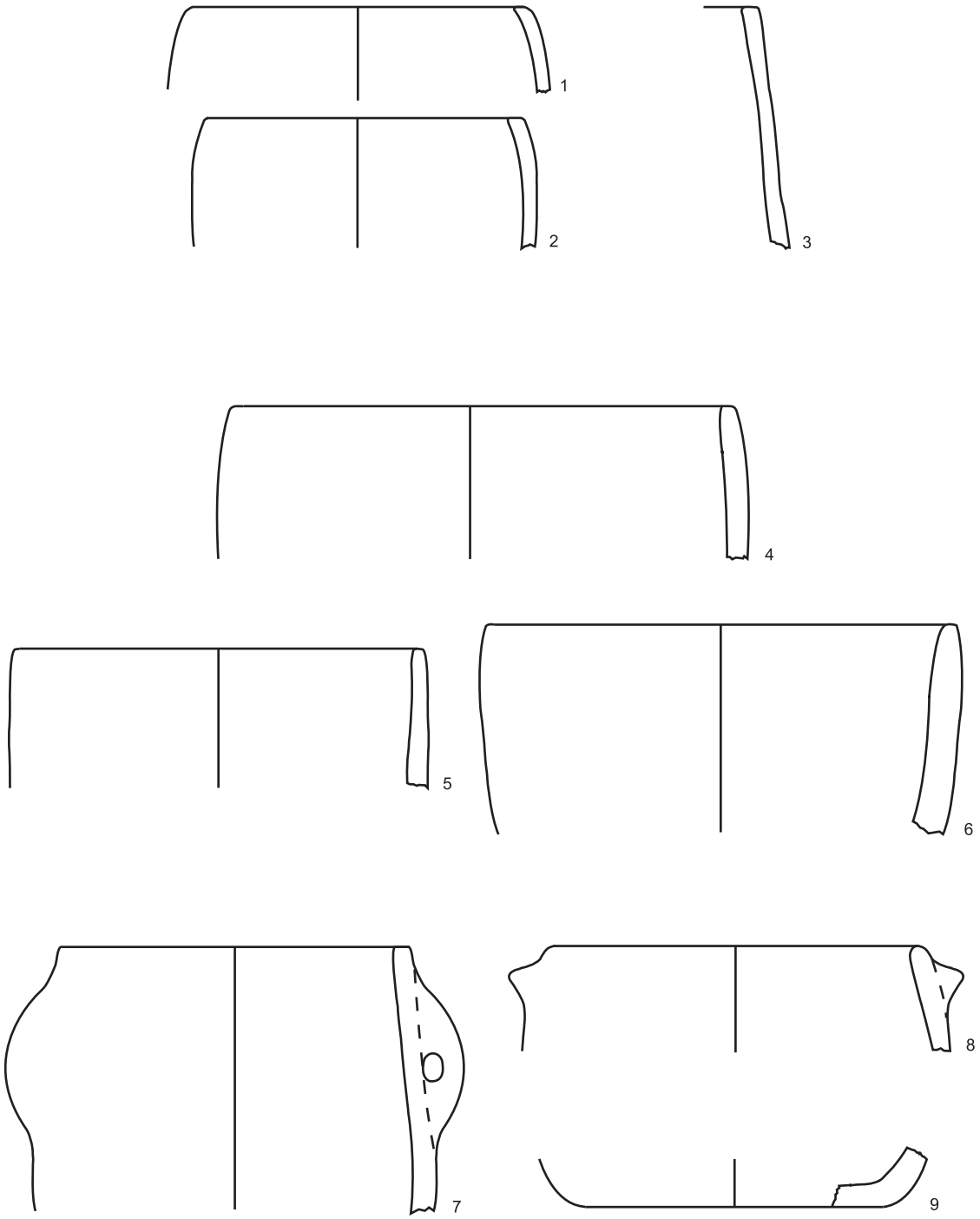

Fig. 2. *Tell Seker al-Aheimar Pre Proto-Hassuna pottery.*
1-3: Early Dark Ware; 4-9: Basalt Tempered Ware. Scale: 1/2.

provisionally to this ware as Basalt and Plant Tempered Ware. It is nearly always burnished, quite intensively. The shapes (Fig. 3), still comparable to those of the mineral-tempered wares, begin to be more elaborated, showing some carinations and lugs which are more numerous and more varied. Painting appears on this ware but not at the beginning.

Plant temper used alone soon develops and plant-tempered pottery becomes the most common ware. At the same time Basalt Plant Tempered Ware becomes very rare and disappears, and soon after Plant and Basalt Tempered Ware also decreases and disappears. Little by little the early wares give way to a Proto-Hassuna assemblage. A fine mineral-tempered ware appears. Burnishing is no longer the most common surface treatment and both plant-tempered ware and fine plant-tempered ware can be smoothed or red-slipped. Grey Black Ware, which is a component of Proto-Hassuna assemblages, is also present. Typical Proto-Hassuna shapes, with concave bodies and carination, are common and are found together with convex and rounded shapes as well as a few open ones (Fig. 4). The necks, which are not typical of Proto-Hassuna, begin to appear only late in the sequence (Fig. 4: 3). Lugs, which are very rare in the Proto-Hassuna assemblage, disappear at Tell Seker al-Aheimar when the Proto-Hassuna assemblage is completed. Some decoration was found on the Proto-Hassuna pottery but it remains rare throughout the sequence; it consists of plastic decoration and painting.

Some evolution in the Proto-Hassuna sequence is suggested by clear differences between the earlier levels and the later one: a larger proportion of open shapes, the presence of necks together with a decrease in concave shapes and carinations, and a relatively larger proportion of decorated sherds.

I should emphasize the evolutional character of the Tell Seker al-Aheimar pottery sequence: one can see a progressive development in the use of plant temper, first associated with mineral temper previously used; the early wares are gradually replaced by plant-tempered and fine wares; basic early shapes become progressively more elaborate, developing carination and concave shapes, typical Proto-Hassuna shapes which appear also in Basalt Tempered Ware and Plant and Basalt Tempered Ware. Therefore it is not really possible to divide this sequence, but we use provisionally the term Pre Proto-Hassuna for the pottery period preceding the completion of the Proto-Hassuna assemblage (Nishiaki and Le Mière 2005). This term simply means that this period predates the Proto-Hassuna and it should not suggest any incipiency, which is debatable.

Tell Seker al-Aheimar has provided completely new data on Neolithic pottery in the Khabur Basin, with unknown early wares and a long sequence, which has been missing in this area.

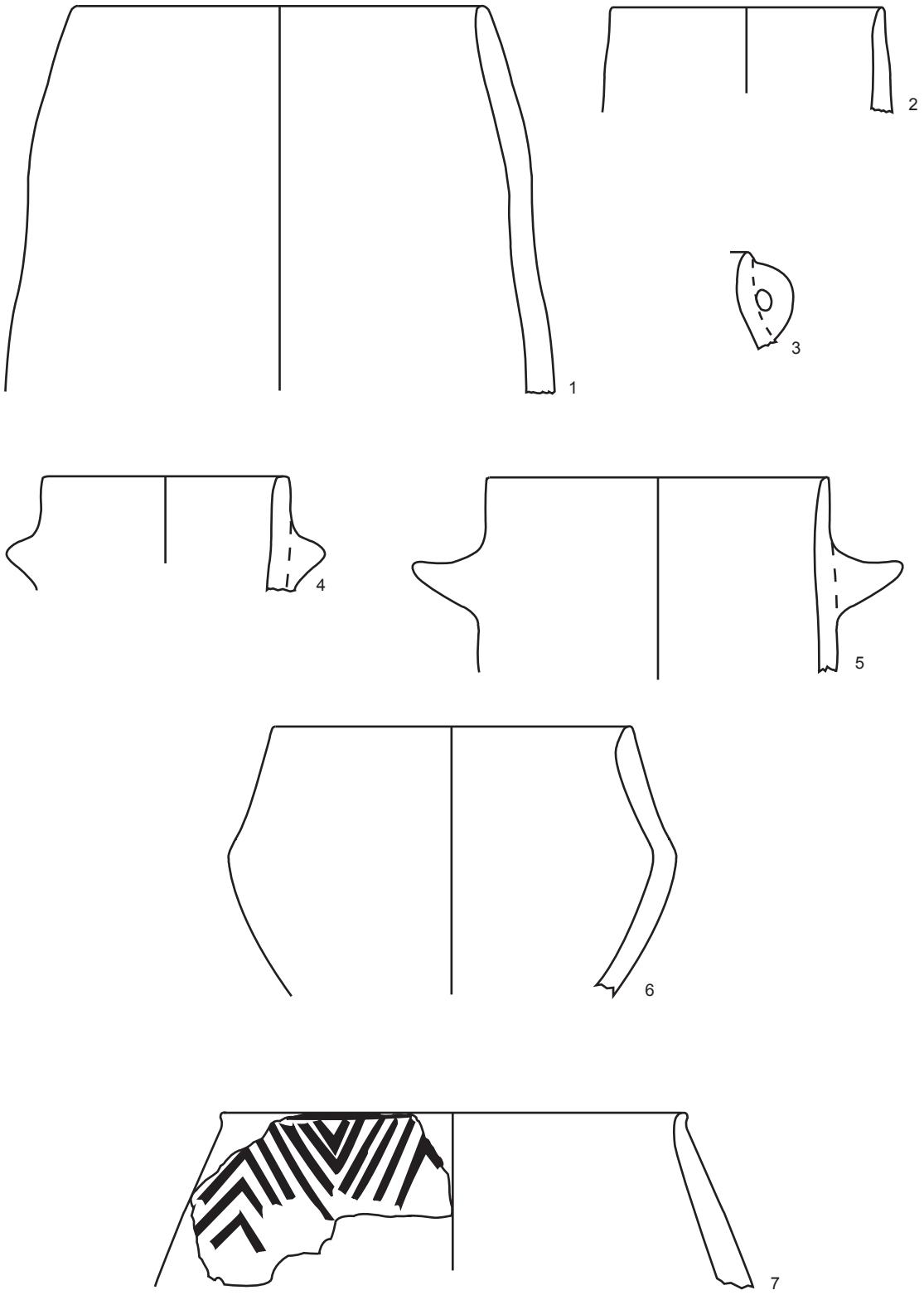

Fig. 3. *Tell Seker al-Aheimar Pre Proto-Hassuna pottery.*
1-7: Plant and Basalt Tempered Ware. Scale: 1/2.

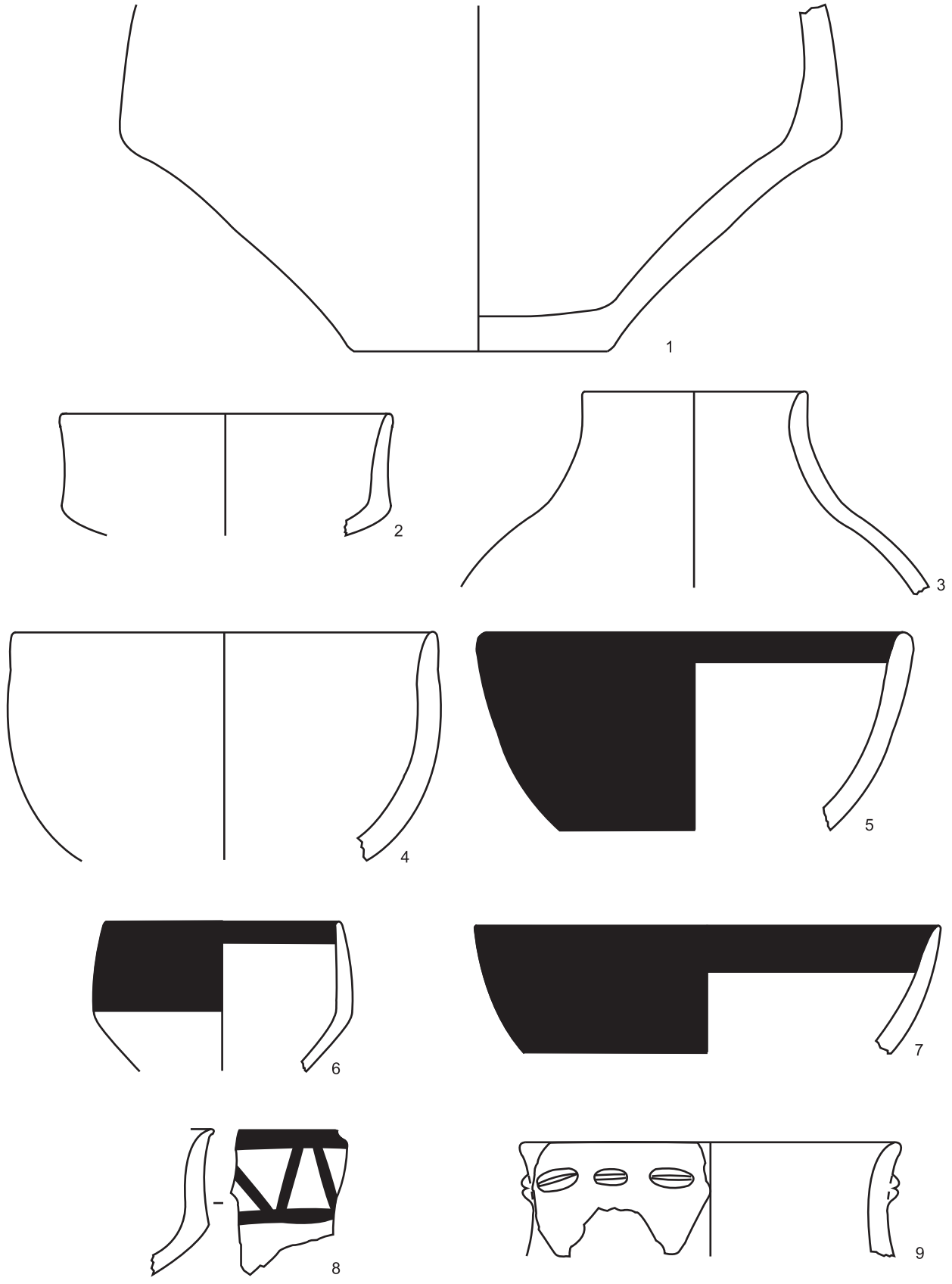

Fig. 4. *Tell Seker al-Aheimar Proto-Hassuna pottery.*
Scale: 1/2 except nr. 3 (1/4).

■Neolithic pottery in the Khabur basin revised

These data open new possibilities of interpretation for material previously found in the Khabur basin which has been puzzling. Tell Feyda is situated in the Khabur valley 15 km west of Tell Seker al-Aheimar. F. Hole recognized a late PPNB occupation in the lithic, bone and other material, collected from the dump created when an irrigation drain was dug (Hole 2001). Among this material a few sherds were recovered, but they were very different from early Neolithic sherds which were then known, thus they were not taken into consideration at that time (Frank Hole pers. com.). The early mineral-tempered wares discovered at Tell Seker al-Aheimar led to a reconsideration of these sherds (Hole 2004) and in fact two of them presented characteristics of Early Dark Ware; they have been analysed and are so close in chemical composition to an Early Dark Ware sherd from Seker al-Aheimar that it is probable that all three sherds have the same provenance.[5]

Thus a so-called Pre Proto-Hassuna occupation is now also attested at Tell Feyda. The presence of such an early ware in Tell Feyda is not only interesting for the site itself but also strengthens the hypothesis that the Khabur basin was a region of early pottery development, since Tell Seker al-Aheimar is no longer isolated.

K-260 is a site surveyed by F. Hole in the Djebel Abd-el-Aziz, situated 20 km south of Tell Seker al-Aheimar (Hole 2004). Together with late PPNB lithic industry a few sherds were found. There are few shapes and some are not very characteristic, although they could be related to Proto-Hassuna. In fact a few of the sherds are clearly Proto-Hassuna. But most of the sherds contain plant and mineral inclusions; these are black and red in colour and, in some cases, quite large. The material from Tell Seker al-Aheimar could provide a parallel with Plant and Basalt Tempered Ware; the red inclusions could also be basalt.[6] Thus the presence of these sherds could suggest that the site was occupied during the Pre Proto-Hassuna period, although only at the later stage of this period since there are no sherds which are exclusively mineral-tempered. But the similarity between K-260 pottery and Plant and Basalt Tempered Ware is not marked and in fact it resembles in its orange colour and type of paste another group of pottery from Tell Seker al-Aheimar, which does not belong to the Pre Proto-Hassuna but to the Proto-Hassuna period. K-260 sherds and this group of pottery are comparable in their chemical composition; both groups could have the same provenance.[7] K-260 material confirms a Proto-Hassuna occupation, but a Pre Proto-Hassuna occupation is still hypothetical.

Tell Kashkashok II confirms a Proto-Hassuna occupation (Matsutani 1991)

5. Preliminary results of analyses which are still in progress at the laboratory "Archéométrie et Archéologie" (UMR 5138 – CNRS) in Lyon. I wish to thank F. Hole for providing Feyda and K-260 (see below) samples.

6. Still to be determined, see note 5.

7. See note 6.

but some elements of the pottery material appear out of place in a Proto-Hassuna assemblage, in particular pierced lugs (Maeda 1991: 23-24, pl. 64: nrs. 15-18). They are made of plant-tempered ware and are rounded,[8] which suggests a secondary deposit. Although these lugs are not representative of the early mineral tempered wares present in Seker al-Aheimar and although only one sherd comparable with Basalt and Plant Tempered Ware has been found in the Tell Kashkashok material, nevertheless they are reminiscent of Pre Proto-Hassuna pottery and suggest an occupation of this period in Tell Kashkashok.

In a review of the Tell Kashkashok material, a few sherds of Orange Ware, mentioned above, were found, indicating that both phases of Proto Hassuna are represented on this site. Thus Pottery Neolithic occupation probably lasted longer than previously thought at Tell Kashkashok.

Burqolya is situated 30 or 40 km to the east of the low Khabur, not exactly in the Khabur basin, but the material found there is worth mentioning. The site has been surveyed by R. Bernbeck, who makes reference, in the publication, to Tell Assouad and Tell Damishliyya in the Balikh, concerning some of the sherds as well as the lithic industry found on the site (Bernbeck 1993). The illustrated pottery shapes are comparable to those of the early wares. Also, two sherds are described as containing large mineral inclusions in the paste and as being burnished. Thus a Pre Proto-Hassuna occupation can be hypothesized on this site, which has not yet produced Proto-Hassuna material but only a very few Standard Hassuna sherds.

Figure 5 shows an updated distribution of Khabur Pottery Neolithic sites, which have been tentatively attributed to the successive stages of pottery development in this area. The new data show extension of Pottery Neolithic Khabur to the south and to the west.[9] All stages of development identified at Tell Seker al-Aheimar are attested or at least suspected at another site. Tell Seker al-Aheimar Proto-Hassuna material is still under study, but to date it is not certain whether this site was occupied during the last phase of Proto-Hassuna (cf. supra).

■Early Neolithic pottery of the Jezirah revised

The new discoveries in the Khabur basin contribute to a modification of the general picture of the advent of pottery in the Near East (Le Mière and Picon 1998, 2003). The first stage of the development of pottery technique represents the elaboration of the technique. It has so far been very poorly attested in the Near East. It is suspected in the Zagros at Tepe Guran, in Anatolia at Çatalhöyük and in the Levant at Tell el-Kerkh and Ras Shamra.

8. I was able to examine the material from Tell Kashkashok; my thanks to T. Matsutani and Y. Nishiaki .

9. The site of Tell Halaf produced the so-called Altmonochrom pottery (von Oppenheim 1943) which has some resemblance to Pre Proto-Hassuna wares, but the shapes include some very elaborated features. In fact another ware, Wirthschaftkeramik, found together with Altmonochrom has proven to be Iron Age material (Bartl 1989). Thus, Tell Halaf will not be discussed in this article.

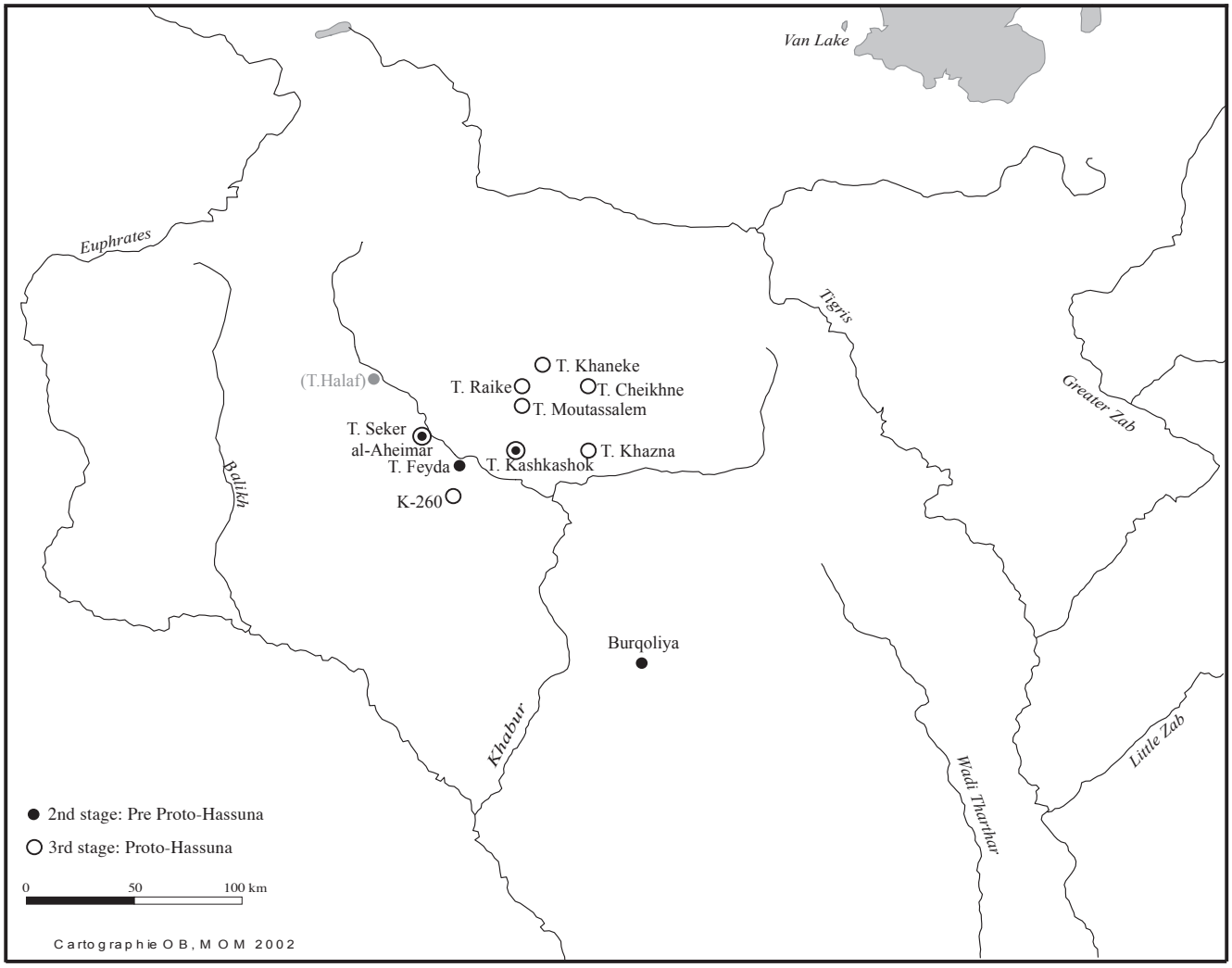

Fig. 5. *Updated distribution of Pre Proto-Hassuna and Proto-Hassuna sites in the Khabur basin.*

Some elements of the Tell Seker al-Aheimar material provide a hypothesis for its presence in the Khabur basin as well; these elements are the immediate succession of pottery levels to Late PPNB levels, the scarcity of sherds in the earliest pottery levels, the variability of the paste of the Early Dark Ware sherds mentioned above, which suggests first attempts in pottery-making as does the complete disappearance of this ware and of Basalt Tempered Ware. Countering this hypothesis is the presence in Early Dark Ware of a very rare mineral, carbonatite, whose presence in the Khabur basin has not yet been proven. Thus the importation of this ware to Tell Seker al-Aheimar is not excluded, while Basalt Tempered Ware seems to have been locally produced.[10] Another argument favours the non-local production of Early Dark Ware; it is the beginning of the use of plant temper together with basalt temper but not with carbonatite. Whether Early Dark Ware was produced in the Khabur Basin has first to be clarified in order to pursue the question of the possible elaboration of pottery technique in this region.

Our knowledge of the second stage has been extended not only by the Khabur data but also by new discoveries in the Euphrates valley, at Akarçay Tepe (Arimura *et al.* 2000) and Mezraa Teleilat (Karul *et al.* 2003, 2004), and in the Tigris valley, at Salat Cami Yanı (Miyake this volume; 2005). The data on the Akarçay Tepe pottery (J. M. Faura and Y. Miyake pers. comm.) are particularly interesting because the pottery from this site and that from Tell Seker al-Aheimar follow a parallel development with three main steps: at Akarçay Tepe, the earliest pottery is also exclusively mineral-tempered:[11] that would represent the first step; then plant temper was introduced, first together with mineral temper: that would correspond to the second step; and later plant temper was used alone but the shapes remain similar to those of early mineral-tempered ware, with typical lugs: that would be the third step. The two sites differ in the mineral temper: at Akarçay Tepe it is crushed calcite whereas at Tell Seker al-Aheimar it is volcanic (basalt or carbonatite). They also differ in the later development of the pottery: the third-stage Akarçay Tepe pottery is characteristic of North Syria/Cilicia Pre-Halaf while at Tell Seker al-Aheimar it is Proto-Hassuna. Nevertheless the similarity of early pottery development on these two sites 200 km distant from each other supports the idea that it could be tentatively used as a reference, not only for the Khabur basin or the Euphrates valley but for a larger region.

Site distribution of the second stage in Jezirah is tentatively presented with its different steps in Figure 6. The first step is known so far only in the Khabur and the Euphrates valleys[12] and was found at very few sites. The next step is attested on more sites and is widespread in the Balikh valley and in the Tigris valley as well. At the third step the number of sites increases significantly. Actually many of these sites were only surveyed or subjected to soundings,

10. Chemical and petrographic analyses are in progress in the laboratory "Archéométrie et Archéologie" (UMR 5133 – CNRS, Lyon).

11. The early mineral temper is usually large in size, and this pottery clearly differs from the later fine mineral- tempered pottery also in colour, surface treatment, thickness, etc.

12. In fact some sherds were found at Tell Magzalia in the Sinjar (Bader 1989) but they were so different from the Neolithic pottery known then, that, as in the case of Tell Feyda, they have not been taken into consideration, although there is no trace of later occupation on the site (Bader pers. com.). Tell Magzalia has many similarities with Tell Seker al-Aheimar in architecture, lithic industry, etc. It cannot be excluded that in the Sinjar as well, this early stage of pottery technique was represented.

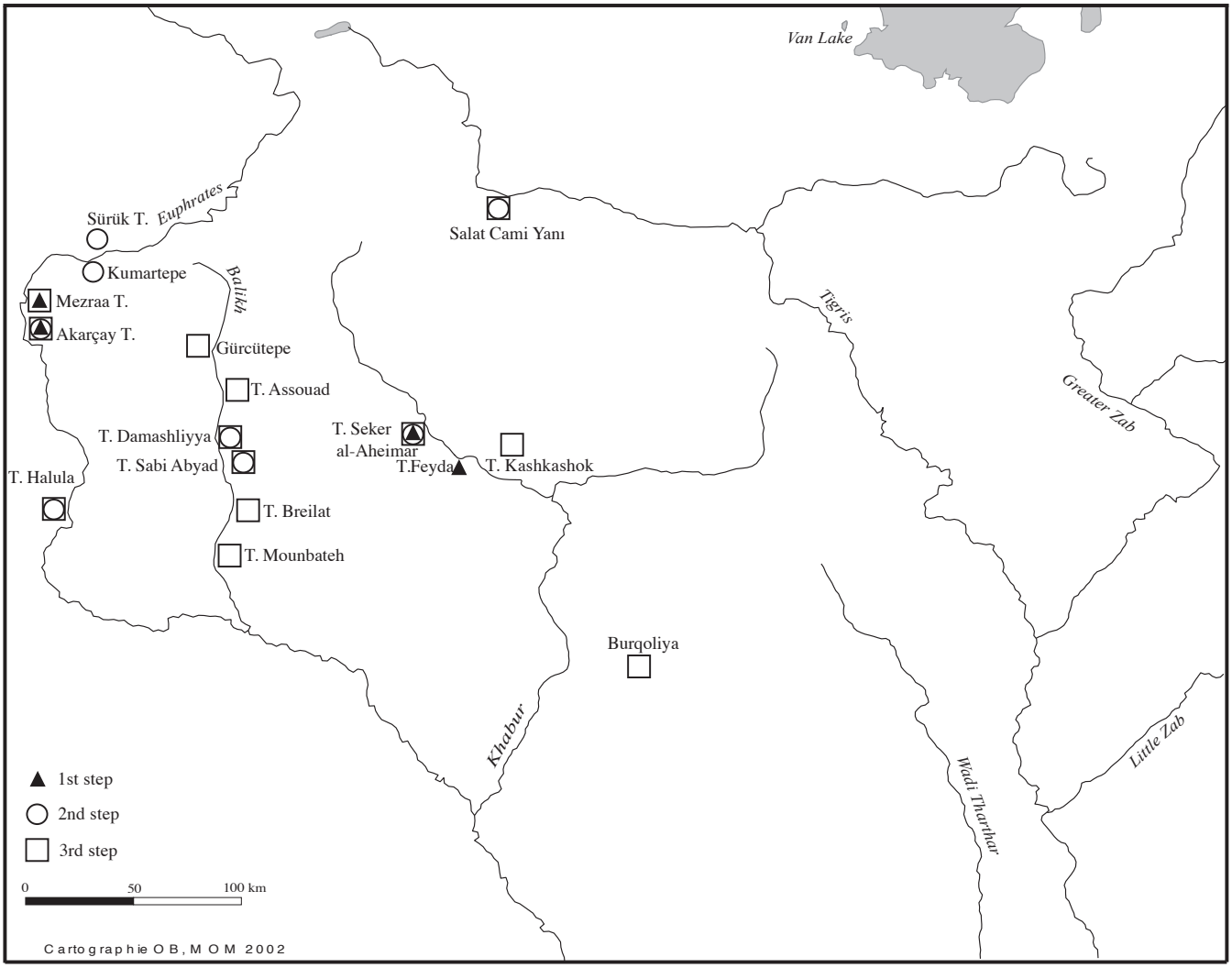

Fig. 6. *Distribution of sites representing the second stage of pottery development in the Jezirah with its different steps.*

thus the pottery assemblages collected could be incomplete and attribution to one or another step would not be reliable. In any case, the second stage of pottery development is much more complex than it has previously appeared; whether one or another of these steps should be considered to be a different stage is questionable: the evolutional character of the sequences known so far appear to argue against this.

While the third stage confirmed a regional diversification of pottery production, the second one appeared somewhat undifferentiated from one region to the other. The new data do not seem to contradict this view although there is not enough evidence for this period to provide confirmation. Nevertheless the rather complex developments of the second stage suggest that this homogeneity could be due not only to a continuing low level of sophistication in pottery techniques. There are two possible hypotheses: either there is a common origin for the pottery techniques which were imported into every region, or this development corresponds to a technical culture common to the whole Jezirah, from the Euphrates valley to the Tigris valley.

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CHAPTER 9

The Proto-Hassuna culture in the Khabur headwaters: A western neighbour's view

Olivier Nieuwenhuyse

■Introduction

I wish to start with thanking the editors of this volume for inviting me to join a particularly active group of scholars. Their exciting new fieldwork and challenging interpretations are rapidly changing the way we perceive Neolithic societies in Syria, and indeed in northern Mesopotamia as a whole. With regard to the Late (or Pottery) Neolithic, which is the focus of my paper, it has often been said that the period has for long been neglected in favor of work on two apparently more conspicuous 'revolutions', *viz.* the invention of agriculture and the Emergence of Civilization (Akkermans 1993: 1-2; Bernbeck 1994: 3; Campbell 1992: 6; Verhoeven 1999: 1). This was certainly the case in the Khabur headwaters of north-eastern Syria, also known as the 'Land of 1001 cities' (Bounni 1990), as a result of the massive archaeological focus on the third millennium. Archaeologists have long known that the region was densely inhabited during the Late Neolithic, but detailed investigations have been few and intermittent. Work at Tell Seker al-Aheimar represents the first long-term archaeological project focussing specifically on the Late Neolithic, combining deep stratigraphic sequences with broad-scale systematic area excavations and with meticulous artefact analyses.

In this contribution I shall not be presenting many new data. Rather, I wish to do what jealous neighbours always do: look across the fence. By means of a comparison of the Balikh valley in the west and the Khabur basin in the east, I shall explore one of the basic conceptual tools that we as archaeologists commonly employ to envisage Late Neolithic communities in the Near East, namely, the concept of a *culture*. Most current discussions concerning the Late or Pottery Neolithic (ca. 6900-5300 cal. BC[1]) implicitly or explicitly base themselves on some reconstruction of culture-historical entities bounded in time and place (e.g. Akkermans and Schwartz 2003; Aurenche and Kozlowski 1999; Aurenche *et al.* 2004; Huot 1994; Mellaart 1975; Redman 1978). I wish here to express some doubts on the validity and even use of this concept. Although concerns have been raised before by various archaeologists, I argue that discussion is especially fruitful now because we are finding new material assemblages for which we have to decide what terminologies to use. As a case study, I shall look at some of the main constituent elements of the entity currently known as the 'Proto-Hassuna' culture, although this paper will of course not repeat the concise presentation of this culture offered elsewhere (e.g. Aurenche and Kozlowski 1999; Aurenche *et al.* 2004; Bader 1993a, 1993b, 1993c; Le Mière and Picon 1999; Mathews 2000; Redman 1978: 189-194). Then follows a brief examination of the relationships between the Proto-Hassuna and its neighbour immediately to the west: the Pre-Halaf culture of the Balikh

1. All dates are calibrated BC.

valley. This will enable presentation of some suggestions for new directions and debates. Finally here it should be noted that this article is not meant as critique of the valuable work of many colleagues, but rather as a cautionary tale with regard to the use of the problematic culture concept.

■Culture history, sherds and archaeological labels

In the Near East, Late Neolithic cultural boundaries are presently drawn largely on the basis of the distinct ceramic products that characterize each 'culture'. With the adoption of fired ceramics, currently dated at around 6900 BC, pottery replaces lithics as the major tool for archaeological classification (Redman 1978: 189). Currently, the traditional Late Neolithic archaeological 'cultures' of northern Mesopotamia are represented by the Pre-Halaf, Proto-Hassuna, Hassuna, Samarra and Halaf cultures. Each of these entities is characterized by a distinct ceramic assemblage, which traces its roots to pioneering excavations at eponymous key sites where the typical pottery was first found. Although new excavations have led to redefinitions of this basic scheme, the original terminologies persist, and with them many of the implicit assumptions contained in their original formulation. These include, first and foremost, the assumption that such cultural entities existed in the shape of regionally and temporally bounded, internally homogeneous distributions of material culture (read: pottery). Second, there is the notion that these distributions reflect distinct regional identities, alternative ways of adapting to some local environment, differences in social complexity, or a combination of those. Whatever the specific interpretation, most scholars today implicitly acknowledge that pottery style in the Late Neolithic constitutes a major source for distinguishing socio-economic and cultural regional entities.

To be sure, there is probably no archaeologist in the world who would argue that, generally speaking, pots equal people in a straight-forward manner. Yet, when it comes to the Late Neolithic of the Near East, much of the vocabulary that we employ as archaeologists ultimately derives from the culture-historical paradigm as formulated by Gordon Childe (Akkermans 1993; Campbell 1992: 4-7; Matthews 2003: 20-21). As is well known, Childe, borrowing heavily from earlier work by Kossina and Montelius, defined a culture as "... certain types of remains – pots, implements, ornaments, burial rites, house forms – constantly recurring together" (1929: v-vi). He attributed archaeological find complexes to a particular culture if they possessed a series of unique attributes, defined by the archaeologist as being characteristic of that culture. Cultures could thus be defined on the basis of a small number of artefacts, basically those relatively resistant to change: domestic pottery, ornaments and burial rites (Childe 1956: 121; Trigger 1989: 171). Elaborating

upon this rather minimalist definition and in line with generally held ideas of his time, Childe eventually accepted the notion that such cultures reflected "... a community sharing common traditions, common institutions and a common way of life. Such a group may reasonably be called a people" (1933: 198-199). The aim of archaeology, then, became to identify nameless prehistoric peoples by means of archaeological cultures, and to trace their origin, movements and interaction (Trigger 1989: 172). Childe's work provided a model that was applied to the study of archaeological cultures all over the globe at least until the 1960s and even in many parts until this very day (Hodder 1978; Jones 1997: 18-26).

Of course, archaeologists soon realized that no archaeological culture ever neatly corresponded to Childe's ideal, and this led them to embrace a different concept of the archaeological culture. David Clarke (1968 [1978]: 36-37) introduced the famous *polythetic* model of culture, in which cultural entities must be differentiated from one another within a larger network of overlapping cultural traits. According to this model, an archaeological culture possesses a large number of the attributes of the larger group of which it forms part, but not all of them, while each attribute is shared by most entities within the larger group, but not necessarily by all of them (Fig. 1). Cultural areas must be defined on the basis of abrupt changes in the distributions of multiple material traits and elaborate statistics may be

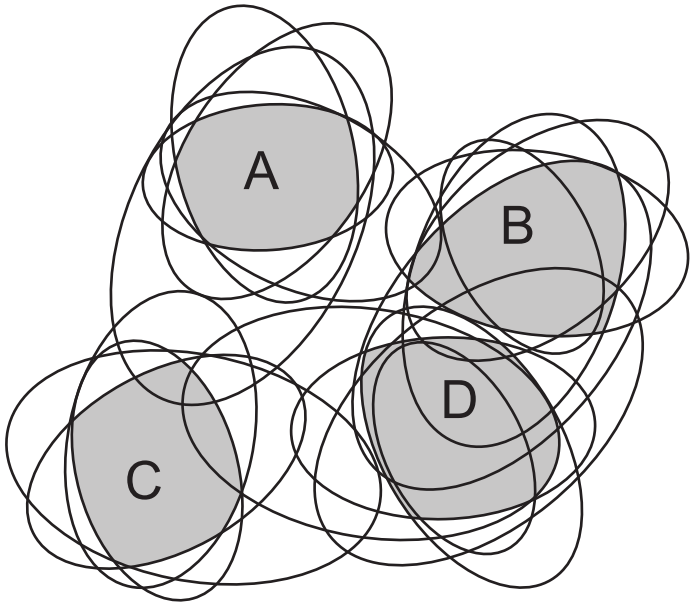


Fig. 1. *The polythetic culture model, showing the boundaries of four hypothetical cultures A, B, C, and D within a larger culture group (after Clarke 1968 [1978]: Fig. 72).*

used (*ibid*.: 311-312). Although the model posits much overlap between the various polythetic groups, Clarke insisted that such 'core' cultural areas did in fact exist, and that these should form the basis of cultural terminology (*ibid*.: 246-247). Of course, like Childe, Clarke stressed that in the real world no culture would ever be found to fit the 'ideal.' Variation within any given culture area should stimulate the archaeologist to distinguish various types of sub cultures, each defined as a polythetic entity (*ibid*.: 250). Both models – Childe's monothetic cultures and Clarke's polythetic cultures – approach the flurry of diffuse archaeological data from the *a priori* assumption that there were, in fact, cultural 'core areas' that archaeologists should recover, and then turn into the subject of our enquiries.

It is Clarke´s polythetic culture concept rather than the original formulation by Childe, that most archaeologists have in mind when they use the culture-historical terminology currently accepted for the Late Neolithic in the Near East. The Halaf phenomenon (ca. 5900-5300 BC) is a prime example of this: the Halaf 'package' is generally seen as a polythetic set of apparently coherent characteristics, including engraved stamp seals, circular architecture, distinctive settlement patterns and, of course, its high-quality pottery (Akkermans 1993; Matthews 2000: 108-111; 2003: 21). Although no archaeologist would ever claim that *all* Halaf sites share *all* of these characteristics – in other words there exists no 'ideal' Halaf site – most would still argue that it is surely possible to distinguish this particular cultural entity in time and space (But see Nieuwenhuyse 2008).

As with the Halaf, all Late Neolithic cultural entities that preceded it in Syria and northern Mesopotamia are thought to be represented by a distinct set of specific material traits. With regard to the period ca. 6500-6100 BC, the current culture-historical framework for northern Syria includes two now well-established Late Neolithic cultures: *Proto-Hassuna* and *Pre-Halaf* (Aurenche and Kozlowski 1999; Aurenche *et al.* 2004; Bernbeck 1995; Campbell 1992; Le Mière and Picon 1999). Pottery was introduced into this region much earlier, but it was not until the later part of the 7th millennium that a progressive technological, morphological and stylistic differentiation suggests the emergence of regional groups (Le Mière and Picon 1999). Hence, between the Khabur and the Tigris rivers we find the Proto-Hassuna culture (for its ceramic signature, see Fig. 3); to the west, stretching from the Levant to the Balikh, lies the Pre-Halaf culture, for which Tell Sabi Abyad in the Balikh valley is a key site. To the south east of the Proto-Hassuna area lies the *Zagros* group (Fig. 2). The area of south-eastern Anatolia immediately to the north is still largely unexplored territory, but salvage work carried out in lake areas on the Tigris is now shedding light on this region (Tekin 2003, 2004).

