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JASON ALIK UR

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CHAPTER ONE:

SOCIAL COMPLEXITY, STATES AND URBANISM

1.1. Introduction

Archaeological ideas of early states and urbanism have taken much of their form under the influence of the results of fieldwork in ancient Mesopotamia. The plains of southern Iraq are considered to be the homeland of the earliest pristine state-level society, and have received a disproportionately large amount of archaeological attention as a result. Inspired by the Bible and national pride, archaeologists began to work in the Near East in the 19th century (Larsen 1996; Kuklick 1996), and since that time, the mounds of the region have endured an almost uninterrupted barrage of picks and trowels.

About a century after the start of Near Eastern archaeology as a discipline (if we can date it to Botta and Layard), scholars began to develop syntheses of the mass of archaeological data from the early complex societies of the Near East and elsewhere. Despite the desire for cross-cultural definitions of urban civilization, these syntheses were based primarily on the best-known early states: Egypt and Mesopotamia. Both were in regions of longstanding colonial interest, and both were literate (or at least their ancient writing systems had been deciphered to some degree). The most notable synthesizer was

V. Gordon Childe; his often-cited essay on "the Urban Revolution" (Childe 1950) expounded on a list of traits he considered to be integral to ancient civilization. Childe's understanding of urban society has proven to be remarkably durable; it is only recently that researchers working outside of the Near East have come to express dissatisfaction with the Near Eastern-derived model for early states and recognized the greater variability in the forms of early social complexity (e.g., Blanton, *et al.* 1996; McIntosh 1991; Stein 2001:360). It is now questionable if this model is appropriate even for the civilization that inspired it:

> The evidence for decentralized heterogeneous cities in Mesopotamia is very significant, because Mesopotamia provided the basis for the traditional, and largely implicit model of urbanism in anthropological research—a model that saw cities and, by extension, states as highly centralized forms of social organization. This traditional "Mesopotamian model" of Oriental despotism has been implicitly or explicitly used to define cities and was applied more or less indiscriminately to other state societies in Egypt, West Africa, or South Asia with little regard for potential cross-cultural differences in modes of urban organization… Large population centers in these societies have either been shoehorned into the Mesopotamian model or dismissed as nonurban if they showed clear differences from Mesopotamian cities (Stein 2001:360; see also Stein 1998:14-15).

This dissertation will consider the social and economic organization of one such early complex society in one particular time and place in Near Eastern history. In the middle of the third millennium BC, the plains of northern Mesopotamia saw the emergence of a series of large nucleated settlements which clung to the southern edge of the fertile crescent (Fig. 1.1). This area is also referred to as Upper Mesopotamia or the Jazira ("Island" in Arabic). Traditionally it has been defined as the land between the Tigris and Euphrates Rivers above where these rivers enter the southern Iraqi alluvial basin. Today this land falls in parts of three nations: northeastern Syria, northern Iraq, and southeastern Turkey (for a detailed discussion of the geography of northern Mesopotamia, see Chapter 2.1).

The largest urban centers attained sizes of between 65 and 120 hectares of high-density occupation. In keeping with the historical emphases of archaeology in this region, all of the major cities of this third millennium urban phase have now seen excavation, some already in the 1930's and some only within the last five years. These excavations have shown these sites to possess nearly all the features to qualify as a "civilization": monumental architecture, use of writing, distinctive elite art styles, socioeconomic inequality, agricultural intensification, etc. From archaeological settlement survey, we know that they presided over a cultural landscape of reduced rural settlement and intensified agricultural and pastoral economies.

In the last quarter century, archaeological discoveries have gradually pushed third millennium northern Mesopotamia into the realm of history, although source material remains frustratingly limited. For the Upper Khabur basin, Max Mallowan's excavations at Tell Brak in the 1930's produced some scattered epigraphic material, not very impressive in quantity but containing enough royal names to tie archaeological layers into the historical chronology of southern Mesopotamia. Most importantly, a massive administrative building was constructed of mud bricks stamped with the name of Naram-Sin, third king of the Akkadian dynasty. More significant was the discovery of the remains of the royal archives of Ebla in western Syria. While mostly concerned with local administration within the kingdom, the Ebla tablets give details of extensive diplomatic relations among the major political forces of the late third millennium, including northern Mesopotamia. The tablets frequently mention a northern kingdom centered on the city of Nagar (Archi 1998). New observations on the tablets already discovered at Brak (Matthews and Eidem 1993) and a new find of tablets at Tell Beydar (Ismail, *et al*. 1996; Milano, *et al*. 2004) have made it highly likely that Nagar was the ancient name of Brak. However, the terseness of the Beydar tablets leave many unanswered questions about the nature, extent and duration of Nagar's political control.

Within the whole of Mesopotamia, the expansion of social complexity in the north was not unprecedented. The initial appearance of urbanism and state-level social and political organization had occurred a millennium earlier and far to the south. The city of Uruk had grown to 250 hectares by the end of the fourth millennium BC (Finkbeiner 1991:194) and featured an array of impressive and monumental palaces and temples. Survey in its hinterland had shown a dramatic reduction in village-level settlement at the time of Uruk's expansion, presumably as the rural residents were drawn to the new urban center (Adams and Nissen 1972). Spatially extensive settlement was not even limited to the irrigated southern plains at this time; in the north, Tell Brak had already exceeded 150 hectares, albeit in a discontinuous pattern (Emberling 2003). Both Uruk and Brak exhibited all of the generally accepted signs of social complexity listed above. When the cities of northern Mesopotamia were developing (around 2600 BC), the southern plains were hyperurbanized; it is estimated that 70-80% of the population lived within settlements of 10 ha or greater, what Adams calls "the world's first predominantly urbanized society (Adams 1981:90-94; see also Pollock 1999:72-73). The wave of developing urbanism that swept northern Mesopotamia was hardly a new phenomenon, neither in its specific region nor in Mesopotamia as a whole.

It was, however, a new phenomenon for the region in terms of scale and pervasiveness. The scale of the mid-fourth millennium experiment in nucleated settlement at Brak had no equivalent elsewhere on the plains of northern Mesopotamia, but when urbanism reemerged in the middle of the third millennium BC, many large centers sprouted nearly simultaneously, with a heavy concentration in the Upper Khabur basin and the adjacent plains west of the Tigris River. These large settlements emerged following the dispersal of the population of Brak, the dissolution of the other settlements of the "Uruk Expansion," and the early third millennium phase of less urban settlement in the Ninevite 5 period. In the south, however, the cities had persevered and in fact that region had become even more urbanized as small settlements were abandoned in favor of a handful of urban centers (Adams 1981). The discordant trajectories have caused most to assume some form of northern state formation under the influence of the by then venerable urban traditions of the south (e.g., Weiss 1986) although the pattern of small competing states generally results from the decomposition of a single larger and more centralized state (Marcus 1998).

The mid- to late third millennium urban phase in northern Mesopotamia lasted approximately five hundred years before settlement saw a dramatic reorganization in the second millennium. The timing and causes of this deurbanization are a matter of dispute. One theory proposes that around 2200 BC, an extreme climatic event resulted in a long phase of aridity, and the resulting failure of the agricultural base drove both the settled and the non-sedentary populations of the north to flee down to southern Mesopotamia, where they caused an equal amount of social disruption (Weiss, et al. 1993; Weiss and Courty 1993). An opposing model stresses the close relationship between climate and agriculture that permitted the growth of urban concentrations, and suggests that the overextended and brittle economic system was liable to collapse in the face of climatic variation (Wilkinson 1994, 1997). Regardless of the cause, the result was that the largest settlements were either abandoned or drastically reduced in population. Although nucleated settlement shortly reappeared across northern Mesopotamia (and may have never entirely disappeared), urban concentrations of a comparable size vanished until deliberately reintroduced by Neo-Assyrian resettlement policy in the first millennium BC.

The formation and dissolution of third millennium urban society are important topics and will be discussed in later chapters. While this dissertation will consider questions of origins and collapse, it will focus primarily on reconstructing its "organizational dynamics" (Stein 1994). In this regard it will follow a recent trend away from general questions of social evolution and toward regionally specific synchronic analyses (Stein 1998, 2001; Marcus and Feinman 1998:3-4). In this sense, it could be accused of a certain lack of ambition; the understanding of social change is the primary goal of the dominant school of archaeology (Processualism). However, such understanding can only come with an understanding of the nature of society at the various stages along the developmental continuum. If one does not understand how society was organized and operated at the end of the fourth millennium, how can one propose to explain how it evolved into something else? Much effort has been expended excavating the palaces and temples of the numerically small but politically powerful elite, but, until recently, little systematic effort has gone into recovering data on a representative portion of the ancient population as a whole. With carefully constructed research designs, these shortcomings are beginning to be addressed, for example at Hacınebi in the fourth millennium BC (Stein*, et al*. 1996) and at Titri→ Höyük in the third millennium (Algaze, et al. 1995), but much more research remains to be undertaken.

This study will propose a model for the organizational dynamics of an urban state at an archaeological moment in time. As is often the case, it will present at least as many new questions as it answers. If this model proves to be accepted (and I would argue that the data needed to evaluate the question properly do not yet exist, given Mesopotamian archaeologists' fixation on a demographically minor segment of ancient society), the next step would be to address questions of its formation and dissolution. Having a better understanding of at least one stage in the process will make any diachronic model much more durable.

To produce a reconstruction of the operational dynamics of third millennium urbanism, this study will draw upon three data sources. The first will be the enormous body of published excavation data from sites of this time (Chapter 2). Almost all of the known urban centers from this period have been investigated to some degree, most particularly (from west to east) Ebla in western Syria, Kazane Höyük and Titri→ Höyük in southeastern Turkey, Tells Chuera, Mozan, Brak, Leilan and Hamoukar in northeastern Syria, and Tells Khoshi, Taya, and al-Hawa in northern Iraq.

The second data source for this reconstruction will be ancient textual sources.

Although they are somewhat restricted in number and subject matter, they can provide important clues to ancient political organization, economy, and the relationship between the two. If one considers texts over a broader area of the Near East at the time (particularly those from Ebla and southern Mesopotamia), it is possible to propose general rules of social organization as well. This is a task recently undertaken by David Schloen (2001), whose ideas form an important core of the theoretical basis for the study at hand (see Section 1.7 below).

The final source will be primary field data from archaeological survey in the Upper Khabur basin of northeastern Syria. In addition to patterns of settlement, this includes the study of the whole landscape, including the areas beyond the site edge (Wilkinson 2003). Consideration of questions of social organization demand a regional-scale approach, and I have therefore made the archaeological landscape as much a part of this study as more traditional settlement patterns. Human activity was not limited to points on a map; rather, it flowed between settlements, in varying degrees of intensity. Since all existing hypotheses on the nature of urban settlement in the Upper Khabur basin have assumed a tight connection between political organization and agricultural and pastoral production, the study of ancient land use through "off-site" archaeological data is crucial in their assessment. Landscape and excavation data are of drastically different characters; the former is extensive in geographic coverage but reveals only general trends in population, settlement organization and landuse, whereas the latter is limited, often to a few hundred square meters, but its intensity allows the reconstruction of highly localized patterns of ancient activity. The two are thus complementary, and any model of ancient society which privileges or excludes one over the other will be deficient.