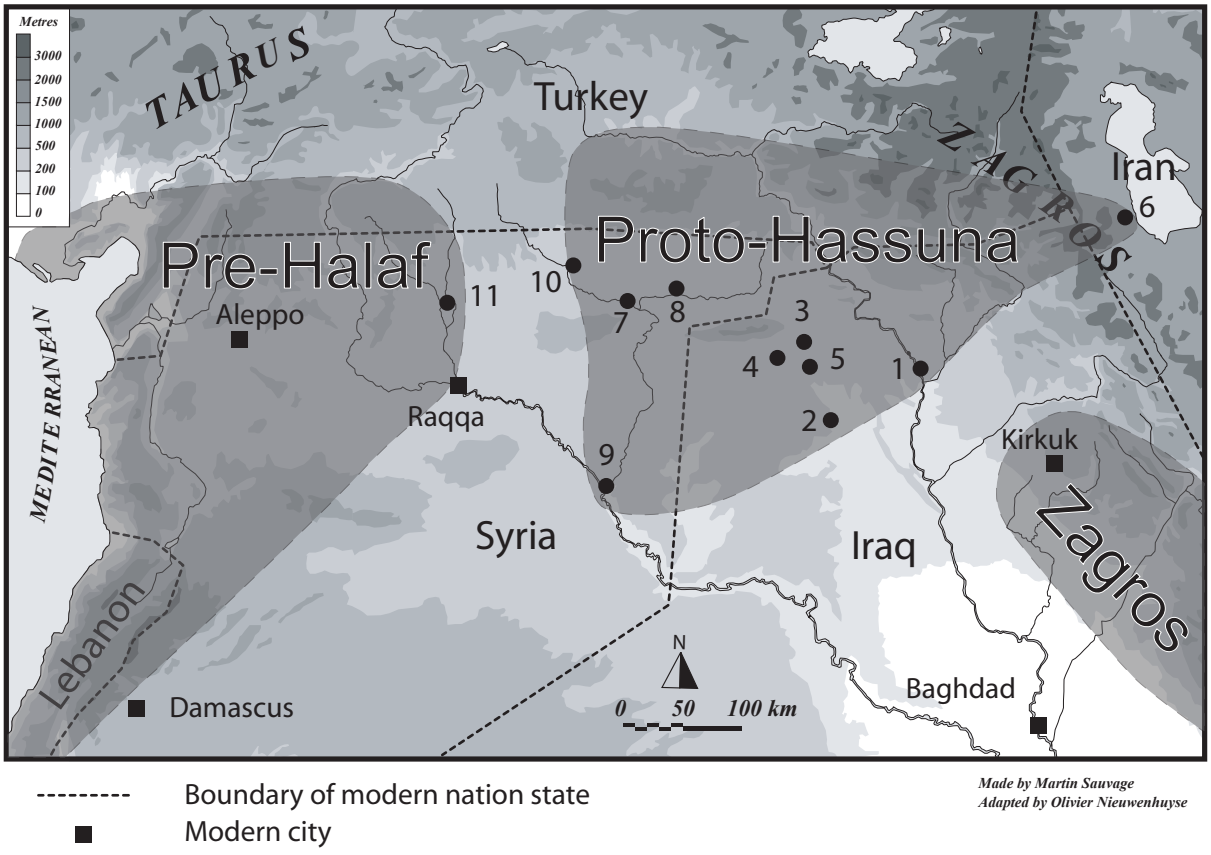


Fig. 2. *Late Neolithic culture groups in the northern Syria and northern Iraq (ca. 6500-6000 cal. BC), showing the boundaries of the Pre-Halaf, Proto-Hassuna and Zagros groups (after Aurenche* et al. *2004: Fig. 2). Some of the main sites: 1: Tell Hassuna; 2: Umm Dabaghiyah; 3: Tell Sotto; 4: Kültepe; 5: Yarim Tepe I; 6: Hajji Firuz Tepe; 7: Tell Kashkashok II; 8: Tell Khazna II; 9: Tell Bouqras; 10: Tell Seker al-Aheimar; 11: Tell Sabi Abyad I.*

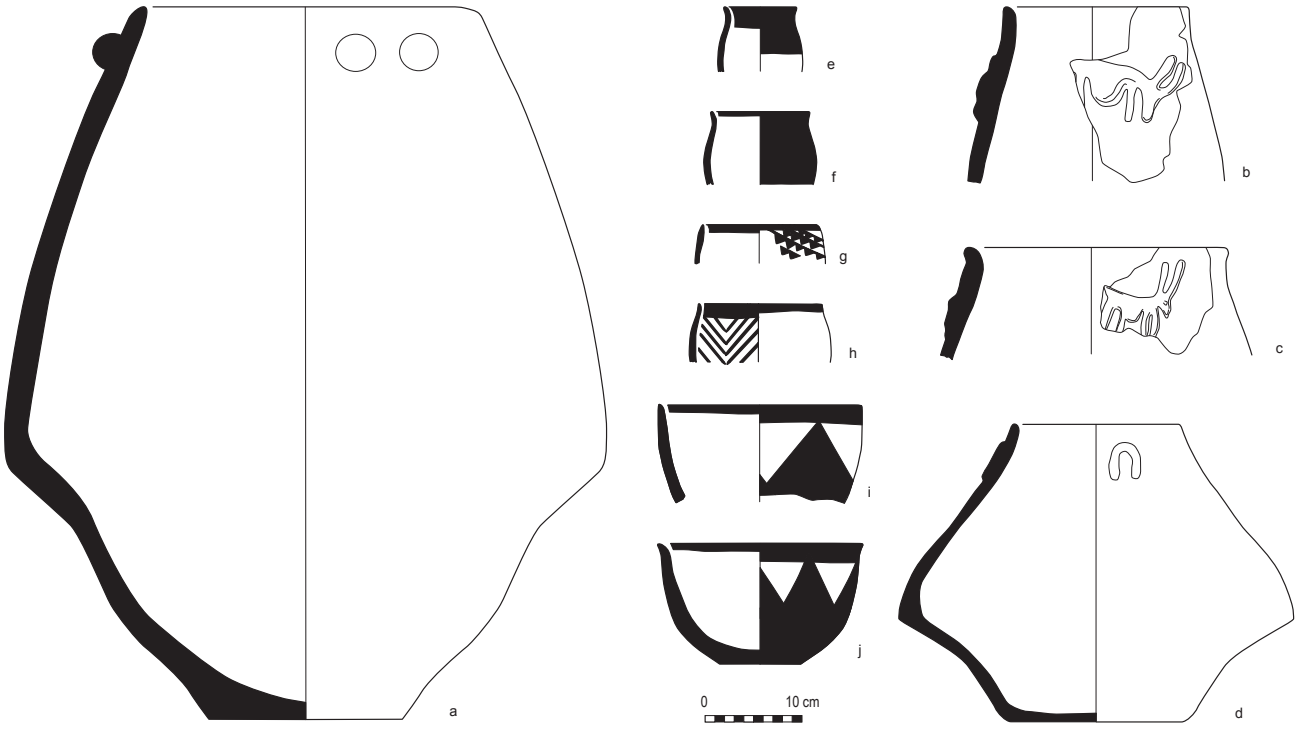


Fig. 3. *The major ceramic elements of the Proto-Hassuna culture. ´Double-ogee´ jars (a, d); coarse, plant-tempered ceramics with appliqué-decoration (a-d); fine, plant-tempered ceramics with red slip (e-f); fine, plant-tempered ceramics with red-painted decoration (g-j). No. a: Tell Hassuna (after Lloyd and Safar 1945); nos. b-c: Umm Dabaghiyah (after Kirkbride 1973); nos. d, g: Tell Sotto (after Bader 1993a; Merpert* et al. *1974); nos. e-f, h: Yarim Tepe I (after Bashilov* et al. *1980); nos. i-j: Kül Tepe (after Bader 1993b).*

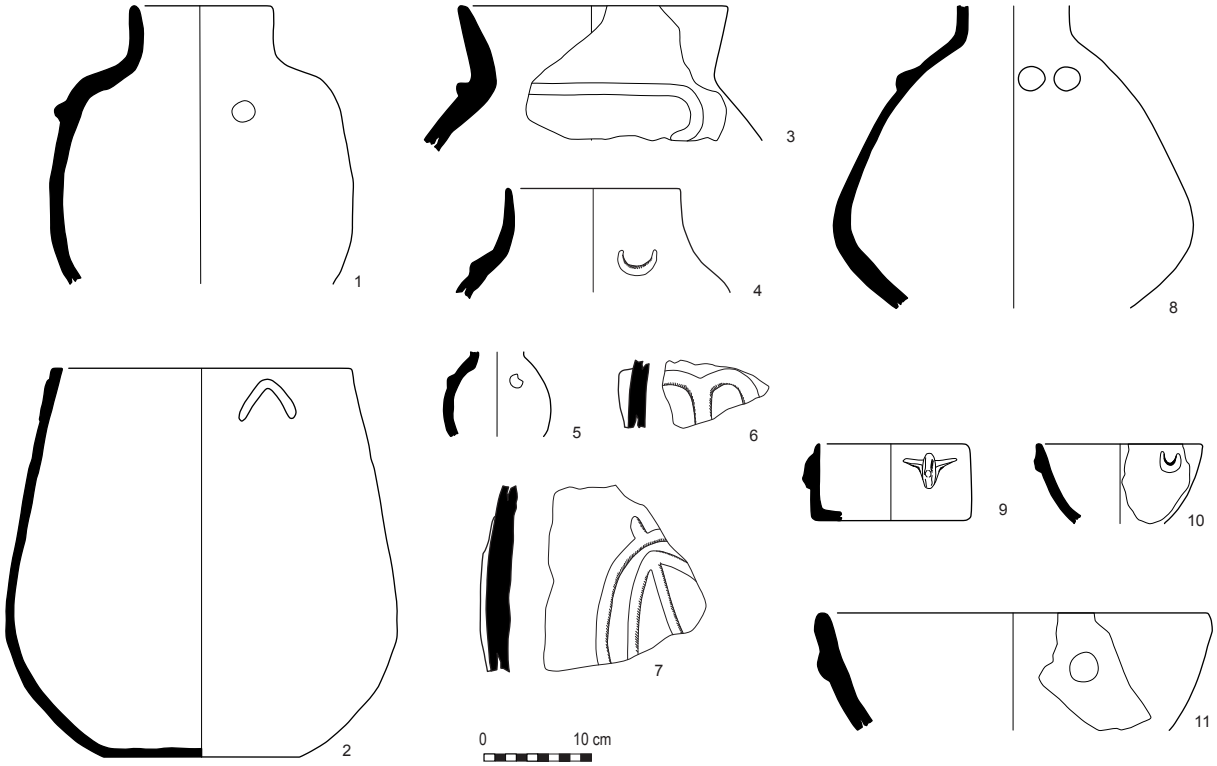
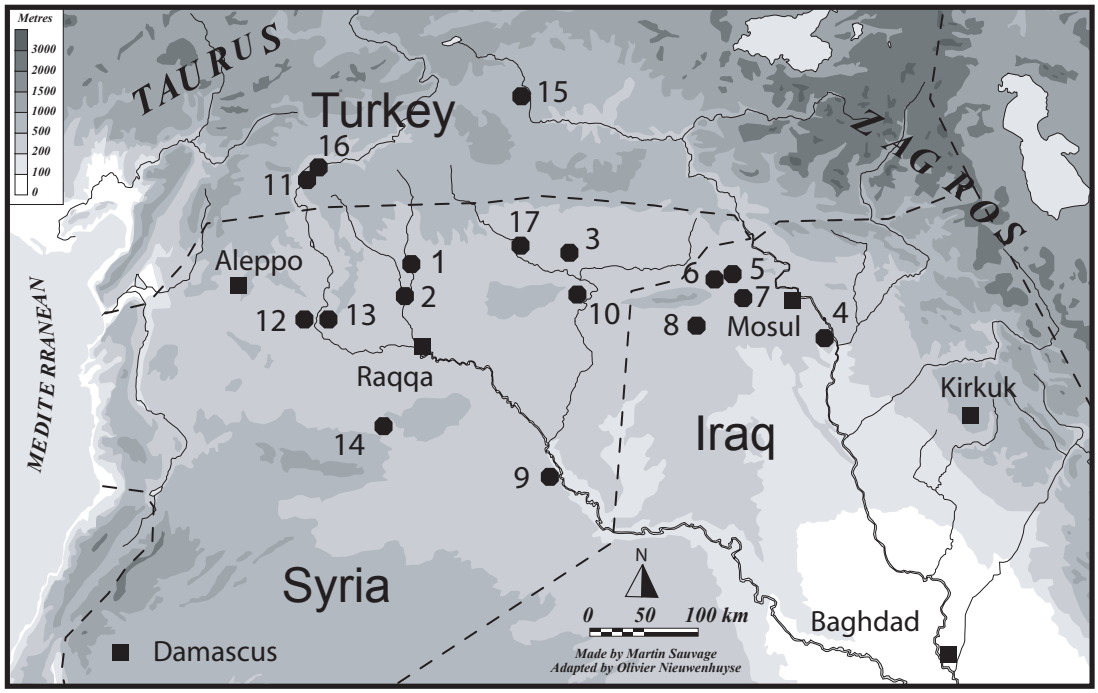


Fig. 4. *Appliqué-decorated Standard Ware from Tell Sabi Abyad I (Pre-Halaf and Transitional stages) (after Nieuwenhuyse 2008).*

Yet the current spatio-cultural framework (Fig. 2) can be criticized from both a theoretical and a pragmatic perspective. First, it should be realized at this point how much this framework has been shaped by the history of archaeological discovery (Bernbeck 2008b; Campbell 1999). Each of the main culture-historical entities for the Late Neolithic has its roots in a key site excavated a considerable time ago, *viz.* Tell Halaf, Tell Hassuna, and Tell Samarra. These labels, in their turn, have given rise to derivations such as Proto-Halaf (Cruells and Nieuwenhuyse 2005), Proto-Hassuna, and now even Pre-Proto-Hassuna. What if, for some reason, prehistoric excavations had not begun in Iraq, but in Syria? With some imagination, Iraqi archaeologists might now be discussing the origins of the 'Proto-Seker al-Aheimar' culture. Evidently, the forces that structured the development of modern archaeology in the countries of the Middle East do not resemble those that shaped the Late Neolithic world. There remains a large degree of arbitrariness in our terminology and there is a strong chance that it reflects the history of research far more than archaeological realities.

As several researchers have stressed, the development of culture history as a way of looking at the past did not occur in a cultural vacuum (Jones 1997; Shanks 2001: 286; Sherrat 2005; Thomas 2004; Veit 1989). The concept of the archaeological culture arose at a time when European powers were competing for their territorial boundaries, and asserting their national identities. In the process of *creating* these identities archaeology played an important part, by furnishing the emerging nation states with material evidence for their putative prehistoric roots. To some degree, culture-historical archaeology projected modern, contemporary concerns into the past (Anfinset 2003; Trigger 1989: 148-206). The notion that there were regionally bounded, homogeneous cultural entities during the Late Neolithic, be they with a monothetic or a polythetic flavor, is essentially very much a modern one (Thomas 2004). Of course, no researcher would ever claim that each site within a given culture area is completely identical to any other, but



the evidence for variation *within* a core area is thought to be less relevant than the amount of variation *between* them. Second, such entities are generally held to *reflect* existing social identities in a rather passive manner (Hodder 1982a; 1982b; 1986; Shennan 1989; Stark 1998).

Here, too, the history, spread and depth of archaeological fieldwork may have influenced the way we look at the past. Until quite recently there were hardly any excavated Late Neolithic sites. With only a handful of Late Neolithic key sites available for comparison, typically situated far apart both spatially and temporally, this could only reinforce the impression of sharp cultural differences. Moreover, prehistoric research in northern Syria had always shown a dominant interest in the lush, fertile landscapes formed by the main river basins of the Euphrates and its tributaries, whilst the vast intermediate areas have been largely ignored. Potentially these relatively arid plains were less attractive to sedentary human settlement, supporting site densities considerably below those found along the major water systems, but at present we simply do not know for sure. Aurenche *et al.* (2004: 357) envisage such an 'empty' zone between the Balikh and the Khabur, which they see as evidence for a Late Neolithic regional 'frontier' (see Kozlowski, this volume). Clarke in fact made the theoretical prediction that human populations are never spread equally, and that this led to discontinuous distribution densities of their material culture (Clarke 1968 [1978]: 312). Apart from the question whether uneven population spread should result in regional boundaries as a matter of principle, it must be demonstrated empirically that it actually *did* so. Emerging survey work in some of these areas now suggests that they were not at all 'empty' in the Late Neolithic (Becker 2004, 2006; Einwag 1993).

Fig. 5. *The regional distribution of coarse plant-tempered pottery with appliqué-decoration.*
1: Tell Sabi Abyad I; 2: BS 148 (Tell Mounbatah); 3: Tell Kashkashok II; 4: Tell Hassuna; 5: Tell Sotto; 6: Kültepe; 7: Yarim Tepe I; 8: Umm Dabaghiyah; 9: Tell Bouqras; 10: Tell Boueid II; 11: Mezraa Teleilat; 12: Tell Halula; 13: Dja'de; 14: el-Kowm; 15: Çayönü; 16: Akarçay Tepe; 17: Tell Seker al-Aheimar (after Nieuwenhuyse 2008).

In this respect it does not help that the relevant material collected in regional surveys has usually not been reported as such. Most investigators only present site-distribution maps instead, with dots representing occupation during particular culture-historical episodes. This may, misleadingly, reinforce the *a priori* impression of distinct, bounded cultural entities, when in fact the evidence rather suggests fuzzy, overlapping regional distributions of particular ceramic distributions (e.g. see Figs. 5, 7, and 9). By slicing up what may well have been a continuous regional and temporal distribution

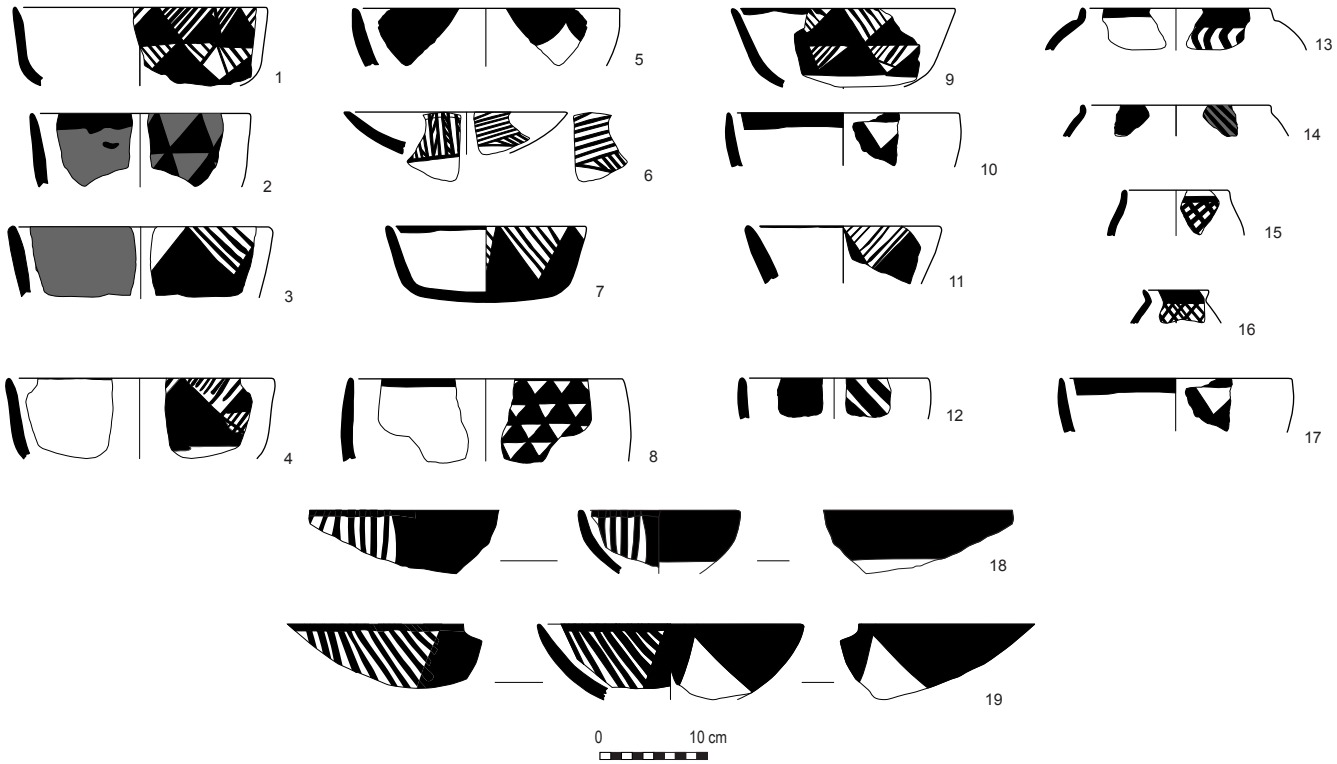


Fig. 6. *Red-painted Standard Ware from Tell Sabi Abyad I (Pre-Halaf and Transitional stages). Nos. 2-3, 14: painted on a red slip (after Akkermans* et al. *2006; Nieuwenhuyse 2008).*

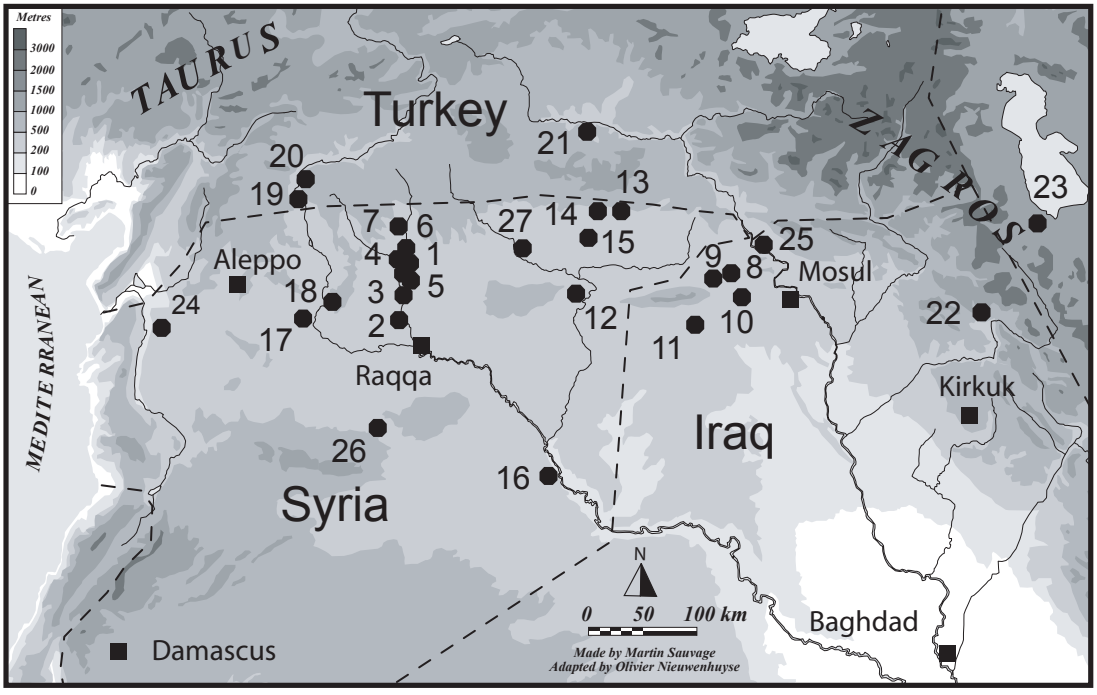


Fig. 7. *The regional distribution of plant-tempered pottery with red-painted decoration. 1: Tell Sabi Abyad I; 2: BS 81; 3: Tell Mounbatah; 4: Tell Sabi Abyad IV; 5: BS 168; 6: BS 316; 7: BS 235; 8: Tell Sotto; 9: Kültepe; 10: Yarim Tepe I; 11: Umm Dabaghiyah; 12: Tell Boueid II; 13: KS 130; 14: KS 39; 15: Chagar Bazar; 16: Tell Bouqras; 17: Tell Halula; 18: Kosak Shamali; 19: Akarçay Tepe; 20: Mezraa Teleilat; 21: Hakemi Use; 22: Tell Shimshara; 23: Hajji Firuz Tepe; 24: Tell el-Kerkh; 25: Kharabeh Shattani; 26: el-Kowm; 27: Tell Seker al-Aheimar (after Nieuwenhuyse 2008).*

of material traits into clean-cut entities, and by presenting them in the guise of 'culture X' versus 'culture Y,' archaeologists may artificially create and reproduce these entities, rather than use the accumulating survey evidence to critically examine their very existence.

By definition, these 'cultures' constitute broad 'umbrellas', which in each case can cover an enormous amount of material culture variation. This tends to be forgotten when such generalizations are used as a basis for further social reconstructions. For instance, with regard to pottery, each of the Late Neolithic cultures is currently defined by a ceramic assemblage that in fact includes multiple ceramic wares, technological traditions, and stylistic categories (these terms are loosely used as alternatives in the archaeological literature). Using synthesizing concepts implies that we know all there is to know about the constituent categories, and yet we are still far from this blissful stage. In practice, similar terms are often used for different groups of ceramics, while *vice versa* the same ceramic category can sometimes be described with different names. The impressive, 'inter-cultural' distribution of the coarse, plant-tempered ware that dominates most regional ceramic assemblages prior to the Halaf period is a good case in point: this pottery is variously presented in the literature as 'Coarse Ware,' 'Proto-Hassuna,' 'Standard Ware,' or simply 'the bulk.' There remains much essential work to be done in the field of ceramic analysis and the definition of ceramic-technological or stylistic categories, before we can jump to generalizing concepts based on pottery.

Finally, the notion that material culture *reflects* existing identities finds archaeological expression in the general lack of serious discussion of what caused the distributions that we observe in the field. Material culture is sometimes somewhat too simplistically equated with social identities. To be sure, the direct equation of these entities with putative *ethnic* identities in the past is no longer made so quickly by Near Eastern prehistorians. But even today, rapid material culture change is sometimes equated with prehistoric population movements: the discussions with regard to the 'origins' of the Halaf culture offer a good example (Campbell 1992; Nieuwenhuyse 2008). Even when such equations are rejected, the perceived material culture similarities are generally accepted to represent "shared values and a shared history" (Yoffee 1993: 265). Hence, apart from their ceramics, the various Late Neolithic cultures are often seen as having alternative forms of socio-economic adaptation and attendant modes of social organization. This is seen, for instance, in the debate concerning the socially complex 'Samarrans' in Central Mesopotamia versus the more traditional 'Hassunans' in the north (Bernbeck 1994; Forest 1996; Huot 1994: 83-107; Matthews 2000: 81-82; Oates 1969, 1972, 1973; Watson 1983). Here scholars have attributed

different forms of subsistence adaptation, *viz.* irrigation agriculture versus rain-fed agriculture, respectively, to these two (polythetic) entities. The reified culture-historical constructions – largely based on pottery style – have become real-live actors on the prehistoric stage.

Does all this really matter? After all, as archaeologists we all need labels. I would argue that this certainly does matter, especially because we have found new sites, located in areas that have not received much serious attention previously. In addition to excavations, new surveys are being conducted wherein the collected artefacts are being treated in a more systematic manner than before (e.g. Akkermans 1993; Becker 2004, 2006; Kozbe 2006, in press; Le Mière 2000; Nieuwenhuyse 2000; Rova pers. comm. May 2006; Weiss 1997; Wilkinson and Tucker 1995). Using traditional cultural-historical terminologies for these new data may mean that we confuse or obscure, rather than enlighten ... Of course, we should not discard every old bit of terminology, as this will create chaos and confusion. On the other hand, we are currently in a unique position, possessing new and rich datasets from contextually-sensitive excavations that allow us to re-think many of our previous assumptions and reconstructions.

■The Proto-Hassuna in the Khabur headwaters

In order to show how these issues bear on actual archaeological fieldwork and interpretation, I shall now examine the case of the Proto-Hassuna in the Khabur headwaters of northeastern Syria. As already indicated, Tell Seker al-Aheimar is a key site for this period in the Khabur region. The term Proto-Hassuna is currently employed to define levels 4-6 in Sector A, level 2 in Sector E, and level 2 in Sector C of the site (Nishiaki 2001, 2002, 2003). I shall briefly outline the constituent elements of the Proto-Hassuna, and then consider if this cultural entity is internally homogeneous and mutually distinct from its contemporaries, in particular from its immediate western neighbour, the Pre-Halaf culture in the Balikh valley. Avoiding complicated statistics, this paper will simply use presence-absence data of elements, from both excavated sites and regional surveys. I shall limit myself exclusively to the ceramics, as these, as seen, form the major element in defining this and other culture-historical entities in the Near Eastern Late Neolithic.

What is now often termed Proto-Hassuna was first identified as a separate culture-historical stage in 1943 by the excavators of Tell Hassuna (Lloyd and Safar 1945). At the bottom of their soundings, in level Ia, they excavated a basal level not associated with any identifiable architecture, but yielding copious amounts of a largely plain, primitive-looking pottery very distinct from the more advanced ceramics recovered from later levels. They did not

yet term this Coarse Ware pottery 'Proto-Hassuna,' because they doubted that it was ancestral to the later Archaic and Standard Hassuna ceramic stages (Lloyd and Safar 1945: 262). Subsequent excavations in northern Iraq resulted in additional find complexes attributed to this cultural stage, notably Matarrah in 1948 (Braidwood *et al.* 1952), and Umm Dabaghiyah, Tell Sotto, Kültepe and Yarim Tepe I in the 1970s (Bader 1993a, 1993b, 1993c; Bashilov *et al.* 1980; Kirkbride 1972, 1973, 1974, 1975; Merpert and Munchaev 1987, 1993; Merpert *et al.* 1976, 1977, 1978; Munchaev and Merpert 1971). This resulted in terms such as 'Sotto-Dabaghiyah type' to describe this cultural stage to this day (Aurenche and Kozlowski 1999: 141; Huot 1994: 70-83; Merpert *et al.* 1981: 22; Matthews 2000: 57-63).

However, the Soviet excavations at Tell Sotto, Kültepe and Yarim Tepe I gave sufficient evidence to argue that the earlier, Sotto-Dabaghiyah type ceramic assemblage was, indeed, ancestral to the subsequent Archaic Hassuna one. Hence, Bader coined the term *Proto-Hassuna* for this ceramic assemblage (Bader 1975, 1993a, 1993b; Merpert *et al.* 1978). Since then the term Proto-Hassuna has shown a remarkable geographical expansion: to north-western Iran, where it applies to the Late Neolithic pottery excavated at Hajji Firuz Tepe (Voigt 1983), to Tell Bouqras on the Euphrates in eastern Syria (Le Mière and Picon 1999), to north-eastern Syria, where it came to define the material excavated at Kashkashok II (Matsutani ed. 1991), and Khazna II (Munchaev and Merpert 1994; Munchaev *et al.* 1993). Most recently, Tell Seker al-Aheimar has been cited as being the westernmost Proto-Hassuna site (Aurenche *et al.* 2004: 358).

What forms did the Proto-Hassuna pottery take? Based upon the literature we can isolate four main characteristics (Fig. 3): (1) the ceramic assemblage is dominated by coarsely plant-tempered ceramics, often termed '*Coarse Ware*' ; (2) there is a strong majority of plain vessels and a small minority of decorated vessels; (3) the main decorative techniques are *red-slipping* (Fig. 3: e-f), *red-painting* (Fig. 3: g-j) and *appliqué* (Fig. 3: a-d) – the former two are often associated with 'finer' fabrics, and the painted motifs often show rows of solid triangles, chevrons or diagonal lines; (4) some of the larger vessels have a characteristic '*double ogee*' carinated contour with a concave lower body (Fig. 3: a, d). In addition to the bulk of plant-tempered pottery, a small minority of dark, burnished mineral-tempered ware occurs at many Proto-Hassuna sites. Work by Le Mière and Picon has proven that at least some of this pottery was of non-local origin and bears strong similarities to what is known in western Syria and the Levant as *Dark-Faced Burnished Ware* (Bader *et al.* 1994; Le Mière and Picon 1987, 1999).

Is the Proto-Hassuna culture-historical entity a homogeneous one? Even a quick survey of the published reports suggests that it is not. Apart from the general properties listed above, there is enormous variation in vessel shape and size, decorative technology, and style. This is perhaps to be expected in a pre-industrial mode of pottery production, but it cautions against concepts that imply a degree of unity that may be spurious. Idiosyncratic, site-specific elements pop up everywhere, as for instance the vessels painted with dots or circles at Umm Dabaghiyah (Kirkbride 1972, pl. X: 3-6, 10; 1973, pl. III: 12-13, 21, 23), that have thus far not been reported from any other Proto-Hassuna site. More examples of variation *within* the Proto-Hassuna can be easily found (e.g. Bernbeck 1994: 129).

Much of this diversity no doubt reflects *diachronic* variation. Clearly, the Proto-Hassuna lasted for some time. However, there still appears to be little consensus on the internal relative chronology of the Proto-Hassuna core area. Compare, for instance, the various discussions of some of the main sites (Bader 1993a, 1993b, 1993c; Bashilov *et al.* 1980; Merpert and Munchaev 1987, 1993; Merpert *et al.* 1978) with the recent propositions of Bernbeck (1994: 115, 129, tables 19, 22) or Gut (1995: 185, table 18). In northern Iraq the Proto-Hassuna still represents the earliest ceramic stage archaeologically attested, but in northern Syria it follows upon a long earlier stage, as documented by the Pre-Proto-Hassuna sequence at Tell Seker al-Aheimar and the Early Pottery Neolithic levels at Tell Sabi Abyad I (For a simplified comparison, see Table 1). At the opposite end of the chronological sequence, Tell Sabi Abyad and other Transitional (or Proto-Halaf) sites now suggest

Date cal BC	Balikh valley	Khabur headwaters	North Iraq
5750 5950	Early Halaf	Early Halaf	Early Halaf
6100	Transitional	Proto-Halaf	Standard Archaic Hassuna
6300	Pre-Halaf	Proto-Hassuna	Proto-Hassuna
6900	Early Pottery Neolithic	Pre-Proto-Hassuna	Final PPNB (post-Nemrikian) ?
	Final PPNB	Final PPNB	Final PPNB (Nemrikian) ?

Table 1. *Simplified, tentative culture-historical comparison between the Balikh valley, the Khabur basin and northern Iraq.*

that what is termed Proto-Hassuna or Pre-Halaf pottery gradually evolved into the Early Halaf ceramic assemblage (Akkermans 1993; Campbell 1992, 1998; Cruells and Nieuwenhuyse 2005). In short, rather than reflecting a chronologically distinct, if heterogeneous, Proto-Hassuna 'culture' we may be looking at fragmented bits and pieces of what in effect constituted a continuous, gradual evolution of pottery production.

Apart from diachronic variation, there likely was significant *synchronic*, or contextual, variation, arising from the role of individual communities within their wider socio-economic networks, their location in the landscape, or the status of their inhabitants. For instance, while non-local Dark-Faced Burnished Ware pottery has been reported from some Proto-Hassuna sites (Bader *et al.* 1994), it has thus far not been reported from *all* of them. While this undoubtedly reflects the current state of research more than anything else, it may also be the case that non-local ceramics showed a discontinuous, socially restricted distribution among Proto-Hassuna communities. A similar argument was made with regard to the famous polychrome-painted saucers from the Late Halaf period: this exquisite pottery appears at some Late Halaf sites but not at others, depending on the fortunes of the communities inhabiting these sites (Watkins and Campbell 1986: 55-56; Campbell 1992: 64, 72-73, 217-218; 1995).

Using one other example, what is immediately striking at the key site of Tell Hassuna – limited as the exposures are – is the conspicuous over-representation of large, coarse double-ogee storage jars in level 1A (Lloyd and Safar 1945: 277). These curious vessels may have been partly buried (Bernbeck 1995: 31). Almost no open shapes and not a single husking tray were reported from this level, two characteristic categories that are regular components of most other Proto-Hassuna contexts (Lloyd and Safar 1945: 277).[2] The excavators' original idea that Tell Hassuna 1A represented the location of a pastoralist 'camp site' (Lloyd and Safar 1945: 271) has now been rejected (Bader 1993c; Merpert 1993); more likely the excavators happened to dig their trenches into an open area or courtyard.

Some scholars would include a dominance of closed shapes into the culture-historical definition of the Proto-Hassuna culture, as opposed to a dominance of open shapes for the Pre-Halaf culture (Aurenche and Kozlowski 1999: 141). However, such morphological variation may reflect functional, rather than regional variation. In other words, the specific composition of the Hassuna 1A ceramic assemblage most likely reflects the nature of specific activities carried out at this particular location – whatever they were – rather than being representative for the culture as a whole.

2. To be precise, the excavators of Tell Hassuna reported that in the strata attributed to level 1A a total of 9 small bowls and 29 large closed storage jars were found, but no husking trays (Lloyd and Safar 1945: 277).

In a similar vein, I have elsewhere compared the ceramic composition of two roughly contemporaneous Late Neolithic contexts, the level 6 Burnt Village at Tell Sabi Abyad I in the Balikh valley and Tell Boueid II in the Khabur basin, both dated to the early stages of the Transitional period between the Pre-Halaf (or the Proto-Hassuna) and the Early Halaf (Nieuwenhuyse 2008). This comparison yielded an interesting series of differences that perhaps reflect differences in the socio-economic role of these two communities, rather than regionally-bounded cultural expressions. In this particular example, whereas at Tell Sabi Abyad I large, coarse pottery storage jars were locally produced, people at Tell Boueid may have imported their smaller, light-weight open vessels. Large storage containers certainly existed at Boueid, but these were made on the spot using local materials such as lime or gypsum – the so-called 'white ware.'

Most later sixth-millennium sites thus far excavated in the Proto-Hassuna culture area seem to follow the pattern seen at Tell Sabi Abyad I: no significant white ware production and the presence of ceramic vessels of all shapes and sizes. At Tell Bouqras, however, pottery was rare, and it appeared alongside white ware containers (Akkermans *et al.* 1983: 354; Kume, pers. comm. April 2006). The Proto-Hassuna pottery at Bouqras appears to have been of small size and comparatively light-weight (Akkermans *et al.* 1983: 351).[3] A limited repertoire of shapes is attested, mostly consisting of bowls but with very few jars (*ibid.* 1983: 352). This would fit a scenario of a community depending on others for its ceramics (Cribb 2001). A good part of the Bouqras pottery came from very far indeed, and consisted of Levantine Dark-Faced Burnished Ware (Bader *et al.* 1994). In conclusion, what seems to be clear is that contextual factors contributed to much more internal variation in the Proto-Hassuna culture than is presently recognised.

Even if we simply ignore this internal variation, accepting it as the regrettable 'noise' that remains in every culture-historical definition, is the Proto-Hassuna distinct *vis-a-vis* other, contemporaneous entities? Again, the current evidence suggests otherwise. This becomes clear if we simply plot the inter-regional distributions of the various constituting elements of the Proto-Hassuna ceramic assemblage (Figs. 5, 7 and 9). Here of course we reach swampy ground, as it forces us to deal with the treacherous issue of Late Neolithic ceramic definition. But if we take the evidence for what it is, the boundaries between the Proto-Hassuna and the Pre-Halaf 'cultures' are not sharp, but very unclear, if present at all. Moreover, the distributions of the various constituent elements do not seem to match one another, resulting in a diffuse network of overlapping and cross-cutting patterns. Let us take a closer look at the distributions of three of the major elements: (1) plant-tempered Proto-Hassuna-style pottery with appliqué decoration; (2) pottery

3. This is suggested by the comparatively limited wall-thickness of the Bouqras pottery. No vessels with a wall-thickness surpassing 20 mm were found (Akkermans et al. *1983: 351).*

with red-painted designs; (3) Dark-Faced Burnished Ware.

(1) Coarse, plant-tempered pottery furnished with appliqué decoration has become accepted as a hallmark of the Proto-Hassuna culture (Fig. 3: a-d). This particular type of surface modification is generally associated with relatively large and closed vessels, presumably used for storage. Moreover, appliqué-decoration tends to be associated with a relatively coarse plant temper, and with a less-carefully finished vessel surface. The appliqués are on the whole rather small, and almost as a rule they were applied to the upper part of the vessel, above the point of maximum vessel diameter. This cautions against the interpretation that their function was to provide a better grip while handling the vessels; rather, they may have had a 'decorative' or symbolic meaning (Cauvin 2000: 183; Esin 1993; Wengrow 2001). Or, as Kirkbride put it, they were 'figurines applied to pottery' (Kirkbride 1973: 5). A large variety of appliqués is attested: most are abstract, geometric motifs with no immediately identifiable referent, but occasionally anthropomorphic or zoomorphic motifs are found.

Perhaps because the rare figurative motifs never fail to appeal to us emotionally, and probably also because this type of decoration is seen as a key for attributing the ceramic assemblage to the Proto-Hassuna culture, Coarse Ware sherds carrying an appliqué seem to be over-represented in preliminary reports – a point made by Conroy and Campbell, who warn against the strong presence of decorated sherds in Kirkbride's field reports (ca. 69% of all sherds) as compared to what they consider to be a more faithful estimate of the role of decorated sherds in the Umm Dabaghiyah pottery (no more than about 2%: Conroy 2006; Conroy and Campbell in prep.). The proportion of, specifically, appliqué-decorated sherds will have been even lower: appliqué-decorated Coarse Ware sherds include no more than about 0.5% of all sherds at the Proto-Hassuna site Telul eth-Thalathat (Fukai *et al.* 1970). None were found at Proto-Hassuna Kharabeh Shattani (McAdam 1995). One may well wonder how representative this hallmark really is.

The main point to be made here, of course, is that appliqué decoration on coarse, plant-tempered pottery was not at all exclusive to the Proto-Hassuna core region, nor was it chronologically restricted to the Proto-Hassuna stage (Fig. 5). At Yarim Tepe I a small proportion of appliqué-decorated pottery continuous to be present into later, Archaic Hassuna and even Standard Hassuna stages (Merpert and Munchaev 1993). In the Khabur headwaters, appliqué decoration occurs within Transitional (or Proto-Halaf) contexts, at Tell Boueid II and Tell Chagar Bazar (Cruells 2006; Nieuwenhuyse *et al.* 2002: 52). Significantly, it occurs in small but persistent quantities on coarse,

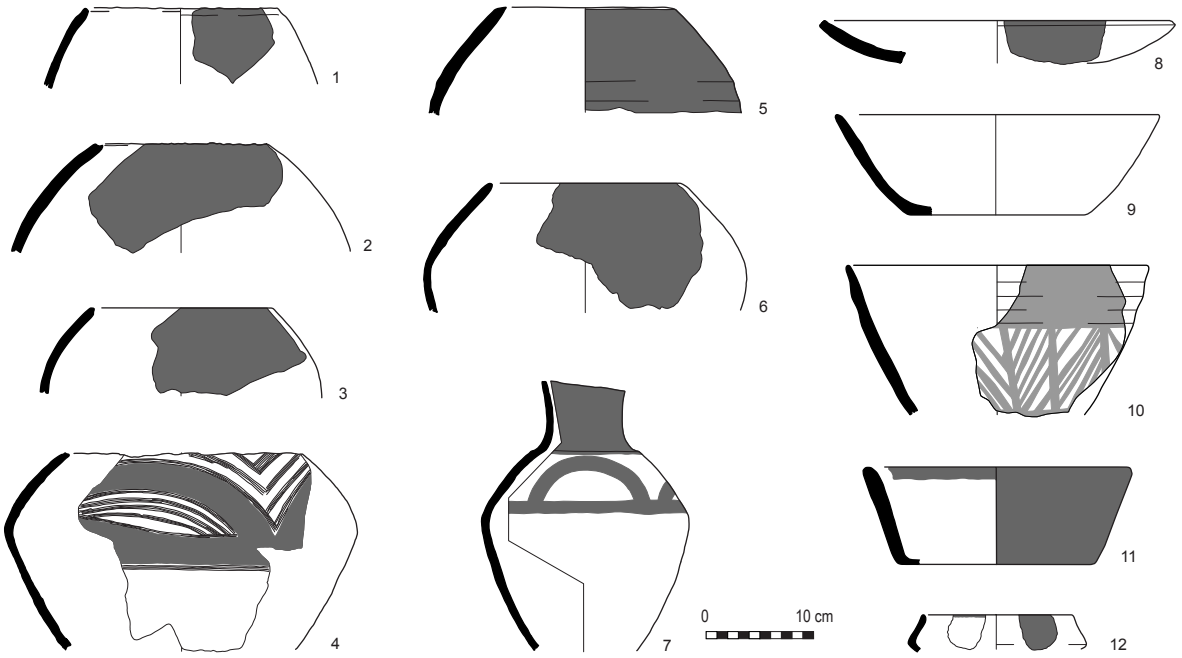


Fig. 8. *Dark-Faced Burnished Ware from Tell Sabi Abyad I (Pre-Halaf and Transitional stages).*
Nos. 1-6: originally made in the form of jars, the necks were removed after which the remaining lower parts were re-used as hole-mouth cooking vessels. 1-3, 5-6, 8, 11-12: red slipped; 7: painted; 4: painted and incised; 10: pattern burnished (after Nieuwenhuyse 2008).

plant-tempered pottery in what is seen as the heartland of the Pre-Halaf culture. At Tell Sabi Abyad I in the Balikh valley, the (low) proportions of appliqué-decorated plant-tempered pottery – locally known as 'Standard Ware' – perhaps equal those from the Proto-Hassuna key sites to the east (Akkermans *et al.* 2006; Le Mière and Nieuwenhuyse 2006; Nieuwenhuyse 2008) (Fig. 4). In the Balikh, in addition to Tell Sabi Abyad I, appliqué-decorated Standard Ware has been attested at Tell Mounbatah (surface finds, examined by the author). The regional distribution of appliqué-decorated, Proto-Hassuna-like pottery includes the entire Euphrates valley, where it occurs at Akarçay Tepe (Arimura *et al.* 2000; Cruells in press), Mezraa Teleilat (Özdoğan 1999, 2003; Özdoğan *et al.* 1999), Tell Halula (Faura 1996a, 1996b) and Dja'de (Faura and Le Mière 1999: 286). West of the Euphrates, appliqué decoration occasionally occurs on 'Coarse Simple Ware' in the Amuq during phases A-B (Braidwood and Braidwood 1960: 48-49, 70), and at Tell el-Kerkh (Tsuneki *et al.* 2000: fig. 8:1).[4] An isolated example occurs at el-Kowm in the Syrian desert (Dornemann 1986: 32). Up north, it occurs at Çayönü on the Tigris (Özdoğan and Özdoğan 1993).

(2) Plant-tempered wares, painted with red, often glossy motives (Fig. 3: g-j), generally have a 'finer' fabric than is common for the bulk of the plant-tempered pottery, including the coarsely-tempered, appliqué-decorated wares (Bashilov *et al.* 1980; Le Mière 2000, 2001). Possibly the potters used dung rather than chopped straw as a temper for producing painted vessels (Nieuwenhuyse 2008). The vessels tend to be relatively small, are comparatively thin-walled, and mostly have even surfaces carefully finished with smoothing or burnishing. It probably was the burnishing that gave the paints their gloss. Open shapes (bowls) and small jars are characteristic shapes. In terms of vessel function, the shape and size of the red-painted Proto-Hassuna vessels suggest that they were used for serving and consuming food and drink. Typical painted motifs include chevrons, zigzags, and rows of solid triangles; often the empty spaces between those triangles were filled with diagonal lines.

As was already suggested for the appliqué-decorated Coarse Ware, this attractive decorative style was not limited to the Proto-Hassuna stage proper, nor was it regionally confined to the Proto-Hassuna core area. At Yarim Tepe

4. On the whole, however, appliqué decoration in the west was not associated with coarse, plant-tempered pottery but with Dark-Faced Burnished Ware (Braidwood and Braidwood 1960; Tsuneki et al. *1997, 1998, 1999, 2000).*

I, red-painted Coarse Ware continued into later stages, alongside Archaic Hassuna painted pottery (Merpert 1993; Merpert and Munchaev 1993). In the Khabur, it continued into the early stages of the Transitional (or Proto-Halaf) Period (Cruells 2006; Nieuwenhuyse *et al.* 2002: 52). To the north, it appears alongside pottery made in the Standard Hassuna and Samarra style at Hakemi Use on the Turkish upper Tigris (Tekin 2003, 2004). The regional distribution of this pottery became even larger than that of the appliqué-decorated wares (Fig. 7). As far as we can presently reconstruct, it reached as far east as Tell Shimshara in north-eastern Iraq (Mortensen 1970: 103-106) and Hajji Firuz Tepe in north-western Iran (Voigt 1983). Red-painted Standard Ware commonly occurs in the Pre-Halaf culture area, for instance in the Pre-Halaf to Early Transitional levels (levels 8-6) at Tell Sabi Abyad I (Fig. 6) and at some other sites in the Balikh (Akkermans *et al.* 2006; Le Mière and Nieuwenhuyse 1996; Nieuwenhuyse 2008). It has been attested along the entire length of the Syrian Euphrates: at Bouqras (Akkermans *et al.* 1983: 352-353, fig. 9: 11-13), in the Tishrin Dam area (Faura 1996a, 1996b; Faura and Le Mière 1999; Le Mière 2001: 185), and in south-east Turkey (Arimura *et al.* 2000; Özdoğan 2003: 38; Özdoğan *et al.* 1999: 180). No red-painted Standard Ware has yet been reported from the Qoueiq (Mellaart 1981), but farther to the west it occurs in the Rouj basin (Tsuneki *et al.* 1999: 9, Fig. 7.21); the Rouj currently represents the westernmost boundary of this extraordinary distribution.

(3) The term 'Dark-Faced Burnished Ware' was first coined by the Braidwoods in the Amuq valley, where it came to represent a heterogeneous ceramic category characterized by a dense, mineral temper, a frequent use of burnishing as a surface finishing technique, and on the whole a dark color of the paste (Braidwood and Braidwood 1960). Dark-Faced Burnished Ware is characteristic for Late Neolithic ceramic assemblages in western Syria, Cilicia and the northern Levant, in which it usually forms the majority (Balossi 2004; Diebold in prep.; Le Mière and Picon 1999). Moving east, very similar-looking ceramics occur as a minority element at many Late Neolithic sites across northern Syria, south-eastern Turkey and northern Iraq. Le Mière has demonstrated that the Dark-Faced Burnished Ware-like sherds at these sites bear a very distinct chemical-geological signature, significantly different from the bulk of local ceramics but in many respects similar to those of the classic Dark-Faced Burnished Ware from the west (Bader *et al.* 1994; Le Mière 1989; 2000: 129; 2001: 180; Le Mière and Nieuwenhuyse 1996: 126-127; Le Mière and Picon 1987, 1999). Le Mière has convincingly argued that this category represented an import, deriving from ophiolite geological formations in the west. Imported Dark-Faced Burnished Ware has thus become accepted as a regular, if rare, component of the Proto-Hassuna ceramic assemblage.

5. Here I ignore the thorny issue of what precisely constituted Dark-Faced Burnished Ware. Although in its most general sense this distinctive dark-colored, burnished, strongly mineral-tempered ware has convincingly been demonstrated to be non-local to this area, different groups of Dark-Faced Burnished Ware may have existed (Balossi 2004; Diebold in prep.; Le Mière and Picon 1999; Nieuwenhuyse 2008).

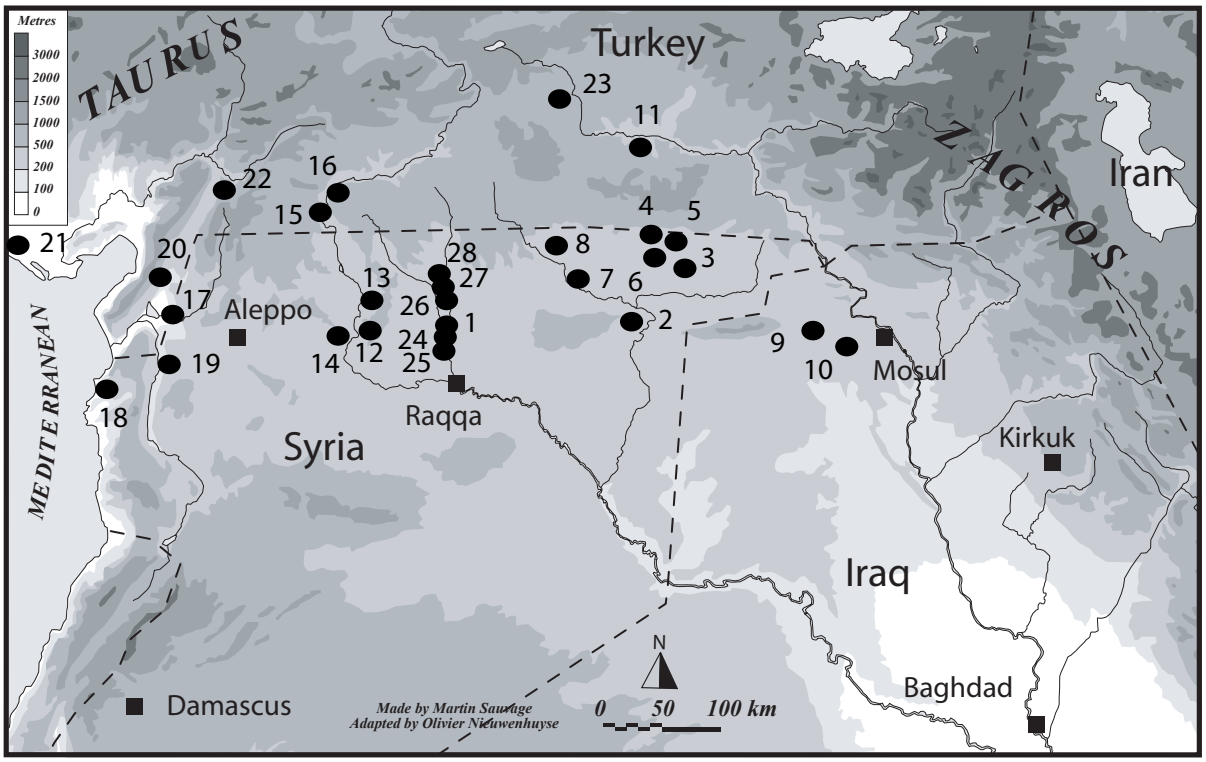


Fig. 9. *The regional distribution of Dark-Faced Burnished Ware.*
1: Tell Sabi Abyad I; 2: Tell Boueid II; 3: Chagar Bazar; 4: KS 130; 5: KS 139; 6: KS 38; 7: Tell Seker al-Aheimar; 8: Tell Halaf; 9: Tell Sotto; 10: Yarim Tepe I; 11: Hakemi Use; 12: Kosak Shamali; 13: Dja'de; 14: Tell Halula; 15: Mezraa Teleilat; 16: Akarçay Tepe; 17: the 'Amuq; 18: Ras Shamra; 19: Tell el-Kerkh; 20: Tell Kurdu; 21: Mersin; 22: Domuz Tepe; 23: Çayönü; 24: BS 168; 25: Tell Mounbatah; 26: BS 235; 27: BS 242; 28: BS 282 (after Nieuwenhuyse 2008).

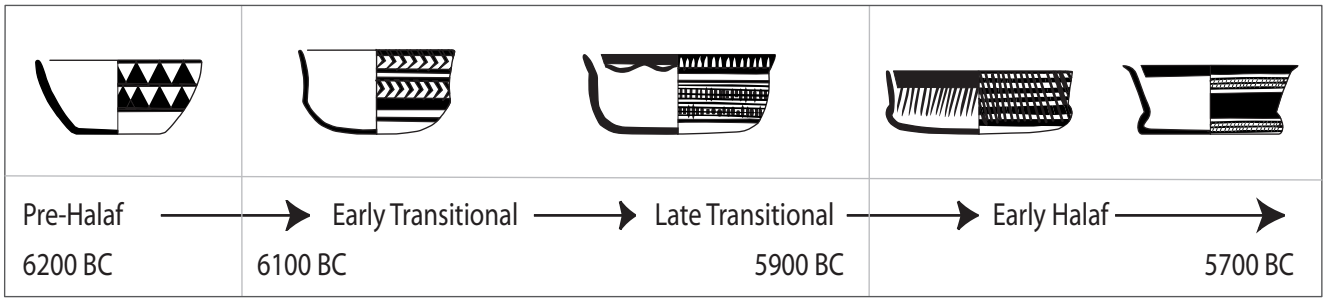


Fig. 10. *Changes in technology and style of fine serving vessels from the Pre-Halaf to the Early Halaf period at Tell Sabi Abyad. (after Nieuwenhuyse 2008).*

The regional distribution of Dark-Faced Burnished Ware-like ceramics is huge (Fig. 9),[5] seemingly not limited to any culture-historical core area in particular. It regularly occurs at sites located in the Pre-Halaf cultural zone, such as Tell Sabi Abyad I where it includes between 4 - 7% of the ceramic assemblage during the Pre-Halaf and Transitional periods (Le Mière and Nieuwenhuyse 1996; Nieuwenhuyse 2008). Like (1) and (2), it crosses the temporal boundaries of this culture-historical entity. In northern Iraq it continues into the Archaic Hassuna phase (Bader *et al.* 1994: 63). In north-eastern Syria and south-eastern Turkey it continues into the Transitional (or Proto-Halaf) Period (Cruells 2006; Cruells and Nieuwenhuyse 2005; Nieuwenhuyse *et al.* 2002; Tekin 2003, 2004).

Perhaps the only unit found in the Proto-Hassuna ceramic assemblage that is not found also in regions much farther to the west, is the large, double-ogee storage jar. This unit, at least, may reflect some localized practice, even if the specific function of this curious vessel shape remains to be ascertained. Does one singular property of the ceramic assemblage suffice to define an entire culture? Like the other elements of the Proto-Hassuna pottery, double-ogee storage vessels, too, have a vast regional distribution: from Seker al-Aheimar in the west as far east as Haji Firuz on shores of Lake Urmia. This large spread alone cautions against the notion that Late Neolithic communities sharing the practice of making and using double-ogee storage jars shared a common set of norms and values, or practised a singular mode of subsistence.

■Pottery in context

In my view, the culture-historical entity currently known as the Proto-Hassuna was far less homogeneous than the use of a singular term implies. Nor was it very distinct. At the very best there were fuzzy, highly diffuse boundaries between the Proto-Hassuna 'core area' and its immediate neighbor to the west, the Pre-Halaf culture area of northern Syria. Drawing parallels with the Balikh valley, I do not assume that this region represented some western off-shoot of the Proto-Hassuna culture, or even that the 'classic' Proto-Hassuna ceramic assemblage occurred as far west as the Balikh. Instead, I argue simply that Late Neolithic ceramic distributions do not follow the artificial boundaries that archaeologists have created in the recent past. As Joan Oates has put it, these culture-historical entities are 'figments of our imagination' (1987: 168).

The issue of cultural labels or, in a broader sense, the interpretation of archaeologically-observed regularities in the material record, belongs of course to the heart of archaeology. The Near East especially has a strong

and rather well entrenched tradition of distinguishing prehistoric cultural entities on the basis of pottery styles. To be sure, we *need* labels. It can hardly be denied that there are strong regularities in the occurrences of particular cultural traits in the Late Neolithic (read: in the pottery) that warrant the use of general labels. As long as we use such labels at a broad, descriptive level there is hardly any problem. Many scholars make it sufficiently clear that they merely intend their labels to define stages in some regional ceramic development. The Proto-Hassuna is perhaps best understood as a rather loosely defined, chronological designation valid for a particular site or a particular area. Used in this manner, it becomes the equivalent of other regional chronologies for the Late Neolithic that have come to the fore recently, for instance in the Balikh (Akkermans 1993), the Syrian Euphrates (Cruells and Nieuwenhuyse 2005) or the Rouj basin (Tsuneki *et al.* 1997, 1998). The problems start when such labels are regarded to be representative for much larger areas, assuming homogeneity where there may have been heterogeneity, thus masking real differences and suggesting regional boundaries where there were none. To use such labels for further social-economic reconstructions or comparative studies, often with far-reaching implications for our understanding of the past, may not be warranted.

Those wishing to adhere strictly to the polythetic model for cultural definition would probably argue that we should simply accept the 'noise.' Those fuzzy boundaries can be explained away by down-playing the items that turn up in the 'wrong' culture-historical location, for instance by calling them 'isolated elements' resulting from cross-cultural trade or emulation (Aurenche *et al.* 2004: 358). Others might prefer the reconstruction of regional 'sub-cultures.' For instance, Bernbeck distinguished between a Sinjar group and a Tigris group within the Proto-Hassuna culture (Bernbeck 1994: 129, table 22). Although this has the advantage of moving closer to regionally-based definitions, it evades the main question of whether such sub-regional boundaries really existed in the Late Neolithic. In addition, it may lead to a rapid multiplying of regional entities. For example, Proto-Hassuna sites excavated in the Khabur headwaters perhaps warrant the establishment of a new sub-culture (a 'Khabur group' ?); if one accepts the proposition that the pottery from Pre-Halaf sites in northern Syria contains valid indicators of the Proto-Hassuna ceramic assemblage, then this might lead to yet another sub-culture (a 'northern Syrian group' ? A 'peripheral Proto-Hassuna' ?). And so on, until every little valley has its own sub-culture.

Moving one step further, scholars might call for the avoidance of labels, and to focus instead on the small-scale, site-specific locus of pottery production and consumption. This would have the advantage of investigating how broader regional entities found expression at a local scale, and how individual

communities contributed to the larger whole (Bernbeck 2008a; Bernbeck and Pollock 2003; Croucher 2005; Irving 2001; Özbal 2006). A 'bottom-up' approach has the potential of identifying *local* meanings of particular cultural traits or materials that are at the same time shared over a larger area (Hermansen 2004).

The basic point here is that these larger wholes in the Late Neolithic do not appear to have existed in the form of bounded, homogeneous entities: there may have been no 'cultures' in the Late Neolithic, in the sense proposed by the polythetic cultural model. It seems to be possible to create 'core' areas at will, by selecting whatever site one prefers as a focal point. To take Tell Seker al-Aheimar as an example, far from lying on the western limit of the Proto-Hassuna culture area, Tell Seker al-Aheimar appears to be *centrally* situated in a remarkably dynamic network of criss-crossing, overlapping patterns of ceramic distributions.

In short, the main focus in our investigations should be to explore what these overlapping networks meant in socio-economic and symbolic terms. A more 'active' perspective on pottery production and consumption is called for, in which *context* is the key. Huge potential exists for studies on pottery function (e.g. Kiliçbeyli 2005; Le Mière and Picon 1991; McGovern *et al.* 1996) and the social role of food and drink (Dietler and Hayden eds. 2001; Halstead and Barrett eds. 2004; van der Veen ed. 2003). Whereas pottery style and decoration have always received scholarly attention, the social meaning of technologies remains largely unexplored (Gosselain 1998; Lemonnier 1986, 1992). At Proto-Hassuna and Pre-Halaf sites currently being excavated such as Tell Seker al-Aheimar, Tell Sabi Abyad, Tell Halula, and Mezraa Teleilaat, such approaches are possible.

Earlier views that tended to equate Late Neolithic pottery distributions with ethnic identities have now been largely discredited (Akkermans 1997; Roaf 2005). Ethnic boundaries – if they existed – would certainly have been expressed by means other than pottery style, such as dress, burial customs, bodily decorations or culinary practices. It also appears to be less likely now that Late Neolithic ceramic distributions reflect distinct modes of subsistence adaptation: their spread over such incredibly large, ecologically heterogeneous, geographical spaces suggests that communities practising different subsistence strategies were responsible for them. For the same reason, earlier views that drew direct parallels between particular ceramic styles and some stage of social evolution now seem too simplistic.

Hodder, back in 1978, argued that we should take the composite culture-historical entities apart and examine their constituent elements individually.

His admonition is still useful today: each of the constituent elements of the Proto-Hassuna should be seen in its proper context. For instance, what is perhaps the most remarkable with respect to the geographic extent of fine, red-painted, plant-tempered ceramics, is that it foreshadows the equally extended distribution of the dark-on-light painted Fine Wares from the Transitional Period onwards (Cruells and Nieuwenhuyse 2005). Work at Tell Sabi Abyad suggests that there were strong continuities between the red-painted plant-tempered pottery from the Pre-Halaf era, the 'Samarra'-style Standard Fine Ware from the Transitional period, and Early Halaf serving vessels (Fig. 10). Continuities can be pointed out in vessel shape and aspects of the decorative style as well as in vessel use (Nieuwenhuyse 2008). Instead of approaching red-painted serving vessels as if they were merely a useful key for attributing sites to a 'Proto-Hassuna culture,' it would be more fruitful to look at them from the perspective of how this pottery functioned socially. Exploring the role of serving vessels, the social practice of the *feast* may form the connection between the red-painted serving vessels from the Proto-Halaf and Pre-Halaf stage and those from the Early Halaf (*ibid.*).

Significantly, in Syria and northern Iraq, the introduction of finely-made, exquisitely decorated serving vessels – and other elements of the Pre-Halaf and Proto-Hassuna ceramic assemblages – seems to have been part of a larger package of socio-economic change that took place at around 6300 BC (Akkermans *et al.* 2006). Moving far beyond mere stylistic and technological innovations in the ceramics, these changes included the spread of stamp seals as indicators of property, the appearance of circular buildings ('tholoi'), and the gradual development of a more mobile, semi-pastoralist society (Akkermans and Verhoeven 1995; Akkermans *et al.* 2006; Verhoeven 1999). Ovicaprids may have begun to be exploited for their wool at this time, as evidenced by the increase of spindle whorls and changes in mortality patterns (Akkermans *et al.* 2006; Cavallo 2000). There may have been changes in diet as well, as is suggested by the recent discoverey of milk residue traces at Tell Sabi Abyad (Evershed *et al.* 2008). There were changes in the architectural layout of the villages, in which large, communal storage buildings became a regular feature (Verhoeven 1999). The increased importance of bulk storage was reflected in the ceramics: large, coarse storage jars became a regular element in both Pre-Halaf and Proto-Hassuna ceramic assemblages.

The introduction of non-local Dark-Faced Burnished Ware in Pre-Halaf and Proto-Hassuna ceramic assemblages suggests changes in the way foodstuffs were prepared. What stands out is its extraordinary resistance to thermal shock, combined with a low porosity, making it an excellent cooking ware (Daszkiewicz *et al.* 2000; Le Mière and Picon 1991, 1999). What happens is that Dark-Faced Burnished Ware jars were locally turned into hole-mouth

'cooking pots,' by removing the neck from the lower part of the vessel (Fig. 8: 1-6). Although the precise location of production of the northern Syrian Dark-Faced Burnished Ware remains to be established, its production may well have constituted a specialized craft (Le Mière and Picon 1987; Bader *et al.* 1994: 67), with the vessels made purposely as items destined for long-distance exchange.

As scholars have recently come to realize, at least some of these changes may have coincided with the so-called 8.2k climate event, evidence for which is accumulating (Akkermans *et al.* eds. in prep.). Precisely how Late Neolithic cultural strategies should be seen in relationship to climatic stresses, however, deserves to be investigated much further.[6] Whatever interpretative perspective one prefers, pottery distributions in the Late Neolithic do not appear to reflect homogeneous, mutually distinct regional identities or socio-economic adaptations in any deterministic sense. Communities across the northern Syrian steppes at the close of the seventh millennium BC were part of an expanding and even vibrant world, enjoying a diverse, 'internationally' oriented ceramic assemblage. The extensive network of communications and the exchange of people, goods and ideas that is known as the Halaf thus had its roots directly in the Pre-Halaf and Proto-Hassuna stages in northern Syria and northern Iraq.

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CHAPTER 10

Outside the body, inside the mind: Interpreting Neolithic landscapes of the Syrian Jezirah[1]

Marc Verhoeven

"*One morning we went walking at Muir Woods National Monument, among 1,000-year-old redwood trees as big around as houses, as tall as rocket ships. On each of the several occasions that we entered forests, Tony seemed to transform, to relax into a natural connection with our surroundings. I like to think that - for a city guy, anyway - I spend a fair amount of time outdoors, but seeing Tony snap into his woodsman trance made me realize that he understood the language of trees and plants in a way that I barely knew existed*" (Brad Newsham 2002).

■Introduction

The citation above about a rice farmer from the Philippine rainforest visiting America vividly illustrates the profound effect of landscape on human behavior, experience and cognition, as well as the different perceptions of the environment. Within the framework of landscape archaeology, these are the main topics of this paper.

The most popular form of landscape archeology in the Near East are surveys. The majority of these have three basic characteristics. First, it appears that, although these projects are about sites in their settings, it is the settlements that receive the great majority of attention. In other words: the landscape is commonly interpreted from a site-based, concentric, point of view. Second, the landscape largely appears either as ecologically deterministic, or alternatively as a passive element upon which human patterns were inscribed. Third, the landscape is treated from a functional and processual perspective, as indicated by the heavy emphasis on e.g. subsistence and settlement patterning.

These characteristics apply to two different types of surveys. First, there are large-scale general surveys, mostly aimed at inventarizing ancient settlement locations, construction of relative chronological frameworks and reconstruction of settlement organization and development (Akkermans 1993; Lyonnet ed. 2000). Second, there are smaller-scale and detailed surveys, carried out to address specific problems or research questions, or to put sites in their proper geological and geographic setting. Apart from the work of Wilkinson (1996, 1997), the recent work of Oguchi and colleagues around Neolithic Tell Seker al-Aheimar on the Khabur (Nishiaki 2005), as reported in this volume, is an example of this approach.

In this paper I would like to go beyond these traditional approaches by paying attention to some aspects of the landscape - experience, perception and cognition - which have hardly been dealt with in Near Eastern landscape studies and surveys.

4. This paper was originally written in 2005 and has been updated in 2010.

This lack of attention to these subjects is not surprising. First, as already indicated, surveys are most often aimed at providing general insights in the nature and development of habitation in circumscribed areas. Often this serves as a basis for selecting sites for more detailed investigation, e.g. excavation. Second, generally it is only possible to start analyzing perception, etc. after a first period (which may consist of years) of more basic, down-to-earth work in a region. Third, topics such as cognition, experience and perception are notoriously difficult to investigate. Although it has been severely criticized, and not without reason, Hawkes (1954) indeed had a point when arguing that immaterial topics such as religion are quite high up the ladder of inference.

High indeed perhaps, but not beyond reach. Indeed, many recent studies have come up with valuable reconstructions of ancient experience, cognition, etc. (e.g. Bradley 2005; Fontijn 2003; Hodder 2006; Richards 1993; Tilley 1991). I would like to make a contribution to this by dealing with peoples' different perceptions of the Late (Pottery) Neolithic landscape in the Balikh valley in northern Syria. This shall be attempted by means of a phenomenological and contextual perspective, especially paying attention to contextuality of behaviour and experience/cognition.

■Data and theory

Bintliff has recently defended the position that theory is secondary, and that it is the primary field data that make archaeology valuable and worthwhile (Bintliff 2004). Theory in archaeology, he argues, would just reflect the ever-changing fashions of the time, doing virtually nothing to reveal the past. Therefore he wants to elevate practical research over thinking about the discipline.

Undoubtedly, Bintliff, a great theoretician, has overdrawn the case to make a nice argument worthy of publication and presentation, but probably his idea will find great appeal among many so-called field archaeologists. I do not wish to extensively dwell upon the quite unhealthy polarization between academics and field archaeologists. Three things are in order, however. First, as noted by others already some time ago (e.g. Shanks and Tilley 1987), but still relevant, given the tremendous difficulties with reconstructing past behaviour, archaeology still needs a highly developed theoretical structure. Archaeology entails thinking about the past, and it is important to be aware and critical about this thinking. Second, like field work, theoretical work is practical, knowledge being created of *theoretical objects*, such as concepts, notions and facts. Third, theory and practice should be (and in effect are) in a dialectical relation, the one informing the other, so as to come closer to

past meanings. This concept of reflexivity is also known as hermeneutics.

■Hermeneutics and dialectics

Hermeneutics is the philosophy of interpretation and understanding, best known through the work of Gadamer (1975) and Heidegger (1972, and see e.g. Palmer 1969; Schmidt 2006). It is argued that understanding is always historically and contextualy located. Thus, understanding is never given, but always based upon previous knowledge. Heidegger called this pre-understanding. This pre-understanding is essential to interpretation and further understanding. Understanding and interpretation, then, are in a constant reflexive dialectic process, moving between interpreter and interpreted, changing both in the process. This is the so-called hermeneutic cycle (Figs. 1 and 2). According to Gadamer, understanding is a fusion of (contemporary and historic/ancient) horizons. In fact, these are not different horizons, but one internally agile horizon of the so-called effective history, which changes in the act of interpreting (Oudemans 1988).

In archaeology especially Shanks and Tilley and Hodder have been major proponents of hermeneutics. Point of departure is that archaeology is an interpretative - and not an objective - practice, a process of actively relating the past and the present. Furthermore, there is a move beyond a dichotomy between archaeologist and data, and related oppositions such as theory-practice, present-past, objectivity-subjectivity. The archaeologist is situated in a liminal position between the past and the present, with the present

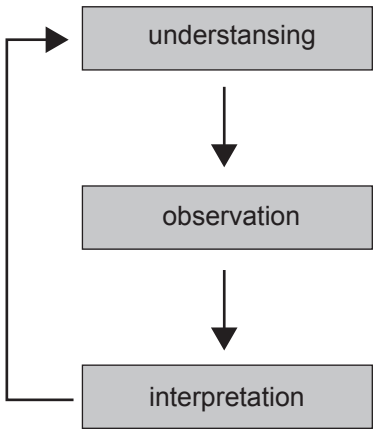

Fig. 1

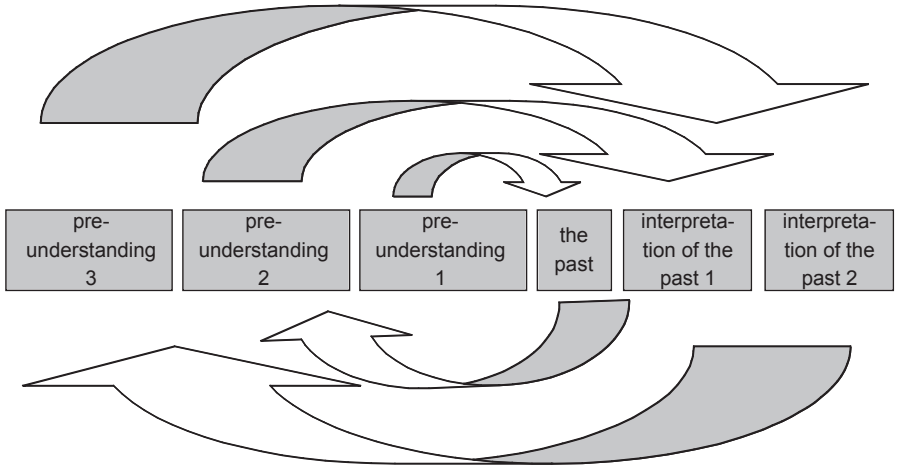

Fig. 2

Fig. 1. *The hermeneutic process.*
Fig. 2. *The hermeneutic cycle (after Finkbeiner and Koplin 2000).*

influencing the past and *vice versa*. "We are involved in a discourse mediating the past and present and this is a two-way affair" (Shanks and Tilley 1992: 104; and see Hodder *et al.* 1995: 237-238; Hodder 1999).

For Shanks and Tilley (1992: 108) archaeologists are in a complex position, as they are involved in a manifold hermeneutic, i.e. the hermeneutic of: (1) working as an archaeologist; (2) being part of contemporary society; (3) trying to understand ancient cultures; (4) transcending past and present. Moreover, to complicate matters even further, archaeologists are dealing with the hermeneutics of past people.

Paradoxically, notwithstanding the hermeneutic and dialectic relationship between theory and data, many archaeological studies are either largely theoretical or factual. This indicates that a researcher's preferences and choices, or agency, are an important part of the hermeneutic cycle, something which is often overlooked. Obviously, both data and theory are important parts in archaeological discourse. Certainly, some analyses or datasets do not lend themselves to either theorization or basic description. It is wrong, however, to *a priori* give pre-eminence to one or the other. It seems that there is a basic difference between (1) unconsciously and (2) consciously applied archaeological theory (or low versus high-level theory). The first mostly refers to description of objects and contexts, which is not a neutral, value-free exercise, as believed by many, but based on archaeological traditions, preferences, etc. There are many possible formats of, for example, coding sheets for pottery. The second class distinguished pertains to the explicit use of theory. In many post-processual studies such theory is almost wholly separated from the data, resulting in philosophical and abstract narratives to which many of us can not relate. Theory should be applied to data, to case-studies, in order to unveil the mysteries of the past. This is a dialectical process: "Subject mediates object and object mediates subject in a reflexive process resulting in knowledge of object by subject. Following from this we must reject any naive distinction between the object conceived as concrete hard fact and theories or ideas about it conceived as abstract" (Shanks and Tilley 1992: 111).

In this paper, then, it shall be attempted to explicitly combine theory and data in an interpretation of Neolithic landscapes. As a start, an introduction about what has become known as landscape archaeology is presented. Second, my theoretical approach is defined. At last, this approach is used to analyze Neolithic perceptions of the Balikh valley in northern Syria.

■Space, place and landscape archaeology

As an introduction to the archaeology and theory of landscape it is useful

to distinguish space and place. Space is largely a geographical and physical concept; it is a three-dimensional surrounding, an undefined dimension upon which humans may act. By this working on the landscape, space is transformed into place: nature is transformed into culture. Order and meaning are created in a seemingly chaotic (i.e. natural) world, and randomness is transformed into predictable patterns (Bargatzky 1994: 9). Place is thus much more specific than space; it is a dimension with meaning. Place is not necessarily created by erecting visible boundaries; it is well-known that in many cultures natural features in the landscape, such as mountains, rocks, waterfalls or caves are sacred places, which have special meaning (Carmichael et al. eds. 1994; Hirsch 1995: 4; Smith and Brooks eds. 2001). Place, therefore, should not be defined as something created by humans, but as something that "... owes its character to the experiences it affords to those who spend time there" (Ingold 1993: 155). The meanings of place are largely culture-specific, i.e. they depend on the worldview of its users, which in its turn is shaped by place (Gramsch 1996; Low and Lawrence-Zúniga eds. 2003).

It should be noted that this distinction of space and place is somewhat reminiscent of the distinction between processual and post-processual archaeology with regard to the study of landscapes and the past in general. As it has been the focus of much debate already, I do not wish to dwell in detail upon the differences between these archaeologies, but some basic remarks are in order.

In processual archaeology the landscape and the environment are considered as space, as a 'neutral stage' on which humans acted. Moreover, the environment is regarded as deterministic, dictating human behavior. This behavior is reconstructed in functional, rather than symbolic terms, the latter held to be of secondary importance. Furthermore, space is something that can be objectively measured and which has a universal impact on people. Hence New Archaeologies' mathematical approaches, as exemplified by nearest neighbor analyses, Central Place Theory, etc. (Tilley 1994: 9-10).

In post-processual archaeology, on the other hand, landscape is regarded as place, i.e. as a dimension not only with function, but also with meaning. Moreover, it is acknowledged that there is a reflexive, dialectic relationship between space and social practice. Space is both the medium and outcome of practice. Thus, human agency is introduced, with space being socially produced. As Tilley (1994: 10) notes: "Socially produced space combines the cognitive, the physical and the emotional into something that may be reproduced but is always open to transformation and change."

Another basic tenet of post-processual notions on space, and one which

forms the basis of the approach taken in this paper, is that meanings are contextually created. Different actors may attach different meanings to places, depending on many factors, including age, gender, social position, cultural values, and so on. Thus, the same landscape or region can be differently perceived by different groups or persons. Indeed, the perception and understanding of the archaeologist dealing with a survey landscape may be wholly alien to the prehistoric or contemporary inhabitants of the region.

I define landscape, then, simply as*: the natural and cultural surroundings experienced by a person, both restricting and enabling social practice.*

The study of landscape in archaeology (and anthropology) is a quite recent branch of the discipline, an outgrowth of post-processual (or interpretative) paradigm. Tilley's *A Phenomenology of Landscape* of 1994 is one of the best known publications in this regard. In this book Tilley integrates philosophical approaches to landscape perception, foremost phenomenology, with anthropological studies of the experiences of landscape in traditional non-Western societies. This is the basis for a series of case-studies in which he examines prehistoric monuments in Wales and southern England in their settings in order to obtain clues for their symbolic meaning. The monuments, it is argued, would be mechanisms for focusing attention on features of the natural landscape. Moreover, Tilley argues that they socialized the landscape and made it meaningful. Other British archaeologists, such as Barrett (1994) and Bradley (2000) have also focused on monuments and their roles in geographic, social and symbolic settings (and see e.g. Scarre ed. 2002). In anthropology, two edited volumes by Bender (ed. 1993) and Hirsch and O'Hanlon (eds. 1995) were pioneering with regard to the interpretation of landscapes (and see Strathern and Stewart eds. 2003). In other studies, both archaeological and anthropological (Ucko and Layton eds. 1999), as well as other perspectives (Kolen and Lemaire eds. 1999) have been combined. Generally, what has become known as landscape archaeology is mainly concerned with the symbolic and cognitive dimensions of landscape, particularly with the different experiences and perceptions of past landscapes, including that of the archaeologist (e.g. Alcock 2002; Ashmore and Knapp eds. 1999; Aston 1997; Chadwick ed. 2004; Clack 2007; David and Thomas eds. 2008; Dimitriadis ed. 2009; Edmonds 1999; Everson and Williamson eds. 1998; Johnson 2006; Meier 2006; Mithen ed. 2001; Moore 2005; Topping ed. 1997). For the Near East, Wilkinson's recent study *Archaeological Landscapes of the Near East* (2003) is one of the few analyses of the landscape proper. In contrast to the studies mentioned, however, this book focuses almost exclusively on the physical landscape.

■Monuments of the past: tells

It is well-known that the Egyptian pyramids were - amongst other things - models of the primordial mound that arose out of the waters of chaos in the beginning of times (Frankfort 1948). Pyramids, then, were iconic symbols of a mythical past. Tells (or *höyük*, *tepe*, *choga, khirbet, telul*), the most conspicuous archaeological remains in landscapes of Southeast Europe and especially the Near East, are, in quite a different way, also monuments of the past. They physically embody the remains of generations of people. However, they are not recreations of past events, and they were never constructed according to a plan or in a single moment in time. What we now see as tells gradually emerged through time because of an extreme attachment to place. Instead of moving laterally, people chose to go up, building and living on the remains of former inhabitants. This intriguing phenomenon, characteristic of the Near East, has long fascinated archaeologists, but exactly why people were so obsessed with place remains a matter of debate. Generally, explanations focus on the economic and social factors of territoriality and kinship, but recently symbolic motivations have been explored as well (e.g. Verhoeven 2006). The following is a very brief survey, taking a recent study as a major example.