This introductory chapter will review current definitions of urbanism and the state (Sections 1.2 through 1.5). Particular emphasis will be placed on ecosystemic approaches, which have dominated the discussion of early complex society since the 1970's. Section 1.6 will discuss recent critiques of ecosystems theories, and the final section will summarize a recent alternative model.

1.2. The Nature of Ancient Urbanism

Before discussing the various models of complex society and their intellectual evolution, it is necessary to review several key concepts which are often used without precise definition. Most important for this study is to define what is exactly meant by "urbanism" and "the city." An intuitive definition seems obvious; like obscenity, it has been stated that many archaeologists feel that when it comes to assessing the urban status of an ancient settlement, they "know one when [they] see one" (Smith 2003:9). Such a commonsense understanding will inevitably result in modern definitions of the city being imposed on the past. It is necessary to develop a definition which encompasses the full range of variation found in the settlements which have been classified as urban, one that is not limited to a single geographic or cultural region or a specific time period. This has proven remarkably difficult to achieve (Blanton 1976:250).

1.2.1. Early "Trait List" Approaches.

An early but still highly influential work was V. Gordon Childe's overview of the "Urban Revolution" (Childe 1950). In an attempt to derive a definition of the city that would be cross-culturally applicable, Childe listed ten traits which characterized this dramatic social shift: demographic size, craft specialization, taxation and concentration of surplus, a ruling class, writing systems, calendrical and mathematical sciences, distinct and non-naturalistic aesthetic styles, long-distance trade, and supra-kinship social organization. These criteria were based almost exclusively on his assessment of the archaeology of Mesopotamia, Egypt, the Indus Valley and the Maya as was known up to the 1950's.

Although he called these criteria "abstract," at least half of them are primarily material, or the resultant infrastructure of cities. Furthermore, this is a list of traits which differ perhaps not in kind but certainly in degree from modern cities, and are thus more descriptive than analytic (Adams 1966:10-12; Smith 2003:9). Furthermore, his trait list approach discounted other civilizations which lacked one or more of his criteria, the most apparent being the undeniably complex and urban societies of South America, which never developed a system of writing, although there existed non-language-based recording systems of impressive sophistication (e.g., Urton 1998). Childe included the Maya as urban, although he felt that "their inclusion seriously complicates the task of defining the essential preconditions for the Urban Revolution" and that "the minimum definition of a city… will be substantially reduced and impoverished by the inclusion of the Maya" (1950:9).

Childe's list of criteria is well suited to a particular conception of social evolution, one where societies move through a discrete set of stages; in Childe's case, this meant the difference between barbarism and civilization. The detection of Childe's suite of characteristics would allow the archaeologist to fit the society at hand into its proper stage, but this classification would not help in understanding the processes that produced social change (Adams 1966:11). However, despite the limiting nature of Childe's criteria, his formulation remains at the core of archaeological definitions of urbanism (e.g., Trigger 2003:120-121) and also of the state (see below).

1.2.2. Quantified Definitions

A means of addressing variation between the complex settlement agglomerations characteristic of distinct cultural traditions in both the Old and New Worlds is through quantification: population and settlement density. Childe listed population size and density as his first criteria for the Urban Revolution, although he struggled with the issue of scale:

> The first cities represented settlement units of hitherto unprecedented size. Of course it was not just their size that constituted their distinctive character. We shall find that by modern standards they appeared ridiculously small and we might meet agglomerations of population today to which the name city would have to be refused. Yet a certain size of settlement and density of population is an essential feature of civilization (Childe 1950:4).

A "certain size of settlement" is a very intuitive means of assessment. Attempts to quantify large settlements more rigorously have been proposed via various forms of population statistics: population, number of buildings, density of persons per area unit, etc., but these figures vary amongst societies and are not very useful at best (Smith 1972; Wheatley 1972:620-621) and ethnocentric at worst (Fox 1977:29). Most critically, quantitative measurements, like Childe's criteria, say nothing about the *function* of cities and the interconnectedness of urban institutions (Wheatley 1971; 1972; see below), but assume that the city differs from the villages in its hinterland only in being larger and more densely settled (Fox 1977:30). Despite these criticisms, population-based definitions of urbanism remain popular among archaeologists undertaking settlement surveys. This is especially true in the Near East, where the internal structure of large sites is not apparent from surface remains. Settlement size is critical for the study of ancient societies, because as the sole archaeological indicator of ancient population, it provides an avenue for determining whether a settlement could feed itself or needed to exchange for surpluses. However, ancient demography is fraught with difficulties (Sumner 1989; Postgate 1994), and most archaeologists are fully aware of critiques of the use of size or population thresholds; Adams himself noted that "the transformation at the core of the Urban Revolution lay in the realm of social organization… it seems to have been primarily changes in social institutions that precipitated changes in technology, subsistence, and other aspects of the wider cultural realm," whereas the criteria listed by Childe were symptomatic of these changes (Adams 1966:12; 1981).

1.2.3. Functional and Social Definitions.

More dynamic functional and social definitions of urbanism as a set of integrated institutions now dominate anthropological studies of the city. "Static definitions… conceal the dynamic nature of urban activities and urban formations, the sometimes explosive growth of population centers from villages to towns to cities, and the changes undergone by even well-established cities from one era to another" (Smith 2003:8). In the 1970's, it was common to define urban settlements via the presence of specialized economic functions which were absent from the smaller settlements surrounding them: "…whatever else a city may be it is a unit of settlement which performs specialized functions in relationship to a broader hinterland… Moreover, while numerous inhabitants of a city may engage in food production, it is agreed that the specialized functions of a city are not agricultural in nature" (Trigger 1972:577; see also Trigger 2003:121). This definition is heavily influenced by Central Place Theory, an analytical model which predicts the size and distribution of settlements in a hierarchy generally based on aspects of marketing and administration (Johnson 1972, 1977; Crumley 1976; Blanton 1976; Wheatley 1972:613-619).

This vision of the city sees it as a home to many specialized producers, including craft specialists, religious specialists, and administrators, who are not engaged in food production and therefore must rely upon social or economic mechanisms to get their sustenance. For example, the Neolithic settlements at Jericho and Çatal Höyük are sometimes mentioned as the world's earliest cities, Jericho because of its monumental outer wall (Kenyon 1956) and Çatal Höyük because of the impressive density of its settlement (Mellaart 1967). Although these towns do share these few formal characteristics with later cities, they lack the economic and social specialization held to be crucial in the emergence of urban settlements (Wheatley 1971:393-395; more recently, Emberling 2003:257-258).

Unlike modern cities, it is now clear that the overwhelming majority of ancient urban dwellers were in fact farmers who were primarily concerned with producing their own means of subsistence, in the Near East and cross-culturally in many early cities

(Schloen 2001:101; Trigger 2003:120; Smith 2003:1). This and other points of functional variance with modern cities inspired Richard Fox (1977) to develop three ideal but not mutually exclusive types of preindustrial cities: regal-ritual, administrative and mercantile; these types are closely related to the nature of the state society within which they are embedded.

Fox's regal-ritual city is the locus of the royal household and/or ceremonial center in a weakly centralized ("segmentary") state; it relies primarily on a shared ideology within the society as a whole for their integration with the settlements of its hinterland (Fox 1977:39-56). The infrastructure of the city therefore consists primarily of palaces, temples and other public buildings, rather than densely packed residences; it is the royal household "writ large." The population is relatively low, and only increases at certain periodic festivals. The regal-ritual city thus lacks the demographic base, communication, transport and productive functions which are associated with cities, but it is differentiated from other settlements by ritual status and political prestige (Fox 1977:56). The regal-ritual type encompasses the form and function of New World cities such as the Maya that so vexed Childe (1950), insofar as he understood them. It has been proposed that cities originated in this form (Wheatley 1971).

The administrative city type is characteristic of stronger, more bureaucratic states (Fox 1977:59-91). It is a predatory extension of the state itself: "The communication functions, demography, class structure, commercial activity, municipal government, and urban architecture of administrative cities depend on the power of the state and its urban allocation of wealth gained from a subservient peasantry. The city exists in adaptation to a highly centralized state regime administered by an elite on the one hand, and to a culturally and economically denuded peasant countryside on the other" (Fox 1977:90). Unlike the regal-ritual type, the administrative city contained large and diverse populations, which were somewhat independent of state control and therefore represented a threat. Administrative cities were a product of state power, rather than communication, commerce or agricultural production.

Whereas the administrative city is a consuming parasite on a productive hinterland, Fox's mercantile city is a center of wealth production, not only because of its control over rural peasant production but also as a center of craft production, long distance trade and moneylending (Fox 1977:92-115). Economic organization is based primarily on market forces, and the power of the state is limited. The bases for this ideal type are the cities of the European Middle Ages and the Greek city-states.

In Fox's ideal types, it is not only the characteristics of the city itself which are important but also the relationship between the city and the non-urban settlements in its hinterland. This distinction is important in the functional models of urbanism discussed above but also in the sociological models which have also been influential in understanding urbanism. The functional definition, favored by geographers, has traditionally focused on urbanism as a type of settlement; in the sociological definition, urbanism is one half of a dichotomy of social types (Smith 1972). Durkheim's version of this dichotomy opposed mechanical solidarity, wherein society is composed of small autonomous groups whose primary purpose is to maintain economic self-sufficiency, with organic solidarity, which characterizes societies composed of interrelated specialized producers, few if any of whom are economically self-sufficient but who are sustained by their place within a whole which is greater than the sum of its parts. Mechanical solidarity is based on kinship and is found mainly in non-urban societies of low complexity, while the division of labor described by organic solidarity is one of the defining characteristics of the city and of complex society. Childe incorporated Durkheimian organic solidarity into his model of early urbanism: "…even the earliest urban communities must have been held together by a sort of solidarity missing from any neolithic village. Peasants, craftsmen, priests and rulers form a community, not only by reason of identity of language and belief, but also because each performs mutually complementary functions, needed for the well-being (as redefined under civilization) of the whole" (Childe 1950:16).

The presence of supra-kinship social groupings, such as social classes, is generally considered intrinsic to the formation of urban agglomerations and indeed the state itself. Kinship relations are often seen as presenting a scale limitation to social organization; more rationalized socio-economic classes offer the means to surpass that limit. Durkheim's distinction between kinship-based rural social organization and class-based urban social organization is frequently used to interpret texts and archaeological remains (e.g., Van de Mieroop 1997:115). Others see kinship remaining an important element of urban society, alongside other principles (Adams 1981; Stone 1995, 1997; Schloen 2001).