Generally, studies of tells as a phenomenon focus on geoarchaeological and stratigraphical aspects (e.g. Rosen 1986). Chapman (1997) was one of the first to deal with the social meaning of tells, in his case in southeastern Europe, arguing that the apparent territoriality and deep history of Neolithic tells served to shape social identities based on ancestries.

Moving to the East, to Anatolia, combining functional and symbolic information, Hodder has put forward some interesting ideas with regard to the choice of location of Neolithic Çatalhöyük. Recent paleogeographical research has indicated that this famous site was situated in the middle of extensive wetlands, and not, as previously thought, amidst agricultural lands (Baird 2005; Fairbairn 2005). Hodder has pointed out that undoubtedly economic factors were involved in the location of the site within rich riverine and flood plain resources. But, there were social, symbolic and ritual factors as well: "The environment was 'lived in' both practically and symbolically, and the location of the site shows these two components of living" (Hodder 2006: 88). For instance, the lime-rich clays that the people used to cover floors, ovens and especially walls, which were plastered and lavishly decorated over and over again were an important practical and symbolic resource.

In a similar vein, with regard to Near Eastern tells and landscapes, Steadman

(2005) has argued that functional and rational approaches on the one hand, and symbolic and cognitive approaches on the other hand, are not mutually exclusive. With regard to the latter, Steadman explores two possible dimensions of tells and their surrounding landscapes, dealing with: (1) kinship and ancestral lands; (2) sacred landscapes. With respect to kinship and ancestry, following Chapman, Steadman (*ibid.*: 293) writes that almost by definition, a tell signifies territoriality or fixed people-land relationships: "... thus grounding identity and integral kin consciousness ...". On the basis of a general overview of evidence for Neolithic ancestor veneration in the Near East, as indicated by the manipulation of human skulls (e.g. Bienert 1991; Verhoeven 2002b), it is argued that the ancestors played a central role in maintaining these relationships. Thus, burials would have identified places as properties of kin groups, and would have offered ancestral protection of place and descendants. "As time carried on and generations of that kin group inhabited their place, the claim to a sacrosanct ownership of property would have become linked in the minds of all inhabitants. In essence, the identity of person would have become inextricably bound with the locality of her place in the settlement or on the landscape" (Steadman 2005: 296).

Regarding the second approach, that of sacred landscape, Steadman indicates, that, as it is well-known, apart from ancestors the landscape could have been related to other supernatural beings. The landscape, then, could have been full with cosmological meaning. In fact, there are numerous ethnographic examples of the spiritual significance of landscapes all over the world (Carmichael *et al.* 1994), the Australian aboriginals' Dreamtime being the most famous one (Chatwin 1987; Jackson 1995; Munn 1986). To approach such possible hidden meanings in archaeological landscapes the author proposes a research agenda consisting of three phases: (1) defining special landscape features which may have been sacred; (2) reconstruction of the use of landscape and sites; (3) interpretation. Underlying these steps is a necessary detailed knowledge of the relevant cultures ('thick description') and the use of ethnographic analogies.

In the following, I shall present my own struggle with interpreting an ancient landscape, in this case the Balikh valley in Neolithic times.

■Getting there: the theoretical framework

Already some time ago anthropologist Mary Douglas (1972: 513) wrote: "The organization of thought and of social relations is imprinted on the landscape. But, if only the physical aspect is susceptible of study, how to interpret this pattern would seem to be an insoluble problem." This pessimism about interpreting and understanding prehistoric landscapes, and in fact about

dealing with many other aspects of ancient societies, still surfaces regularly in both anthropological and archaeological texts. How, then, should one approach an archaeological landscape? How to extract meaning and perception from it? In my view, two general concepts are of much help in this regard:

(1) phenomenology and dwelling;
(2) contextuality.

Phenomenology and dwelling

As an ontological concept, phenomenology is closely related to hermeneutics. In very general terms, which serve the purpose of this investigation, phenomenology refers to the manner in which people experience and understand the world. In Heidegger's philosophy phenomenology revolves around the hermeneutical relation between Being and Being-in-the-world (Heidegger 1972, 1993). By the latter is meant the experience of the world by bodily perception, which serves to understand the world and one's place in it. There is a constant tension in the distance between subject (people) and object, which needs to be created and bridged in order to be human (see Tilley 1994: 12). The philosophy of Heidegger is notoriously difficult to understand, and interpretations of its meaning vary. Regarding the enormous importance attached to experience, it could be objected that it is wrong to suppose - as for instance empiricist Enlightenment philosophers Hume (1978) and Locke (1976) did - that experience is our only way of understanding the world. As Kant (another great Enlightenment thinker) already indicated in 1781, human thinking involves an interaction between experience and pre-existing mental structures, which we use to make sense of our perceptions (Kant 1998). Thus, in other words, there is a dialectic relation between our 'hardware' and 'software.'[2]

Basically, then, phenomenology is about human-environment interactions. With regard to these, the anthropologist Ingold (e.g. 1996a, 1996b, 2000) uses the notion of *dwelling* in order to indicate that human apprehension of the world is an active process of engagement with other beings and entities in the (built) environment: "... it is through dwelling in a landscape, through the incorporation of its features into a pattern of everyday activities that it becomes home... " (Ingold 1996a: 116). Knowledge and understanding of the world and oneself, then, would be gained by active engagements of people with the constituents of their surroundings, including the house, village, city, fields, deserts, etc. Thus, dwelling is foremost about movement through a landscape (or a settlement). Obviously, walking is the most intensive sort of movement, and particularly relevant for Neolithic landscape archaeology,

2. The Routledge Encyclopedia of Philosophy *(Craig ed. 1998) is recommended as a fine introduction.*

as it can be safely assumed that the large majority of Neolithic people travelled on foot. Through walking, as elegantly put by Ingold (2004: 333), "... landscapes are woven into life, and lives are woven into the landscape, in a process that is continuous and never-ending."

The human-environment interactions and relations typical of dwelling are at the basis of *skill*, which may be defined as practical knowledge, in combination with ability, cleverness and expertness. Skill, then, is incorporated in humans through their interactions with environments (Ingold 2000, 2004; but see Carrier 2003). Skill is thus as much biological as cultural. Our surroundings and landscapes, then, are at the basis of experience and understanding, as indicated in the citation which started this paper (Newsham 2002: 367).

In his 'Theory of Practice,' which basically is about human-environment interactions too, the French sociologist Bourdieu (1977) has foregrounded the house as the basic formative factor of cognition, or *habitus*, which is both shaped by and shaping social and material structures. Dwelling refers to all our surroundings, including the house and the wider environment. Whether we call it Being-in-the-world, dwelling or habitus, human perception and understanding of the world is gained through experiencing many different contexts, with persons and surroundings engaged in dialectical and structuring relationships.

A variety of other research disciplines also stress the importance of surroundings on human cognition and perception. The amount of literature is huge; here two examples, one from neurobiology are presented, the other from cultural psychology.

In a now classic study, Diamond (1988) investigated the impact of the environment on the anatomy of the brain, based on experimental studies with rats. She distinguished so-called enriched and impoverished environments. Enriched environments consist of sufficiently large and diversified surroundings with a number of species; in impoverished environments a single animal is enclosed in a monotonous surrounding (*ibid*.: 53). Diamond found that enriched or impoverished environments have respectively positive and negative effects on brain growth throughout life. Thus, instead of a nature-nurture dichotomy, it seems that not only internal factors (genes), but also external factors, such as the landscape, have impact on our minds and therefore experiences.

In analyses of economic and social factors that effect perception, psychologists Witkin and Goodenough (1977) showed that not all people

are able to efficiently separate objects from their surrounding contexts. They call this 'field dependence', by which is meant the degree to which perception of objects is influenced by its surrounding context. In a book about differences in thought processes between Westerners and East Asians Nisbett (2003: 43) has taken up this idea to argue that hunter-gatherers and traditional farming peoples had contrasting field dependences, which were at the basis of different cognitive processes. It is said that farmers rely on close coordination of work with others, hence they would have been more field dependent than hunter-gatherers, who would not need an extended network of social roles and obligations. Moreover, Nisbett (*ibid.*: 34) maintains that certain landscapes favoured agriculture (fertile plains), whereas others (mountains) made hunting-gathering most attractive. To a certain degree this is all true, but, of course, such coarse generalizations are much too simplistic. Depending on the context, (different groups of) farmers and hunter-gatherers each may have had differing degrees of field dependence. The killing of a large and dangerous animal, for instance, would have been a communal effort for hunter-gatherers, and it is to be expected that patterns of socialization differed according to settlement type, e.g. aggregation vs. hunting camps. Furthermore, Nisbett's environmental determinism seems to be flawed. In fact, the thesis of a causal link between fertile plains, farming, close cooperation, emphasis on relations and holism in China is directly contradicted by the Netherlands, marked by fertile plains and farming on the one hand, and a highly individualistic society on the other.

As will be shown, the concept of dwelling is of particular interest in landscape archaeology, as it allows the archaeologist to focus on patterns of movement and experience. Of course, due to cultural differences ancient perceptions may have differed substantially from ours. However, by explicitly dealing with them the landscape and peoples' attitudes to it 'becomes alive.' This is quite different from 'objective' and abstract reconstructions of pre-defined categories, such as catchment areas, annual yields, etc. In hermeneutic terms, the researcher is actively and consciously relating the past and present, with acknowledged subjectivity, both limiting and enabling understanding. Such an approach is only worthwhile when a good understanding of the prehistoric landscape, including sites, by means of e.g. surveys and excavations is present. Fortunately, the area of the case study to be presented, the Balikh valley, has been intensively investigated over the last 20 years.

Contextuality

Contextuality refers to the different contexts in which prehistoric people and cultural and natural objects played a role. Such contexts (and their relations) can be manifold: spatial contexts, temporal contexts, social contexts,

symbolic contexts, etc. There are three main aspects to contextuality. First, similar contexts can be perceived differently by different people. The landscape is: "... differentially understood and produced by different individuals, collectives and societies, it can have no universal essence. What space is depends on who is experiencing it and how" (Tilley 1994: 11). Second, there is a dialectical relationship between object and context, with context both giving meaning to and gaining meaning from objects (Hodder 1992: 15). Third, the notion of contextuality indicates that, depending on the research context different reconstructions of similar archaeological features and phenomena are possible. Thus, there can be many alternative pasts.

■Landscape typology

I distinguish the following types of prehistoric landscapes, which in fact are different dimensions of the landscape:

(1) the *natural landscape*, consisting of geologic and natural features, such as rocks, mountains, rivers, forests, steppes, deserts, etc.;

(2) the *social landscape*, referring to landscapes that are used, experienced and interpreted by humans.

The social landscape basically consists of:

(A) the *architectural landscape*, referring to human-made elements in the landscape: buildings, villages, roads, bridges, industries, etc.;

(B) the *economic landscape*, which refers to landscapes which have been altered by humans for subsistence activities and economic production and consumption, e.g. agricultural fields, fishtraps, quarries, etc.

(C) the *symbolic landscape*, denoting non-functional and meaningful aspects of the environment, often related to the supernatural world. Examples are the dreamscapes of the Australian aboriginals, holy mountains, sacred trees, etc.;

(D) the *cognitive landscape*, or 'the landscape of the mind'. Meant is the interpretation and understanding of the environment. As has been argued, it is by Being-in-the-world and dwelling in the landscape that people become aware of themselves and their culture.

It will be noted that the symbolic and cognitive landscapes are of a wholly different order than the other landscapes. These landscapes are immaterial and 'cover' all other distinguished landscapes, with people perceiving,

assigning and/or finding meanings in many different contexts. As has been indicated, depending on many different factors, these meanings may be understood and experienced differently, i.e. they are fluid rather than static and fixed.

Obviously, this typology is a heuristic device, i.e. an oversimplification. These distinctions are not absolute; in reality the different types recognized are interlinked in many and complex ways. The social landscapes, for example, are embedded in the natural landscapes; these on their turn are connected physically and symbolically. Of course, landscapes or part thereof can change into other landscapes. Admittedly problematic with the above typology, moreover, is the division between natural and cultural landscapes. As has been debated fiercely in anthropology, the division between nature and culture is largely a Western construct. In many 'traditional' non-Western cultures all over the world the distinction is meaningless, and things are connected, rather than separated. Landscape in particular is such a holistic feature, with landforms, plants, animals, humans material culture and ancestors being interlinked in many different ways (Descola and Pálson eds. 1996; Ingold 1996a, 1996b). Obviously, prehistoric societies may have entertained such holistic notions as well. In fact, for the prehistoric Near East there seems to be good evidence supporting this view (Verhoeven 2004). Notwithstanding this, I feel that the suggested typology is useful as it structures one's frame of reference, one's *pre-understanding* (*cf.* Heidegger). It is the starting point of my analysis, at the same time an obstacle and a pre-requisite to understanding. Through a dialectic between present theory and past empirical data this understanding is changed and insight may be obtained.

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■Experiencing the landscape of the Balikh valley

After this lengthy theoretical introduction it is now time to move on to a real prehistoric landscape, in this case that of the Balikh valley in Neolithic times. The basic aim is to show that different groups of people used and perceived the landscape in different ways. This may sound obvious, but, judging by the literature, this aspect of prehistoric Near Eastern landscapes

has hardly been explored.

The Balikh valley

The Balikh valley is located in the western part of the dry steppes of the so-called Jezirah in northern Syria (Fig. 3, Pl. 1). The north-south oriented valley is ca. 100 km long and 1 to 12 km wide, with an average width of 5 km. It can be divided in three zones: (1) the Balikh river; (2) the valley proper; (3) the plateaus bordering the basin (Akkermans 1993: 15-25; Boerma 1988; Wilkinson 1996; Wirth 1971). Let us briefly look at each of these different environments.

(1) The Balikh is a perennial tributary of the Syrian Euphrates. It is mainly fed by a spring near 'Ain al-'Arous at the Syrian-Turkish border. Generally, it is a small stream only, with an average width of 6 m. In summer large parts of the lower Balikh are dry. The excessive pumping for irrigation of cottonfields has nowadays resulted in very low water tables, and the almost complete disappearance of the small spring-lake at 'Ain al-'Arous. Several sidestreams, most notably the Nahr Qaramokh in the west, contribute to the Balikh.

(2) The Balikh valley consists of two terraces. The lowest terrace, with virtually all ancient settlements, is a flat area made up of Holocene alluvial deposits (mainly loamy and silty soils). The upper Pleistocene terrace consists of gravel, gypsum and limestone.

The valley is intersected by numerous wadis, and late 19th and early 20th century visitors in the valley reported extensive swampy areas (e.g. Sachau 1883). The distribution of rainfall differs between the northern and southern part of the valley, with the border near the confluence of Balikh and Qaramokh. The upper Balikh region is suitable for dry-farming, while in the south irrigation is needed for successful agriculture.

Information about the Holocene vegetation of the valley mainly derives from excavations at archaeological sites and core samples at selected locations. It seems that there was a riverine forest marked by stands of reed, poplar, elm and ash along the river. Around the settlements there were agricultural fields, mainly with wheat and barley, but pulses and linseed have also been attested. Fifth millennium pollen samples from lake Wazgöl in the northern part of the valley indicate that in the Neolithic the valley was drier than today, marked by steppic vegetation of *Artemisia* (which can be used for grazing and fuel) and other shrubby perennials such as *Prosopis* (Bottema 1989; van Zeist 1999; van Zeist and Waterbolk-Van Rooijen 1996).

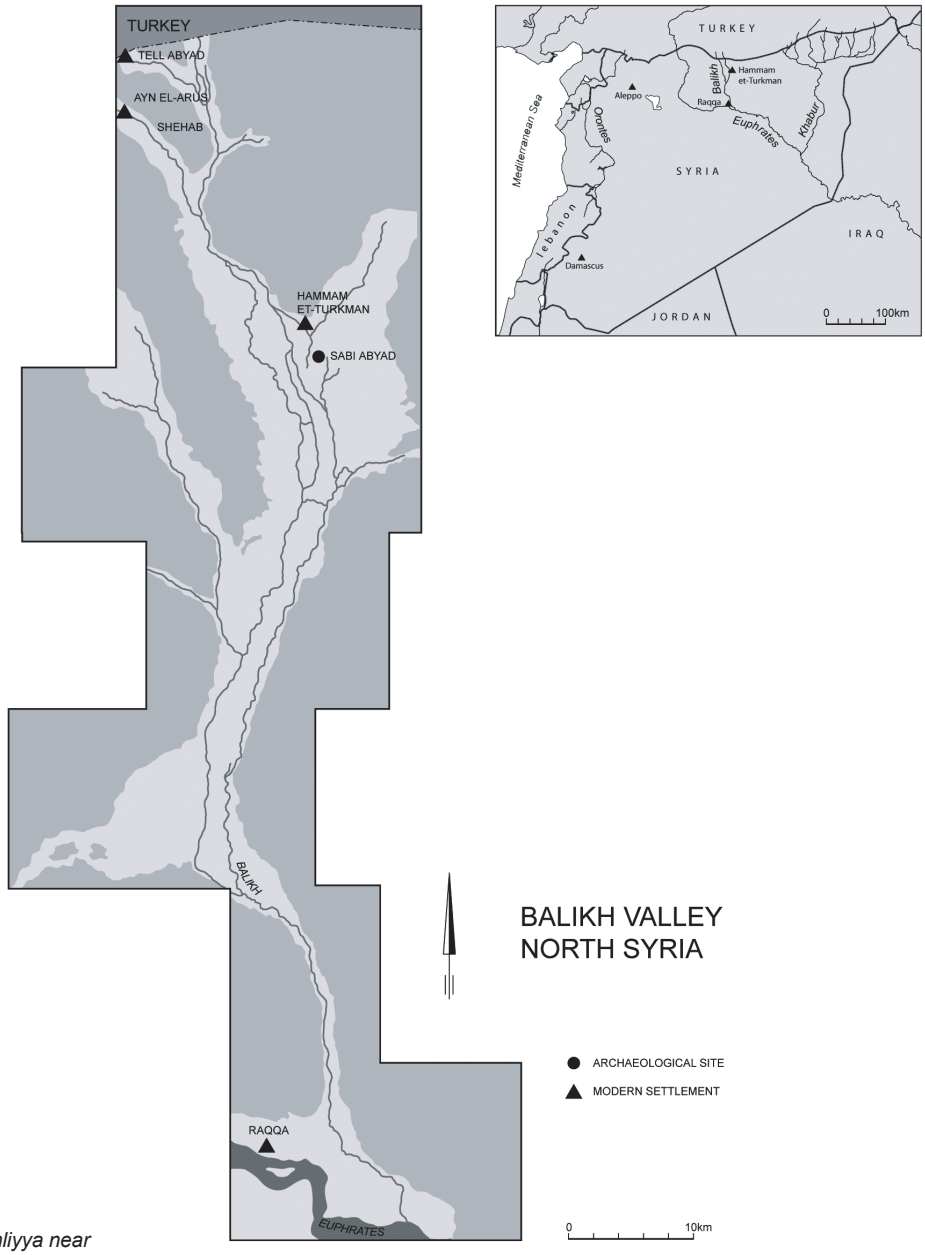


Fig. 3. *Map of the Balikh valley.*

Pl. 1. *The Balikh valley: the village of Damishliyya near Tell Hammam et-Turkman in the northern part of the basin.*

As indicated by analysis of animal bones from Sabi Abyad I (Cavallo 2000), the major domestic animals in the Late Neolithic Balikh valley were sheep and goat; pigs and cattle were less numerous. Dogs were also present. With regard to the wild species, Cavallo (1996: 503) has noted that while hunting decreased in importance, the number of hunted mammal species increases from the Early Pottery Neolithic to the 'Transitional' period. "Birds, molluscs, and tortoises were hunted and gathered here, while the exploitation of the steppe continued, with the hunting of mainly onager and gazelle" (Cavallo 1996: 503). The wild animals attested are: onager, gazelle, and probably less commonly wild cattle, deer, wild pig, hyaena, bear, fox, hare, rodents, various bird species – among which goose, duck, stork, crow – tortoise and various species of fish and molluscs (Cavallo 1996, 2000).

(3) The dry steppic plateaus to the east and west of the valley can be divided into four areas: (a) Pleistocene Euphrates deposits in the south; (b) a gypsum region in the east; (c) a limestone region in the west; and (d) the interfluve of the Balikh and Qaramokh. The shallow soils on the plateaus must have been home to dry-steppe vegetation. In deeper and slightly moister soils *Artemisia* may have been present.

Tell Sabi Abyad I

Perhaps paradoxically, the key for my interpretation of the Neolithic landscape of the Balikh valley is settlement evidence. More in particular, the ongoing excavations at Tell Sabi Abyad I provided basic insights with regard to the social landscape.

Tell Sabi Abyad I ('mound of the white boy') belongs to a cluster of four Neolithic mounds (Tell Sabi Abyad I to IV), located in the upper part of the Balikh valley, about 30 km south of the Syro-Turkish border and dating from the seventh and sixth millennia B.C. (calibrated). Locally the cluster is known as Khirbet Sabi Abyad. The Sabi Abyad tells are located at a short distance from each other in a linear pattern. This situation suggests that they lay alongside a prehistoric wadi, possibly the Nahr et-Turkman, a branch of the Balikh. Nowadays the Balikh itself flows ca. 5 km to the west of the tells.

Tell Sabi Abyad I is the largest mound of the cluster and measures about 4.5 ha at its base; its height varies between 5 and 10 m above modern field level. At present, the tell has a rather flat and coherent appearance, but in fact it consists of four small, mainly prehistoric, mounds which have merged in the course of time.
Initially, work was concentrated on the southeastern mound, now termed

operation I (Akkermans, ed. 1996), but current large-scale excavations are also carried out on the other mounds: operations II-V (Akkermans *et al.* 2006). The tell has given evidence of a series of well-preserved and stratified villages dating from the earliest to the developed Pottery Neolithic period, ca. 6700-5800 cal. BC (Early Pottery Neolithic, Pre-Halaf, Transitional [or 'Proto-Halaf', *cf.* Cruells and Nieuwenhuyse 2004] and Early Halaf). At the southeastern mound a settlement of the Transitional period, dated to ca. 6000 cal. BC, which had been largely destroyed by fire was discovered. This so-called Burnt Village was marked by circular and rectangular buildings, the latter consisting of many small rooms. Spatial analysis has indicated that the circular buildings were probably used as houses, whereas the rectangular buildings mainly served for storage of different goods (Verhoeven 1999).

Farmers and pastoralists

On the basis of the excavations of the Burnt Village, it has been argued that the population related to this settlement was not composed entirely of permanent residents, i.e. that there was a considerable mobile component. As a shorthand, these people will be referred to as pastoralists. Pastoralism is here defined as the mobile exploitation of domestic animals, mainly sheep and goat (Barth 1961; Bar-Yosef and Khazanov, eds. 1992; Hole 1978, 1980). Elsewhere, the case for this pastoralism has been well-developed (Akkermans and Duistermaat 1997; Verhoeven 1999); here just the basic arguments will be mentioned.

To begin with, analysis of the hundreds of clay sealings and tokens found in the Burnt Village (Akkermans and Duistermaat 1997) strongly suggests that these were related to storage for relatively large groups of people related to the site, and not, as commonly assumed, to elite groups. First, the existence of at least 77 stamp seal designs makes it highly unlikely that there was some sort of chief; apparently numerous persons had access to seals. Second, the sealings do not seem to have functioned in long-distance exchange networks, as indicated by analysis of the clay of the sealings, which was from the Balikh valley, possibly even from Sabi Abyad. Third, there is no evidence at all for clear status differences in the Burnt Village.

Another reason for postulating pastoralists is the fact that the rectangular storehouses apparently served for storage of goods of large numbers of people, given the many sealings. Put differently, it is highly unlikely that the rectangular storage buildings served to keep household belongings only, because the amount of storage space by far exceeds domestic purposes. In fact, the excavations have shown that there were simply not enough dwellings to house all the people storing goods.

Furthermore, analysis of sheep and goat bones indicates selective culling for secondary products, and moreover a conscious control of herds. On the basis of this it has been suggested that seasonal pastoral movements were relevant subsistence strategies at Sabi Abyad (Cavallo 2000).

Finally, there are good ethnographic parallels for interactions between pastoralists and residents in the Near East, including the existence of large communal storage buildings, such as the *agadir* in Tunesia and Morocco (Jacques-Meunié 1949; Montagne 1930).

In conclusion, it seems that there was a considerable mobile or transhumant component, which made use of the site for specific purposes at specific times, was related to the residents of the Burnt Village. According to this view, the pastoralists stored their belongings in the rectangular storehouses, while the residents took care of these goods. This arrangement need not have been static; ethnographic examples indicate that it is quite conceivable that farmers and pastoralists may have changed roles when wished or necessary (e.g. Akkermans and Duistermaat 1997; Köhler-Rollefson 1987, 1992; Rowton 1973). Let us look a little closer at the pastoralists.

Pastoralists

In a recent paper about the development of pastoralism in the central Zagros mountains of Iran, Abdi (2003) has provided a useful basic classification of pastoralism, presenting a continuum from fully sedentary to fully nomadic pastoralism.

(1) In *village-based herding* the majority of the population leads a sedentary life in the village. This mode of pastoralism is divided in 'proximate' and 'distant' forms. Proximate village-based herding herds graze in pastures and fallow fields close to the settlement in warm periods of the year, usually returning to their pens every evening. During colder periods the animals are kept and fed in pens. In distant village-based herding shepherd and herd are a few days travel away from the village.

(2) *Transhumant pastoralism* describes seasonal movement of the herds between summer pastures in the highlands and winter pastures in the lowlands, with use of campsites. This form of pastoralism is mainly used by farmers occupying specific ecological zones, especially mountains, in order to use other areas at their most productive moment.

(3) *Seminomadic pastoralism* indicates an economy primarily based on pastoralism, and marked by extensive herding and periodic change of

pastures during a large part of the year. Either the entire social group deals with both agriculture and pastoralism, or specific groups are primarily or exclusively devoted to pastoralism or agriculture.

(4) *Nomadic pastoralism* is marked by high mobility of the whole group, and an almost complete absence of agriculture. Contrary to popular belief, nomadic pastoralism is quite exceptional.

According to these definitions, the pastoralism related to Neolithic Sabi Abyad is probably best described as transhumant or seminomadic, as both village-based herding and nomadism make no sense in a storage system related to pastoralists. In the case of transhumance, the nearest mountainous area, the Taurus foothills, is located about 80 km to the north of Sabi Abyad, around Urfa in Anatolia where hills and mountains between 500 and 1000 m high can be found. Higher mountains, up to 2000 m, are located ca. 85 km further to the north (Anastasio *et al.* 2004). Considering the ethnographically documented long distances travelled in transhumant pastoralism (up to 450 km, cf. Cribb, 1991), the Anatolian hills may certainly have been visited. Closer to the tell, herds may have grazed in the Balikh valley or on the surrounding plateaus; when it was not too dry, the latter offered virtually limitless amounts of grassy and shrubby vegetation.

Dynamic communities: farmers, pastoralists and hunter-gathers

In the model presented, pastoralists were related to the relatively large occupied site Tell Sabi Abyad I. This village was marked by well-built architecture and an extensive material culture, and it was probably occupied year-round and inhabited by farmers who cultivated domestic plants and kept animals, primarily sheep and goats. Apart from such larger villages, there were many smaller sites. In fact, throughout the Neolithic period in the Balikh valley small sites predominate: "It appears that small, temporary occupations rather than large, permanent villages were the rule in the Late Neolithic, and that mobility, instead of long-term sedentism increasingly dominated life in this long period" (Akkermans and Schwartz 2003: 127). An example of such a small site is Late Halaf Khirbet esh-Shenef. This ca. 0.5 ha site consisted of one architectural level marked by a series of circular buildings (*tholoi*) which were replaced by others after short periods of use (Akkermans 1993; Akkermans and Wittmann 1993). Almost 40% of the retrieved animal bones stem from wild animals, mainly onager and gazelle. Also in the Khabur region and in Iraq most of the Late (Pottery) Neolithic sites seem to have been small (Campbell 1992; Nieuwenhuyse 2000). Moreover, the few excavated small sites, such as Umm Qseir and Boueid II, on the Khabur were marked by an extensive exploitation of wild animals too

(Hole and Johnson 1986/87; Suleiman and Nieuwenhuyse eds. 2002; Tsuneki and Miyake eds. 1998; Zeder 1995).[3]

Another Neolithic type of small site is represented by lithic scatters which may represent temporary camp sites related to hunter-gatherers. Such open-air sites have been reported from the Upper Khabur region (Nishiaki 2000: 90). The number of these sites is very low, but it should be taken into account that neither the Balikh nor the Khabur valleys and terraces have been intensively surveyed for these *small* sites. More thorough reconnaissance might reveal more of them. Moreover, these ephemeral locations may have completely disappeared due to erosion and/or human disturbances. Another problem, besides limited sample size, is that it is not possible to ascertain if the 'hunter-gatherer sites' were related to full-time hunter-gatherers or to sedentary populations who periodically went in pursuit of wild animals and plants (or both?). Related to this issue, furthermore, is the possibility that different groups with different material culture assemblages made use of the same - natural - landscape. Thus, hunter-gatherers with traditional PPNB toolkits may have been contemporaneous with Pottery Neolithic farmers and pastoralists. Notwithstanding these remarks, I believe that it is worthwhile to explore the role of hunter-gatherers in the Pottery Neolithic.

On the basis of the above settlement information and general theoretical expectations Table 1 relates sites, duration of occupation, social groups and subsistence in the Pottery Neolithic of the Balikh valley. Some remarks are in order. First, with regard to settlement permanency, obviously, there is a continuum from fully mobile to fully sedentary. The prefix 'semi' has been used to indicate that sedentary lifeways not necessarily entail permanence throughout the year. Second, although three social groups are distinguished – farmers, pastoralists and hunter-gatherers – their main subsistence strategies are not mutually exclusive. In fact, as indicated above, farmers

Table 1. *Pottery Neolithic sites in the Balikh valley: hypothetical relations between nature of occupation, social groups and subsistence.*

Site	Occupation	Social/subsistence group
large tell	(semi-) permanent	farmers
large tell	(semi-) permanent	farmers, pastoralists
small tell	(semi-) permanent	farmers
small tell	seasonal	pastoralists
camp	seasonal or shorter	pastoralists, hunter-gatherers

3. In southeastern Anatolia the recently investigated site Hakemi Use east of Diyarbakir on the Tigris is another example of a small (120 × 4 m) Pottery Neolithic (Hassuna/Samarra) site (Tekin 2005).

and pastoralists may have changed places when necessary or desirable. Furthermore, both farmers and pastoralists may have engaged in hunting and gathering (by definition, however, it is not expected that hunter-gatherers practised farming or pastoralism).

Obviously, these various social groups used the landscape in different ways. In the following the different and/or similar uses and perceptions of the landscape in and around the Balikh valley by these groups shall be explored. The discussion is organized according to the five different landscapes earlier distinguished. Hunter-gatherers have been regarded as having been fully mobile.

The natural landscape

Farmers were based in the Balikh valley, although occasionally they would have ventured further for various social or economic pursuits, including participation in rituals and feasts, exchange and obtaining raw materials. By definition, pastoralists travelled much more and further than farmers. They would have negotiated larger areas within, but also outside of the Balikh valley, travelling in the steppe and perhaps to the Taurus foothills in Anatolia. It is expected that hunter-gatherers were the most mobile of our three groups. Whereas pastoralists directed the movement of animals, hunter-gatherers were - among other things - moved by game, resulting in a deeper immersion in the natural landscape.

The architectural landscape

Farmers were obviously attached to tells, made up of architecture, including houses, storage buildings, courtyards and activity areas. Apart from architecture, they were surrounded ('entangled' cf. Hodder 2006) by an extensive material culture, used for social, economic and symbolic purposes. Outside the tell, the architectural landscape may have been represented by e.g. sheds in the field, irrigation canals, wells, roads and cemeteries. The architecture of transhumant and seminomadic pastoralists probably consisted of temporary shelters, such as tents or basic huts. Alternatively, they could have used caves and rockshelters. It can further be expected that the animals were kept together in pens or corrals. The associated material culture would represent a limited range of activities mainly associated with herding. As it is well known, hunter-gatherers are characterized by an even more limited use of material culture. Their architecture would probably have consisted of simple huts or tents erected at base camps, aggregation camps or more transient encampments, such as hunting stations. Whereas farmers and pastoralists may have changed roles, it is not expected that hunter-gatherers

lived in tell settlements.

The economic landscape

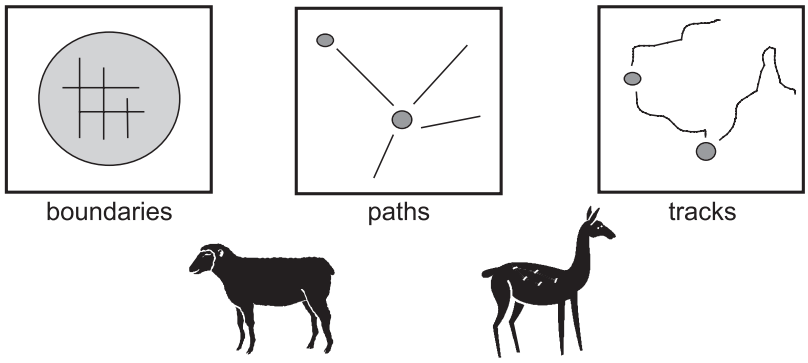
The subsistence of farmers was directly related to agricultural fields and pastures, used to grow crops and tend animals. A 5 km radius is commonly assumed to be the limit of efficient agriculture (Fairbairn 2005: 200). Perhaps there were even clearly circumscribed territories around tells. Plots of land could have been the property of individual households, or alternatively be worked and exploited communally. Especially in times of harvest, communal labour would have been advantageous, if not crucial.

As already indicated, the economic landscape might have been further marked by elements of the architectural landscape. Pastoralists used the landscape for feeding their animals, moving from pasture to pasture in or outside the Balikh valley. Hunter-gatherers most likely only minimally altered the natural landscape. Burning might have been used for encouraging the growth of valued plant species (see Smith 1995: 17 for ethnographic examples). Fishtraps would be another example of economizing the landscape.

The symbolic landscape

On theoretical grounds, one would expect that many features in the landscape had a special significance for Neolithic people, but at the moment nothing is known about such symbolic dimensions of the environment. However, there is intriguing settlement evidence with regard to symbolism and ritual.

In the Burnt Village at Tell Sabi Abyad I the remains of two adult skeletons surrounded by a series of highly stylized clay beasts, marked by protruding horns of wild sheep, most likely represent the remains of a mortuary ritual. There is convincing evidence for intentional and ritual burning of the settlement and this seems to have been related to the mortuary ritual. I have suggested that here we have evidence for an extended 'death ritual' ending, but also transforming human and material life (Verhoeven 2000). Death, fire and abandonment, then, seem to have been closely related. Some examples suggest that these relations also existed at other Neolithic sites in the Near East (Akkermams *et al.* 1983; Stordeur 2000). Thus, Sabi Abyad I may have been the focus of quite dramatic ceremonies in which death and wild animals played a central role. Obviously, the people living at the tell, the farmers, would have been present at the ritual, but it is to be expected that the associated pastoralists, and perhaps even hunter-gatherers, would



have been present as well. In fact, according to many anthropologists and archaeologists (e.g. Kuijt 2000; Rappaport 1999; Verhoeven 2002a) a crucial function of ritual would be to produce feelings of social cohesion in symbolically highly charged contexts. Although I reject the universal appliance of this explanation, it is tempting to argue that it played such a role in the context of farmers and pastoralists at Sabi Abyad I. Anyway, it is conceivable that large-scale rituals at Sabi Abyad, and other large tells, were an important part of the symbolic landscape of farmers and pastoralists.

The cognitive landscape

I would like to propose that the cognitive landscape of the three distinguished groups was based on quite different principles, due to differences in the nature of the above introduced notion of *dwelling* (Ingold 1993, and Fig. 4), especially of moving - walking - through the landscape (Ingold 2004; Snead *et al.* eds. 2009). It seems that especially animals played an important role in this regard.

Farmers were surrounded by fields, roads, canals and, on the tells, by architecture and walls. Consequently, their perceptions of the environment were largely shaped by *boundaries*. In fact, tells were the most clearly demarcated features of the landscape, bringing to mind feelings of locality, place and identity. The domestic animals of farmers, mainly sheep, goat and, to a much lesser extent, cattle and pig were most likely herded and tended near the tell. Quite literally, they were confined and bounded by the tell and its immediate surroundings.

Pastoralists, on the other hand, were constantly on the move, literally changing their views of the landscape. By moving along *paths* with the animals they would have added history to the landscape, inscribing meanings to it. In a certain way, the animals commanded the movement and perception of the pastoralist's landscape. Symbolically speaking, these animals were in an intermediate, liminal, position between domestic animals kept near tells and wild animals of the wider landscape.

Like pastoralists, *hunter-gatherers* were part of the wider landscape. But these people were even more mobile. Moreover, due to the movements of wild animals and probably a lack of clear territories, their negotiation of the landscape, their dwelling, was less structured than that of pastoralists. I have designated this by the notion of *tracks*.

From the above, it would seem that animals played a central economic, symbolic and cognitive role. Indeed, it is recalled that animals were a

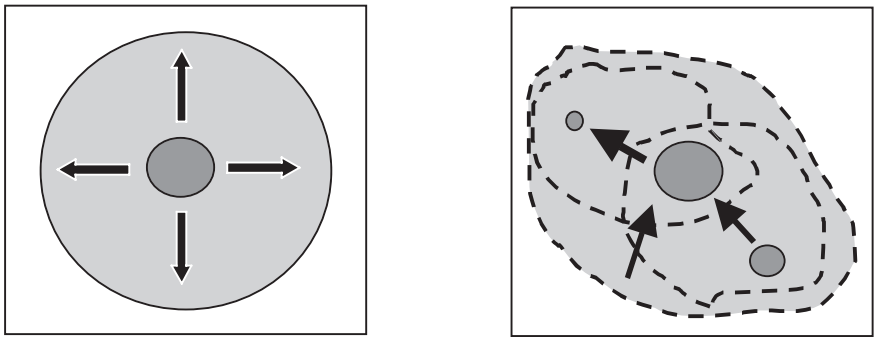
Fig. 4. *Models of three different types of dwelling of the cognitive landscape: boundaries (farmers), paths (pastoralists) and tracks (hunter-gatherers). Animals played a central role in experiencing the landscape. Circles depict sites, lines restrictions (boundaries) and opportunities (paths, tracks) for movement.*

prominent part of a large and dramatic death ritual executed in the Burnt Village. As it is well known, an important general function of rituals is the expression and imprinting of basic and crucial cultural ideas and values about life, death and the cosmos (e.g. Geertz 1973; Rappaport 1999; Verhoeven 2002a). The fact that apparently mythical beasts were foregrounded in a major ritual, which was possibly attended by farmers, pastoralists and hunter-gatherers, underlines the social importance of animals in this Neolithic context. As Lévi-Strauss (1962) has argued, animals were good to think with. Indeed, in many other Neolithic ritual contexts animals, and as far as we know not plants, played a crucial symbolic role. Most often these are wild and dangerous animals, such as bulls, snakes and carnivores (e.g. Helmer *et al.* 2004; Peters and Schmidt 2004). On a psychological level, this preferential role of wild animals is understandable. Unlike plants, animals share their basic biology with us. In the case of mammals we are even closely related. At the same time, humans and animals are, of course, very different. Thus, animals provide excellent metaphors for thinking about the 'cultural' and 'natural' world, especially so in societies which interacted closely with the environment.

■The role of tells

As already indicated, in discussions of the social and symbolic dimensions of tells as human-made occupation mounds the obvious and associated notions of property, territory, identity and ancestry are put to the fore. Most often, these concepts pertain to the inhabitants of the tells, i.e. farmers. In addition to this, Akkermans and Schwartz (2003: 130-131) have pointed out that: "... large and permanent villages in each region must have been pre-eminent landmarks in a landscape otherwise sparsely modified, existing since time immemorial in the minds of the population and providing food, shelter, security, storage, and other facilities to sedentarists and pastoralists alike. These were centers of production, storage, exchange, and distribution, and the scenes of all kinds of social engagements such as courting, marriages, festivities, ceremonies and political decisions."

It is possible, then, that many Pottery Neolithic tells were not settlements in the classic sense of the term. Thus, they were not necessarily occupied every day of the year, and some may have fulfilled a storage and distributive, rather than a living function. It may be that many tells foremost acted as central places (or nodes: Haggett *et al.* 1977: 6-10; Roberts 1996: 125), rather than as villages as we know them today. So, instead of looking outward from the tell to the landscape, it might be instructive to take the natural and social landscape as the point of departure. Put differently, as illustrated in Fig. 5, an alternative to a *concentric model*, with the settlement as the primary feature,



may be a *surface model*, indicating spheres of influence and flows of people, goods and ideas (*ibid.*).

The role of the tell will have changed according to social context, i.e. which group used and perceived the tell. Moreover, tells would have had different functions, meanings and connotations. Thus, for instance, economically some tells, such as Sabi Abyad I, may have been related to both farmers and pastoralists, whereas others were the bases of farmers only. Or only specific tells might have been the focus of large-scale rituals. There is no need to enumerate all various possibilities. It suffices to acknowledge that tells were probably not static, monolithic units, but represented various meanings to various groups at different times. Concepts such as central places, territory, identity and ancestry need to be contextualized, and do not have the same functions and meanings at all times and for all people. This may seem obvious, but in many analyses such multi-dimensionality is not accounted for.