The various definitions considered thus far are fairly static, in that they consider the city as an isolated entity; others, especially Wheatley (1971), see the city a process.

The formation of a city transforms not only the settlement itself but its entire region. An urban center cannot exist in a vacuum; it relies on other settlements in its hinterland as well as the terrain that surrounds it (Schwartz and Falconer 1994). In this sense, urbanism is as closely tied to a center's hinterland and its transformation as it is to the center itself. This dynamic aspect of urbanism is one that archaeology is particularly well suited to address.

The definitions of urbanism in use today are thus an uncomfortable blend of functional (economic and political) and social aspects. Going back to Childe (1950), these definitions frequently include reference to material manifestations in the form of monumental architecture and demographic or geographic size; this is especially common amongst archaeologists, who have easier access to the physical traces of ancient urban institutions and processes than to the institutions and processes themselves. Fox (1977:29-31) probably approximates the most general cross-cultural definition when he attempts to accommodate all three: his city is defined as demographically large, with important social, ritual and economic activities which make it a demarcated zone (socially and geographically) in relation to the countryside. The greater complexity of its internal social and ideological functions take on a spatial form as the city itself. The degree to which this model is appropriate for the large settlements of northern Mesopotamia in the third millennium BC, or indeed if they should be considered cities at all, will be discussed in Chapter 7.

1.3. Defining the State

A huge amount of anthropological thought has gone into the origin and definition of the state as a political form. Great debates raged in the 1960's and 1970's (Fried 1967; Service 1975) and have reemerged recently (Nichols and Charlton 1997; Feinman and Marcus 1998). As with the treatment of urbanism above, this study will not presume to repeat or extend this debate, except for a brief summary which will culminate in a working definition to which most archaeologists would subscribe. This definition will be compared with survey, excavation and textual data from northern Mesopotamia in Chapter 7.

At the most general level, conceptions of the state can be divided into those that stress consensus or integration and those that stress conflict (Cohen 1978). Conflict theories, especially Marxist approaches, understand the state as an organization that originated to institutionalize emergent inequalities in power and wealth: "This formal organization of power has as its central task the protection (and often extension) of the order of stratification" (Fried 1978:36). The state's success at this task led to the permanent creation of the non-kinship-based social classes, which are a major point of difference between states and chiefdoms (Flannery 1972:402; Marcus and Feinman 1998:6-7) and a very common defining characteristic of urbanism (see Section 1.2 above).

Rather than preventing societal disintegration through repression, integrative theories propose that the state government gains legitimacy and acceptance by performing functions that benefit the society as a whole. Such organizational benefits might include the administration of a redistributional economic system, successful offensive and defensive military practices, and public works such as the construction of irrigation and transportation systems (Service 1978:27-28). Through such actions, the ruling minority builds a consensus in the society as a whole that the state's hierarchical organization is beneficial, despite the reduction of individual freedoms and the presence of inequality. Despite this dichotomous presentation, most theorists would see states on a continuum between these two poles, as a product of both conflict and consensus (Cohen 1978:7-8).

A very influential outgrowth of the integration school was the use of an ecosystemic approach to understanding early social complexity (Flannery 1972:409-424; Wright 1978; Brumfiel 1992:551-553). Human society, and the state in particular, were analyzed as a complex system of interrelated units, wherein a change in one component would initiate a reaction in one or more connected units (Wright 1978:55). The state was envisioned as strongly hierarchical; higher-order control units regulated the behavior of lower-order subsystems. The key processes of the system were segregation (internal specialization) and centralization, the degree to which the highest-order controls could direct the subsystems (Flannery 1972:9); the state resulted when these two processes reached a "certain threshold" (Flannery 1972:423). With regard to the origin of social complexity, the emphasis on the multivariate nature of societal evolution championed by the ecosystemic approach was a dramatic improvement over older theories which privileged a single factor such as irrigation (Wittfogel 1957) or population pressure (Carneiro 1970).

An example of such a multivariate approach is Wright and Johnson's analysis of the fourth millennium Uruk state in southwestern Iran (Wright and Johnson 1975). After considering several "prime mover" theories such as population pressure and trade, they conclude that only through the interaction of multiple variables could the state have emerged: "Two regulatory processes which, when they operate alone have a damping or negative feedback effect, could have a positive effect when they operate simultaneously… Reorganization of some productive tasks could lead to complementary specialization and reorganization of others, with consequent specialization of task control, increased information flow, and subsequent increased hierarchical complexity" (Wright and Johnson 1975:285). The emphasis of the model of the state used by Wright and Johnson is on information processing, which leads them to define the state as a society with specialized administrative activites (see also Wright 1977). In their state hierarchy of control, the highest level controls the decisionmaking of intermediate levels, which in turn control the actual activities of the producers who make up the lowest level. A society with an administrative hierarchy containing three or more decision-making levels "must necessarily involve such specialization because the lowest or first-order decision-making will be directly involved in productive and transfer activities and second-order decision-making will be coordinating these and correcting their material errors. However, third-order decision-making will be concerned with coordinating and correcting these corrections" (Wright and Johnson 1975:267). This three-level decisionmaking hierarchy (see also Blanton, *et al*. 1993:17) accords well with administrative variations on Central Place Theory and has been used to suggest state definitions from parallel settlement pattern hierarchies (Johnson 1973:15).

The ecosystem school's strong emphasis on information-processing as the key impetus in the formation and operation of the state has proven to be highly influential, and minimum levels of adminstrative and settlement hierarchies continue to be important elements of its definition. While commending the methodological rigor of their approach, Robert McC. Adams stated that "the routines not only constitute a gross oversimplification of politics but also provide a misleading picture—one lacking in the pervasive but volatile and usually unexpressed elements of contingency, calculation, and coercion" (Adams 1981:77). Furthermore, the extent of the state in the ecosystemic approach has been questioned; whereas Johnson (1973) would see the state as the society, others have argued that the state is only one element of it, particularly with regard to its centralized decision-making (Stein 1994). These assessments foreshadow other later critiques of the ecosystemic approach, to be discussed below in Section 1.5.

In conclusion, the generally accepted model of a state-level society is one characterized by social and economic inequality, organization by social classes as opposed to kinship, internally and externally specialized decision-making apparatus, and a hierarchical organization of at least three levels (especially with regard to decision-making). These often manifest themselves in a hierarchy of settlement where small unspecialized agricultural villages are presided over by regional centers, which are in turn dominated by larger capitals. Urbanism is thus a major feature of most (although not all) states. The relationship between urbanism and the state has been the focus of debate, and is worth further consideration.

1.4. Cities, States and City-States

Almost all discussions of ancient urbanism assume a close relationship with complex forms of social organization, and most discussions of the state assume that its economic and political centralization manifested itself in the form of nucleated settlements. Fox (1977) regarded the form of the city to correspond closely to the organization of the larger state society. At one end of the continuum of state political centralization, his administrative form of the city is a direct extension of a strong bureaucratic state, created by its ability to extract products and labor from the rural peasantry; at the other end, the regal-ritual city, with its emphasis on ideological connections with its dependent settlements, is characteristic of a weak state (Fox 1977:34-37). Fox's mercantile city results from a situation where several politically balanced groups offset each other's claims to power, creating the conditions for unimpeded market exchange. As discussed above, Fox's ideal types are not static and can be transformed from one type to another; however, even the regal-ritual city requires a state level of social stratification.

Others are even more emphatic. Trigger justifies the separate discussion of urban and state formation by considering that states can exist without cities, but not vice versa (Trigger 1972:576). Wheatley (1971:398) assumed the simultaneous emergence of city and state, with the city serving as the "organizing principle." Cowgill (in press) considers the question to be unproductive in that it conflates types of settlements with types of political organization.

It has been proposed that the state as a political and geographic entity can be subdivided into the "city-state," built around a central urban center, and the "territorial state," which is geographically larger (see papers in Nichols and Charlton 1997). The city-state term has a long history, having originated in the late 19th century as an English translation of the Greek word *polis*, which could refer to the city or the city and its hinterland together (Charlton and Nichols 1997:2-4). In the slightly reformulated modern archaeological usage, the phenomenon of the city-state is closely related to the distribution of settlement: "In general, we understand city-states to be small, territorially based, politically independent state systems, characterized by a capital city or town, with an economically and socially integrated adjacent hinterland. The whole unit, city plus hinterlands, is relatively self-sufficient economically and perceived as being ethnically distinct from other similar city-state systems" (Charlton and Nichols 1997:1). Whereas the territorial state integrates a large area through a multi-level hierarchy of centers, the city-state is two-tiered and features little integration aside from basic taxation by the rulers.

The use of the city-state term was almost uniformly rejected by participants in a 1989 School of American Research seminar (published as Feinman and Marcus 1998). They noted that many Aegean specialists, studying the region for which the term was developed, do not regard the *polis* as a state at all, and that most of the states to which this term has been applied lack the democracy and economic self-sufficiency which is the essence of the *polis* (Marcus and Feinman 1998:8-10). Furthermore, the small polities often labeled city-states were the products of the decomposition of a former large territorial state, in the case of Early Dynastic period Mesopotamia but also cross-culturally (Marcus 1998). When a large state collapses, its provincial components remain; each attempts to assert dominance but because they are roughly equal in terms of political power, often an equilibrium of small states develops.

Despite this criticism, the term remains in use to oppose the territorial state, often without substantial differentiation, except for an unquantified size difference (e.g., Trigger 2003). In particular, Elizabeth Stone (1997) argues that the city-state is a valid subtype on a continuum of state societies; the city-state is characteristic of complex societies wherein the mutability of the land means that control over agricultural labor is more important than control over the land itself. The challenge is to build consensus among groups in order to mobilize the labor, and the city is the ideal settlement type for such consensus-building. In Mesopotamian city assemblies, Stone sees an earlier form of the democracy which characterized the Greek *polis* (Stone 1997; see also Stone 1995; Jacobsen 1943, 1957). Although Stone makes a good case for Mesopotamia in certain periods, it is difficult to overlook the high degree of variation amongst so-called city-states (discussed in Yoffee 1997) and the ease with which they coalesce into territorial states (Marcus and Feinman 1998:9-10).

Recently, Monica Smith (2003:12-13) has proposed that the urban form need not be linked exclusively with the state. She argues that much urban theorizing has really been about the state, and that cities continue to exist after the decomposition of centralized states. Smith is correct that many discussions of the city do not sharply distinguish it from its societal context; however, many would argue that the new social forms which characterize the state allow the formation of the city (e.g., Adams 1966), which is its most common (but not universal) form of expression. Furthermore, the collapse of centralized states generally results in either the abandonment of cities altogether, or their dissolution into competing "city-states" as described by Marcus (1998); path dependency (discussed below in Section 1.8) prohibits societies from simply reverting to their former selves.