■A holistic landscape

In terms of the hermeneutic cycle, on a scale from etic to emic (or theory and data), the landscape typology was at the etic side, more informed by theory than data, whereas two of the social groups distinguished (farmers and pastoralists) were towards the emic side, having been proposed on the basis of primary data. The hunter-gatherers, on the other hand, are largely a theoretical construct. Another element of the cycle has been the construction of many divisions, the most important of which pertaining to different landscapes and social groups. As a conclusion of this paper, I wish to bring together these different elements.

As indicated in the theoretical introduction, and as was to be expected, theory has been both a barrier and pre-requisite to my understanding. The various divisions made have been useful heuristic devices, but in each case it has been difficult to reach understanding by sticking to boundaries. In fact, a good case can (now) be made for a more holistic landscape in which different social groups (i.e. farmers, pastoralists and hunter-gatherers), animals, plants, material culture, etc. were related, rather than separated. Indeed, as has been shown, at some Pottery Neolithic tells sedentary farming and pastoralism weere probably combined. Many ethnographic examples also document the fluid, rather than fixed, boundaries between farming and pastoralism (Cribb 1991; Khazanov 1994; Köhler-Rollefson 1992; Rowton 1973; and see Akkermans and Schwartz 2003: 130). With regard to the Early (Pre-Pottery) Neolithic recent detailed analysis of the process of domestication in the Levant also suggests relations, rather than divisions, between social groups and many other entities, including 'nature' and 'culture' (Verhoeven 2004).

Fig. 5. *Hypothetical alternative models of the role of tells. Dark circles represents sites; light grey areas the landscape around sites; arrows the direction of interactions; dotted lines the different and overlapping spheres of socio-economic influence.*

Due to the movements and interactions both social groups and their cognitive concepts – such as boundaries, paths and tracks – interacted in different contexts. Thus, interdependencies would have been formed between different social groups and their cognitive orientations. In fact, social psychologist Kitayama and colleagues (2003, cited in Nisbett 2003: 227) found evidence that cognitive processes can be modified even after limited immersions in other cultures. Thus, boundaries, paths and tracks need not have been mutually exclusive, but may have been part of the cognition of farmers, pastoralists and hunter-gatherers. This becomes understandable if we add temporal context to the spatial contexts, something which I have ignored up to this point. Simply, the longer time is spent in a certain context, say a farming village or a pastoralist trek, the greater the influence of this context, and the more profound the cognitive effect. We may recall here the neurobiological research of Diamond (1988), who found clear environmental effects on brain development, which can occur throughout life. However, perhaps the most basic and lasting impressions are formed in childhood, when the world is in many ways an enchanted place (Bourdieu 1977; Piaget 1973). Put differently, the landscape is a crucial element of culture, and as Bloomer (1976) and Rochat (2001) have made clear, through the complex interrelations between the self, objects and other people, children acquire language, perceptions and habits appropriate to the culture in which they are brought up.

Notwithstanding the suggested cognitive temporality and flexibility, I would argue that the particular concepts distinguished acted as basic mental templates. It would be unlikely that people had no clear identity, that they were a sort of cultural, social and cognitive shape-shifters. Rather, Neolithic classifications may have been less strict than those of the current Western world; fluid, rather than atomistic. As is the case for ourselves, however, dwelling through, using and experiencing the landscape gave Neolithic people a place in the world.

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CHAPTER 11

Recent progress in the Neolithic investigations of the Anatolian Tigris Valley

Yutaka Miyake

■Introduction

Thanks to the pioneering explorations at Tell Kashkashok II (Matsutani ed. 1991) and the subsequent investigations at Tell Seker al-Ahaimar (Nishiaki 2001), our understanding of the Neolithic period in the Khabur Valley has greatly improved. Now it has become possible to deal with the Neolithic culture in this area compared to the surrounding regions, such as the Balikh Valley to the west, the Sinjar Plain to the east and the Euphrates Valley to the south. Unfortunately, however, there has not been sufficient evidence for the region north of the Khabur Basin until recently.

The sources of the Khabur River and its tributaries originate in the mountainous region known as the Mardin Mountain in southeast Anatolia, which rises between the Khabur Basin and the Tigris Valley. This mountainous region and the Anatolian Tigris Valley have actually seen little or no research investigations for a considerable period of time, not only including the Neolithic period but also for the rest of the prehistoric sequence as well.

In actuality, the first investigation dates back to the middle of the 19th Century,[1] when two Neo-Assyrian stelae were found at *Kurkh* (modern Üçtepe) by an English traveller (Taylor 1865), but it was not until 1988 that the first scientific excavations were carried out in this region; it was again at Üçtepe (Sevin 1990). Besides these activities, only two surface surveys were known; one was conducted by K. Kökten in 1946 around Bismil (Kökten 1947) and the other one was made within the framework of the Joint Prehistoric Project by Istanbul University and the University of Chicago in the early 1960's (Benedict 1980).

During the late 1980's, however, with the planning of the construction of a series of large-scale dams on the Tigris (the Ilısu and Cizre Dams) as well as on the Euphrates (the Birecik and Carchemish Dams), rescue activities were conducted in these future reservoir areas. As an initial endeavour, comprehensive surface surveys have been executed under the auspices of the Tigris-Euphrates Archaeological Reconnaissance Project (Algaze 1989; Algaze *et al.* 1991, 1994), resulting in the discovery of 135 sites in the Batman-Tigris confluence area alone. Although part of a separate project, another surface survey in the Batman Dam reservoir (Rosenberg and Togul 1991) was carried out approximately 50 km north of the modern city of Batman, and led to the discovery and then excavation of the site of Hallan Çemi (Rosenberg 1999).

As the construction plans for the dams gained practicality, a full-scale rescue

1. *For the comprehensive review of the previous research in southeast Anatolia, see Günay and Whallon 1980.*

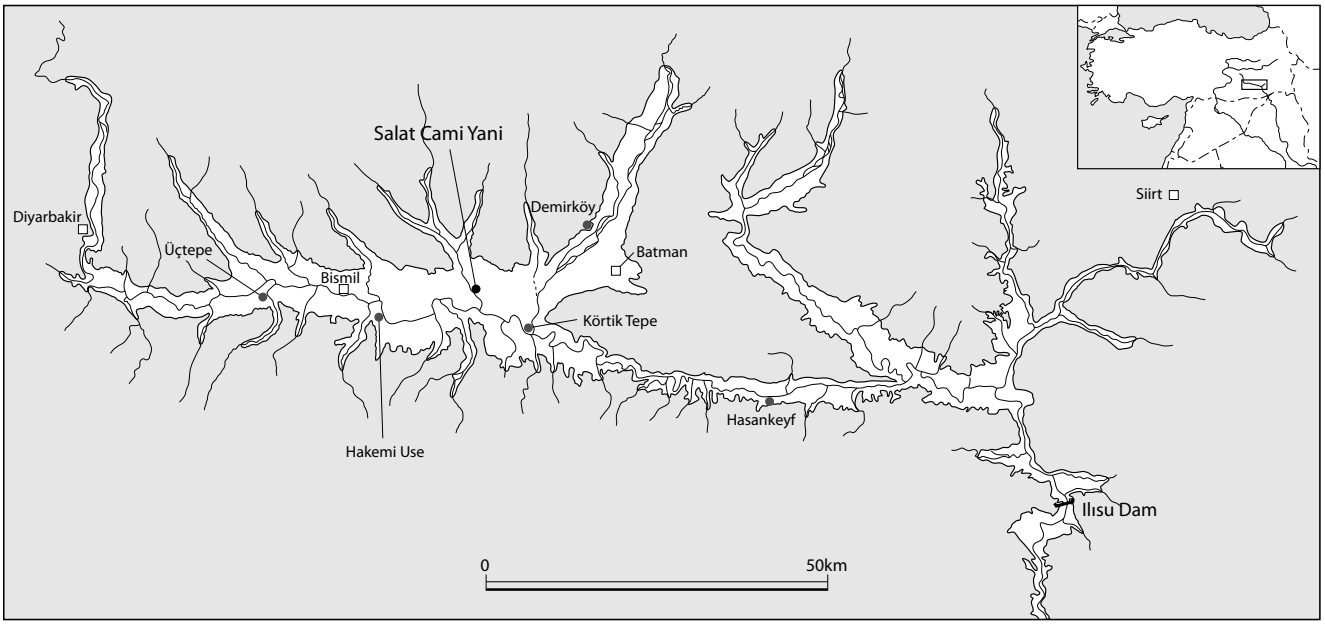


Fig. 1. *Map showing the location of Salat Cami Yanı and related sites in the Anatolian Tigris Valley.*

project was launched by TAÇDAM (Centre for Research and Assessment of the Historic Environment) of the Middle East Technical University at Ankara, following the previous Keban and Lower Euphrates Projects. Since 1998, within the framework of the TAÇDAM Project, a number of archaeological investigations have been actively progressing (Tuna and Öztürk eds. 1999; Tuna *et al.* eds. 2001, 2004; Tuna and Velibeyoğlu 2002). In the Carchemish Dam reservoir on the Euphrates, two Neolithic sites have been excavated so far. Both Akarçay Tepe and Mezraa Teleilat provided well stratified sequences from the PPNB to the Pottery Neolithic periods (Arimura *et al.* 2000; Karul *et al.* 2002, 2004).

In recent years, with the completion of the Carchemish Dam, the main rescue activities are gradually shifting to the Ilısu Dam reservoir on the Tigris. So far, 14 archaeological sites have been excavated, including four Neolithic settlements: Demirköy Höyük (Rosenberg and Peasnall 1998), Körtik Tepe (Özkaya *et al.* 2002), Hakemi Use and Salat Cami Yanı. The former two are Pre-Pottery Neolithic sites, and the latter two sites belong to the Pottery Neolithic period. Now, new evidence from these sites has provided us with a general picture of the Neolithic period in the Anatolian Tigris Valley, even though it is not yet a fully satisfactory one.

■New evidence from Salat Cami Yanı

The site of Salat Cami Yanı is situated about 20 km east of the modern city of Bismil in Diyarbakır province and is located on the left bank of the Salat River, about 3 km upstream from its confluence with the Tigris (Fig. 1). This site was first discovered in 1989 during the course of the Tigris-Euphrates Archaeological Reconnaissance Project (Algaze *et al.* 1991).[2] Late Neolithic, Early Bronze Age, and Early Islamic materials were noted.

In 2003, within the framework of the TAÇDAM Project, detailed surface surveys were carried out in order to assess the site potential properly and to record the present status of the archaeological resources (Miyake 2005a, 2005b). The topographic map drawn in the early 1970's demonstrates that Salat Cami Yanı was originally a low and oval shaped mound (Miyake 2005b:

2. At first, this site was referred to as Salat Cami Tepe (Algaze et al. *1991: Fig. 2b, no. 55). But afterwards the General Directorate for Cultural Heritage and Museums in Turkey officially decided to register it using the name Salat Cami Yanı.*

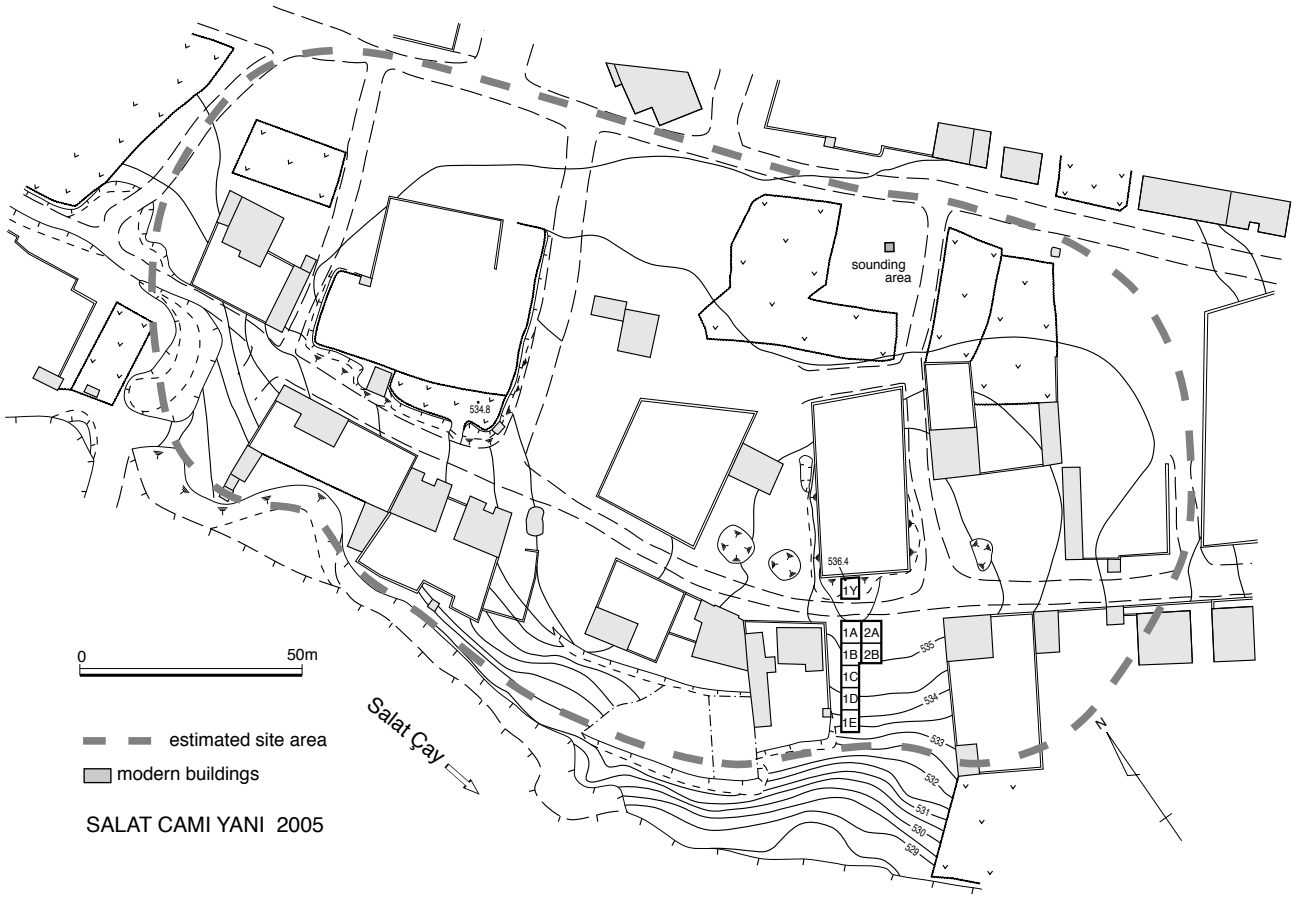


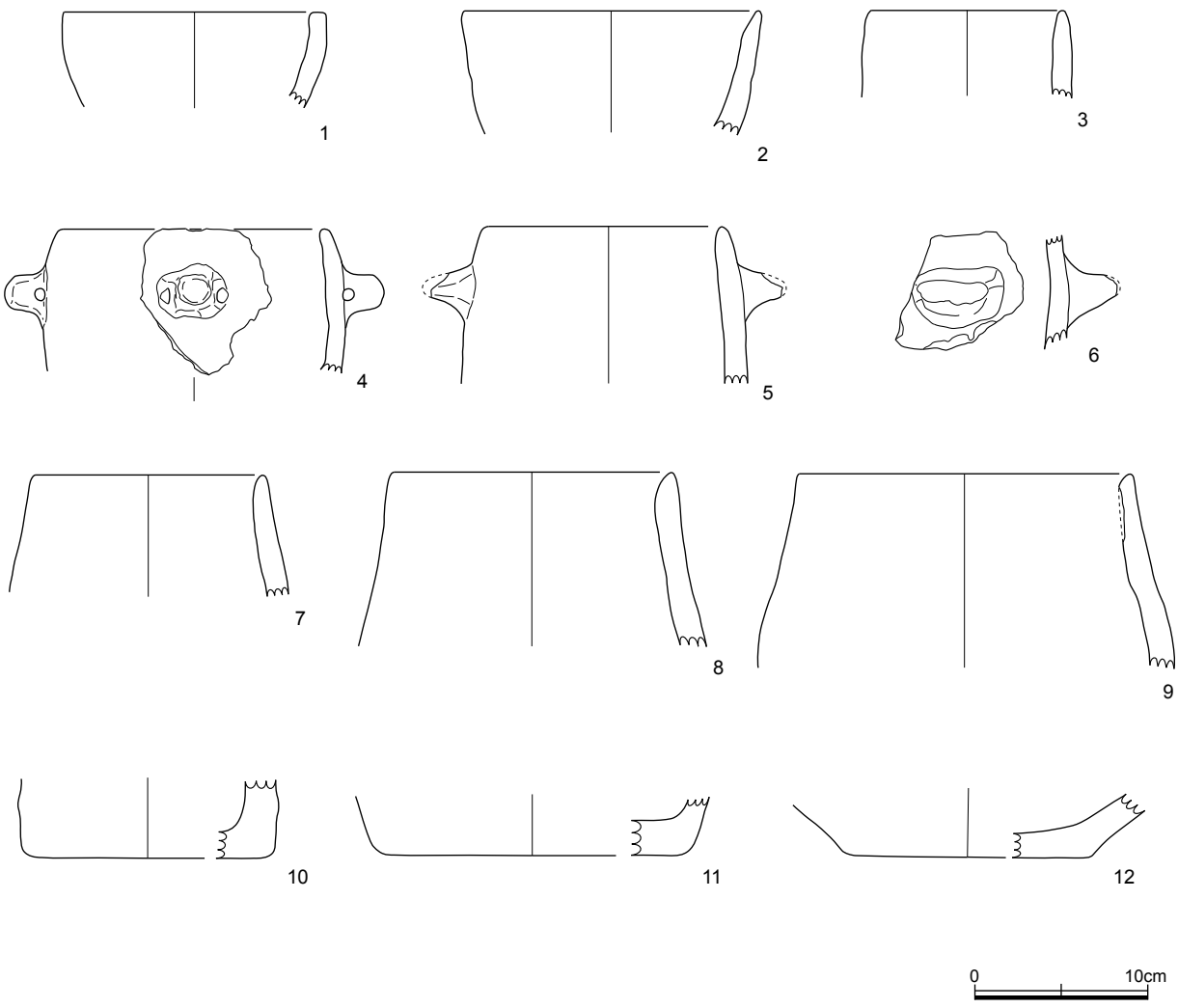
Fig. 2). However, when we visited the site in 2003, the extent of the nearby village had expanded towards the riverbank, and consequently this Neolithic settlement was completely included within the modern village. And in the end, the mound itself had been almost thoroughly leveled (Fig. 2). Fortunately, however, the surface surveys proved that the Neolithic deposits (that are at least 3.5 m thick) still remain intact, while of course, the upper layers have been seriously damaged.

Following the surface surveys, the joint Turkish–Japanese archaeological mission began to excavate at Salat Cami Yanı, and two season's work in 2004 and 2005 have been completed so far (Miyake 2006, 2007). The Neolithic deposits directly beneath the surface soil have been exposed, while a number of large storage pits dating to the Iron Age and the Islamic period have also been found. In total, 11 Pottery Neolithic layers are recognized above the virgin soil and can be grouped into at least three phases mainly based on preliminary studies of the pottery assemblages. We could not acquire any evidence for the Pre-Pottery Neolithic occupation, at least in the area of the site that was investigated. Therefore, it seems likely that the initial occupation of Salat Cami Yanı occurred from the Pottery Neolithic period onwards.

Phase 1

Phase 1, the earliest occupation phase at Salat Cami Yanı, was witnessed in Squares 1D and 1E which are set on the gentle slope facing the Salat River

***Fig. 2**. Topographical plan and excavated area of Salat Cami Yanı.*



(Fig. 2). The lower five layers on the virgin soil can be assigned to this phase. No substantial architecture was found, however, a series of stone pavements were detected at different levels. It seems likely that this sector functioned as an open space or plaza throughout this phase.

The pottery of Phase 1 has fairly distinctive features from those of the upper two phases. They consist exclusively of a considerably large amount of coarse mineral inclusions, that, as a result, add weight to the pots. There are some examples that also include fine vegetal temper, but they are restricted in number. As for the surface colours, both dark and light tones are observed. Usually the surfaces are well burnished.

Unfortunately almost all potsherds were obtained as small fragments, so the vessel shapes cannot be fully detected. But, it can be suggested, at least, that they are rather simple, such as hemispherical bowls (Fig. 3: 1, 2) and deep jars with slightly incurving rims (Fig. 3: 3-5, 7-9). In general, the bases are relatively wide and flat (Fig. 3: 10-12). Some rim and base fragments reveal that there are relatively large sized vessels as well, exceeding 20 cm in diameter. Ledge handles attached below the rims are conspicuous (Fig. 3: 5, 6). Another kind of handle, such as pierced knob handles (Fig. 3: 4), are also known, but rather exceptional. Decorated pieces are totally absent. These ceramics described here correspond well to the earliest pottery groups recently attested in the Middle Euphrates and the Khabur Basin, as will be discussed below.

***Fig. 3**. Salat Cami Yanı Phase 1 pottery.*

Phase 2

The layers of Phase 2 have been the most extensively investigated. The cultural deposits of this phase were uncovered throughout the entire excavated area. Rectangular buildings made of *pisé*, oval shaped hearths and subterranean ovens have been detected. The *pisé* buildings were built without stone foundations, and some are divided into small rooms by partition walls. In the open space outside of these architectural features, hearths and ovens are located. The floors of the hearths, which are surrounded by low clay walls with a void on the short side, are coated with mud plaster, and hardened as a consequence of firing. Most of them have stone pavements beneath the floors, probably for the sake of thermal retention.

In Phase 2 the aspects of the pottery had changed dramatically. The mineral tempered and burnished ware, that derives from Phase 1, occurs only sporadically, especially in the lower layers. The new ware group, which contains a large amount of plant inclusions together with grits, constitutes the great majority of the pottery assemblage. The vessel walls are relatively thick, and dark coloured cores are clearly visible. The surface colours are generally a light tone; ranging from reddish brown to buff. The surfaces are usually finished by smoothing. Such general traits of the fabric, surface treatment and surface colour, may remind us of the "Proto-Hassuna" pottery in the Jezirah.

However, the vessel shapes and decorations are obviously different. The vessel shapes are generally simple; hemispherical bowls (Fig. 4: 2-5) and jars with incurving rims (Fig. 4: 6-12) are common. Some rim and base fragments indicate that there are both oval and square shaped vessels. Jars with distinct necks and vessels with sharp carination, which are known among the "Proto-Hassuna" pottery, are absent. Ledge handles continue to be seen in this phase, and two types are known; one possesses horizontally elongated handles attached below the rims (Fig. 4: 7, 8, 13, 14), the other one has crescent shaped handles attached on the rims (Fig. 4: 15, 16). Horizontally pierced handles are also found (Fig. 4: 9) but in highly restricted numbers.

Decorated sherds were not recovered at all from the excavations. The absence of painted pottery, applied decoration and husking tray, that are all essential components of "Proto-Hassuna" pottery, suggest that Salat Cami Yanı Phase 2 precedes the "Proto-Hassuna" phase, as well as their simple vessel shapes.

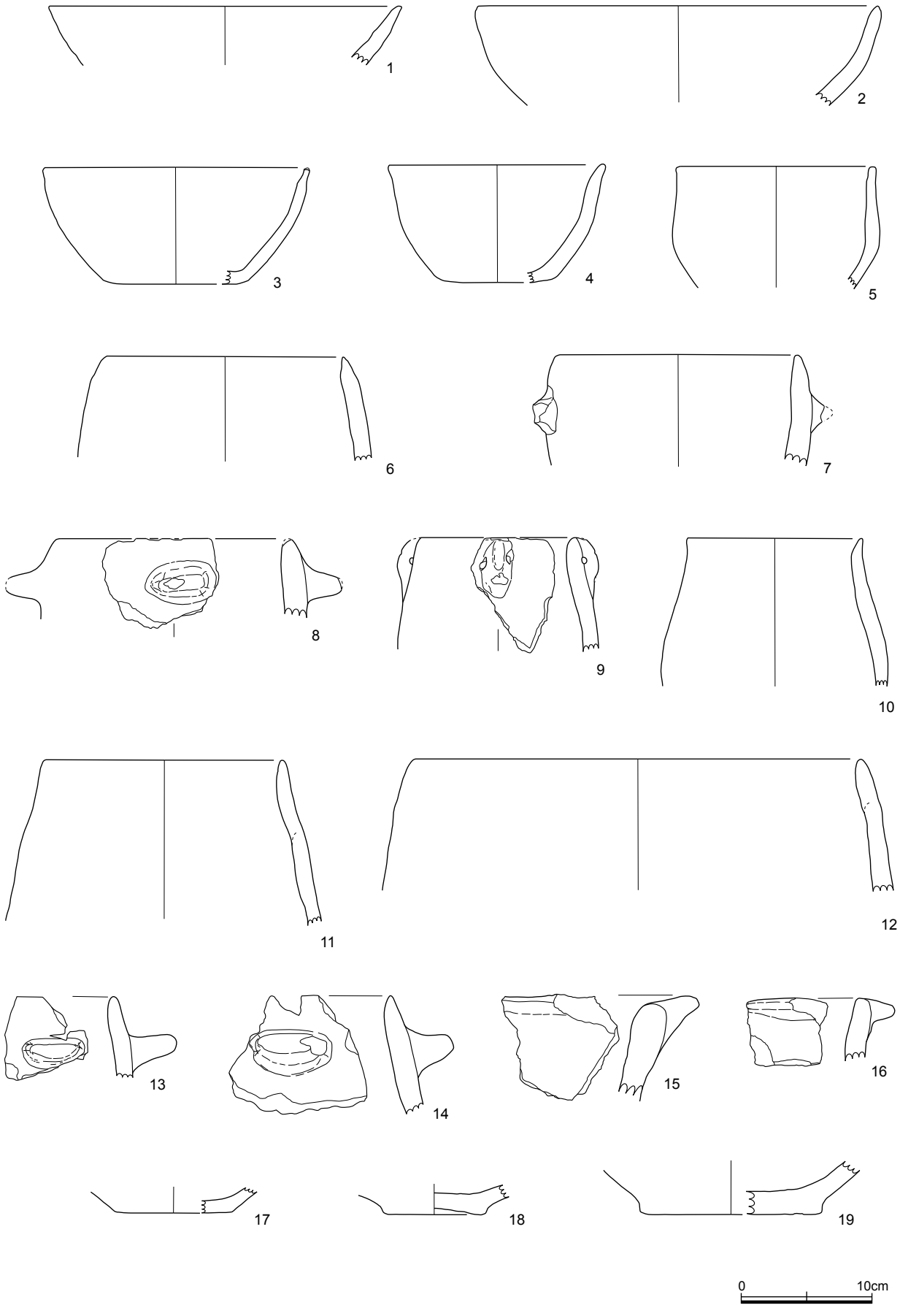


***Fig. 4**. Salat Cami Yanı Phase 2 pottery.*

Phase 3

The layers of Phase 3 were exclusively uncovered in the Square 1Y, that includes the highest point of the site in its present state (Fig. 2). Unfortunately, in the course of the serious destruction of the site, it seems quite likely that the greater part of the deposits of Phase 3 had already been removed. Mainly due to insufficient exposure, no structure has been detected so far.

Basically the Phase 3 pottery is in the tradition of the previous phase. Monochrome ware, that contains a large amount of vegetal temper, continues to be the most predominant group. However, some significant changes can be observed.

First of all, the new vessel shapes come into existence with relatively complex profiles, such as carinated bowls (Fig. 5: 6), ogee form pots (Fig. 5: 10, 11) and jars with distinctive necks (Fig. 5: 7-9). The presence of husking trays (Fig. 5: 16, 17) should also be mentioned. Secondly, decorated pieces appear among this ware group. Simple knob-like applied decoration (Fig. 5: 5, 12) is prevailing, and it could be the rudiment of a ledge handle, that is no longer seen in this phase. Among this kind of decoration, there are also a few examples that depict a human figure (Fig. 5: 14) and a snake-like wavy line (Fig. 5: 15).

In addition to this vegetal tempered coarse ware, several fine ware groups, such as painted pottery, dark coloured burnished ware and red washed ware, join the pottery assemblage. Only three small fragments of painted pottery (Fig. 6: 1-3) were acquired. They contain fine mineral inclusions exclusively, and the vessel walls are generally thin (ca. 5 mm). The surfaces are slightly burnished or carefully smoothed, with matt red paintings on buff. Their motives consist of geometric designs, such as chevrons (Fig. 6: 2) and vertical zigzag lines (Fig. 6: 3).

Dark coloured burnished ware (Fig. 6: 4-7) also include fine mineral particles exclusively. They are generally well fired and carefully burnished on both surfaces. Some fragments strongly remind us of the Dark-faced Burnished Ware (DFBW hereafter) in the Levant. Red washed ware (Fig. 6: 8-11) contains fine vegetal temper together with fine mineral inclusions. The vessel walls are generally thin, and the washed surfaces are slightly lustrous. There are some vessels with sharp carinations among both wares (Fig. 6: 6 and 10). It can be concluded that the pottery assemblage of Phase 3 corresponds well to that of the "Proto-Hassuna" phase in general.

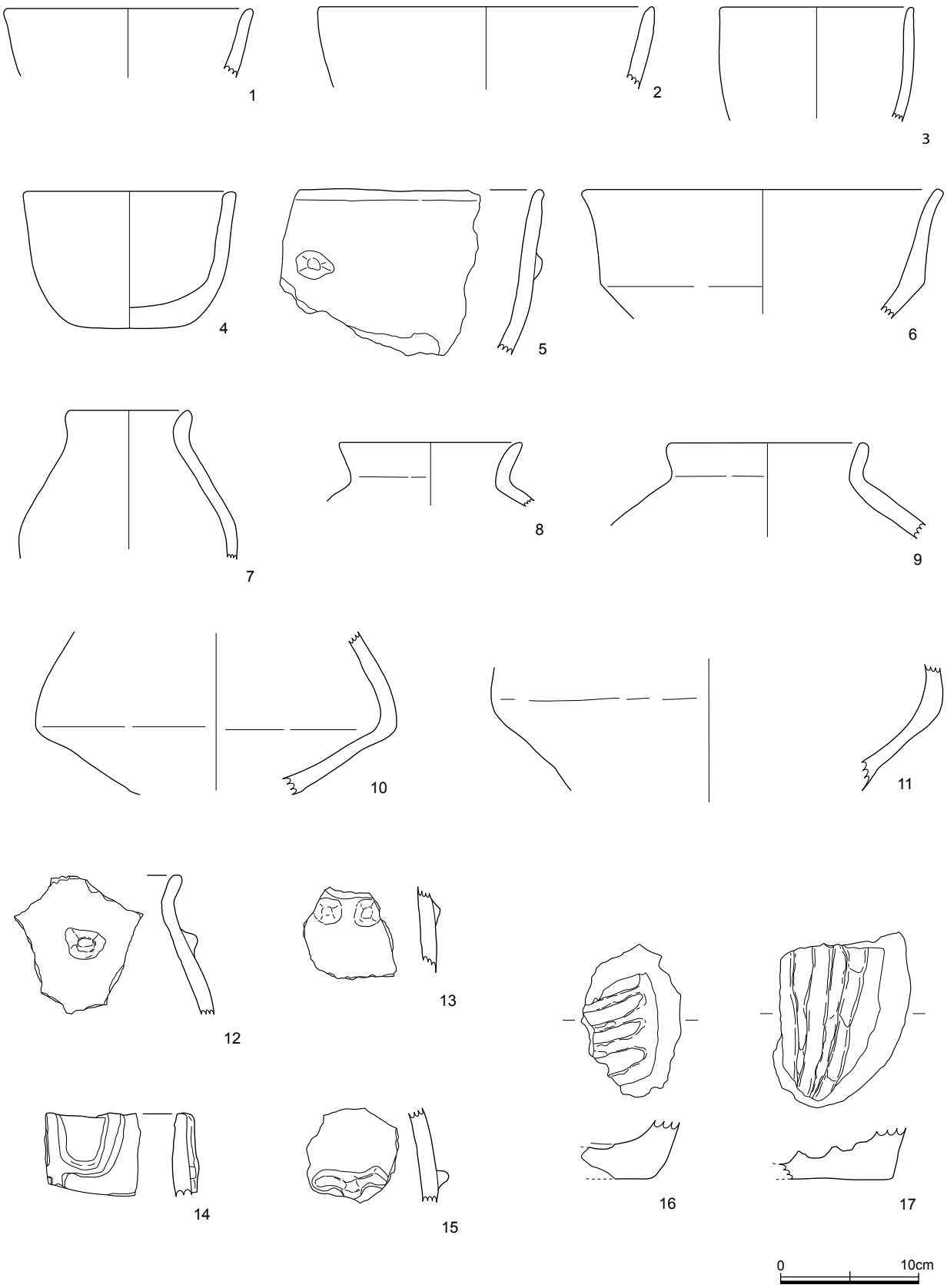


***Fig. 5**. Salat Cami Yanı Phase 3 pottery.*

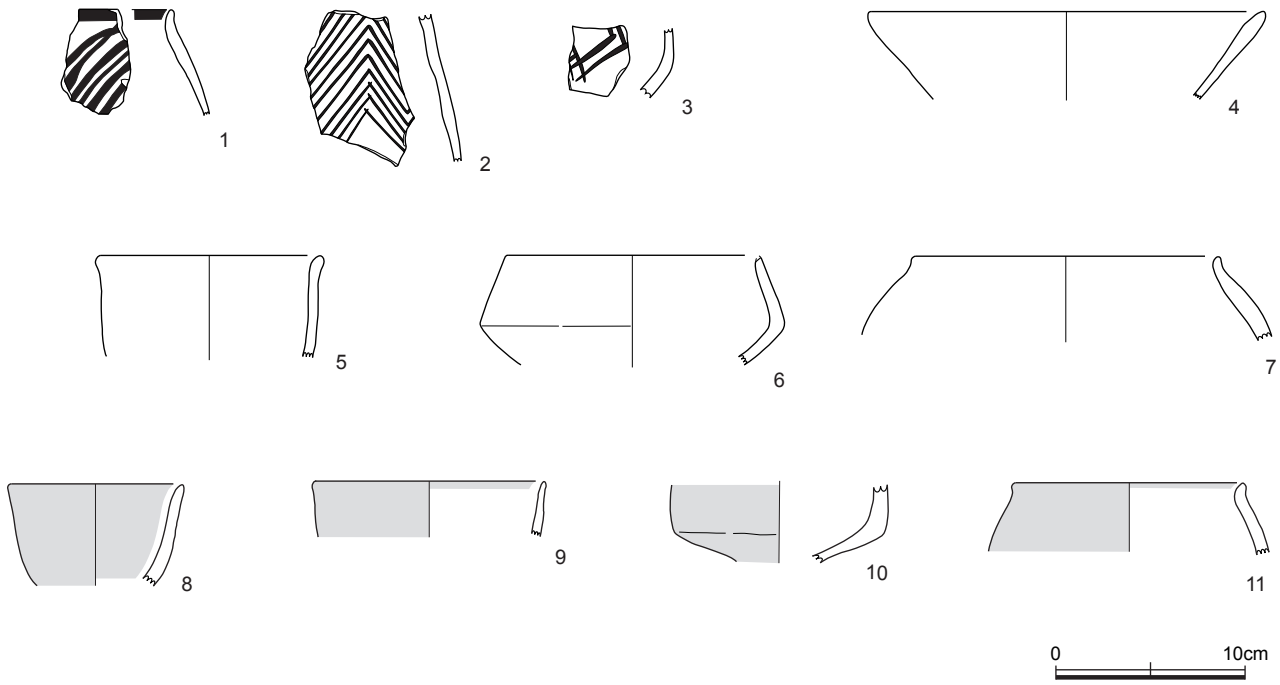


Fig. 6

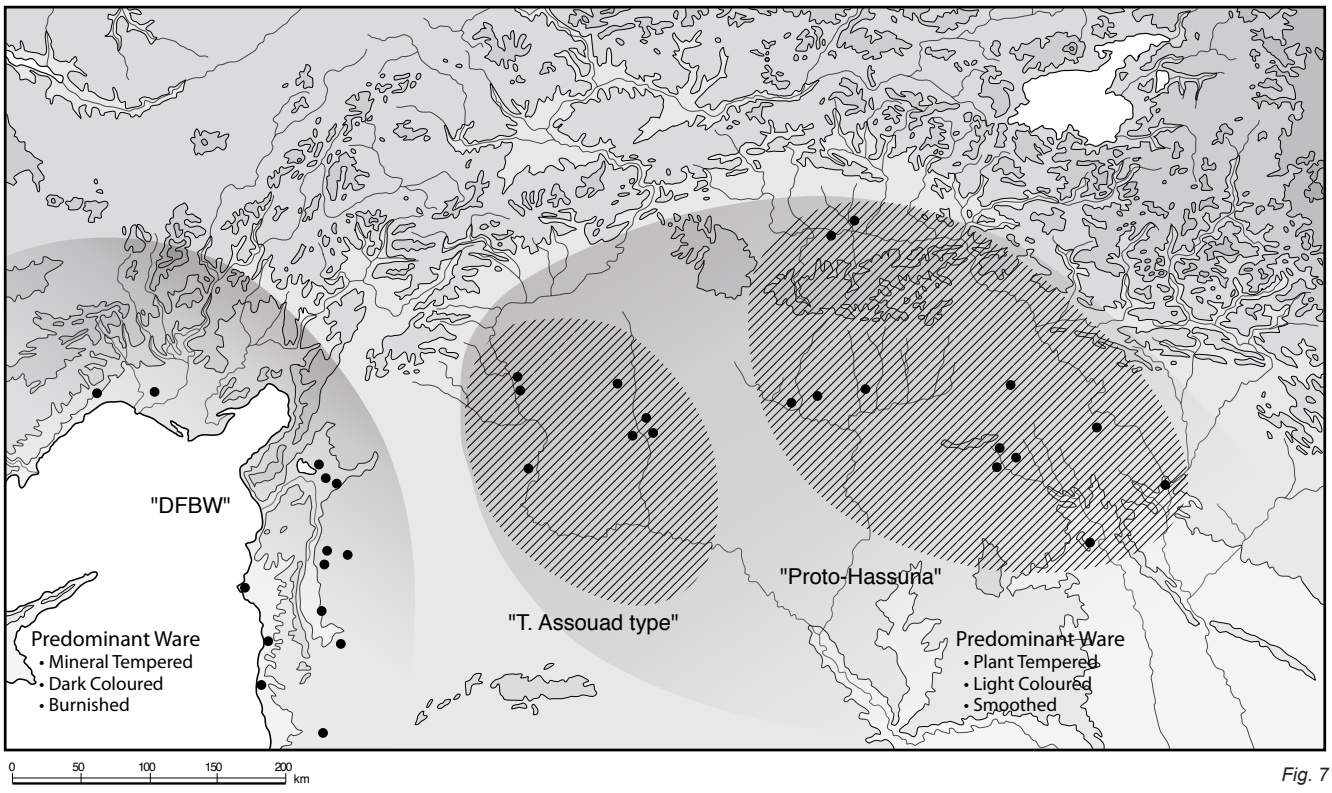


Fig. 7

***Fig. 6**. Salat Cami Yanı Phase 3 pottery.*
1-3: painted pottery; 4-7: dark coloured burnished ware; 8-11: red washed ware.
***Fig. 7**. "East and West" in the Pottery Neolithic period.*

■Pottery Neolithic sequence in the Tigris Valley and its comparison

As described above, the recent excavations at Salat Cami Yanı provide a relatively well stratified Pottery Neolithic sequence, especially for the earlier part. Additionally, Hakemi Use, the other Pottery Neolithic site in the Ilısu Dam reservoir, primarily covers the following phases. Therefore, combining the results from these sites gives us a general picture of the Pottery Neolithic sequence in the Anatolian Tigris Valley. One might expect that this evidence will afford new insights into the Pottery Neolithic culture that have been discussed so far, and that have virtually excluded southeast Anatolia.

Initial phase of the Pottery Neolithic

Within the last decade our perception on the emergence of pottery, especially in the region from the northern Levant to northern Mesopotamia, has changed dramatically (Miyake 2005b: 5-6). Until the beginning of the 1990's, Amuq Phase A in the northern Levant, Tell Assouad and Tell Damishliyya in the Balikh Valley, and "Proto-Hassuna" in the Khabur Basin and northern Iraq were thought to represent the initial stage of the Pottery Neolithic period in each region (Schwartz and Weiss 1992: 226-228; Porada *et al.* 1992: 80-81).

However, a series of new discoveries in recent years revealed that the origins of pottery manufacturing ascended even earlier. In the beginning in the early 1990's, the Pottery Neolithic layers preceding the Amuq Phase A, and characterized by the dominance of *Kerkh Ware*, were identified at Tell el-Kerkh 2 (Tsuneki and Miyake 1996; Miyake 2003). Following this at Akarçay Tepe in the Carchemish Dam reservoir, ceramics clearly antedating "Tell Assouad type pottery" were detected (Arimura *et al.* 2000). Similar materials also occurred at Mezraa Teleilat and Tell Halula in the Middle Euphrates (Karul *et al.* 2002; Faura and Le Mière 1999). Most recently, in the Khabur Basin, Seker al-Aheimar yielded a pottery assemblage prior to the "Proto-Hassuna" phase (Nishiaki 2001).

Interestingly enough, these newly attested earliest ceramics possess fairly common attributes, especially in the region from the Middle Euphrates to the Khabur Basin. They contain such a large amount of coarse mineral inclusions, to the exclusion of any other material, that one can easily realize their unusual weightiness. The surfaces are carefully burnished, and the vessel shapes are rather simple. As far as we know, ledge handles are commonly seen at Akarçay Tepe. The Phase 1 pottery of Salat Cami Yanı shows close resemblance to those earliest pottery groups, and accordingly

can be dated to the very beginning of the Pottery Neolithic period.

The *Kerkh Ware* in the northern Levant, probably the predecessor of DFBW, also has similar properties with those materials in general, while the mineral inclusions are not coarse but considerably fine (Miyake 2003). It might be possible to consider such difference as a sign of regional variation.

An important consequence that has to come to light centres on the earliest pottery in the region from the Middle Euphrates to the Khabur Basin that, contrary to earlier perceptions, is not made with vegetal tempered coarse ware but mineral tempered burnished ware. In addition, it has now become clear that the Anatolian Tigris Valley also shares the same material culture. Furthermore, it seems less probable that still earlier and very primitive pottery will be found in the future, as the stratigraphic context clearly indicates. In contrast to the former "earliest" pottery, all of these newly attested materials were found directly on the top of the late PPNB layers, except for Salat Cami Yanı. Henceforth, the arguments regarding the beginning of pottery production need to be revised based on these materials.

Second phase of the Pottery Neolithic

In the Anatolian Tigris Valley, the next phase of the Pottery Neolithic is represented by Phase 2 at Salat Cami Yanı, and might precede the "Proto-Hassuna" phase. In fact, based on the materials from Ginnig in northern Iraq, it has already been maintained that there was a monochrome pottery phase prior to the "Proto-Hassuna", mostly consisting of vegetal tempered coarse ware (Campbell and Baird 1990: 72). The absence of husking trays, painted pottery and applied decorations at Ginnig correspond well with Salat Cami Yanı Phase 2, while ledge handles also seem to be absent at the former site.

The pottery assemblage, mainly consisting of vegetal tempered coarse ware, is also known in the Middle Euphrates and the Balikh Valleys. In this region highly homogeneous ceramics are attested at Tell Assouad, Tell Damishliyya, Akarçay Tepe (Phase II), Mezraa Telailat and Gürcütepe II (Beile-Bohn *et al.* 1998), which can be grouped under the designation "Tell Assouad type" pottery. The traits of the fabrics, surface treatments and vessel shapes bear general resemblance to the Phase 2 pottery of Salat Cami Yanı, while some elements such as the horizontally applied bands below the rims and loop handles are characteristic of this group. It is quite likely that this group is contemporary with the Salat Cami Yanı Phase 2.

Further to the west beyond the Euphrates Valley, however, the pottery

assemblage in the northern Levant presents a striking contrast. The most predominant ware group is DFBW, which exclusively contains mineral inclusions and is well burnished, according to the materials in the Rouj Basin and the Amuq Plain (Miyake 2003; Braidwood and Braidwood 1960). Vegetal tempered coarse ware also exists, but constitutes only approximately 10% of the pottery assemblage. Unfortunately, at present, , there is no secure evidence to link this assemblage to the east, but its relative order in the chronology may suggest that El-Rouj 2b period or the earlier part of Amuq Phase A can be dated to this phase (Miyake 2003: 127). Some fragments of *Washed Impressed Ware* attested at Akarçay Tepe (phase II) and Mezraa Teleilat can be a clue to this correlation (Arimura *et al.* 2000: Fig. 10-4; M. Özdoğan personal communication).

In the second phase of the Pottery Neolithic, regional variations in the pottery assemblages become much more evident than the previous phase. In the northern Levant mineral tempered and burnished ware continues to be produced since the initial stage. On the other hand, in the region east of the Euphrates Valley the aspects and techniques of pottery manufacturing changed significantly, and vegetal tempered coarse ware became predominant. For the time being it can be further divided into two sub-groups; the "Tell Assouad type pottery" group in the west and the "Salat Cami Yanı Phase 2" group in the east.

Third phase of the Pottery Neolithic

The new evidence from Salat Cami Yanı properly defines the chronological positon of the "Proto-Hassuna" phase with the secure stratigraphical circumstances, and now it can be assigned to the third phase of the Pottery Neolithic. Basically the pottery manufacturing technique relates to the same tradition of the previous phase. However, a series of new elements came into existence during this time. These include the following features: 1) developed vessel shapes, such as carinated bowls, ogee form pots and jars with distinct necks, 2) husking trays, 3) painted pottery, 4) applied decoration, 5) dark coloured burnished ware, and 6) red washed ware.

Naturally, these characteristics of the "Proto-Hassuna" pottery were once considered to be representative of the earliest pottery in northern Mesopotamia. However, now it has become evident that these elements are the products of a relatively long history of pottery production, and it is necessary to revise former interpretations.

For instance, husking trays were once thought to have originated in northern Mesopotamia, because of their early appearance. When the "Proto-Hassuna"

phase represents a fairly developed stage of pottery production, husking trays could have appeared almost simultaneously over a wide geographical range, from the Mediterranean coast (Ras Shamra), through northwest Syria (Tell Ain el-Kerkh), the Middle Euphrates (Akarçay Tepe Phase I, Mezraa Teleilat), and the Turkish Tigris Valley (Salat Cami Yanı Phase 3) to northern Mesopotamia ("Proto-Hassuna" sites).[3]

Subsequent phases of the Pottery Neolithic

Hakemi Use, the other Pottery Neolithic site in the Ilısu Dam reservoir, provides a good sequence of the subsequent phases in the Anatolian Tigris Valley (Tekin 2003, 2004a, 2004b). Particularly astonishing findings included the presence of Hassuna pottery that can be assigned to Hassuna Standard Painted Ware and Hassuna Standard Incised Ware (Tekin 2005). These are the first examples witnessed in Anatolia, as well as the region outside of northern Iraq. It seems likely that these Hassuna ceramics of Hakemi Use were not local productions, since the predominant ware group is vegetal tempered coarse ware derived from the local tradition.

The existence of Samarra Painted Ware clearly indicates that Hakemi Use was continuously occupied just before the start of the Halaf period. It is also worth noting that pattern burnished decorations are seen among *Slipped Burnished Ware*. These are the easternmost examples attested so far, while the fabric and manner of decoration are not exactly the same as their western counterparts, such as in the Amuq Phase B and El-Rouj 2d period at Tell Ain el-Kerkh (Braidwood and Braidwood 1960; Tsuneki *et al.* 1997).

It is very significant that Hassuna pottery was found in the Turkish Tigris Valley. Even in the Khabur Basin, no Hassuna Standard wares have been attested so far, while Samarra Painted Pottery was found at Tell Chagar Bazar and Tell Boueid II (Cruells and Nieuwenhuyse 2004; Nieuwenhuyse *et al.* 2002). This should not be overemphasized, until the Pottery Neolithic period in the Khabur Basin has been fully investigated. However, for the time being at least, the presence of Hassuna pottery in the Anatolian Tigris Valley may suggest a direct connection with northern Iraq, probably through the Tigris River Valley.

3. In fact, husking trays survived even in the Halaf period, as indicated by the materials from Tell Umm Qseir (Miyake 1998: 75). Thus, it is not necessarily appropriate as a chronological indicator.

■"East and West" in the Pottery Neolithic period

In recent years, it has been proposed that the Pottery Neolithic culture in the region from the northern Levant to northern Mesopotamia can be divided into two distinct groups; "Pre-Halaf" in the west and "Proto-Hassuna" in the east (Le Mière and Picon 1998; Aurenche *et al.* 2004). Moreover, the boundary was drawn between the Balikh Valley and the Khabur Basin. However, it is unfortunate that this scheme involves two major problems; one is regarding the terminology and the other one deals with the way the boundary was divided.

The term "Proto-Hassuna" is already well-established in West Asian archaeology. However, the coverage of this term has expanded as the number and intensity of research investigations progress.[4] It is known that the distribution of Hassuna pottery is tightly confined to the Mosul region and the Sinjar Plain in northern Iraq. As already mentioned above, this type of pottery was recently found at Hakemi Use too, but in restricted numbers. In the Anatolian Tigris Valley, the local pottery tradition seems to continue in this period as it is contemporary with the Hassuna, possibly also in the Khabur Basin, where no Hassuna pottery has been detected so far. Strictly speaking, if there is no proper Hassuna period or culture in these regions, and if the preceding period had nothing to do with it, it does not make any sense to refer to this period as "Proto-Hassuna."

However, in the case of "Proto-Hassuna," the problem is merely its incoherency in the definition of the word. The "Proto-Hassuna" group is still substantial, because it can be defined by its specific pottery types. The other term "Pre-Halaf", on the other hand, is very problematic. In the first place, it has the same problem as "Proto-Hassuna". The Northern Levant has been often included within the "Pre-Halaf" group. In fact, however, the Halaf culture never expanded into this region. Indeed some Halaf painted pottery was found here, but they were not common and probably imported from elsewhere. Furthermore, no early Halaf painted pottery has been found so far. The most predominant pottery is DFBW and its variant that are derived from the local pottery tradition. The round structure known as *tholos* was also not detected. Thus, it is not appropriate to refer to the Pottery Neolithic prior to the Halaf period as "Pre-Halaf" for the same reason as "Proto-Hassuna."

But the crucial problem is that the "Pre-Halaf" group includes two distinctive, rather diverse pottery assemblages. As already discussed above, in the northern Levant the mineral tempered burnished ware, or DFBW,

4. It was at Tell Kashkashok II in the Khabur Basin, outside of northern Iraq, where the complete identification of the "Proto-Hassuna" period in the region was accomplished for the first time (Matsutani ed. 1991).

continues to be manufatured. In the Middle Euphrates and the Balikh Valley, on the other hand, the tradition of vegetal tempered coarse ware persists, except for the initial phase of the Pottery Neolithic. These two groups are totally different from each other in every aspect of manufacturing technique, vessel shapes, and decorations. Therefore, it is unreasonable to deal with these two distinctive groups under the name of "Pre-Halaf."

Furthermore, the Neolithic pottery in the Middle Euphrates and the Balikh Valleys bears general resemblance to the "Proto-Hassuna" group rather than that of northern Levant. The differences from the "Proto-Hassuna" group should be treated as a regional variation within the larger pottery sphere, that can be defined by vegetal tempered, unburnished and light coloured ware. Significant differences in the pottery assemblages are seen between the northern Levant and the region to the east of the Euphrates. At least from the point of view of the pottery, the boundary can be drawn somewhere between the Euphrates or around the Qoueiq Valley (Miyake 2003: 128).

Both "Proto-Hassuna" and "Pre-Halaf" are rather convenient terms to define and refer to a specific period or culture, that was previously anonymous. However, if it is dealt with as a culture or cultural entity, it unfortunately becomes the cause of confusion or misunderstanding, as discussed above. Recently the term "Proto-Halaf" has also been used (Cruells and Nieuwenhuyse 2004). A profusion of such terms will prevent us from a proper understanding and evaluation of the aspects of the Pottery Neolithic period. Unless there is a compelling reason, we should avoid using the nomenclature of "Pre-/Proto-, plus specific culture names" like "Pre-Halaf" or "Proto-Hassuna." Perhaps the alternative is to make good use of the term Pottery Neolithic, which is fairly neutral, like PPNA or PPNB, for the Pre-Pottery Neolithic period.

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CHAPTER 12

Another image of complexity: The case of Tell el-Kerkh

Akira Tsuneki

■Introduction

During the past twenty years, many scholars have noted that large Neolithic settlements appeared during the late PPNB period (7,600-6,900 BC) in West Asia. Of course, most of these Neolithic settlements are relatively small, generally less than 3 ha, and they seem to have been autonomous farming villages. On the other hand, a small number of Neolithic settlements grew to be quite large, especially during the late PPNB and early Pottery Neolithic periods. Some notable examples of these settlements include Ain Ghazal (Rollefson 1987; Rollefson and Simmons 1988), Basta (Gebel *et al.* 1988; Nissen *et al.* 1991) , Wadi Shu'eib (Zeuner 1957), and Beisamoun (Lechevallier 1978) in the south Levant, Tell Abu Hureyra (Moore *et al.* 2000), Tell Halula (Molist 1996) and Tell el-Kerkh (Tsuneki *et al.* 1997, 1998, 1999, 2000) in the north Levant, Asklı Höyük (Esin 1996) and Çatal Höyük in Anatolia. Interestingly, these large settlements are distributed only in the Levant and the Central Anatolia. The regions east of the Euphrates, including Khabur, lack the evidence of such large settlements in the early Neolithic.

The size of these large settlements sometimes exceeds 10 ha, a size that is comparable to the small cities of later periods. Some scholars call them "regional centers" and recognize them as centers for the development and diffusion of new concepts and techniques (i.e. Rollefson 1987). Other scholars are skeptical about the size of these settlements and believe that they merely appear to be large because of a sequential accumulation of smaller settlements (i.e. Hole 2000). They strongly suggested that there were no qualitative differences between the large and small settlements. The essential part of this problem is whether the existence of social, economic, and/or religious complexity can be observed from these large Neolithic settlements. Therefore, I would like to discuss these aspects of complexity in this paper. I will discuss the entities, indicating the complexity of large Neolithic settlements. Since we have been excavating Tell el-Kerkh, one of the largest Neolithic settlements in West Asia, since 1997, I would like to review the results of our research from the viewpoint of complexity.

■The size of Tell el-Kerkh and its settlement hierarchy

Tell el-Kerkh is a very huge tell complex that consists of three contiguous artificial mounds: Tell el-Kerkh 1, 2 and Tell Ain el-Kerkh (Figs. 1-4). Although Tell el-Kerkh 1 and the southern part of Tell Ain el-Kerkh were covered with later thick cultural deposits, the whole of Tell el-Kerkh 2 and most parts of Tell Ain el-Kerkh contain only Neolithic cultural layers. We have excavated 600 m^2 at the center of Tell Ain el-Kerkh, 200 m^2 at the northwest of Tell Ain el-Kerkh and 25 m^2 at the center of Tell el-Kerkh 2.

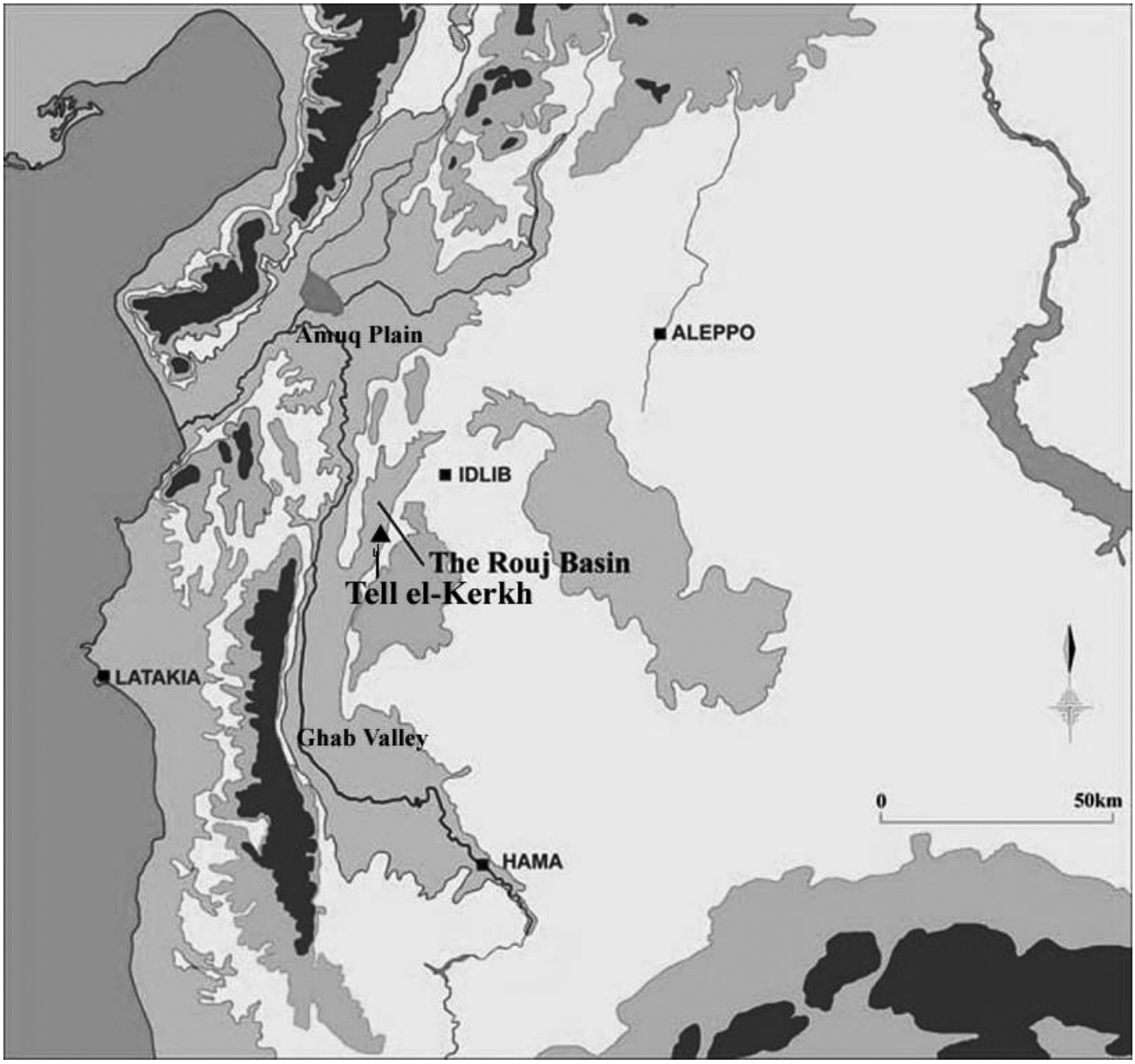


Fig. 1

Fig. 2

Fig. 1. *Map showing the location of Tell el-Kerkh and the Rouj basin.*
Fig. 2. *General view of Tell el-Kerkh.*

Fig. 3

Local phases	Supposed years based on ^{14}C dating (cal.)	Regional chronology
El-Rouj 2d	6100-5800bc	Late PN
El-Rouj 2c	6600-6100bc	Middle PN
El-Rouj 2b	6900-6600bc	early PN
El-Rouj 2a	7000-6900bc	Incipient PN
El-Rouj 1b	7600-7000bc	Late PPNB
El-Rouj 1a	8500-8200bc	Early PPNB

Eleven test pits were also dug in various parts of Tell Ain el-Kerkh (Fig. 4). Thick Neolithic cultural layers were discovered in all of these excavated squares and test pits. The layers date back to the early PPNB in the northwest area, and the latest Neolithic deposits at the summit of Tell Ain el-Kerkh date to the late Pottery Neolithic period. They cover approximately 3,000 years based on ^{14}C dating.

In addition to the excavations, systematic surface collection was executed throughout the tell complex. Based on this research, we concluded that the Neolithic settlements, especially during the late PPNB and the early phase of the Pottery Neolithic (c. 7,600-6,500 cal. BC.), extended approximately 16 ha (Fig. 4). To testify as the contemporaneity of the Neolithic settlement is not easy. However, the depth of the Neolithic deposits reaches over ten meters at the summit of Tell Ain el-Kerkh, and we can suppose that most parts of the Neolithic settlement had been continuously inhabited.

In addition to Tell el-Kerkh, we discovered at least sixteen Neolithic tells within the Rouj Basin (Fig. 5). Although the duration of each settlement differs, most of them have cultural layers belonging to the early phase of the Pottery Neolithic periods. Some of them (ex. Tell el-Ghafar 1) also produced late PPNB materials. These Neolithic settlements are relatively small, ranging from 0.5 ha to 2 ha, except for the settlements at Tell el-Kerkh and Tell Aray. Tell el-Kerkh was approximately 16ha in size as mentioned above, and Tell Aray seemed to be c.8ha during the early phase of the Pottery Neolithic period. Based on these survey data, it is quite clear that a definite settlement hierarchy was visible during the early phase of the Pottery Neolithic period in the Rouj Basin.

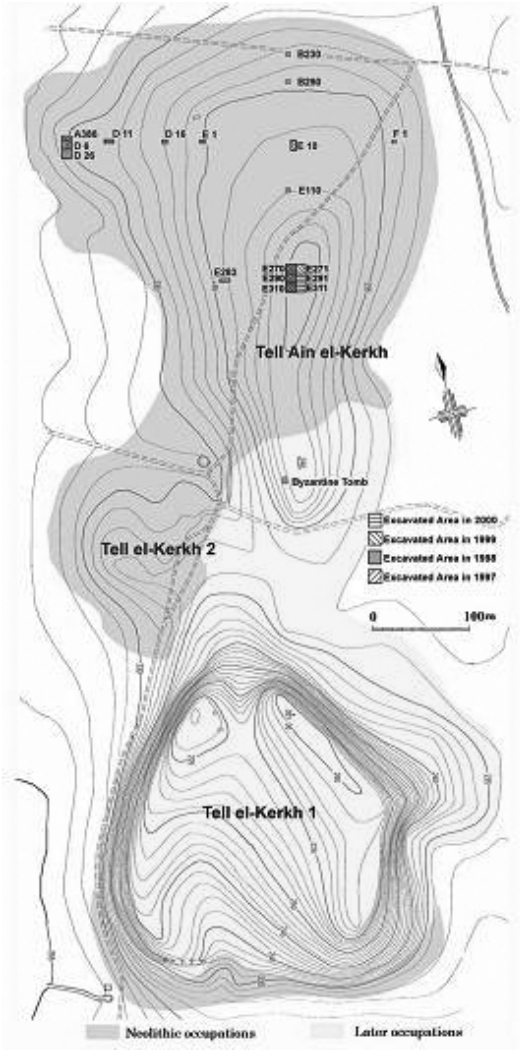


Fig. 4

Fig. 3. *Tell Ain el-Kerkh chronology and the supposed years based on ^{14}C dating.*
Fig. 4. *Distribution of the Neolithic and later occupations at Tell Ain el-Kerkh.*

Fig. 5

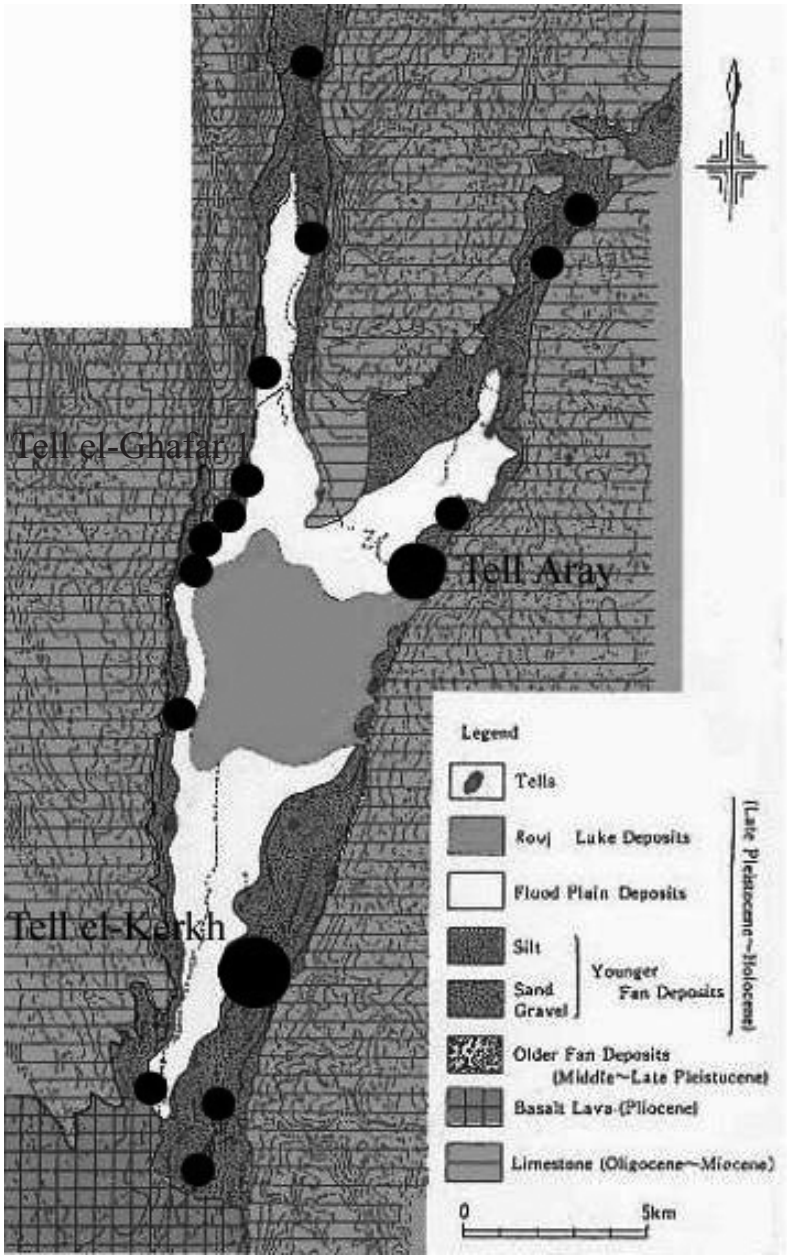


Fig. 6

Fig. 5. *Geological map of the Rouj basin and the Neolithic settlements.*
Fig. 6. *Cache of the flint blades discovered at the corner of the Str. 244, Square D6.*

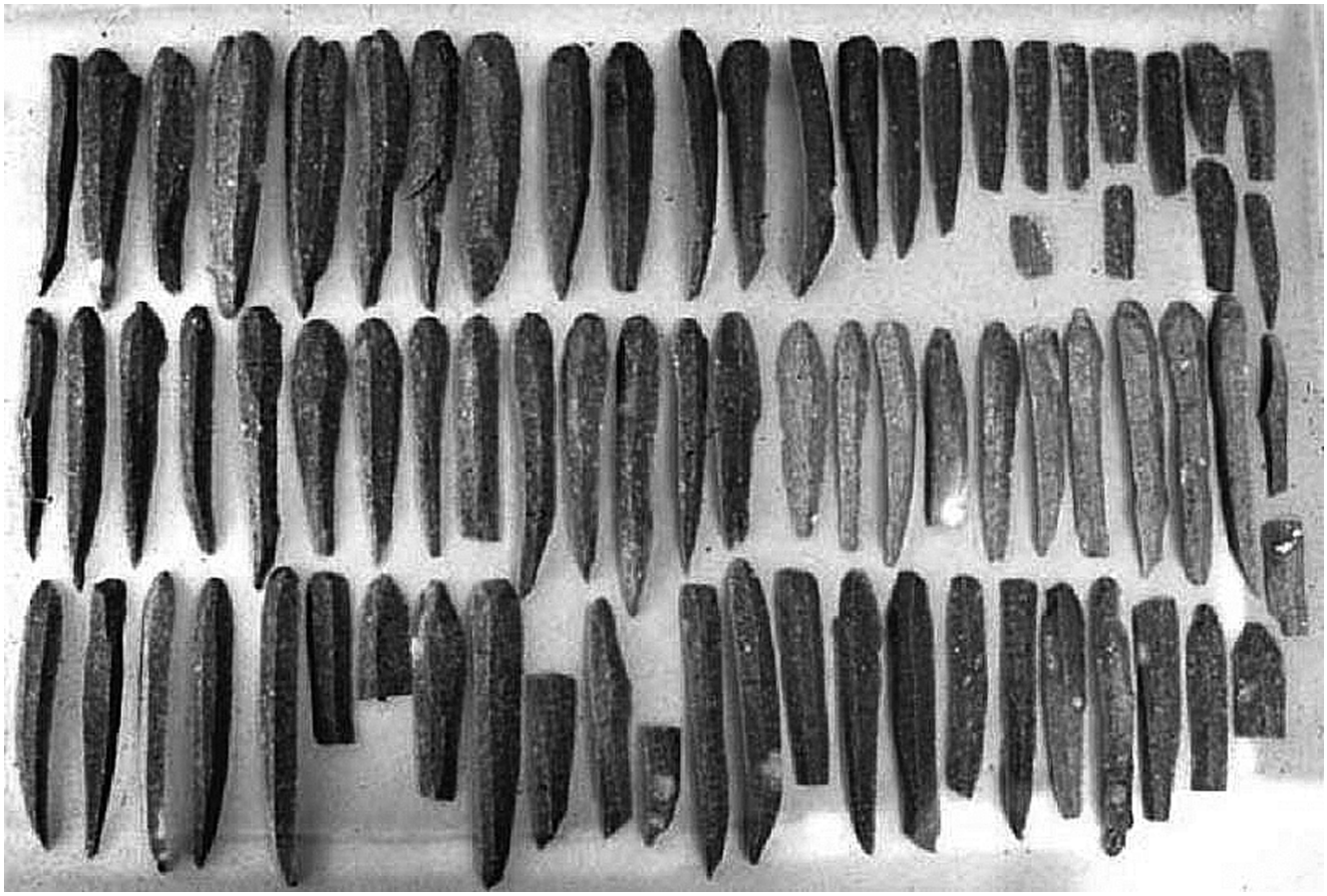


Fig. 7. Neolithic flint blades from the cache of Square D6.

■The evidence of complexity at Tell el-Kerkh

The Neolithic settlements of Tell el-Kerkh not only covered a vast area but they also possessed evidence suggesting social complexity. As for structures and materials indicating complexity in the Neolithic societies at Tell el-Kerkh, we can point out the following items. These items belong to the various periods from the Rouj 1b (LPPNB) to the Rouj 2d (Late phase of the Pottery Neolithic), and I will begin my discussion with the earlier items.

Caches for sickle elements

Two caches of flint blade blanks were discovered from the Rouj 1b (LPPNB) layers. One cache, consisting of 86 blade blanks, was discovered at the corner of one room of the rectangular building in Square D6 (Figs. 6 and 7). The other cache, 31 blade blanks, was discovered from the test pit at Square G192b. As each blade of these caches points in the same direction, the blades must have been put in a pouch and stored in the house. Judging from the characteristic grainy brown flint, it is very probable that the blade blanks were raw materials for the sickle elements. As people can produce two to three sickle elements from each blade blank and each sickle is made of some six to seven elements, the potential number of sickles from these blade blanks numbers in the dozens. As these numbers are too large for personal or family utility, we can guess that these caches were not household ones but made for communal storage. Though the PPNB excavated areas were quite limited (c. 230 m^2), we discovered two caches of sickle elements. This means that communal storage was quite commonplace within the Late PPNB settlement at Tell el-Kerkh.

Fig. 8. Unfinished beads and flint drills found together in Square D26.

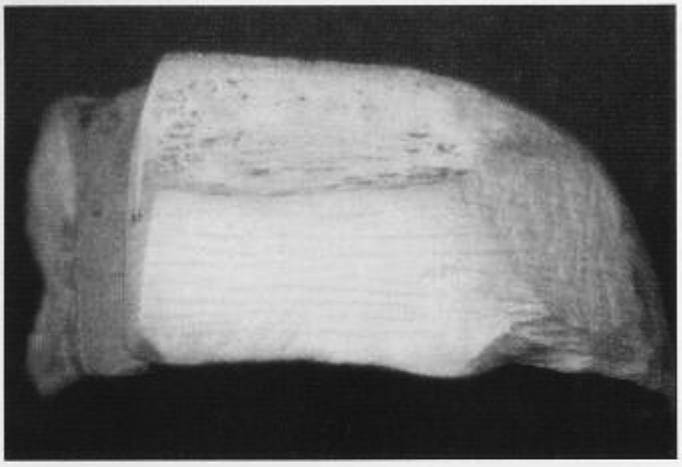
Skillful stone ornament manufacturing, using various kinds of local and exotic materials

Thousands of beads have been discovered from the excavations of Tell el-Kerkh. They were made of stone, shell, bone and natural metal. Some serpentinite unfinished beads and specific flint drills were discovered together from the Rouj 2b context in Square D26 (Fig. 8). This evidence indicates the existence of a bead workshop in the early Pottery Neolithic period. Small and fine siliceous flints were used for making micro-borers, and it is very probably that these special types of micro-borers were prepared for bead and ornament manufacturing (Arimura 2003: 159). Based on this evidence we can observe some specialty in beads production at Tell el-Kerkh.

In addition to the bead workshop many personal ornaments were discovered in each Neolithic layer. Beads and pendants are the most frequent, and various kinds of materials were used (Fig. 9). Besides local materials, such as flint, limestone, basalt, animal tooth and unio shell, some exotic materials, such as serpentinite, gabbro, malachite, agate, gypsum, turquoise, and tusk shell, were imported and processed into beads and other ornaments. Many unfinished ornaments indicate that most of them were processed within the settlements. Ornament manufacturing in the Kerkh Neolithic settlements show not only skillful craftsmanship but also the system of acquisition of exotic materials though long distance trade.

Fig. 9

Fig. 10



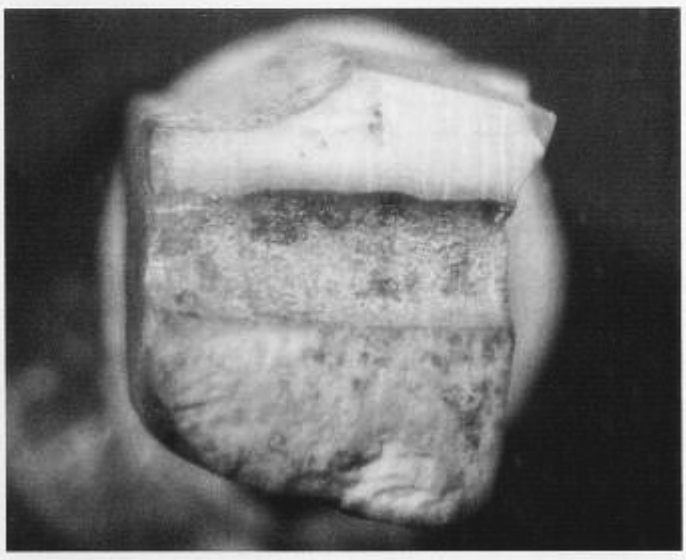


Fig. 11

Fig. 9. *Various kinds of beads and pendants from the Rouj 1b-2d layers.*
Fig. 10. *Imitation turquoise beads.*
Fig.11. *Surface and cross-section of an imitation turquoise bead.*

Fig. 12

Fig. 13

Fig. 14-1

Fig. 14-2

Fig. 12. *Various stamp seals from the Rouj 2c and 2d layers.*
Fig. 13. *Stamp seals from the Rouj 1b and 2b layers.*
Fig. 14. *A flog-shaped stamp seal from the Rouj 2c layer.*

Imitation-turquoise bead production

One of the highly technological objects found from Tell el-Kerkh is the imitation-turquoise beads from the Rouj 2c and 2d layers (the middle and late Pottery Neolithic) (Figs. 10 and 11). From their appearance and color, we believed at first that they were made of turquoise. However, some of them have a strange white core, and we finally understood that they were made of some whitish material and colored with a lustrous blue stain. Chemical analyses and laboratory experiments indicated that the blue beads from Tell el-Kerkh were an alternative to and an imitation of natural turquoise beads, made of an apatite core with the turquoise color obtained, possibly, by heating with transition metal compounds including manganese or alkali (Taniguchi *et al.* 2001). This evidence shows that the Neolithic people at Tell el-Kerkh were skilful enough to make an imitation object from wholly different material.

Seal-sealing system

One of the most conspicuous objects discovered from Tell el-Kerkh is the stamp seal (Figs. 12, 13, and 14). Until 2005 spring, 73 stamp seals, including unfinished seals, were discovered from the late PPNB to the late Pottery Neolithic contexts. The number of stamp seals increases every year as the excavation proceeds. Most of stamp seals were made of stones, such as

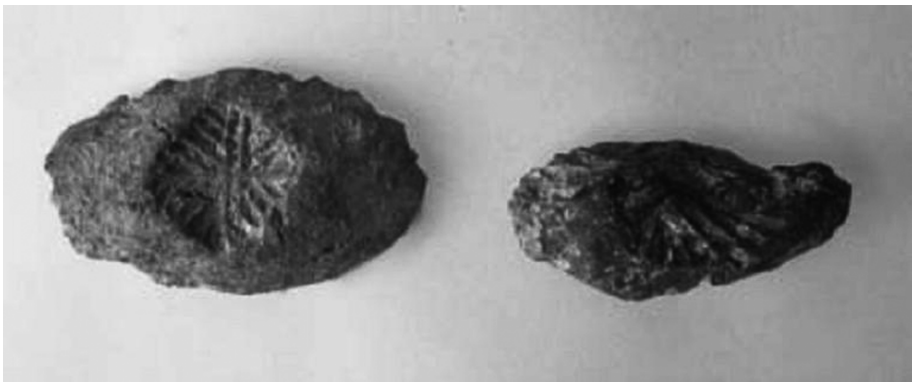


Fig. 15 -1

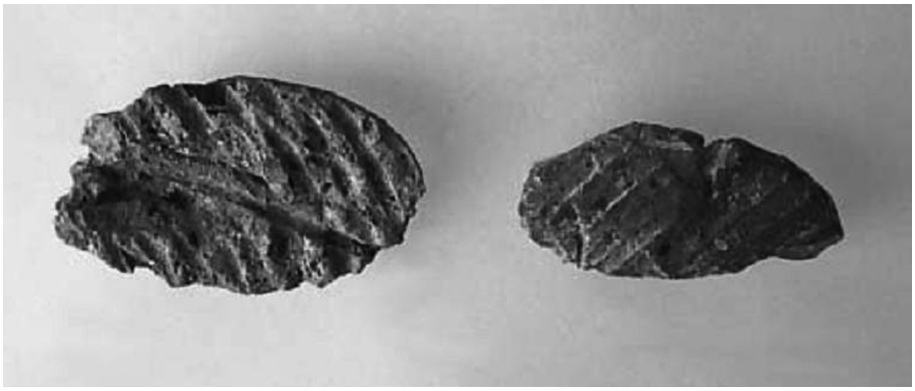


Fig. 15 -2

Fig. 16

serpentinite, gabbro and limestone, and some were made of bone and terra-cotta. One seal was made of shell. Therefore, Tell el-Kerkh is one of the Neolithic sites that produced the most numerous stamp seals. Each seal has its own impression design, that can be easily identified.

Although the number is much smaller than the seals, the importance of clay sealings is in no way inferior to seals. At Tell el-Kerkh, six clay sealings were discovered mostly in the Rouj 2c (middle Pottery Neolithic) context. Five of them have the seal impression on the obverse and traces of strings and basketry on the reverse (Fig. 15: 1 and 2). It is certain that they were used for the sealing of baskets or containers covered with matting. Another type of clay sealing has a circular impression with a bucranium-like design on the obverse side. Even though an impression cannot be observed on its reverse side, there is a trace of a string and knot on its broken side (Fig. 16). Thus, it is assumed that this sealing was not attached directly to the container, such as a basket, pottery or bag, but rather hung from the container or other facilities like a label. These six specimens are the earliest clay sealings in West Asia and they demonstrate concrete evidence that the sealing system worked within the Kerkh Neolithic settlement. The last specimen indicates that sealing systems worked not only for direct sealing but also for recording contexts.

Fig. 15. *Clay sealings with the traces of strings and basketry.*
Fig. 16. Bulla *type clay sealing from the Rouj 2c layer.*

Though most seals and sealings were discovered in the fill, some seals came from buildings. One of the small foundation rooms of the two-story

Fig. 17

Fig. 18

Fig. 17. *One-roomed building from the Rouj 2c context.*
Fig. 18. *Multi-roomed building from the Rouj 2c context.*

building in the Rouj 2c period (Str. 167) produced five stamp seals. As these foundation rooms were probably used for storage purposes, stamp seals might be used for the administration of stored goods. At any rate, the stamp seals and sealings indicate that concepts of property and ownerships were well developed in the Neolithic settlements of Tell el-Kerkh.

Architectural remains showing elaboration

Until now, the most extensive excavation was carried out at the Rouj 2c settlement. In this period, two kinds of main building structures are recognized; One roomed buildings (Fig. 17) and multiple roomed buildings (Fig. 18). The former building is relatively small, measuring c. 3 × 2 m in the smallest and c. 6 × 3 m in the largest. They have a square or a rectangular plan. They ordinarily had a thick and elaborated lime plastered floor. One of these buildings (Str. 74) has a foundation deposit under the floor, and it shows that some ritual practice was celebrated before the building construction (Tsuneki 2002). Another type of main structure includes the larger buildings, that are mostly rectangular in plan. They measure 7-10 × 5-6 m and the inside was divided into small square or rectangular rooms, measuring sometimes less than one meter per side, separated by partition walls. One of the better preserved of these buildings, Str. 167, contained the remains of the upper flooring structure, made from timber, hard-packed clay, pebbles, and lime plaster (Fig. 19). This structure is positive evidence that multiple roomed buildings were on the ground floor or comprised the foundation of two story buildings. Considering the finds, we can also point out that the first floor, consisting of small rooms, was frequently used for storage purposes.