1.5. Critiques of the Ecosystemic Model

At the most general level, and despite their claims of objectivity, systemic approaches have been accused of being the unconscious product of a middle class American national ideology which, owing to its status as a new political phenomenon, downplays the importance of history in an attempt to see cross-cultural regularities in the way sociocultural systems operate (Trigger 1989:312-316). Several more specific areas of disagreement have emerged in recent years, particularly with reference to complex societies; these include the place of human agency and the reification of groups, the importance of heirarchy, the roles of adaptation and intentionality, and the nature of complexity.

In an eloquent essay, Elizabeth Brumfiel (1992) summarizes several elements of social change that have been ignored by the ecosystemic model's use of whole populations and behavioral systems as the units of analysis. Social systems are assumed to seek out and maintain an equilibrium which requires some sort of external disturbance in order to shift to a new state; internally generated social change is neglected. Her statement that "we should recognize that human actors, and not reified systems, are the agents of culture change" (Brumfiel 1992:559; see also Schloen 2001) is now seconded by many archaeologists who are seeking to repopulate ancient societies with motivated individuals who are simultaneously constrained by the structures of their societies but capable of changing those structures through their actions.

Archaeologists who attempt to create a role for human agency in the operation and evolution of social systems base their work primarily on the writings of Pierre Bourdieu and Anthony Giddens (reviewed in Dornan 2002:305-308). Although there are substantial differences between them with regard to the intentionality and self-consciousness of behavior, Bourdieu's Practice Theory and Gidden's Theory of Structuration both place human action within social structures which both determine that action but are also continually reproduced by it. This recursive process means that these structures do not exist outside of individual agents; the level of the analysis is shifted from reified social entities to the people who comprise them.

The rapidity with which the agency concept has been taken up in order to fill the "theoretical vaccum left by the collapse of high-level systemic models" (Dobres and Robb 2000:3) has meant that there is often variation on how the term in employed (Dornan 2002; Dobres and Robb 2000). One such point of variance is the unit of analysis. While some would equate an agency approach with the study of individual lived lives (e.g., Hodder 2000), it is incredibly difficult to recover a single ancient person from the archaeological record. Such a focus generally means the study of highly visible elites, exactly the sort of top-down approach equated with ecosystems theory. Others argue for some form of collective agency, for example at the level of the household (Schloen 2001).

It is possible to circumvent the question of the unit of analysis by considering the "generic individual" and limiting one's areas of concern to activities where motivations would have been widely shared across society—generally meaning economic subsistence (Bell 1992). Subsistence-related activities have the twin advantages of being more archaeologically visible than social actions and being cross-culturally predictable; everyone has to provision oneself and one's family. However, such a "rational actor" approach appears to leave out the possibility of resistance and individual creativity (Dornan 2002:315). The issue of the locus of agency remains an active source of contention.

The agency approach does appear to be a profitable paradigm for understanding social change and variation, but it may be as much a product of the social context of its practitioners as was ecosystems theory. Whereas the unconscious experience of corporate domination of American society and disillusionment with the possibility of social mobility may have inspired ecosystemic analysis at the level of reified social groups, the new focus on the individual in antiquity mirrored contemporary dissatisfaction with corporate dominance (Trigger 1989:327).

Alongside movement from reified social systems to agency approaches is a new critique of hierarchy in complex societies. Ecosystemic models have confused hierarchy with complexity, such that an increase in the number of a levels in a hierarchical system means that it has grown to be more complex (Crumley 1987:160-161). In recognizing that not all social organization takes the form of a vertical hierarchy, Crumley has proposed the concept of heterarchy, defined as "the relation of elements to one another when they are unranked or when they possess the potential for being ranked in a number of different ways" (Crumley 1995:3; see also Crumley 1987). Heterarchy is not solely a form of structure in itself but also a condition; unranked social units (heterarchy) can come to be organized in a hierarchy, or vice versa (Crumley 1995:4).

The critique of hierarchy appears alongside the realization that there was much less consensus and much more variability within ancient states than had previously been appreciated (summarized in Stein 1998, 2001). The ecosystemic state is an adaptation in which all members of society ultimately benefit from a superior organizational form. However, in ethnographically documented societies, almost all political energy goes into maintaining power rather than toward more general system-benefiting activities such as economic regulation:

> The intensity and diversity of these internal tensions mean that, over long periods of time, states are guided by short-term crisis management rather than long-term system-serving goals. This, in turn, calls into question the fundamental ecosystem-theory assumption that complex societies are adaptive… the history of states is the history of strategy and counterstrategy deployed by oppositional groups, leading cumulatively to the emergence of social hierarchy and its dissolution. But the membership of these groups, their sources of strength, and the logic of their strategies cannot be discovered by systemic approaches that ignore the organization of human actors (Brumfiel 1992:558).

Brumfiel and others (Adams 1988:29-32; Blanton 1998; Chapman 2003; papers in Brumfiel and Fox 1994) thus call into question the automatic assumption of centralization and hierarchy in complex societies. In particular, the appreciation of the role of factions in the formation and operation of complex societies has cast doubt on the coterminous nature of society and the state (Stein 1994). The state as a political entity exists as only one element, albeit a very successful one, in a larger arena of competing groups which aim to take its place. At one end of the continuum, highly centralized states such as the Ur III state in Mesopotamia may approach the ecosystemic hierarchical ideal. At the other end, evenly matched local factions may prevent the formation of such a state, as in the Mesopotamian Early Dynastic period. Changes in the fortunes of factions (and the individual agents that comprise them) can cause a shift along this continuum.

In a parallel conception, decentralization can be seen as an alternative "corporate" strategy of governance, characterized by the lack of aggrandizement of individual leaders ("faceless" government), the inhibition of exclusionary power, and the semi-autonomy of lower-order subsystems (Blanton, et al. 1996; Blanton 1998; see also Possehl 1998). Societies can cycle between corporate strategies and the more exclusionary strategies associated with centralized hierarchies. The corporate strategy has been questioned from an archaeological standpoint by Flannery (1999), who shows that centralized states created by aggrandizing agents can have identical material signatures in ethnohistorically known cases, but Blanton's alternative strategy is to be credited for attempting to explain variation in centralization between states, rather than compressing them all into a rigidly hierarchical model.

Understanding complex societies as possibly decentralized and heterarchical permits a reconsideration of the connection between political and economic organization. Before continuing, it is necessary to review briefly the important distinction between the staple and prestige economies, as described by D'Altroy and Earle (1985, who prefer the terms staple and wealth finance) and how they relate to the political economy (i.e., how supra-household political institutions fund their operations). The staple economy involves the collection and distribution of subsistence goods such as livestock and cereals. These have the advantage of being in an already usable form, but have the disadvantage of being bulky and prone to decay or death; as such they tend to be used locally. States which rely on staples in this manner are characterised by large state-built storage facilities. On the other hand, the prestige economy "involves the use of valuables, primitive money, or currency as means of payment of taxes or tribute to a central authority, which then uses these goods and others manufactured by attached specialists to fund governmental activities, particularly political services… Goods move directly to the state and are paid out by the central authorities for political services" (D'Altroy and Earle 1985:193). Prestige goods have the advantage of being light, high value and generally non-perishable, without the need for the construction of enormous storage facilities; however, they are difficult to convert into staples outside of a monetized economy. Most archaic states employed some combination of the two systems to fund their operations.

Ecosystemic models of early complex societies have often assumed a tight connection between political hierarchy and economic organization; indeed, most propose that the state evolved as a decision-making adaptation to a complex economy. With the increasing appreciation of heterarchy in early states, many are questioning this assumption (Brumfiel 1995:126-127). Blanton and his colleagues (1993:18) recognize the potential for the decoupling of political and economic systems in their discussion of boundedness, one of their four core features of societies (see below). D'Altroy and Earle's distinction between staples and prestige goods must be reintroduced here. While all elites must have had some economic basis for their status, its extent should be proven, rather than assumed, and the degree to which nonmaterial ideological factors are involved should be considered. For example, Maya rulers appear to have controlled the production of prestige items but more utilitarian items were produced independently (Potter and King 1995). The same could also have been the case for the subsistence economy. For example, Hassan (1994) describes the autonomy of the economic base of ancient Egypt, generally considered to be one of the most centralized and territorial of ancient states, as the key to continual regeneration. When faced with the need to fortify natural levees, build dikes, and dig canals, local communities dealt with the realities of flood irrigation themselves: "These efforts were primarily local, as was the case well into the nineteenth century of the present era. The key activities that required collective labor and organization on the regional level were seasonal participation in the reinforcement of natural levees along the channel of the Nile itself. None of this required central management by the pharaoh" (Hassan 1994:177). If Egyptian society could function as a state without direct control over the staple economy by the pharaoh, it is worth questioning the assumed close connection elsewhere. It may be that exchange in prestige items underlies political organization, or perhaps something less tangible:

> Indeed, the heretical thought arises that there might be no systemic connection even between political integration, on the one hand, and economic integration, on the other, because the legitimation of political authority and the desire for political authority may be based in such unpredictable factors as a leader's personal charisma, or simply in the traditional sanctity of an inherited role, so that political integration relies on symbolically mediated patterns of action which have little to do with economic motivations and concerns (Schloen 2001).

1.6. Social Typologies, Organizational Variables and Complexity

The most general impact of the various critiques of the ecosystemic models of the state has been to simply highlight their enormous variability. This realization has caused many theorists to question the usefulness of the standard neo-evolutionary typology of societies (e.g., Chapman 2003:41-45). The huge range of variation in "middle range" societies has been demonstrated ethnographically (Feinman and Neitzel 1984), and the point of difference between some chiefdoms and states has been debated as well. Indeed, the anthropologist most closely associated with the study of the chiefdom as a political form has said that "the fundamental dynamics of chiefdoms are essentially the same as those of states" (Earle 1997:14).

The purpose of a typology is to order variable phenomena into a smaller set of types for analysis; however, there is a fine balance between lumping dramatically different entities into the same type and creating so many types as to render the analysis meaningless. One way around this problem is to isolate a set of key features or variables of societies and to track how variations in these features are related to each other within a society and cross-culturally; this is the approach of Blanton and colleagues (1993:13-23). Their features are *scale*, the size of the society; *integration*, the interdependence of various social units within the society; *complexity*, the functional differentiation among these social units; and *boundedness*, the permeability of the external boundary of a society and how the population interacts across it. In this manner, societies can be studied by the characteristics of these four variables, rather than after being placed in a rigid type.