Fig. 19. *Timbers spreading over multiple-roomed building of Str. 167.*

Both kinds of buildings show this elaboration in architecture, and they

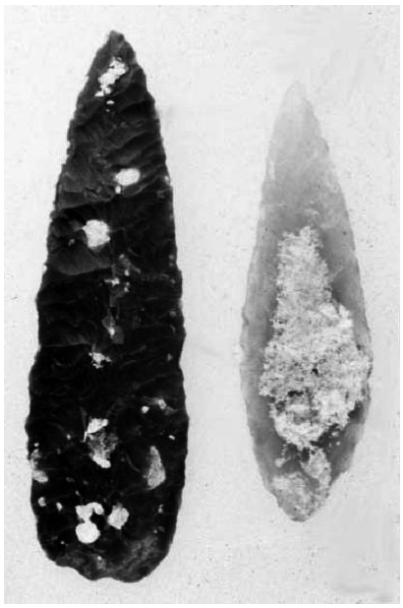


Fig. 20. Daggers made of flint and quartz.

indicate that ritual and storage activities were quite commonplace in the Neolithic settlement at Tell el-Kerkh.

Some prestige objects as personal property

The middle and last phase of the Pottery Neolithic period at Ain el-Kerkh, the Rouj 2c and 2d layers, produced some exquisite objects indicating the presence of personal property. In this sense, two complete stone daggers are the most notable objects. One dagger was made of reddish brown flint and other of quartz (Fig. 20). They were discovered in the fill of the Rouj 2d settlement. The former is 14.2 cm long and the latter measures 11.2 cm. They were elaborately fashioned by pressure flaking on both faces. As small dents by retouches are visible on the middle of lateral sides, these specimens were probably hafted. Their form and fashion immediately remind us a series of famous daggers discovered from Çatal Höyük. One of the finest specimens of Çatal Höyük had a bone handle carved in the form of a coiled snake (Mellaart 1964: 94 and Fig. 46). These daggers were usually found from the male burial and they were supposed to have been used ceremonially. Although our specimens lack the clear context within the settlement, they did not seem to be ordinary tools. No use-wear could be observed on their edges at all. Therefore, we supposed that our daggers were the prestige objects within the Neolithic settlements.

The shallow small pits around the child graves in the Rouj 2d context of Square E310 produced a series of marvelous pottery. Pedestal bowls, cream bowls and cylindrical-necked jars are the main types. As all of them were intentionally broken and placed carefully in the pits (Fig. 21), they were probably buried in some funeral ceremonies. Pottery discovered from the pits is quite elaborate, especially two pedestal bowls (Fig. 22) and one cream bowl. As the number of pedestal bowls is quite limited in the excavations, we can guess that this type of pottery was made originally for some ritual purposes. If this specially made pottery was dedicated to the small children buried around the pits, they must have had some prestigious features.

Some small but elaborate pendants (Fig. 23) and figures (Fig. 24) were discovered in the the Rouj 2c context. These materials also indicate the presence of personal property.

I will now discuss items that indicate some complex characteristics from our excavations of Tell el-Kerkh. The traits indicating complexity based on these items include communal storage, craft specialization, advanced technology, long distance trade, the concept of ownership, ritual practices, personal property, and so on.

Fig. 21

Fig. 22

Fig. 23

Fig. 24

Fig. 21. *Pottery discovered in a pit of Square E310.*
Fig. 22. *Pedestal bowls from the pits of Square E310.*
Fig. 23. *Stone pendant from the Rouj 2c context.*
Fig. 24. *Stone pendant from the Rouj 2c context.*

■Evidence for social complexity

All of the above-mentioned categories seem to be related to a high level of social complexity. However, the direct evidence for social complexity at Tell el-Kerkh does not accord with this view. Here, I discuss the burial and building evidence from Tell el-Kerkh, as the direct source of social complexity.

First, I discuss the burial evidence of Tell el-Kerkh. Fifty-five burials have been discovered up until 2005 spring in the Rouj 1b to the Rouj 2d context. Some burials contained more than one human body with a total 57 individuals. Most of them, at least 42, are infants less than six years old, including prenatal babies. There are only five adult and four juvenile burials, and we can guess that adults were buried in the cemetery within or outside the settlement. If this is the case, considering the social aspects from these burials is not easy. However, most of the individuals, from infant to adult, were buried in the same manner, i.e., in flexed positions lying on their left or right side, with a few funeral gifts. Some exceptions are the urn burials and the burned human bone fragments in the ritual pits of the Rouj 2d period. Only four infants and two juveniles have funeral gifts, but the gifts are not outstanding and were limited; one small pottery bowl, one shell bead, one flint point, two stone beads, and so on. Five adults were buried without any gifts. They were buried in the ordinary position, i.e. in flexed position lying on their side, but with the head turned over on the face at least in two burials. In the case of Str. 533, a large stone slab was placed on the head. We cannot presume precisely the meaning of this treatment, but this kind of interment gave us an extraordinary impression of ritual behavior at Tell el-Kerkh. The dead, both adult and child, seemed to be treated with great care, and their burial size and practices were fundamentally similar. Burials did not show clear evidence of the existence of social ranking in the Neolithic societies at Tell el-Kerkh.

Residential buildings is another item for discussion. Is it possible to find some social differences among residential buildings at Tell el-Kerkh? As I mentioned above, a series of large two story buildings and elaborate plastered buildings were discovered in the Rouj 2c settlement at Tell el-Kerkh, and storage and ritual activities prospered within the settlement. If the building size is considered, the smallest one-room building measures 6 m^2 and the largest multiple-room two-story building measures ten-times that at 60 m^2. However, the former had the elaborate white-lime plastered floor and a special foundation deposit under the floor. These facilities indicate that even such a small building was carefully constructed. The largest multiple-room building measures only 60 m^2 at most, and such a large sized building

did not seem to have been a "palace" that lorded over the whole settlement. No special facilities exist, except for a carefully made two-story floor, was observed among such buildings. Anyhow, we can assert that the size and qualitative differences among the residential buildings are very small, and we cannot observe clear evidence of social ranking at all.

■Characteristics of complexity at Tell el-Kerkh

If we consider the human history in terms of evolving societal complexity, where can place the Neolithic societies of Tell el-Kerkh in this sequence? Earle, one of the leading scholars considering the problem of social complexity, used the term of chiefdom to characterize some levels of social complexity in stateless societies (Earle 2002: 43). He summarizes the main defining characteristics of chiefdoms as scale of integration, centrality of decisionmaking, and stratification (ibid. 53-57). When we consider the social complexity mainly based on political aspects discussed by Earle and other scholars, we can conclude easily that the Neolithic societies at Tell el-Kerkh did not become chiefdom level society at all. We have not observed any evidence of central decisionmaking chiefs, hierarchical organizations or social inequality among the archaeological evidences.

However, we still can feel some considerable levels of complexity in the Neolithic societies at Tell el-Kerkh. The aspects of complexity include communal storage, craft specialization, advanced technology, long distance trade, concepts of ownership, ritual practices, and personal property, as mentioned above. Above all, its settlement size and inevitably its population size were much more enormous than mere simple farming societies in the Neolithic period. The Neolithic people of Tell el-Kerkh actually managed quite a large scale of society. However, how could they manage this large society? What kind of principles worked in the management of such a large society?

It is assumed that ordinary types of complex or chiefdom societies were managed by some social elites, and their existence was indicated by central decisionmaking hierarchies and social stratification. However, we failed to find out any archaeological evidences indicating the presence of such entities at Tell el-Kerkh. Instead, we discovered the previously mentioned traits indicating societal complexities. Concerning the characteristics of these complexities, we can summarize that all of them are deeply related to the communal and ritual aspects of the society. Few of them have any relationship with political aspects.

In short, I conclude that the large Neolithic settlement of Tell el-Kerkh

developed considerable social complexity, but it did not develop a stratified and ranked society. The community was not ruled by a single powerful or influential individual, such as a chief or king. Instead of any evidence of personal political power, we observe considerable evidence of communal and ritual relationships among the members of the community. There were frequent interchanges of goods, information and ideology through communal storage, craft specialization, advanced technology and short and long distance trade. Interaction between people accelerated and was controlled by ownership concepts and ritual practices. Therefore, the complexity of Neolithic society at Tell el-Kerkh was not achieved by the imposition of a powerful authority, but rather through communal relationships among the constituents of the society.

■Conclusion

Such kinds of complexity can sometimes be observed in other primary West Asian Neolithic sites as well. The title of this paper was chosen in reference to Akkermans and Verhoeven's paper titled "An Image of Complexity" (Akkermans and Verhoeven 1995). In that paper, they discussed the socioeconomic organization of late Neolithic society based on the materials excavated from Tell Sabi Abyad. Though they did not specify the whole attributes of the complex society, they pointed out the existence of a well-developed system of administration, and extensive networks of long and short distance exchange. The administration system here does not mean a political type, but an economic one through evidence such as sealings. The excavations at Tell Sabi Abyad also did not produce evidence about social elites or central hierarchies that were related to the existence of political power. Besides Tell Sabi Abyad, most of the Neolithic settlements of West Asia lack evidence for political elites and stratified societies. On the other hand, they produce abundant evidence of communal relationships and ritual practices.

Even if we do not observe any evidence of political complexity in large Neolithic settlements, we cannot conclude that the society was not complex. As mentioned above, they possessed many features indicative of complexity specifically relating to communal and ritual relationships. Therefore, I stress once again that Neolithic complexity was not achieved through political power, but by communal and ritual relationships. In this sense, we must consider another image of complexity besides that of the political for the large settlements dating to the Late PPNB and Early Pottery Neolithic periods.[1]

1. This paper was written in 2005 just after the Khabur Symposium. *We have been going on the excavations at Tell el-Kerkh, and a lot of new data have been accumulated since then. Especially, the discovery of a large-scale cemetery in 2007 proposed us much information for the life and the afterlife of the Pottery Neolithic (the Rouj 2c) people. However, I believe that there is no need to change the fundamental image of complexity for the Late PPNB and Early Pottery Neolithic periods.*

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CHAPTER 13

Neolithic pottery in the northern Levant and its relations to the east

Takahiro Odaka

■Introduction

Recent archaeological activities in Syria and Anatolia are producing important new data for understanding the role of Neolithic pottery in the Near East. Important projects in this regard are salvage operations in dam reservoir areas, such as in the Tishreen, Carchemish and Ilısu regions, located in northeastern Syria and southeastern Anatolia. In the northern Levant and Cilicia, however, archaeological research of the Late (Pottery) Neolithic is still limited, but recent work (e.g. Miyake 1997; Balossi 2004) has resulted in reconsiderations of traditional chronological frameworks.

Regional studies of Neolithic pottery have made much progress, and we are now moving towards a better understanding of inter-regional relations. This paper will explore such relations by means of a comparison between the northern Levant and the East regions.

■Neolithic pottery in the northern Levant: the Rouj basin

The 1930's investigations in the Amuq plain by the Oriental Institute of the University of Chicago was the starting point for research into the Late Neolithic in the northern Levant (Braidwood and Braidwood eds. 1960). Until very recently, the then established chronological framework served as the standard temporal scheme for this region. One of the reasons for this is that the Amuq sites were the only excavated sites with *representative* Neolithic assemblages in the area. Certainly, in some archaeological soundings made after the original Amuq project, Late Neolithic layers have been reached, e.g. at Ras Shamra, Tell Sukas, and Qminas (Fig. 4, and see Contenson 1992; Riis and Thrane 1974; Masuda and Sha'ath 1983), but the samples were too limited to either revise or confirm the Amuq sequence.

Recent archaeological work in the Rouj basin in northwestern Syria, however, has resulted in important new data for the Late Neolithic. In this regard, the so-called Rouj chronology was proposed in 1993 based on the results from the soundings at Tell el-Kerkh 2, Tell Aray and Tell Abd el-Aziz (Tsuneki 1993). Subsequently, the excavations at Tell Ain el-Kerkh (the northern mound of Tell el-Kerkh, which consists of three mounds: Tell el-Kerkh 1, Tell el-Kerkh 2 and Tell Ain el-Kerkh) have resulted in a huge amount of Neolithic pottery, contributing to further refining the chronological framework (Tsuneki *et al.* 1997, 1998, 1999, 2000).

The Rouj chronology consists of the El-Rouj 1 (PPNB) to El-Rouj 6 (Early Bronze Age) periods. The Late Neolithic corresponds to the El-

Rouj 2 period, which is be divided into four sub-periods (El-Rouj 2a to 2d). Occasionally, sub-periods are divided into phases. The Neolithic pottery sequence in the Rouj basin can be summarized as follows.

El-Rouj 2a represents the period of the earliest pottery in the northern Levant. This period was identified on the basis of the archaeological assemblages from layers 6-5 at Tell el-Kerkh 2, just above PPNB (El-Rouj 1) layers. So-called Kerkh Ware (Fig. 1: 1-6) dominates almost half of the ceramic assemblage. The other components are Dark-Faced Burnished Ware (DFBW; Fig. 1: 7-13), which is the dominant ware of Neolithic pottery in the northern Levant, and Coarse Ware (Fig. 1: 14). These assemblages indicate that already from early pottery assemblages on the "Fine Ware" versus "Coarse Ware" distinction was well established in this region. Kerkh Ware, named after the site where it was discovered, is characterized by mineral tempering, burnished surfaces, a lack of decoration, thick walls, and simple vessel shapes (Tsuneki and Miyake 1996). Balossi points out that the "*calcite in red clay*" sherds (Braidwood and Braidwood eds. 1960: 49), found among DFBW from the earliest floors (Jk3 28-26) of Amuq phase A, are probably similar to Kerkh Ware. In addition, she noted that "Sandy Ware" from the deepest levels at Yumuktepe in Cilicia is possibly correlated with the "*calcite in red clay*" sherds of DFBW (Balossi 2004). At all sites these sherds were recovered from just above virgin soil, therefore, the ceramic assemblages including them seem to be the earliest in the northern Levant and Cilicia, parallel with the El-Rouj 2a period.

The ceramic assemblages of El-Rouj 2b are marked by a sharp decline in the quantity of Kerkh Ware and an increase of DFBW. Small quantities of Kerkh Ware still remain in the earlier phase of this period, but in the later phase it wholly disappears. DFBW overwhelmingly dominates the ceramic assemblage. Characteristic are decorations in the form of impressions (Fig. 1: 18, 19, 22, 23), incisions (Fig. 1: 25) and appliqué, found on both DFBW and Coarse Wares. Among the Coarse Ware, there are also pieces with plaster coating (Fig. 1: 26), applied horizontal bands (Fig. 1: 24) or lugs. DFBW shoed lugs only (Fig. 1: 23). The El-Rouj 2b assemblage seems to correspond to the later part of Amuq phase A from Tell al-Judaidah and phase VB of Ras Shamra (Miyake 1997; Balossi 2004). Similar assemblages were also found at Qminas, Qal'at el-Mudiq, Hama and Tell Sukas (Fig. 4; Masuda and Sha'ath 1983; Collon *et al.* 1975; Thuesen 1988; Riis and Thrane 1974).

Pottery from El-Rouj 2c period was found at from several sites (e.g. Tell Aray 1, Tell Aray 2 and Tell Ain el-Kerkh). In this period DFBW is still predominant. In the later phase of this period, so-called Fine Painted Wares (Odaka 2003, and see Fig. 1: 39) appear for the first time, albeit in very small

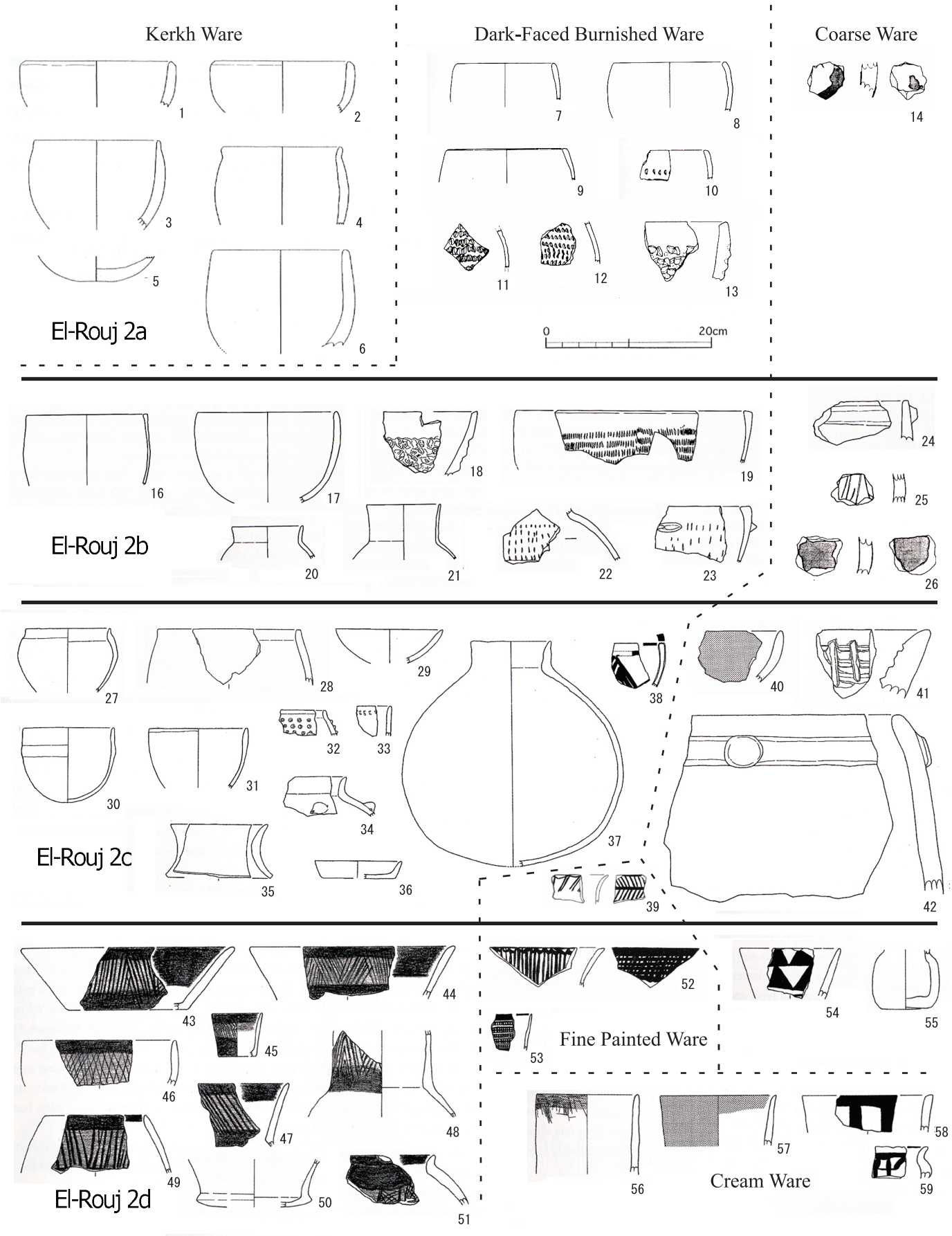
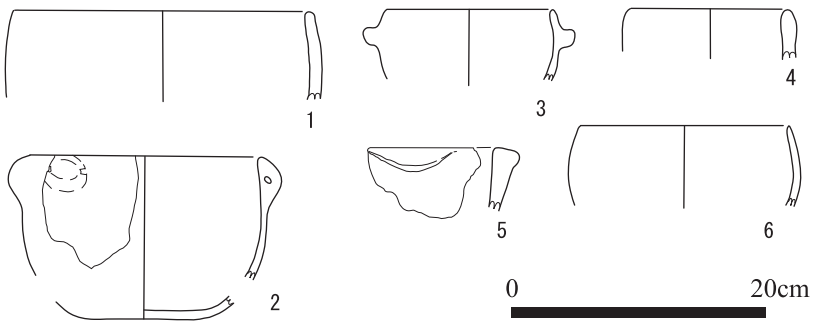


Fig. 1. *Pottery assemblages from the El-Rouj 2a to 2d periods (Tsuneki* et al. *1998, 1999; Miyake 2003; Odaka 2003b).*



numbers only. They seem to be identical to Samarra painted wares, i.e. they were possibly imported from the east. Among the Coarse Ware assemblages, so-called husking trays (Fig. 1: 41) were found in the later phase. Decorations become less numerous, and techniques and designs of decorations are varied. Plaster coating, for example, was now applied both Coarse Wares and DFBW (Fig. 1: 38). The pottery with plaster coating was often painted with red-to-brown pigment, applied in geometric motifs. Additionally, in the later phase pattern burnishing appears on DFBW. Horizontal applied bands (Fig. 1: 30, 42), lugs and handles (Fig. 1: 34) are typical of DFBW and Coarse Ware. Horizontal applied bands become thin, and are perhaps decorative instead of functional. The El-Rouj 2c period can be equated with the Amuq phase A of Tell Dhahab, the early part of Amuq phase B, and phase VA of Ras Shamra (Miyake 1997; Balossi 2004).

In the El-Rouj 2d period, finally, DFBW remains important, but it decreases in quantity, and, interestingly, it shows clear influences of Halaf pottery, particularly with regard to vessel shape. New ware-types such as Dark-Faced Unburnished Ware (DFUBW) and Cream Ware (Fig. 1: 56-59) now occur. Cream Ware seems to be a variety of DFBW, characterized by a compact fabric and firing in oxidizing conditions. Its surface color varies from cream to orange-buff. Lustrous red to brown wash (Fig. 1: 56, 57), and geometric designs in red paint (Fig. 1: 58, 59) are characteristic. On DFBW, pattern burnishing was very common (Fig. 1: 43-49, 51), occasionally painting appears. Fine Painted Wares show clear influences of Halaf Painted Ware (instead of Samarra), and their numbers slightly increase (Fig. 1: 52, 53). It has been argued that the ceramic assemblage of El-Rouj 2d is identical to a part of the so-called First Mixed Range of the Amuq sequence (Miyake 1997).

■Early pottery from the west and the east

Recent excavations in the middle Euphrates region have provided some very early pottery assemblages. The so-called Black Series (Fig. 2) recovered from Tell Halula and Akarçay Tepe seems to be the earliest pottery in this region (Faura 1996; Faura and Le Mière 1998; Arimura *et al.* 2000; Balkan-Atlı *et al.* 2002, 2004). Some of the earliest pottery at Kumartepe and Mezraa-Tereilat might correlate with the Black Series (Le Mière and Picon 2003: 187-188; Karul *et al.* 2002). Pottery of the Black Series is characterized by a large amount of calcite or mica tempering and a black-colored, burnished, surface.

In the upper Khabur region, traditionally the earliest pottery was believed to be represented by Proto-Hassuna ceramics such as found at Tell Kashkashok II and Tell Khazna II. However, recent discoveries of very early pottery at

Fig. 2. *The so-called Black Series. 1, 2: Akarçay Tepe; 3-6; Tell Halula (Arimura* et al. *2000; Faura and Le Mière 1999).*

Tell Seker al-Aheimar have changed this picture (Le Mière and Picon 2003; Le Mière in this volume; Nishiaki and Le Mière 2005). As is clear from the stratigraphy at the tell, some pottery is obviously earlier than Proto-Hassuna ware. At Tell Seker al-Aheimar dark-colored wares with volcanic mineral tempering are predominant in the earlier levels just above pre-pottery layers. Through time pottery tempered with plant material gradually increases.

Another region where very early pottery has been unearthed is the upper Tigris region, notably at Salat Cami Yanı (Miyake *et al.* 2009; Miyake in this volume). Two ware-types earlier than Proto-Hassuna ware have been discovered: from the lower layers a burnished ware, characterized by a large numbers of minerals as temper; from the upper layers a slightly brittle ware, with a smoothed surface and plant temper. In addition, recent excavations at Tell Sabi Abyad I in the Balikh Valley in northern Syria revealed very early pottery showing some resemblances with the earliest pottery in the middle Euphrates (Akkermans *et al.* 2006; Nieuwenhuyse 2006).

The Black Series in the middle Euphrates and the earliest pottery in the Balikh, the Khabur and the Upper Tigris are reminiscent of Kerkh Ware in a number of respects. First, although the types of mineral varied, all these wares are marked by mineral tempering. Second, commonly, dark-to-black colored surfaces are burnished, with decorations appearing rarely only. Third, vessel shapes are simple, consisting almost only of bowls whose diameters measure around 20 cm. In addition, vessel walls are relatively thick, measuring about 10 mm. These common characteristics suggest that in a vast area (from the Mediterranean coast to the Syrian Jezirah and the Taurus foothills: see Fig. 3) the earliest pottery in Syria and southeastern Anatolia was produced in a similar fashion.

This distribution contrasts with clay vessels found in the Pre-Pottery Neolithic (PPN) period (Fig. 5). At many PPN sites in the Near East vessels of brittle clay, both unfired and fired, have been discovered in "pre-pottery." Such material was also found in Syria and southeastern Anatolia (e.g. Cauvin 1974, 1977; Özdoğan and Özdoğan 1993). Characteristically, these clay vessels show various ideosyncratic features and few common aspects, not only between each site but also at the same site. The only common aspect, I believe, is the use of a relatively primitive production method. In contrast, techniques for the earliest pottery manufacture in the late Neolithic period are quite sophisticated, and, as noted, they seem to be standardized.

Finally, the 2005 excavations at Tell Sabi Abyad I in the Balikh Valley in northern Syria revealed very early pottery showing some resemblances with the earliest pottery in the upper Euphrates and the Khabur regions

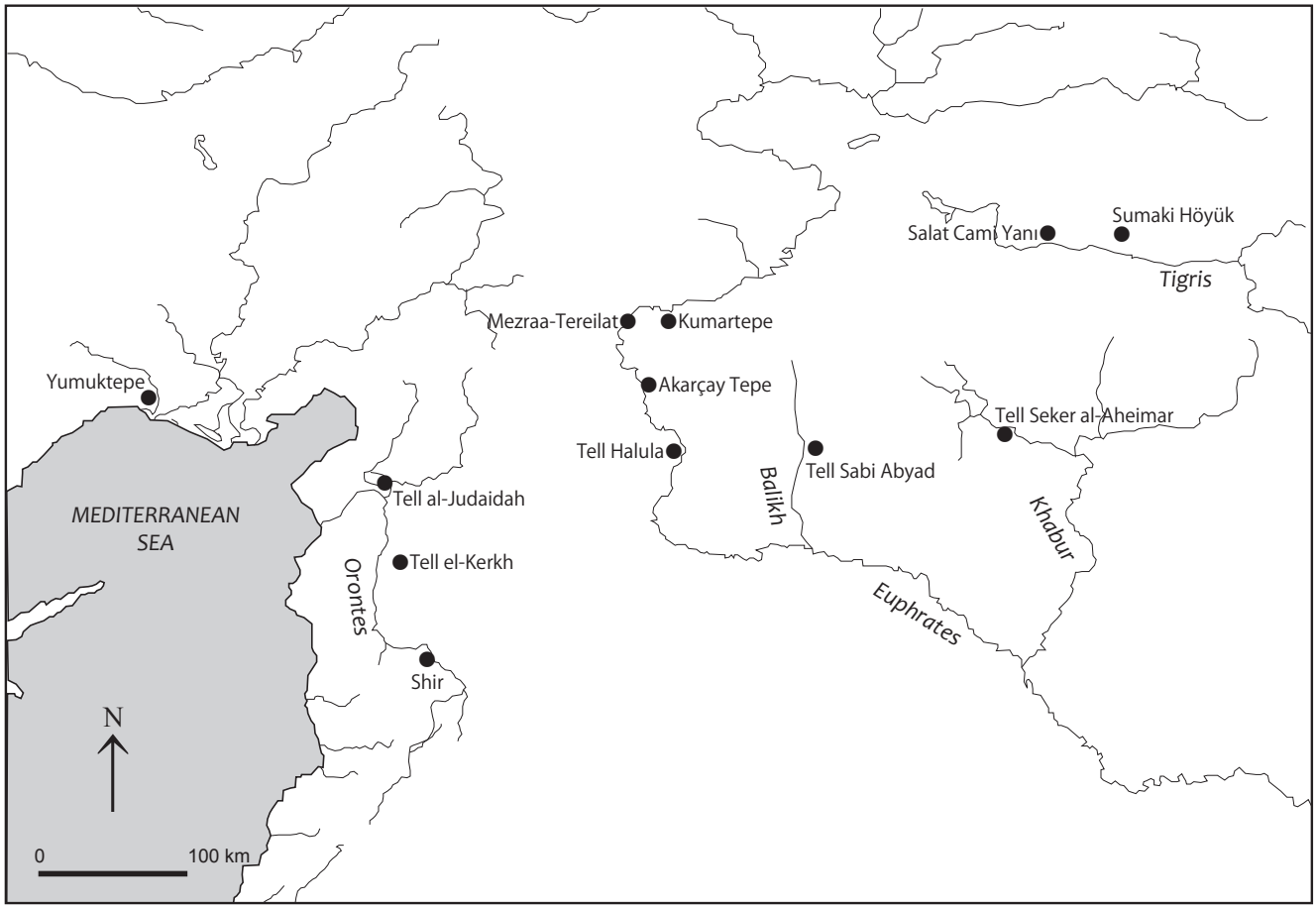


Fig. 3

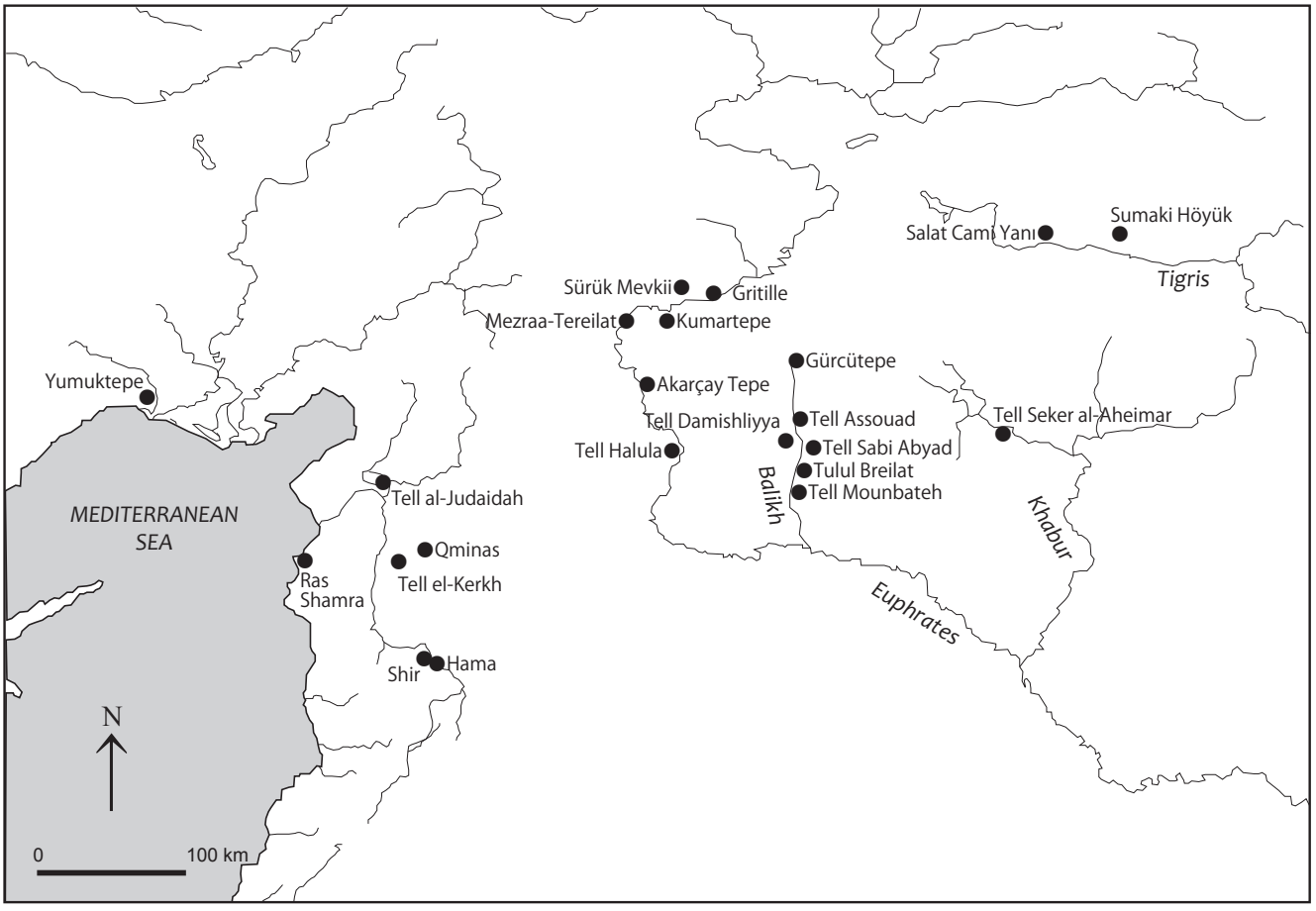


Fig. 4

Fig. 3. *Sites with very early pottery.*
Fig. 4. *Sites with succeeding pottery.*

(O. Nieuwenhuyse, pers. comm.). Thus, I suggest that standardized manufacturing techniques were also employed for the earliest pottery in the Balikh region.

■Late pottery from the west and the east

At most of the sites where early pottery is retrieved later pottery is found as well (Fig. 4). In the middle Euphrates region, ceramics succeeding the Black Series is a plain plant-tempered ware, with relatively thick walls and a lightly burnished surface. Similar pottery is found at Sürük Mevkii and Gritille at the Anatolian Euphrates (Stein 1992; Voigt 1985), and at several sites in the Balikh region, for example, Gürcütepe, Tell Assouad, Tell Damishliyya I, and Tell Sabi Abyad I and II (Beile-Bohn *et al.* 1998; Cauvin 1972; Le Mière 1979; Akkermans 1989; Le Mière and Picon 2003: 185; Nieuwenhuyse 2001). In the upper Khabur region, at Tell Seker al-Aheimar, plant-tempered ware dominates in the ceramic assemblage, which succeeded the earliest - mineral

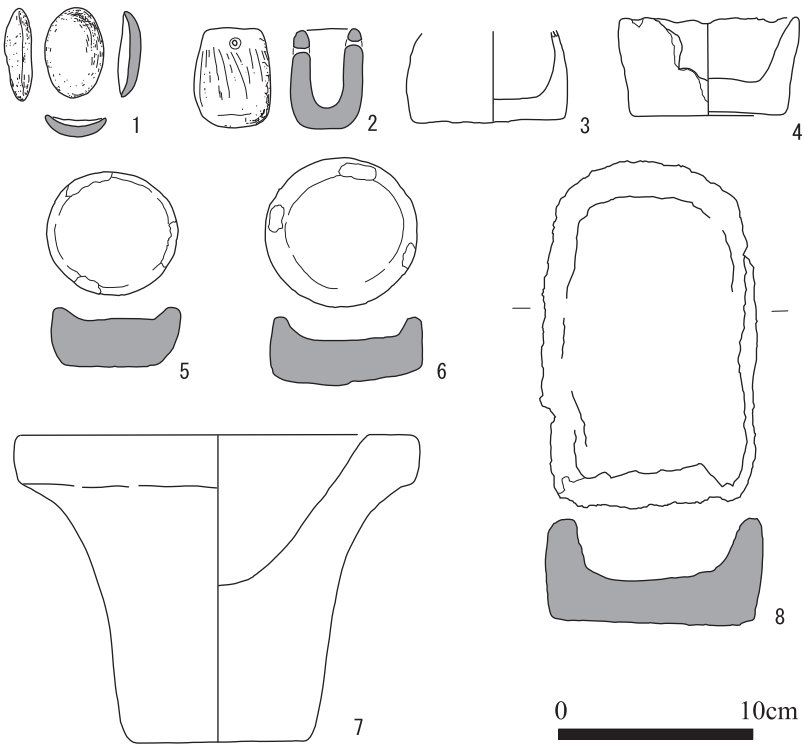


Fig. 5. *PPNB clay vessels. 1-4: Tell Mureybet (Cauvin 1977); 5-8: Çayönü (Özdoğan and Özdoğan 1993).*

tempered - pottery. This is also the case in the upper Euphrates and the Balikh regions. It also holds for pottery at Salat Cami Yanı in the upper Tigris region (although surface treatment changed, as mentioned above).

The transition of the use of mineral to plant inclusions for temper is a common phenomenon in the area from the upper Euphrates to the upper Khabur and the upper Tigris. In contrast, in the northern Levant and Cilicia, mineral tempering continues to be used in DFBW (although the size of mineral particles becomes smaller through time). It has already been indicated that Kerkh Ware and other contemporaneous pottery in these regions apparently belongs to the earliest phase of the DFBW tradition (Tsuneki and Miyake 1996; Miyake 2003; Balossi 2004). In the East, on the other hand, the later pottery seems to be quite different from the early ceramics, and also from the DFBW, in the West. In this later stage, then, crucial regional variations appear in ceramic assemblages, foremost marked by the occurrence of DFBW in the West, and by plant-tempered wares in the East. The border dividing the West from the East was probably located somewhere between the Euphrates and the Qoueiq (Miyake 1995).

Since the emergence of the above-noted regional variation, plant-tempered ware remained the most major ware-type in Neolithic ceramic assemblage of the East. However, the appearance of Fine Painted Ware, i.e. Samarra and Halaf painted wares, indicate a drastic change in the production and use of pottery. As the results of the excavations at Tell Sabi Abyad I in northern Syria show, Samarra Fine Painted Ware had a dominant position in the ceramic assemblage, and gradually it was transformed into Halaf painted ware, which far exceeded coarser wares (Le Mière and Nieuwenhuyse 1996). This change from plant-tempered wares to Fine Painted Wares can be observed in the whole of northern Mesopotamia.

At the same time, in the northern Levant and Cilicia, the DFBW tradition continued, although it was influenced by manufacturing techniques of Fine Painted Ware from the East. Therefore, it seems that, as in the earlier period, there was considerable regional variation between the West and the East. The noted variation in the appearance of Fine Painted Ware might simply depend on the distance from the homeland of Fine Painted Ware, which was probably in Mesopotamia. In addition, it can also be explained by the fact that preceding local pottery manufacture in the West was quite different from the East, as noted above.

I have distinguished Coarse Ware versus Fine Ware in very early ceramic assemblages in the West. It is recalled that Fine Ware is represented by Kerkh Ware and DFBW. As they had their own ceramic traditions, potters and

communities in the West were influenced by, rather than swept over, Fine Painted Ware from the East. Thus, DFBW was maintained, but its vessel shapes and decorations were transformed.

■Concluding remarks

As indicated, the marked resemblance of the earliest pottery across regions collapsed in the succeeding period, and regional variation arises; manufacturing techniques continue in the West, but in the East, they change drastically, especially with regard to temper. This crucial variation influenced the appearance of Fine Painted Ware.

It should be emphasized that pottery was widely distributed after the emergence of regional variation. Especially in the East, pottery was distributed in sites stretching from the woodlands or steppe-forest around the Taurus foothills to the dry steppes of the Jezirah. In the West, on the other hand, sites with pottery were largely limited to forested areas. The change of pottery in temper from mineral to plant in the East was perhaps related to the environment; in the vast steppes fuel for firing pottery is relatively limited. According to the results of excavations at Salat Cami Yanı, plant-tempered wares from the upper Neolithic layers are quite fragile, and are incompletely oxidized, as shown by black section profiles (Miyake 2005: 23). This suggests that firing temperature was lower than that for the early pottery with mineral tempering. Thus, plant-tempered wares needed less fuel for firing, when compared with mineral-tempered wares. According to my own observations, at least Kerkh Ware and the majority of DFBW were probably fired in a reduced atmosphere that required good facilities, such as kilns. Firing of Neolithic mineral-tempered wares takes a relatively large amount of fuel. Adaptation to an environment with steppe vegetation, then, might be one of the reasons why plant-tempered wares, instead of mineral-tempered wares, dominated in the East.

Although I have emphasized regional differences, there were also some, but much less, similarities. For example, lugs, handles, or horizontal applied bands commonly appear in both the West and the East. These traits are basically functional applications; decorative elements are rarely added. It can be suggested that these appliqués served as grips, making vessels suitable for transport, although pottery must have served for cooking and storage purposes (cf. Moore 1995; Le Mière and Picon 1998, 2003; but generally vessel size of early pottery is too small for them to be used as storage containers: Odaka 2005). Transportation of products by means of pottery was probably stimulated by the increased production of commodities in established Neolithic farming communities. However, considering the small

vessel size noted above, long-distance transportation by means of pottery is questionable. Some scholars, though, have argued for the possibility of imported pottery in the early part of the Late Neolithic (Le Mière and Picon 2003: 185; Miyake 2003: 127).

To conclude: important recent discoveries of very early pottery are changing our ideas of the technological, social and economic roles of ceramics in the Late Neolithic of the Near East. However, many dimensions of early Neolithic pottery are still obscure. It seems to me that valuable new insights can be obtained by further exploring the noted inter-regional relationships in production, use and spread of pottery. In addition, further experimental studies and chemical analyses are needed to identify the potentially diverse functions of pottery. Foremost needed are detailed regional studies of diachronic developments in pottery, placing it in its proper socioeconomic contexts. Comparison of similarities and differences, moreover, will be crucial to a better understanding of the functions and meanings of pottery during the Late Neolithic in the Near East.

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CHAPTER 14

The Jeziran Neolithic "market"

Stefan Karol Kozlowski

■What…

It all began 9000/9500 years ago, in the second half or rather at the end of the 8th millennium BC, in a small village of rectangular mud houses on the Balikh River. Or was it the Khabur? One day a Stranger arrived, bringing with him attractive commodities from far off lands — color beads, small stone pots, things made of a glistening Turkish obsidian, excellent, high quality flint arrowheads, stone axes and Syrian querns of basalt. It was there and then, and for the first time in the world that mass production and far-reaching distribution of various goods was organized, giving rise to the first market. It was then that the Neolithic Revolution was fulfilled.

The central part of the Fertile Crescent , that is, the Jezirah, was one of these "markets" and one that was possibly the best organized parallel to the South Levantine one.

■Where…

Jezirah is Arabic for island. It is a vast (c. 120,000 km^2) and flat region, turning into a plateau toward the north (another 50,000 km^2, known as the High Valleys), where today's border between Syria and Turkey runs. On the far north it was limited by the ridges and peaks of the Zagros and Taurus mountains, on the south by the deserts of Syria and Arabia. It was a steppe, therefore rather arid, forming a great (Golden) triangle, organized along the two mighty rivers, the Tigris and the Euphrates, both taking their source from the Taurus Mountains.

In those times the hill and mountain slopes in the north were densely wooded, as were isolated gebels running from east to west (Sinjar, Abd-al-Ariz); finally certain regions of the plateau (High Valleys). The rest was taken over by steppe.

Added to this are two, perhaps the most important elements, that is, external borders of the region and its inner communication structure. These boundaries restricted village settlement to the narrow zone in the middle of the Fertile Crescent, reaching in width from 100 km to a maximum of 300 km, that is, the distance as the crow flies from the Taurus slopes in the north to the edges of the desert in the south. Isolated villages could be found in the landscape of both the hills (Jarmo, Shimshara, Cafer, Böy) and the desert (El Kowm oasis), but they were still an exception in these regions, with the major focus of development being the Jezirah. Settlement is located naturally on water reources, which are not that abundant in this area. These water courses, meaning rivers and exceptionally also big wadi or lakes and

springs organize the pattern of settlement in this entire region, dividing up the territory into "wet", meaning fertile and inhabited areas, and arid, non-fertile, deserted land (Fig. 1).

The water courses in the Jezirah include foremost the upper and middle Tigris and Euphrates (flowing generally from the northwest to the southeast, more or less latitudinally) and their tributaries, mostly left-bank (Smaller and Greater Zab, Khabur, Balikh, running rather longitudinally, very much like the longitudinal Syrian stretch of the Euphrates), finally the bigger wadis (Tartar and Aqiq) and the two latitudinal branches of the Upper Khabur (the Khabur itself and Er-Radd).

The result is a network of connections, existing even today, with bigger or

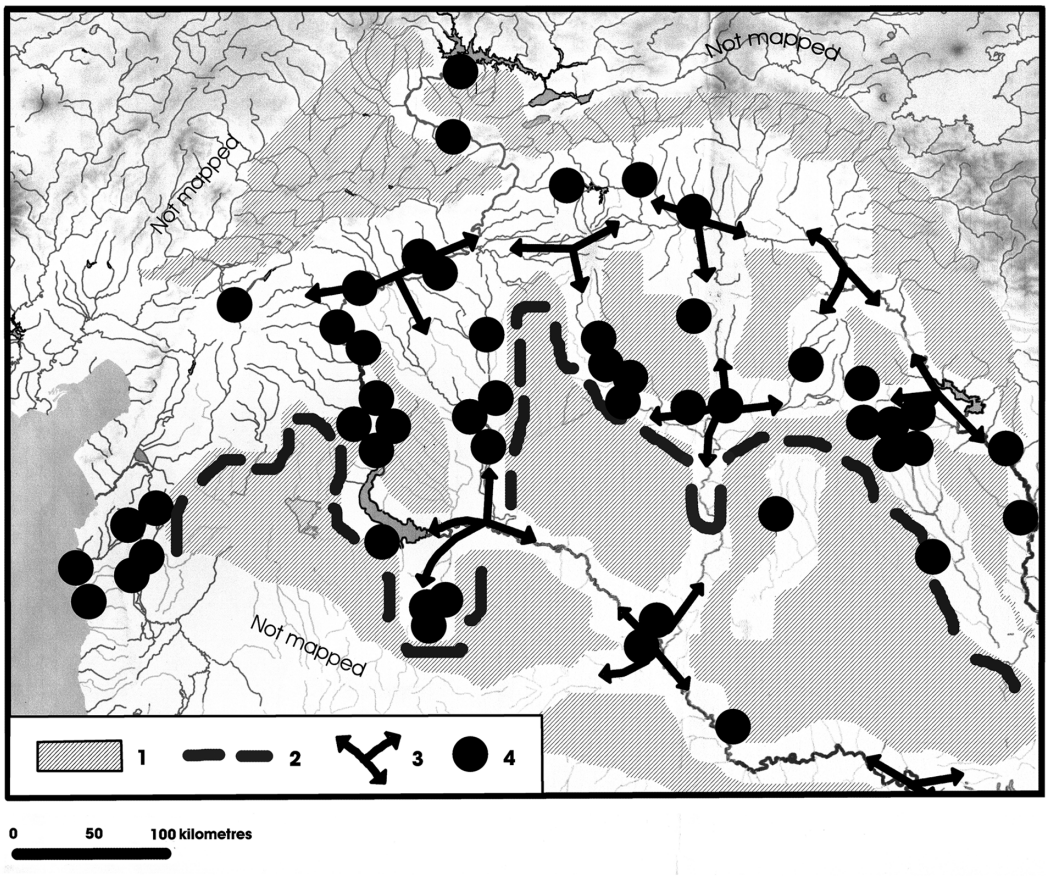

Fig. 1. *The Jeziran and North Levantine LPPNB/PN/Early Chalcolithic permanent settlement.*
1. Empty/non permanently settled spaces
2. Border between permanently settled and deserts territories
3. Main "cross-roads" in the communication "corridors"
4. Excavated tells/villages

smaller "islands" of aridness, meaning emptiness (between the Balikh and Khabur and east of the Lower Khabur, up to 100 km on the E-W line, and 150 km between the Balikh and the Khabur). South of the Middle Euphrates there is just one big empty "island," a deserted No Man's Land with no permanent settlement.

Neolithic villages sprang up along the lines of this network, which were (and remain) natural "corridors" of communication. Today's landscape bears witness to these villages in the form of tells rising at the edge of the plateau or on the valley bottom. These tells, the bigger multi-layered ones reflecting settlement lasting for many centuries and concentrations of smaller ones from different periods and not as enduring in time, appear at an average distance of 0 – c. 40 km from one another. Their location, usually where a wadi empties into a river (our "corridor") and at the cross-roads of communication passages, appears to be dictated by strategic rationale.

Now imagine the itinerant artisans (and peddlers, too?) traveling from village to village along these tracts and everything becomes clear …

■When…

The stratigraphy of multi-layered sites coupled with numerous radiocarbon dates set the starting point for this trade in the LPPNB, that is, more or less in the second half of the 8th millennium cal. BC. From LPPNB contexts come the oldest finds of objects in question (our "commodities"), excluding a few later dated pieces (like the small spouted bowls of stone; cf. Fig. 2).

Thus, the beginnings of the phenomenon, even keeping in mind the limitations of available dating methods, appear to be set in time more concretely that many would like to concede. The present author is even inclined, but only intuitively, to consider the very end of LPPNB as the period when it all began.

Once initiated, the phenomenon endured for a very long time. As recently published cartograms (Kozlowski and Aurenche 2005) demonstrate, it lasted into the classic Halaf period, actually even the Ubaid culture, but the latter is beyond the scope of this paper. Architectural and pottery styles changed, but the system once created endured unmodified. Innovative in the second half/end of the 8th millennium cal. BC, it quickly turned into routine and only the list of itinerating goods changed to keep up with the needs and demands of the participants in this exchange. In the period in question, the list changed insignificantly, with the spouted stone vessels putting in an appearance in the 7th millennium.

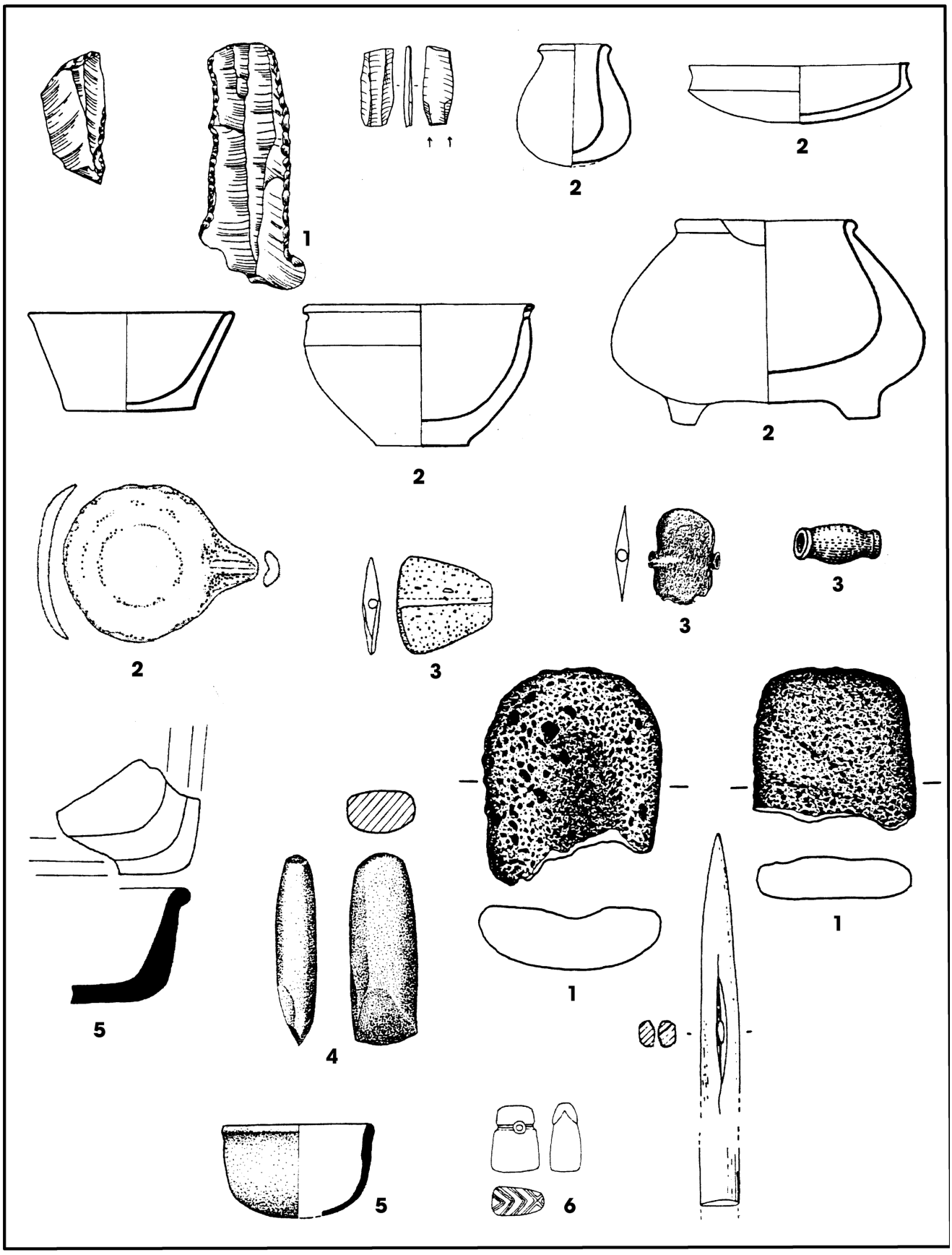

Fig. 2. *The main circulating "market" goods (Numbers refer to the maps on Fig. 3).*

■Goods

The list of goods in circulation is sizable and includes the following overall groups (to be analyzed in detail later on in this paper): highly specialized objects of everyday use, jewelry accessories, prestige objects (used in the burial ceremonies, for example), made of specific raw materials, of special size or locally unavailable at a given time (e.g. obsidian), or requiring specific properties of the material (like the porous stone needed for grinders), or simply impressive to look at (banded alabaster/marble, other colored or decorative stones for small pots and beads).

The following is a detailed, although surely incomplete list of goods and commodities in circulation:

- obsidian (pre-cores, cores?, blades);
- good quality flint (pre-cores, cores?, blades, arrowheads?, sickle-inserts) ;
- small stone vessels;
- basalt querns and pestles;
- stone celts, including miniatures;
- stone beads;
- white ware? and perhaps Mureybet-type needles;
- some luxury clay vessels.

Some of the traded goods were stamped with seals (with hole) right from the start (Buqras).

The author is inclined to consider the existence of far-distance circulation of listed goods on the following premises:

- The manufacture of these commodities is evidently based on highly specific and often exotic raw materials (exotic as much in appearance as in the source).

- Technical production standards are very high, including techniques of specific chipping (pressuring), turning, piercing, polishing stones, knapping/forming of celts; it is unlikely that the small farmer had practical knowledge of such techniques, especially in application to large sizes (cores) or materials difficult to process because of their hardness.

- Technical limitations are no obstacle in maintaining the high quality of these circulated goods, which demonstrate a surprising regularity (e.g. width of blades, cf. Kozlowski 1999, arrowhead shape,

stone vessel size). Difficult to make stone vessels are especially conservative in their shape.

- Procurement of raw materials (at least the commonly occurring ones, like obsidian, banded "alabaster/marble", porous basalt) is linked to specific deposits; e.g. obsidian from southeastern Turkey, Syrian basalt. Somebody had to transport the raw material mined or collected in these places (or products made of this material) even to the farthest villages.

- Secondary information suggesting or confirming the existence of specialized workshops producing semi-products or ready goods stands in favor of the idea (in the case of obsidian and flint, see the flakes-to-blades ratio on village sites, suggesting that blades were produced elsewhere (Nishiaki 1993; Kozlowski 1999); the flint and obsidian mines in Cappadocia, Ain Ghazal and Ramat Tamar, workshops in Cappadocia, Douara Cave and Azraq Basin, Mesad Mazzal, finally caches of pre-cores and cores (Cayönü), and hand-picked blades (Kerkh, Beidha); bead semi-products and borers from Mezraa Teleilat and Kerkh; stone vessels from a workshop in Buqras, Basta or Jarmo?; the deposit of (traded?) goods in the "burned house" in Buqras.

The present article does not go into other "segments" of this "market", but one should also mention here the production and distribution of stone bracelets (Baaja, Jarmo) and the production and perhaps also distribution of tokens (Kozlowski and Aurenche 2005).

Considering all of the above, the existence of an organized *system* already in the LPPNB seems apparent and the Jezirah is a regional "leg" of this system.

■How…

The system connects two points, the point of origin (e.g. raw material outcrops) with the point of destination located in some distant village. Goods, whether raw materials, semi-products or ready products, have to be transported from the "village of producers" to the "village of consumers" and someone has to do it. First extract the needed kind, size or appearance of raw material, then subject it to pre-processing, i.e. pre-forming of pre-cores, pre-knapping of celts, pre-forming of beads etc., in workshops either on the spot or at some distance from the mine (in a village on the way to the "market", for example).

Further processing and finishing of the products took place next: blades were retouched and formed into tools, stone vessels were turned and polished, stone celts given a shine, and beads pierced and polished. We are not quite clear on where this process was located, although we know that a significant part of the production of actual objects was located outside the villages. Some work was done in the villages as well.

Barring details, which escape us still, the model must have been as follows:

outcrops/mines/workshops procuring raw material
↓
transport of raw materials, half-products and ready goods to nearby villages/ workshops
↓
production of half-products and ready goods for exporting
↓
transport to the "market" in distant villages
↓
selling on the "market"

How else can one explain the phenomenon, if not by the working of a model similar to the one presented above?

■Roads in the wilderness

Circulation must have followed literally beaten tracks, this in view of the existence of settled river valleys separated by arid and most likely uninhabited regions. The motivation needs not have been negative in view of the size of these arid areas (between the Khabur and Wadi Tartar - 50 km) and the communication difficulties, although this must have been a deterrent to some degree. It was purely positive, following the demand; the peddler had a ready market for his goods in every village he passed along the way. Assuming the motivational aspect, it remains to be concluded that the road network followed the river valleys. Consequently, an analysis of the hydrological system of the Jezirah combined with the distribution of known villages and distribution of objects of interest for the present discussion, will give us the real itineraries of these first merchants (Figs. 1 and 3).

The hydrography of the region described above demonstrates potential advantages, as well as evident limitations.

The advantages include, obviously, the valley of the Euphrates (in the longitudinal part with villages in: Mezraa Teleilat, Akarcay?, Halula, ceramic

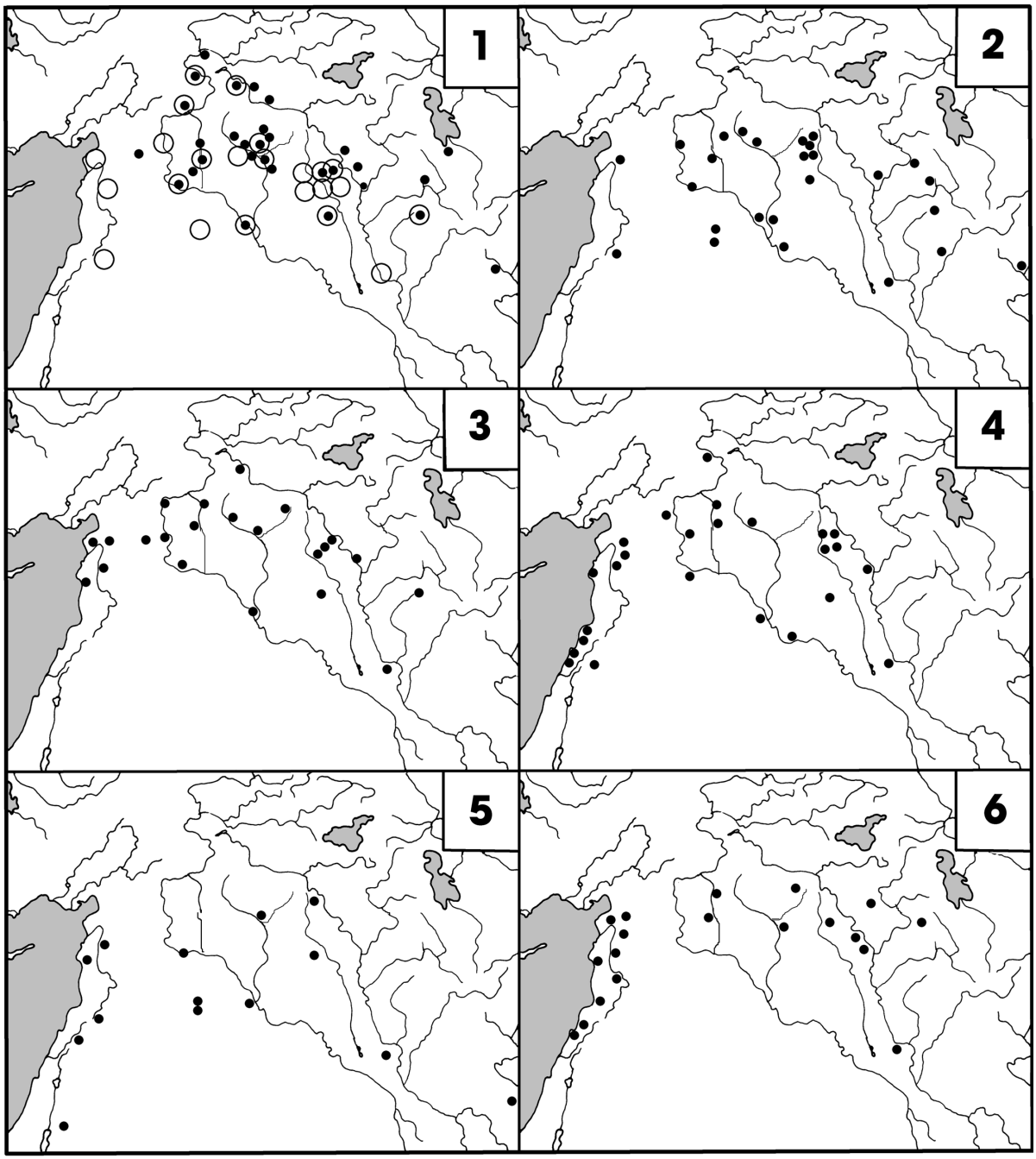

Fig. 3. *The ranges of main circulating "market" goods* (Numbers refer to Fig. 2.)*
*1. Cayönü-tools and basalt querns/ pestles**: black dots =Cayönü-tools, circles = basalt pieces (only Jeziran sites concerned).*
2. Thin-walled stone vessels
3. Beads
4. Polished axes-celts
5. White ware
6. Seal with hole

**According Kozlowski and Aurenche 2005 with new additions.*

***Basalt pieces (map 1) come from the following sites: Abu Hureyra, Akarcay, Buqras, Cafer, Cayönü, El Kowm 2, Gritille, Halula, Jarmo, Kashkashok, Kerkh, Kosak Shamali, Kül, Magzalia, Mezraa T., Ras Shamra, Sabi Abyad II, Sotto, Telul-eth-Thalathat, Umm Qseir, and Yarim II.*

Dja'de, and Abu Hureyra), that of the Balikh — also longitudinal (Sabi Abyad I and II, Gürcü and Assouad) and upper Khabur, in this case an E-W axis (Seker, Kashkashok, Feyda, etc.) connected with the Iraqi part of the Tigris (from Teluleth-Thalathat, Magzalia, Yarim Tepe I and II, Kül, Hassuna) and the upper part of Wadi Tartar (Umm Dabagiyah), further on the Smaller and Greater Zab. The entire system is connected with the Zagros (Jarmo, Shimshara). A similar connection via the Euphrates with the Taurus (Cafer, Böy) must have been less effective, the valley being deep and narrow.

Communication difficulties appear to have grown exceedingly to the west of the middle Euphrates (the Syrian stretch) where the Fertile Crescent narrows extremely and the arid regions reach the farthest north (Aleppo region). The poor local rivers, mainly the Orontes, seem not to have afforded sufficiently

good passage; hence most of the communication appears to have gone via the edge of the desert, justifying the presence of the otherwise illogically situated oasis El Kowm with its villages and the importance of the trail through Wadi Tadmur (with villages no longer existing today, e.g. in the Palmyra basin). Hence the cultural border existing, cf. Kirusli, Arowenshi, between the middle Euphrates and Orontes valleys (Kozlowski and Aurenche 2005).

Relative difficulties for passage from the northwest to the southeast and vice versa were constituted by the very narrow valley of the Tigris on the modern Iraqi-Turkish border. It "protected" the region of Mosul from excessively rapid BAI/PPNB acculturation (Thalathat in the early ceramic period is still Nemrikian!!).

The High Valleys region lying north of the modern Turkish-Syrian border appears to have been at a disadvantage in terms of communication potential compared to the Jezirah. The entire system had to be based on the Euphrates and Tigris with no medium-size tributaries available, hence the impression of handicapped exchange, which could be due, however, to an insufficient state of research. In any case, the culture of the High Valleys was never quite the same as that in the Jezirah (Kozlowski and Aurenche 2005).

The southern part of the Jezirah, on the other hand, appears to have been at a serious disadvantage regarding communication, even though the lower Khabur and the Euphrates (latitudinal stretch) flow through the region. The region gives the impression of total emptiness. German researchers located almost no Neolithic tells on the Lower Khabur (information H. G. K. Gebel, and P. Bielinski). Apart from Buqras, Baghouz and Sawwan (which were something like border-posts or merchant factories), the latitudinal part of the Euphrates flows through an arid uninviting desert between the Balikh and Khabur and between the lower Khabur and Wadi Tartar on one hand (less than 200 km) and through the vast Syrian and Arabic deserts on the other.

To recapitulate, the communication system in the west follows a N-S axis (middle Euphrates and Balikh) and a rather latitudinal one in the east (upper Khabur and Er-Radd rivers and much less the latitudinal stretch of the Euphrates).

■Elements of the system

Chipping and trading in obsidian and flint

Obsidian's special role on the Jeziran market is unquestioned as it is easily recognized (Chataigner 1998) and its sources are known, mostly thanks to M.-C. Cauvin. It spread far and wide, even to Deh Luran a spectacular 800 km away. It should be noted, however, that gadgets rather than goods traveled thus far. Obsidian as a commodity appears to be limited to the Jezirah (without its western part), where in different periods (earlier rather than later) and depending on the distance between a given site and the sources, it reaches from 30% and more (Nishiaki 1993; Kozlowski 1999). Thus, it was obviously an important raw material that was imported in large quantities and used on a large scale.

Contrary to the preceding period (PPNA/EPPNB), which was characterized on the whole by self-sufficient lithic production, mostly carried out at home (Kozlowski 1999), in the case of obsidian we are dealing with a different situation. Tool assemblages from sites demonstrate an evident overrepresentation of retouched tools and blades (including evidence of remakes, repairs and use, e.g. side-blow flakes and Çayönü tools) contrasted with low debitage indices. Obviously, at least part of the production was executed "away from home" and most likely also outside the village, very possibly in specialized workshops.

Beside blades (and retouched tools), the village market also absorbed pre-cores (e.g. Çayönü) and cores; these could be exploited "at home" to satisfy current needs.

The Jeziran peasants seem to have been unable to master the complicated core exploitation techniques of the times (pressure chipping in the east and also locally in Cafer, especially with respect to oversize specimens which became the trend in the period, naviform in the west), not to mention difficulties in access to sources, by which I mean not only the distance, but also possible ownership issues.

Later (e.g. upper layers in Magzalia), at least in the south-central Jezirah, obsidian clearly lost its importance to the advantage of high-quality flint. Even so, flint continues to be a selected raw material, just like obsidian, with the best quality being sought. Mostly through mining from original sources (e.g. mines at Ain Ghazal in Jordan and in southern Israel). The archaeological record is again characterized by a deficit of flakes. The potential for procuring large-size concretions of good raw material locally,

increasingly more apparent to local communities, slashed at long-distance trade, cutting down the distance from villages to sources of raw material. The system appears to have reorganized itself automatically, obsidian prevailing in the north where it would have been perceived as a local material and all but disappearing from the south where people started using raw materials within their reach. Nonetheless, all the fundamental parameters (except the distance) seem not to have changed. Flakes continued to be underrepresented and blades especially overrepresented on village sites; caches of hand-picked blades appeared (Beidha in the south, but also Kerkh - 2 cases, in the north) and flint workshops exporting blades and cores (?) were operational (Douara Cave, D. Baird's sites in Jordan).

Naturally, since flint sources are not as well researched as obsidian ones, we can identify trends, but a more precise description of the phenomenon escapes us at present.

A separate issue altogether is the production and distribution of ready-made retouched tools, by which I mean two highly specialized tool groups: arrowheads/projectile points and sickle inserts. This has nothing to do with the villagers' skills in more or less professional flint chipping, which they must have done on a regular basis in their villages in the course of everyday use of their scrapers, burins and other retouched blades and *ad hoc* retouched flakes.

Projectile points are represented in the Jezirah of the period by two principal types, Byblos and Amuq, with the Jericho type prevailing farther to the south and the Aswad type in the west. All are of considerable size and strongly standardized, and all were made of excellent imported raw materials. Their role in Kfar HaHoresh and some specific individual features merit attention. The question is, could these highly standardized (Gopher 1994) and beautifully aerodynamic (a feature important from the point of view of their function) projectile points be produced individually or were they rather the work of professionals? The same can be said of sickle inserts, both the triangular type and the Jarmuk thinned-blade type (J. Cauvin considered them as traded goods, 1994). After all, the parameters of inserts had to be ideally suited to the sickles.

Let's imagine the following scene. The lady of the house tells her husband: John, why don't you go to the market and get me some new knives and sickle inserts? And while you're about it, you could get some arrowheads as well.

Stone vessels: Jeziran types

The most popular object in circulation beside obsidian were stone vessels. They occur in the southern Levant and in the Jezirah from the Mediterranean Sea in the west (Judaidah), and the Syrian Middle Euphrates (Abu Hureyra) to the Zagros Mountains and the piedmont regions in the east (Jarmo). Some 800 km in a straight line! In the Syrian Desert, they are found only in the El Kowm oasis and in the north, the said types are apparently all but absent (or rare?) from the High Valleys (!), giving a range of 300 km in the north-south line.

The vessels in question are small pots represented by four different types, 5-7 cm high on average, made of ornamental or colored and soft kinds of stone. Petrographic studies have yet to be made of this material, but it can be said for now that the pots were made in part of a soft whitish or creamish stone with characteristic banding or veining of reddish/pinkish or brownish color (Sawwan, Buqras). It has been referred to in the literature as "marble" or "alabaster" and is believed on the grounds of macroscopic observation to originate from a single unfortunately unidentified source or outcrop. Other raw materials include, among others, basalt and greenstone.

The pots appear to hold some cultic or prestige significance, because they are found commonly, for example, in the already famous children's graves at Sawwan (usually together with figurines made of the same material) and in a single case of a grave from Kerkh. They are first observed in the LPPNB (Umm el-Tlel, Magzalia, El Kowm 2) and continue unchanged at least into the classic Halaf period and perhaps longer.

Starting in the end of the 8th millennium cal. BC, four types of these pots are as follows (Fig. 2: 2):

- S-shaped profile with narrow mouth and bulging body;
- shallow profiled bowls with vertical walls;
- wide-mouthed jars with profiled neck;
- footed jars.

Flat round spouted bowls will be added to this repertoire in the Halaf period, as well as a number of other forms along the way (but rather in the late period), hardly well studied because of their rarity (Yarim II, Sawwan etc.).

Two features of these vessels are striking: repeatable formal standard and high quality of execution. Both indicate a professional workshop (already known from Buqras and perhaps Jarmo?), working for the purpose of

"selling" its products, possibly with the use of a turning technique. Similar professional producers of stone pots are known from, e.g., Basta in Jordan. Other professional artisans producing stone bracelets are known from Jarmo and the Jordanian Baaja. The chronological horizon for these phenomena starts in the LPNNB or slightly later.

In this context, the rich set of luxury pots found in the "burned house" at Buqras (of later date) suggests that the building had been used by a producer of these stone knick-knacks or else a dealer in such pieces, among other goods, in other words, it could have been a shop. Hardly to be excluded in this period of specialized production and far-distance trade.

Small flat-bottomed vessels of stone

Small thin-walled and flat-bottomed vessels of stone (type H at Jarmo; Fig. 2: second row, left) appear to have been of somewhat different status. They are consistently not to be encountered in either the High Valleys or the Jezirah, but they start appearing in the LPPNB in the east (Sawwan, Jarmo) as well as in the west (Kerkh, Byblos, also Munhata and Abu Gosh!). A larger variant is also present on the southern edges of the Jezirah, but in this as in other cases, the emptiness west of the Khabur is characteristic.

Assuming the voids are not accidental and that the parallel occurrence of similar specimens in the east and west is not mere correspondence, we have to look for communication passages between the two areas where this type of stone vessel is found. One such road would be Wadi Tadmor passing through Palmyra, the traditional trail joining Mesopotamia and the Levant, penetrated by people in the LPPNB (BAI/PPNB campsites discovered by the Japanese expedition).

Basalt querns and pestles

Flat basalt grinders proliferated at about the same time as the other goods making up this circulation system, but unlike the beads or pots, which were considered as gadgets or prestige-related objects, the querns and pestles satisfied a real need. They continued to be exchanged until the Ubaid period at least (like the pots) and perhaps even longer.

The raw material, a porous black basalt, used to make these thin, oval or rectangular slabs with a flat working surface was extracted from sources of known location (Syria), making it possible to reconstruct circulation patterns. These radiated from Syria in all directions, reaching Umm Dabagiyah in the east and Ramad in the west, together with some basalt pots and other stuff.

Celts with rectangular cross-section

Known almost exclusively from the LPPNB-PN period, they occur throughout an extended Golden Triangle from Beirut and Judaidah to Cafer, Hassuna and Sawwan. Made of different kinds of stone (diorite, gabro, dolorite, etc.), these trapezoidal and rectangular celts with rectangular cross-sections demonstrate a fairly limited distribution compared to the ubiquitous oval-sectioned pieces, which are of generally earlier date. The idea of specialized production and far-distance distribution is based on the criterion of imported raw materials and the complicated/specialized production itself, as well as considerable standardization of the pieces. It could also concern the mini-celts made of different colored rocks, greenstone among others.

Stone beads

Of the flat beads – oval, rectangular, butterfly, triangular – the latter two are distinctive because of their limited distribution compared to the other two, which occur over larger areas. These two are limited practically to the region between the Sawwan-Jarmo line and the Mediterranean coast. Also unlike the first two types, they are limited in time almost exclusively to the L PPNB/PN period. Butterfly beads reach the High Valleys (Cayönü). Barrel-shaped beads with tube represent the same territorial and chronological range.

Little is known of the raw materials, which have to be striking and naturally differentiated. The flat types were produced, for instance, in Mezraa Teleilat and in Kerkh.

Other products

There is no way of ascertaining whether the alleged "market" was also open to other products, like the bone needles of Mureybet type occurring from Jarmo to the southern Levant and the figurines of "charming gazelles" found from Abu Hureyra to Magzalia. Both types are almost exclusively of Late Period date.

Globular thin-walled stone vessels were probably also traded, but their territorial range exceeds the Jezirah. Nor should we forget the alleged trade in luxurious (e.g. Samarra) pottery.

White ware

Brittle white ware would seem the last thing anybody would want to

transport for any distance, and yet two types, rectangular and simple/globular, are fairly widespread, the former from Abu Hureyra to Sawwan, the latter from the Orontes river to Deh Luran (!), both from the Late Period. The first type is also known from the High Valleys. Possibly it was not the pots that traveled but their producers, who manufactured them on commission, each time on the spot where they were found?

Seals

Known already from the PPNB period from Buqras, in the later period seals occur in a zone from Byblos to Sawwan and Banahilk, avoiding the Haute Valleys (?) and marking their function in the trade with the famous seal impressions from Sabi Abyad I and Buqras. The Sadi Abiad example indicates that they were used on containers with goods transported for long distances. Could there be any more explicit proof of our theory?

■Who…

We have seen that these goods were the object of long-distance exchange (all of 400 km for the obsidian from Eastern Turkey being brought to the Jezirah!), meaning they were circulated from the source deposits as raw material, half-product and ready-made object to the target village. The transfer of goods from point A to point B required considerable organization (see the section on How…), a whole chain of activities, in which the last link was the "salesman", the man who actually brought the goods to the door, or to the local market.

Who is this man? There is more than one possibility and each is more or less probable. The most traditional but simultaneously least probable option is for individual consumers or groups of consumers (inhabitants of a single village) to be involved in the entire chain of events from extracting the raw material through its professional processing and transport of the ready-made goods.

Distance is the weakness in this theory, as is also the issue of ownership of the sources of raw material and the complexity of operations, at the mining as much as processing levels. Somehow I do not think that the average Jeziran peasant had it in him to accomplish the last mentioned stage.

If not personally, then through an intermediary. This projected intermediary could have been a miner, craftsman and merchant all rolled up in one, meaning a multi-functional specialist making a living of his trade (the least complex model of itinerant artisan), or else each activity — mining, crafting and selling — required a separate specialist. The former of the two options

is still functional in many places on earth and it appears to be the minimum that the Jezirah in the 8th millennium cal. BC achieved.

It is not really important whether this itinerant artist knocked at every door or whether he set up trade at local markets and fairs. Neither is it really important whether this traveling man traded in the one commodity he produced or in several commodities (which would make him a peddler). What is important is that such a man appeared and did what he did. Nothing was the same after that. From now on, Jeziran culture developed not only under the influence of local production and traditions, but often a chunk of this culture could be bought on the market. This is what the Neolithic Revolution was all about!

■Old deal, new deal

In the periods preceding the events described here, the Jezirah was not a

West	East
Jordan points	Nemrik points
Aswad points	Backed pieces
Byblos points before 7500 cal. BC	Geometrics
Jerf el-Ahmar points	
Nevalı Çori points	
Sheikh Hassan points	
Mureybet points	
Qaramel points	
Hagdud truncations	Dominant conical and "bullet" cores (single pieces west of this region)
"Herminettes"	
"Pedunculated" pestles Decorated "shaft straighteners"	
Thick-walled decorated stone vessel with sophisticated motifs	Thick-walled decorated stone vessels with simple motifs
Stone figurines	
Bone hooks with hole	
Small decorated oval plaquettes	

cultural entity, but was evidently and deeply divided. Without going into the details of the earliest and least researched divisions (Natufian-Zarzian-Trialetian), let us go to the better known Early Neolithic Period, largely corresponding to the Levantine PPNA and EPPNB, that is, the 11th-9th millennium cal. BC.

The two cultural zones, eastern and western, formed in those times were strongly contrasted typologically, as the table below nicely illustrates.
The border between the said zones is easily traced between the Khabur and Balikh, and runs longitudinally with little mutual penetration (isolated finds of Nemrik points and conical cores on the Syrian stretch of the Euphrates).

In the region east of the Balikh at the turn of the Pleistocene, the prevailing culture is the Nemrikian, which originates from the Zarzian, and further to the east, its cousin, the Mlefatian, lasting unchanged, the first until the 7th millennium cal. BC, the second much longer (Kozlowski 1999). The case is different for the western zone, which is a dynamically changing unit ("Khiamian"-Mureibetian-Aswadian-BAI/PPNB), constantly under transformation and with a sequence of changing projectile points (Khiam – Sheik Hassan - Aswad – Byblos/Amuq). Two different worlds, one is tempted to say: different art, different accessories, different stone vessels, different architecture. Two different worlds that know little about one another and are not really interested in maintaining any kind of mutual contacts (maybe with the exception of the sanctuary at Göbekli which is visited by both sides).

From the second half/end (?) of the 8th millennium cal. BC, that is the L PPNB period, the situation changes diametrically, with elements known earlier in the west starting to penetrate into the east. These are primarily new flint technologies and typologies, invented on the banks of the Euphrates in the EPPNB, that is, the Big Arrowheads/PPNB Industry with its change of object size, technology and system of supplying raw materials (obsidian included!). A number of characteristic types of products appeared in the east, mainly Byblos and Amuq points, but also rare naviform cores and especially big blades (Çayönü tools), which compete with the local Nemrik points, backed bladelets and geometrics.

The flint industry in the east changes into BAI (Iraqi BAI or Jeziran; cf. Kozlowski and Aurenche 2005) without losing important traditional elements, such as single platform cores with pressure technique, Nemrik points and geometrics. Moreover, the extreme northeastern variant of Nemrikian remained virtually unchanged until the early pottery period (Thalathat).
Anyhow, the east-west border had been overcome with the eastern Jezirah

taking on some occidental traits and mutual contacts becoming quite lively. Goods start being moved interregionally, west and east along longitudinal trails, giving rise to the Jeziran market with its elements of relative cultural unification and greater border transparency.

Profession of faith

Earlier considerations, supported by some general anthropological and historical experience, incline the present author to hypothesize about certain parallel processes of Neolithization occurring in the 8th millennium cal. BC, parallel to the actual domestication of plants and animals. Among these, long-distance distribution of specific goods played a role of considerable significance, regardless of whether we are dealing with purely utilitarian objects (grinders, obsidian and/or flint pre-cores and cores, blades, arrowheads, sickles, and stone celts) or goods meant to satisfy the human need for status and prestige (beads made of visually attractive materials, small decorative pots, maybe figurines, luxury pottery wares, stone bracelets etc.).

In the case of the Jezirah, these goods made of excellent and visually impressive materials, reached the villages of the LPPNB and PN throughout the zone extending from the Mediterranean coast (or the Middle Euphrates in its Syrian stretch) to central Mesopotamia and Western Zagros, possibly handicapping the High Valleys to some extent. The relative repeatability of successive ranges is striking.

The goods discussed here are found in villages located along the river "corridors" (Turkish-Syrian Euphrates, Balikh, but not lower Khabur with its latitudinally flowing upper branches, finally the Greater and Smaller Zab, upper reaches of Wadi Tartar), between which there extended a vast and arid, uninhabited desert (between the Balikh, Khabur, Wadi Tartar and the Mesopotamian Plain, as well as the Syrian Desert). To be effective, the circulation of goods had to be organized in a "village-to-village" system. Obsidian was traded mainly along the north-south routes, other products could have been circulated on one of the latitudinal tracts along the Euphrates between El Kowm and Sawwan (not as extensively) and along the upper Khabur and Er-Radd to the Tigris valley (more extensively).

Thus, the objective was first to extract the appropriate raw material, secondly to pre-process and test it, and thirdly to produce the half-finished and finished product, which required some skill. The next two steps covered the delivery and selling of a ready product to a distant customer.

It is difficult to imagine the inhabitants of Buqras on the Syrian Euphrates organizing expeditions 400 km away to Bingöl or Nemrud Dağ for obsidian, another hundred km for basalt to make querns, or to some unknown source for banded "alabaster/marble" to produce stone vessels, including the highly complicated footed cups. The professional hand of a good craftsman was required to achieve the quality of execution represented by all these products. Simple peasants from the Jezirah were not likely to achieve this.

It was in response to such consumer demand that an entire professional system of mining, production and distribution was created in the LPPNB, supplying the capacious market of the Jezirah with such coveted goods.

This, Ladies and Gentlemen, is the true Neolithization!

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1. *As well as personal communications (Y. Miyake, Y. Nishiaki, K. Schmidt, H. Sudo, A. Tsuneki, E. Coqueugnot, P. Bielinski, H. G. K. Gebel and M. Özdoğan) and study of collections from Kashkashok, Thalathat, Seker-al-Aheimar and Kerkh.*

2. *Note on newly excavated sites: no individual publications/reviews of Jeziran sites will be cited here, but their value and importance are naturally recognized (Kerkh, Salat Cami Yani, Kosak Shamali, Umm Qseir, Sabi Abyad I and II, Mezraa Teleilat, Gürcü, Akarçay etc.).*

ex oriente e.V.

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