As ecosystems theorists and others realize that early states were far too complex to be diagrammed on the most detailed flow chart, the complex adaptive systems (CAS) concept is increasingly becoming as a new avenue of study. The general concept is of a set of subsystems which are interrelated but without centralized control; a change in one aspect of one subsystem can result in changes in other connected subsystems and ultimately in dramatic and unpredictable global change. From small-scale local rules, ultimate global order emerges (Gleick 1987). Ecosystems theory emphasizes negative feedback mechanisms which keep a system at equilibrium until some external input forces it to change, but CAS emphasizes positive feedback, which allows the system to change itself (Schloen 2001:55-56; MASS Project Members 2004).

The application of CAS is most frequently found in the physical and natural sciences, but attempts are increasingly being made to understand social systems in this manner as well (Zimmerer 1994; Lansing 2003). It is well suited to addressing the critiques of ecosystems theory as described above. For example, because it recognizes that local rules (actions) enacted by small-scale units (individuals) have the potential to have system-altering effects, it places great importance on agency. Because interacting subsystems are not necessarily centrally controlled and can be interrelated in a non-hierarchical manner, it easily accommodates heterarchy.

Thus CAS might be able to "salvage" the system metaphor of ancient societies, as long as it is remembered that the components of the system are "not the hypostasized patterns of behavior that we label 'structures' or 'subsystems,' but are the individual social actors themselves, whose complex interaction generates those patterns of behavior" (Schloen 2001:61). Some of the original proponents of the ecosystemic approach were early enthusiasts of CAS applied to archaeology (H. Wright 2000), as were some of its earliest critics (Adams 2001), which suggests that it may prove to be the basis for future disciplinary consensus. Because of the relative abundance of ancient textual sources to provide an understanding of the motivations of individual actors (the "local rules"), the Near East is particularly amenable to a CAS approach (Adams 2001; Lehner 2000; Schloen 2001:59-62). The evolution of high-powered computers is beginning to allow such bottom-up social models to be simulated (Kohler and Gumerman 2000; MASS Project Members 2004).

1.7. The Patrimonial Household Model

David Schloen, in his book *The House of the Father as Fact and Symbol* (2001), has proposed an understanding of society in in the Near East simultaneously addresses the major flaws in ecosystemic theories and accommodates the native conception of the social order. Noting that in ancient texts, the basic houshold terminology of father, son, brother, master and servant are used not only in their literal sense but also to signify relations of social inequality at the supra-household level, Schloen develops his "Patrimonial Household Model" (PHM) from the hermeneutical philosophy of Max Weber and Paul Ricoeur. He stresses the importance of the indigenous (emic) understanding of the social order, as opposed to an objectivist (etic) understanding imposed by outsiders, so the PHM is not intended to be applicable cross-culturally; however, the nature of the PHM as "a type of understanding of social relationships" rather than a type of society might tend to generate a limited range of social behavior (Schloen 2001:63; citing Gleick 1987:233-236 on basins of attraction in complexity theory).

Most models of complex society and urbanism consider kinship too limiting for the cohesion of large populations; however, the *metaphorical* extension of kinship allowed the creation of elaborate social hierarchies without recourse to the rationalized social classes which are characteristic of modern Western society. The social order is thus a hierarchy of households linked by personal ties; "In a patrimonial regime, the entire social order is viewed as an extension of the ruler's household—and ultimately of the god's household" (Schloen 2001:51).

Those at the upper tiers of this social order had the most to gain from its acceptance, but it is more than a "dominant ideology" which elites promote for their own economic and political benefit. As Schloen's subtitle emphasizes, the PHM was both a fact and an metaphor. In the sense of the latter, the "kinship" structure often lacked a biological basis. However, it was a pervasive organizing principle and was considered to be real and legitimate at all levels of society. Although the household metaphor was accepted at all levels of society, the relative ranking of individuals and households was not. It was therefore possible to subscribe to the Patrimonial Household "ideology" without necessarily accepting the legitimacy of the highest household in the hierarchy. It is this flexible aspect of the PHM which allowed such variability in political and economic centralization across space and time in ancient Near Eastern societies.

Schloen's model has been criticized for being overly hierarchical, without acknowledging the undeniable importance of heterarchy (Stone 2001), but Schloen sees the PHM as being centralized only in its ideal form:

> The effective power of the ruler is diluted by his need to exercise authority through subordinates (and their subordinates), whose 'household' domains are smaller in scale but similar in structure to his own. As a result, all kinds of private economic activity and jockeying for political and social advantage can take place beyond the ruler's direct supervision. What looks at first glance like an all-encompassing royal household reveals itself, when viewed from another angle, to be a complex and decentralized hierarchy of households nested within one another and held together by dyadic 'vertical' ties between the many different masters and servants who are found at each level of the hierarchy (Schloen 2001:65).

Through such "jockeying," the households of subordinates could, and did, occasionally remove themselves from an existing hierarchy and reassert themselves in a different order. The "local rules" of patrimonialism were recognized at all levels and strongly emphasized at the uppermost level, but in actuality the need for continual renegotiation of the vertical ties meant that, far from being rigid, the social order was in a constant state of flux.

As patriarch, the king's "household" consisted of his entire kingdom, which was structurally identical to a father's control over his own household; indeed, there is evidence in the Bronze Age Near East that entire villages could be granted to a subordinate by the king (Schloen 2001:268, 306). This should not be confused with the exclusive rights of ownership, however. Most of the king's land was in the hands of subhousehold sharecroppers, who held usufruct rights to it in perpetuity and could pass those rights to their descendants, provided that certain obligations to the king (their "father") were carried out (Schloen 2001:231). The difference in the obligations to one's family and the duties to the king have been interpreted as a dichotomy of "public" and "private" life in the Near East, but these are not separate socioeconomic sectors but two possible "orientations" of action, that is "between externally or 'publicly' oriented actions taken by a dependent householder on behalf of his master (who at the highest level was the king), and internally or 'privately' oriented actions undertaken for the direct benefit of the dependent householder himself" (Schloen 2001:299-300).

As an organizing principle rather than a type of society, the PHM allows for variations within ancient Near Eastern societies. Although in theory it was his right as the patriarch of his household to reallocate land and make demands for goods and labor, the ability of the king to carry out these actions varied. At few times, if ever, in the history of the Near East was the king able act in the idealized manner of the patriarch. The cyclical progression of society should not be seen as shifts between qualitatively different structures (i.e., from tribe to chiefdom to state) but rather as "an oscillation between decentralized and centralized forms of the patrimonial model of social organization, whose extreme poles are represented historically by small scale 'tribes' and 'chiefdoms,' on the one hand, and by political behemoths such as Ur III Mesopotamia and pharaonic Egypt, on the other" (Schloen 2001:71).

It should be obvious by this point that Schloen's conceptions of ancient Near Eastern society conflict rather strongly with with the ecosystemic model of the state. The PHM also demands a reassessment of the city as a form of settlement and its relationship to its hinterland as well. In keeping with its emphasis on local rules, this model predicts that most households would be self-sufficient. Rather than a highly differentiated aggregation of interdependent specialists (the Durkheimian "organic solidarity" model which is the basis for most models of ancient urbanism), the ancient Near Eastern city was primarily composed of households whose primary occupation was subsistence in the form of farming and herding. Certainly craft specialists existed, but with the exception of the producers of expensive prestige goods, they were part-time and independent, spending the rest of their time on the same mundane activities as everyone else (Schloen 2001:101). Urban neighborhoods were not organized by socioeconomic class but by kinship—essentially spatially adjacent villages which were inwardly focused (Schloen 2001:109-114; see also Stone 1995; Stone 1997). Therefore there was no dichotomy between parasitic consumer cities inhabited by non-producing elites and craft specialists and agricultural producer villages; there may have been movement of products and labor between them, but this was not due to qualitatively different social organization, which was organized on the same PHM principles (Schloen 2001:101-103). The archaeological and textual support for this conception of urbanism, which has been previously proposed in different forms (Gelb 1979; Pollock 1999), will be discussed in detail in Chapter 2.

1.8. Landscape and Society

One of the recurring points of emphasis in the previous extended discussion of complex society has been the importance of space, in particular the importance of the manner in which its members arrange themselves across the landscape they inhabit. Of necessity, then, any study of early states must adopt a broad framework that extends beyond the (often arbitrarily defined) boundaries of "the site" to consider not only other sites but the spaces in between them and the relationship between settlement patterns, the environment, and society. This sort of landscape perspective is by no means limited to complex societies; however, urban societies in particular have an intense and reciprocal relationship with their environment that has the advantage of being more visible archaeologically than the cultural landscapes of societies of smaller scale.

At its most basic, a landscape perspective includes the study of settlement patterns, which has been called the greatest methodological advancement in archaeology since World War II (Sabloff and Ashmore 2001). The distribution of populations in settlements of different sizes has been used as the primary indicator of social complexity; in particular, a settlement hierarchy with three or more levels is often used as the regional signature of the state in ecosystemic studies. Although there are myriad difficulties in translating surface distributions of sherds into ancient demographics, the use of aggregate settled area remains the best means of tracking the growth and decline of population.

More recently, archaeologists have come to realize that the islands of settlement labelled "sites" are just the most visible component of a continuous ancient landscape (Cherry 1983). The landscape is covered with a carpet of artifacts and features, which represent the surviving traces of a continuum of ancient activity, ranging from the intensive and obvious (settlement construction, material culture production, discard of waste) to the extensive and ephemeral (agriculture, pastoralism, extra-site human movement) (see examples in Wilkinson 2003:52-70). In the case of the urban societies which are the focus of this study, the relationship between the "islands" (perhaps more accurately called "continents") of settlement and their hinterlands is of tremendous importance for understanding their political and economic systems. In particular, offsite methods allow the reconstruction of the agricultural foundations of urban settlement.

While considering settlement and accompanying patterns of land use in their landscape context, it is important to recognize a recursive relationship. The environment is of course not a mere backdrop for settlement patterns. It does not determine them (or the social, economic and political dynamics of which they are a product), although in some cases it can have a tremendous impact. Conversely, humans can dramatically impact their landscapes; this can be done either deliberately, such as the excavation of a canal system which alters a region's hydrology, or unintentionally, as in the erosion which follows excessive treecutting or agriculture. However, humans have never fully escaped the constraints of climate and geography, despite some very early and notable technological innovations; even today there are environments where humans cannot live without great expense (deep sea trenches, the moon, etc.). With this dynamic relationship in mind, this study will adopt a dialectical approach identical to that found in agency and complex adaptive systems. Variously called settlement ecology (Anschuetz, *et al.* 2001:177-178), historical ecology (Crumley 1994), or human ecodynamics (McGlade 1999), it supposes that human societies (or more properly the social actors within them) and the environment are interactive, impacting each other in a continuous manner which is difficult or impossible to predict (Crumley 1994; McGlade 1999). Contrary to the ahistorical nature of systemic models, this approach stresses the importance of historical path dependency (Arthur 1988): the outcomes of past human-environment interactions cannot be undone, and constitute part of the new cultural landscape (McGlade 1999:476-477).

1.9. The Growth, Operation and Decline of Urban Settlements in the Upper Khabur Basin

The study at hand intends to contribute to the still ongoing debate on the nature of early urbanism by considering the excavated remains of these cities, their distribution and relationship to their subordinate settlements, and their impact on the landscape. As we have seen in the review above, there are strong theoretical grounds for critiquing ecosystemic models of the early state, but does the data support a high level of centralized control over all aspects of the economy that characterize these theories? To attempt an answer to this question, one must seek evidence for centralized control over land, agricultural yields, and pastoral products, and their redistribution by powerful administrative institutions in the archaeological and cuneiform record. If these are lacking, we must ask whether these data be better understood via a more flexible, less rigidly centralized model such as the PHM, which would predict a household or neighborhood basis for most agricultural and pastoral production with tight economic control perhaps limited to elite dominance over the production and distribution of certain prestige items.

The following chapter will review the state of northern Mesopotamian archaeology in the third millennium BC with these issues in mind, and will assess the two major models in light of the critique of ecosystems theory and the Patrimonial Household Model. The methodology (Chapter 3) and results (Chapter 4) of the settlement surveys of the Tell Beydar and Hamoukar areas will be described, followed by the analysis of offsite traces of roads and agricultural intensification (Chapter 5). Following a discussion of the historical geography of third millennium northern Mesopotamia, I will make a speculative attempt at reconstructing the extent of the Kingdom of Nagar (Chapter 6). Finally, having found little evidence for a highly centralized and powerful government, I will propose a new model based on the synthesis of the field data and interpreted within the framework of the PHM (Chapter 7).

CHAPTER TWO:

THE ARCHAEOLOGY OF THE UPPER KHABUR BASIN IN THE THIRD MILLENNIUM BC

Settlements of the third millennium BC have been extensively if somewhat unevenly studied by archaeologists throughout ancient Mesopotamia. Syntheses of this mass of data are hampered on several fronts, most notably a heavy bias in favor of urban settlements, and within them, on the large institutional households, mostly palaces and temples. Additional difficulties stem from still-unresolved problems of relative ceramic and absolute historical chronologies, which make it difficult to evaluate tight diachronic interpretations.

Nonetheless, strides have been made in not only describing third millennium society but developing models of urban state formation, operation and dissolution. This chapter will review the general state of archaeological knowledge and the two most developed models in the current literature. Before doing so, important issues of environment and chronology will be summarized.

2.1. The Environmental Context

Urbanism throughout northern Mesopotamia developed in an environmental context very different from that of southern Mesopotamia. The plains of the south were almost completely flat, with aggrading rivers flowing above plain level, and negligible rainfall (see especially Buringh 1960; Sanlaville 1989; Wilkinson 2003:76-87). The northern and southern environmental contexts placed very different limits upon, and offered different opportunities for, the development of ancient urban society.

The geography of northern Mesopotamia (Fig. 2.1) began to take its modern form in the early Miocene (ca. 20 million years ago), when the Gulf of Suez rift failed, causing the onset of ridge-push faulting in the Dead Sea transcurrent fault as the Arabian plate separated from the African plate. By the mid-Miocene, it had collided with the Eurasian plate along the Bitlis suture in southern Turkey. The Palmyra and Sinjar troughs deformed in response to this collision, since they contained several thousand meters of under-compacted Mesozoic and Tertiary sediments. By the late Miocene-early Pliocene, the northern part of the Arabian plate was uplifted and the formation of the Taurus-Zagros orogenic zone had begun (Lovelock 1984; Litak, et al. 1997; Sawaf, et al. 1993).

The folding of sedimentary deposits in the Sinjar-Palmyrene trough caused the emergence of the Sinjar and Jebel 'Abd al-Aziz anticlines along its north edge (Sawaf*, et al*. 1993). At the edge of the orogenic zone, the Mardin High (Tur Abdin), an ancient part of the Arabian plate which has escaped the forces which produced the Taurus Mountains to its north, was elevated. These tectonic processes reactivated structural weaknesses within the Arabian plate, causing volcanism which resulted in several basalt plateaus, including the Jebel Kaukab near Hassake and the 'Ardh al-Shaykh west of Tell Beydar (Fig. 2.2). The uplift of the Jebel 'Abd al-Aziz and the Taurus during the Mio-

Pliocene and Pleistocene also resulted in undulations in the Miocene substratum to the north; it is in these north-south depressions that the major wadis of the basin have formed. Also at this time, a large "Paleo-Tigris" river channel drained a large catchment within the Taurus mountains; the large water-rounded cobbles of this river have been found in deep sections at Tell 'Alo and near Tell Brak (Wilkinson 2002a).

Within this tectonic framework, the Upper Khabur basin (Fig. 2.2) has filled with rocks and sediments of Tertiary and Quaternary date, although Quaternary basalt sheets extend along the northern limits of the basin at the foot of the Turkish mountains, and Pliocene clays survive in the northeast corner and west of the Wadi Khanzir (Wilkinson 2002a). The more recent sediments have been brought into the basin by the Khabur river, the Jaghjagh river, and the various seasonal wadis, which have collection basins within the Tur 'Abdin, while the other major wadis are fed primarily by springs at the foot of the mountainous zone and the various basalt plateaus (Courty 1994). These fluvial systems flow generally north to south, and have produced a broad alluvial plain filled with eroded sediments from the Tur Abdin. At the eastern end of the basin, the Sinjar ridge has altered the flow direction to create a marshy area (*sebkha*) along the Wadi Radd.

The wadi floodplains are generally a few tens of meters wide but show considerable aggradation over the last four millennia. At the southern end of the Wadi Aweij, a series of geomorpological trenches demonstrated variable rates of floodplain aggradation, with a particularly intense phase at the end of the third millennium BC, where almost 3 m of sediment were rapidly deposited (Courty 1994), and similar floodplain observations have been made further to the north near the modern Tell Tamr-

Qamishli road (Wilkinson 2001). The interfluves, on the other hand, have much shallower soils and have seen much less aggradation. These soils are at most 2 m deep on a hard quaternary substratum (Courty 1994). Throughout the Upper Khabur and the adjacent plains of the Iraqi north Jazira, the dominant soil type is Calcic xerosol, which is very fertile (Wilkinson and Tucker 1995:5-6; Wilkinson 1997:70-72). These soils are classified as brown or reddish-brown soils by Buringh (1960:78).

Today, the Upper Khabur region features a strongly seasonal Mediterranean climate, with the vast majority of rainfall during the winter months and very dry summers; this regime results from the southward shift of moist westerly winds in the winter and the northward expansion of the subtropical high-pressure belt in the summer (Wright 1993). Northern Iraq and northeastern Syria benefit from additional moisture in the spring which is derived from stationary low pressure cells that advect moisture from the Persian Gulf, and is precipitated orographically by the southern Taurus Mountains. The increased solar radiation and temperature of spring lead to water stress, but this late boost in rainfall can prolong the agricultural growing season and increase crop yields (Kouchoukos 1998).

The degree to which these modern conditions pertain to the past is currently a matter of debate between investigators using different data sources. It is generally agreed that during the last glacial maximum (late Pleistocene, 18,000 years BP), conditions in the Middle East were generally cooler and dryer. Pollen cores from lake sediments throughout the region indicate a drastic reduction in tree pollen at this time (Butzer 1995; Wright 1993). The colder temperatures resulted in reduced evaporation and therefore reduced precipitation, which caused the contraction of forests. The reduced evaporation also resulted in the raising of lake levels throughout the region, which can be documented by increases in the O^{18} isotope (Lemke and Sturm 1997).

The climate and soils of the Upper Khabur basin are very productive for dry-farming agriculture, particularly in the northern half of the basin, where annual rainfall is more reliably above the minimum necessary for a successful crop. The superior productivity and reduced risk of irrigation agriculture compared to dry farming is well documented; under pre-industrial agricultural conditions, an irrigated field will be 50% to 100% more productive than a rainfed field of the same size (Weiss 1986). However, the geomorphology of the southern Mesopotamian plains restricts cultivation to the sloping sides of river levees; the soils of the basins beyond are fine-textured, poorly drained and saline, although these factors varied through time and with changes in land use (Wilkinson 2003:77-78). Although there are also differences in productivity between floodplain and interfluve, the soils of the Upper Khabur basin are somewhat more homogenous. Thus on the northern plains, cultivation would not have been as geographically restricted as in the south, and much more cultivable land would have been available, although still strongly influenced by the availability of rainfall (Wilkinson 1997, 2000c). Weiss has concluded that "the dry-farming plains of northern Mesopotamia could have generated *aggregate* yields considerably greater than those of southern Mesopotamia" (Weiss 1986:74; emphasis added), perhaps two to three times as much as in the irrigated south (Weiss 1983). The critical issue then becomes the transport of harvested cereals: bulk grains could be moved efficiently by boat on the canals of the southern plains, but the friction of overland transportation on the northern plains is prohibitively expensive beyond a certain distance (Wilkinson 1994:503). This environmentally defined difference in transportation efficiency is a major point of divergence between the Bronze Age economies of northern and southern Mesopotamia (Stein 2004:76-77; Algaze 2001).

2.2. Problems of Chronology

The study of the formation and collapse of urbanism requires that the archaeological data be chronologically subdivided as finely as possible. The development of relative and absolute chronologies is one of the earliest focuses of modern archaeology (Trigger 1989:73-86), and in some cases has become an end in itself. Being between two areas which have much longer traditions of archaeological exploration, archaeology in northern Mesopotamia has attempted to apply their chronologies onto much different material, with poor results.

The reckoning of time in northern Mesopotamia (Table 2.1) has been done via a complicated method of intertwining relative chronologies and absolute chronologies. Excavations at multi-period tell sites have resulted in relative sequences of material culture, most commonly ceramic types and glyptic styles. These have been linked to a historical chronology which has been developed from written sources, predominantly from southern Mesopotamia. This historical chronology has in turn been tied to absolute dates based on astronomy and radiocarbon dating (discussed in Section 2.6 below). All of these chronologies are problematic in some way or another and must be used critically.

<table>
<tr><th>Absolute Dates</th><th>Southern Mesopotamia</th><th>Oates/Brak</th><th>Leilan</th><th>Santa Fe/ Pfälzer-Lebeau</th><th colspan="2">THS/TBS</th></tr>
<tr><td>4400-4100</td><td>Late Ubaid</td><td>Terminal Ubaid/ Brak D</td><td rowspan="2">Leilan VIb</td><td>LC1</td><td rowspan="2" colspan="2">Period 04</td></tr>
<tr><td>4100-3800</td><td>Early Uruk</td><td>Northern Early Uruk/ Brak E</td><td>LC2</td></tr>
<tr><td>3800-3600</td><td rowspan="2">Middle Uruk</td><td rowspan="2">Northern Middle Uruk/ Brak F</td><td>Leilan V</td><td>LC3</td><td rowspan="3">Period 05b</td><td></td></tr>
<tr><td>3600-3300</td><td rowspan="2">Leilan IV</td><td>LC4</td><td rowspan="2">Period 05a</td></tr>
<tr><td>3300-3000</td><td>Late Uruk</td><td>Late Uruk/ Brak G</td><td>LC5</td></tr>
<tr><td>3000-2900</td><td rowspan="2">Early Dynastic I through early III</td><td>Brak H</td><td></td><td>EJ 0</td><td rowspan="3" colspan="2">Period 06</td></tr>
<tr><td>2900-2600</td><td>Brak J</td><td>Leilan IIIa-c</td><td>EJ I</td></tr>
<tr><td>2600-2500</td><td>Early Dynastic IIIa</td><td>Brak K</td><td>Leilan IIId</td><td>EJ II</td></tr>
<tr><td>2500-2300</td><td>Early Dynastic IIIb</td><td>Late ED III/ Brak L</td><td>Leilan IIa</td><td>EJ III</td><td rowspan="3" colspan="2">Period 07</td></tr>
<tr><td>2300-2100</td><td>Akkadian</td><td>Akkadian/ Brak M</td><td>Leilan IIb</td><td>EJ IV</td></tr>
<tr><td>2100-2000</td><td>Ur III</td><td rowspan="2">Post-Akkadian/ Brak N</td><td>Leilan IIc</td><td>EJ V</td></tr>
<tr><td>2000-1800</td><td>Isin-Larsa</td><td>"Habur Hiatus"</td><td rowspan="2"></td><td colspan="2"></td></tr>
<tr><td>1800-1600</td><td>Old Babylonian</td><td></td><td>Leilan I</td><td colspan="2">Period 08</td></tr>
</table>

Table 2.1. Chronologies in northern Mesopotamia. Based on Lebeau 2000, Oates and Oates 2001, Schwartz 1988 and 2001, Hole 2001, Wright and Rupley 2001). Late fifth through fourth millennium dates are based on radiocarbon dates. Akkadian-Old Babylonian dates generally follow the Middle Chronology but could be up to 150 years too early (see Section 2.2).

In particular, the historical absolute chronology in long use (the "Middle Chronology"; Brinkman in Oppenheim 1977:335-348) was never considered to be the "final word," even by its author. However, it has achieved a quasi-canonical status, mostly because it is easier to simply apply it than to undertake the detailed studies necessary to revise it. Such studies are only recently being undertaken. Most of these reevaluations (e.g., Gasche, *et al*. 1998; Reade 2001) are favoring a much lower chronology that would bring periods currently placed in the third millennium BC forward in time, although others favor higher chronologies. What is clear from these studies is that the absolute historical chronology in the late third and early second millennia BC is by no means established, and all historical designations should be heavily qualified.

This study will generally use a simple relative chronology which is based on major changes in ceramic traditions recognizable in surface assemblages (Table 2.1, THS/TBS). The periodization derives from a ceramic typology originally devised by David Tucker for the surface collection of Tell al-Hawa (Ball, *et al.* 1989) and later used for the North Jazira Project (Wilkinson and Tucker 1995). Tucker and Wilkinson gave their periods cultural ("Uruk") or historical (e.g., "Mitanni" and "Middle Assyrian") designations which can be problematic; therefore, this study uses numeric designations which are much blander but free of cultural or historical baggage. Individual periods tend to be longer than site-based sequences based on excavation or the recently proposed regional sequences for the fourth (LC1-5: Schwartz 2001; Wright and Rupley 2001; Rothman 2002) and third (Early Jazira I-V: Pfälzner 1997, 1998; Lebeau 2000) millennia BC. This "lumping" reflects the limitations of surface assemblages (see discussion in Chapter 6.3). The periodization also differs by splitting Tucker and Wilkinson's fourth millennium ("Uruk") period into an earlier (Period 04) and a later (Period 05); furthermore, Period 05 is divided into two partially contemporary assemblages which reflect intrusive southern Uruk (Period 05a) and local northern Mesopotamian (Period 05b) ceramic traditions. In contexts where greater chronological precision is called for, reference will be made to the various regional and site-specific chronologies listed in Table 2.1.

With these general environmental and chronological issues in mind, the next three sections will review archaeological evidence for third millennium society in the Upper Khabur basin, using the published results of excavations and surveys.

2.3. Dispersed Village Settlement in the Ninevite 5 Period (3000—2600 BC)

After the clear signs of social complexity vanish at the end of the fourth millennium BC, northern Mesopotamia appears to have entered a period of "devolution" (Schwartz 1994a) in the beginning of the third millennium BC, a time when contemporary society in southern Mesopotamia was reaching its urban apex (Adams 1981).

The name "Ninevite 5" is derived from a deep sounding dug by Mallowan at Nineveh in 1931-32; the fifth level was characterized by distinctive painted and incised pottery (Mallowan 1933; Gut 1995:9-19). Subsequently, both the decorated ceramic style and the chronological period in which it occurred have become known by this designation (for further discussion see Roaf and Killick 1987; Rova 1988:5-10). The earliest variety was a red-brown to purple paint, mostly in geometric designs; this style then appeared beside a fine incised variety. An elaborate excised style was introduced later (Schwartz 1988; Roaf and Killick 1987), followed by a somewhat careless zigzag style at the end of the period (Calderone and Weiss 2003:198-199).

The earliest painted Ninevite 5 ceramics appear along the Upper Tigris in what would later be the heartland of the Assyrian empire. Here it evolved from a local late fourth millennium painted tradition that appeared in assemblages with southern Uruk-style pottery; in a "mature" form, it subsequently spread into the Upper Khabur basin (Rova 1996, 2000).

Despite its exposure on sites throughout Syria, Iraq, and Turkey (Fig. 2.3), the nature of Ninevite 5 settlement and society remains obscure. In general, exposure of Ninevite 5 period remains in Northern Mesopotamia have been limited, for several reasons. Most importantly, excavation has focused on the largest and highest tells, which achieved that morphology by thousands of years of occupation. In most cases, many meters of mid- to late third millennium occupational debris seal the Ninevite 5 levels, making them difficult to reach without great time and expense. These succeeding levels have frequently revealed monumental architecture immediately beneath the tell surface; as a result, archaeologists have concentrated on broad exposures of a single period, rather than sounding down into Ninevite 5 levels. Finally, the construction of these monumental buildings damaged or removed Ninevite 5 layers in antiquity, as earlier buildings were leveled and preexisting tell surfaces were terraced (see especially R. Matthews 2003; Oates, et al. 2001).

The exceptions have come from areas where salvage projects have rescued threatened sites, particularly the Khabur river dam below Hassake in Syria (Monchambert 1984a, b) and the Saddam Dam on the Iraqi Tigris, above Mosul (Ball and Wilkinson 2003). In the Middle Khabur area, many of the twenty-two third millennium sites identified in the initial reconnaissance were excavated, particularly at Raqa'i (Curvers and Schwartz 1990; Schwartz and Curvers 1992), Bderi (Pfälzner 1988), 'Atij and Judeida

(Fortin 2000). Perhaps the greatest exposure of Ninevite 5 levels has been at Tell al-Raqa'i levels 3-4, where nearly the entire preserved extent of this small village was excavated (see Akkermans and Schwartz 2003: Fig. 7.7).

Settlement surveys have also run into difficulties in recognizing Ninevite 5 settlement. The decorated Ninevite 5 types, which are the most recognizable as well as the most chronologically sensitive, are finewares which may have had a prestige role (Stein and Blackman 1993); as such, they occur less frequently in surface assemblages and may reflect loci of elite settlement rather than settlement in general. Furthermore, these non-robust types survive poorly on exposed surfaces. Finally, the even distribution of Ninevite 5 types throughout the Upper Khabur basin can be questioned. The earliest painted style was probably produced and distributed mostly in the Tigris area, around Nineveh (Rova 1988). Although such vessels have been found in excavations in the Khabur basin as far west as Chagar Bazar and Tell Brak, several surveyors have noted the scarcity of painted Ninevite 5 on site surfaces. The intensive surface collection of Tell al-Hawa produced only five sherds (Ball, *et al.* 1989:32) and they were much less common than incised types on surrounding sites (Wilkinson and Tucker 1995:49, 95). In the Jarrah basin, surveyed by Stein and Wattenmaker (2003), only a single site produced painted sherds. The Mozan high mound surface collection recovered a single sherd as well (Buccellati and Kelly-Buccellati 1988:45).

While painted Ninevite 5 is uncommon throughout the Upper Khabur, the western basin appears to be lacking the later incised and excised types as well. These types of decoration are well represented at Leilan, Chagar Bazar, Tell Brak, and as far west as Tell

Beydar (Lebeau and Suleiman 2003b) and Abu Hafur (Kolinski and Lawecka 1992) on the Aweidj. However, Lyonnet found no incised or excised sherds in the southwestern quadrant of her survey universe; these types were absent from sites along the Khabur River and the wadis west of the Aweidj (Lyonnet 1996, 2000). Further downstream, Ninevite 5 decorated sherds from excavated sites in the Middle Khabur area are rare and have been frequently described as "crude local imitations" (Schwartz and Curvers 1992:414) or not in the "classical Ninevite 5 style" style (Hole 2000:614). Excavations in the western Khabur basin have yet to produce a solid published assemblage of local early third millennium ceramic types which would have been contemporary with the decorated types of the eastern basin. In the face of such chronological uncertainty, Monchambert (1984b) lumped all third millennium sites into a single category, and the West Jazira Survey used a statistical approach, by seriating types from the surface collection (Kouchoukos 1998:367-368).

Bearing in mind these data shortcomings, some tentative generalizations can be made about north Mesopotamian societies at the beginning of the third millennium.[1] Settlement surveys have demonstrated that the Ninevite 5 countryside consisted of dispersed small settlements, with a few small towns. The best data come from two high-intensity surveys, at the eastern end of the basin (Leilan) and immediately across the Iraqi border to the east. In the Leilan hinterland, Leilan and Dougir (both 15 ha) presided over a number of smaller villages, all of less than 9 ha (Stein and Wattenmaker 1990, 2003).

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[1] A post-Late Uruk, pre-Ninevite 5 occupation (Early Jazira 0) exists over several sequential levels at Tell Brak Area TW (Oates and Oates 1991) and elsewhere on the site (R. Matthews 2003:123-124). This ceramic repertoire has not been identified in any other excavation or within surface assemblages, so no discussion of EJ 0 society is possible at present.

In the Iraqi North Jazira area, a three-level hierarchy of sites had developed, with Tell al-Hawa (24 ha) at the apex. Other small towns existed at three sites, and all were surrounded by a halo of "satellites" of 1-2.5 ha (Wilkinson and Tucker 1995:49-50).

Several other surveys have reported Ninevite 5 settlement patterns but are of lower intensity and thus must be viewed more critically. The West Jazira Survey (Kouchoukos 1998), which concentrated on the areas around the Jebel 'Abd al-Aziz, located only 14 small villages, none of which was larger than 1 ha. In the western half of the basin proper, an extensive survey by Bertille Lyonnet (1996; 1998; 2000) collected an opportunistically selected group of tells and cannot be used for settlement pattern analysis. The low-intensity survey of Meijer (1986) recognized Ninevite 5 types, but the other early third millennium diagnostics he used are based on questionable parallels with the Levantine ceramic chronology.

Excavations also suggest a reduction in the level of social complexity in the Ninevite 5 period (Akkermans and Schwartz 2003:216-224). Most forms of administrative technology disappeared after the collapse of the LC 4-5 "expansion." There are no examples of writing known from Ninevite 5 sites, but the use of cylinder seals continued. Both sealings and the seals themselves, in the "Piedmont" style (Pittman 1994) and unrelated local types (R. Matthews 2003:133-134), have been recovered. Their role in administration has yet to be fully explored with functional analyses, but the few existing studies place sealing in the context of small private or temple households (R. Matthews 2003:111-113).

Mass production of pottery, which was done on a large scale in the mid- to late-fourth millennium (e.g., Oates and Oates 1993:181-182), vanishes with the end of the Uruk period. In its place appeared new labor-intensive production methods which involved elaborate decoration (Blackman, *et al*. 1993; Stein and Blackman 1993).

Monumental architecture is almost unknown at this time. When temples can be identified, they are small single-room structures such as the Raqa'i Level 3 temple (Schwartz 2000) rather than the large institutions known from the south at the same time (Matthews 2002). At Raqa'i and Tell Khazna, large round buildings have been excavated, which are reminiscent of the contemporary round buildings of the Hamrin basin (Gibson 1981) in external appearance if not in function. Residential buildings, when they have been fully excavated, have tended to be small one- or two-room structures with little ornamentation or size differences between them (Schwartz and Klucas 1998). A study of the distribution of grave goods in the Ninevite 5 period concluded that there was some degree of socio-economic stratification, although not nearly as much as in contemporary burial groups in southern Mesopotamia, which include the Royal Cemetery at Ur and the Kish Y cemetery (Schwartz 1986).

The general absence or infrequency of the material correlates of social complexity at settlements of the early third millennium BC has inspired several scholars to label these societies as chiefdoms (e.g., Schwartz 1994a; R. Matthews 2003; Akkermans and Schwartz 2003:224). However, there is substantial evidence from the Middle Khabur region that economic organization was more complex than merely household agricultural self-sufficiency. Salvage excavations at Tell al-Raqa'i on the Middle Khabur produced a large exposure of Ninevite 5 levels which included a thick-walled round building surrounded by small domestic structures (Curvers 1987; Curvers and Schwartz 1990; Schwartz and Curvers 1992). Grain storage had probably been important from the start of settlement at Raqa'i; at the lowest levels reached (levels 5-7), the excavators recovered grill-like structures similar to those known from small exposures at Talul al-Thalathat and Tell Karrana (Schwartz 1994a; Wilhelm and Zaccagnini 1993). They interpret the Ninevite 5 large structure as a specialized storage structure for locally produced agricultural surpluses. These structures suggest that even in the context of these less complex polities that succeeded the Uruk expansion, centralized storage remained significant (Schwartz 1987).

Schwartz has proposed that Raqa'i was one of several small villages on the Middle Khabur which had a grain storage specialization (Schwartz 1994b; Akkermans and Schwartz 2003:218-222). The excavators contend that the recovered storage facilities at Raqa'i and elsewhere at this time greatly exceeded the needs of the estimated ancient populations, and were probably used for storing grain staples that were to be shipped via river transport to larger polities elsewhere. Thus, these were not self-contained agricultural villages but specialized centers for storage, processing, and distribution of grain products, tied into a regional economic system. Candidates for the controlling polity include Mari, which exists in a marginal rainfall zone and was known to import cereals from the Khabur region in the second millennium BC (Margueron 1991), or some polity within the southern region of the Upper Khabur basin which may have been forced to import surplus from the Middle Khabur area due to circumscription by competing states elsewhere in the basin (Schwartz 1994b).

This rural specialization model has been critiqued from two directions, both proposing local consumption. Frank Hole's survey in the West Jazira area around the Jebel Abd al-Aziz recovered as many as 36 sites of the first half of the third millennium BC (1991; 1997; 1999). By using a lower population estimate, Hole suggests that the surplus was for both local consumption and fodder for livestock. In the wet season, flocks would have grazed on the steppe beyond the river floodplain; in the dry season, these flocks, and their human shepherds, would have needed to return to the floodplain for water and food. Furthermore, the wetter conditions in the first half of the third millennium BC would have meant that the land would have been more productive anyway (Hole 1999). Another reassessment of Raqa'i's population by Peter Pfälzner (2002), in combination with comparisons of domestic storage throughout northern Mesopotamia, also proposes local consumption, but by the human population of the village.

At present, this debate on the organization of the agricultural economy of the Middle Khabur cannot be resolved. Much of the difference between the two models revolves around the quantity of surplus agricultural production, which in turn derives from equally plausible reconstructions of ancient population density and total volume of storage space. However, it is worth emphasizing some of the underlying assumptions of each. The surplus-shipping model primarily advocated by Schwartz assumes that surplus production will occur under the influence of an extractive centralized polity, and is strongly influenced by the hierarchical emphasis of ecosystems theory. Hole's pastoral interaction model, on the other hand, is more heterarchical in that it recognizes the possibility of non-sedentary groups which may have had fluctuating political and economic relationships with sedentary agriculturalists. Indeed, a dynamic relationship between the two groups may have been important in the formation of the large *Kranzhügel* settlements in the later third millennium BC (Kouchoukos 1998; Lyonnet 1998).

2.4. The Urban Explosion (2600—2400 BC)

At the end of the Ninevite 5 period, a handful of villages in Northern Mesopotamia underwent a very rapid transformation into cities (Fig. 2.4). This has been best documented at Tell Leilan, where soundings into virgin soil in the 90 ha lower town have shown that in all cases, the initial phase of settlement (Leilan IIId) is characterized by a very late and somewhat careless variety of Ninevite 5 excised pottery (Calderone and Weiss 2003; Weiss 1990: Abb. 12). Unfortunately exposures of Leilan IIId have been very limited in extent so that little can be said about the nature of society at this pivotal point.

The most obvious manifestation of this process is the expansion of settled areas at the major sites (Table 2.2). In the early third millennium, the landscape was characterized by villages and rare 15-20 ha small centers in a hierarchy of two or at best three levels (Wilkinson and Tucker 1995:49-50). The best surface documentation comes from the Upper Khabur Basin and immediately adjacent regions. Some time between 2600 and 2500 BC, Leilan grew from 15 ha to 90 ha (Weiss 1983).[2] Mozan and Hamoukar expanded to 120 ha and 105 ha, respectively (Ur 2002b: Table 1 and Chapter 4 below). Brak's size at this time has been estimated at 40 to 65 ha (Emberling, *et al.* 1999:16); however, the current program of intensive surface collections begun in 2003 will demonstrate that it was larger. To the east, Tell al-Hawa expanded from 24 ha to 66 ha (Ball, *et al.* 1989), and to the west, Chuera grew to 65 ha (Orthmann 1997). Elsewhere in northern Iraq, southeastern Turkey, and western Syria, select sites attained

Site	***Size***	***Source***
Tell Taya	155 ha	(Reade 1997)
Tell Mozan	120 ha	(Buccellati and Kelly-Buccellati 1999: Abb. 3, 5)
Hamoukar	105 ha	1999 Field Survey
Kazane Höyük	100 ha	(Wattenmaker 1997)
Tell Leilan	90 ha	(Weiss 1986)
Tell Khoshi	90 ha	(Kepinski-Lecomte 2001)
Tell Hadhail	90 ha	(Weiss 1983: Fig. 11)
Tell Farfara	75 ha	(Meijer 1986: Fig. 6)
Tell al-Hawa	66 ha	(Ball, et al. 1989:34, Fig. 9)
Tell Brak	40-65 ha	(Emberling, et al. 1999:16; J. Oates, pers. communication)
Tell Chuera	65 ha	(Orthmann 1997)

Table 2.2. Major urban centers of the mid to late third millennium BC in northern Mesopotamia.

[2] Weiss and Courty (1993:135-136) put the total at approximately 100 ha.

sizes of up to 100 ha (see Table 2.2).

Third millennium cities almost all developed out of earlier settlements, which resulted in a distinct and consistent morphology (Van Liere 1963; Van de Mieroop 1997:83-86). The existing settlement of the earlier third millennium was often in the form of a high mounded tell; most cities had in fact been occupied since the fifth millennium BC if not earlier (e.g., Brak, Leilan and Hawa). These mounds were already up to 30 meters high in the early third millennium. At the time of their sudden expansion, lower and much more extensive areas of settlement formed around this older core. These lower towns generally do not exceed 5 meters in height as they are preserved today. This morphological dichotomy between high mound (or acropolis) and lower town was recognized in ancient Akkadian terminology: αδα□□υμ and κιρ—υμ, respectively (Dossin 1972; Van de Mieroop 1997).

Where regional settlement patterns have been recovered, the relatively undifferentiated Ninevite 5 pattern gave way to a hierarchical distribution of cities, towns and villages. In the Leilan region, the estimated sustaining areas of the small towns and villages of the early third millennium BC showed little overlap, suggesting to the surveyors that these were economically self-sufficient settlements (Stein and Wattenmaker 1990, 2003). The sustaining area estimations for the second half of the third millennium, on the other hand, overlap substantially, particularly between Leilan and its neighbor Tell Muhammad Diyab (see Stein 2001: Fig. 5.5). To the east, the plains of the Iraqi North Jazira supported a three-tiered hierarchy of settlement size, with Tell al-Hawa at the apex and secondary centers at Tell al-Samir, Kharaba Tibn and Abu Kula

(Wilkinson 1994:487-490; Wilkinson and Tucker 1995: Fig. 53). A ring of small Ninevite 5 hamlets was abandoned prior to the mid-late third millennium BC, presumably because their populations relocated to the expanding Hawa or to one of its emerging secondary centers (Wilkinson and Tucker 1995:52, Fig. 37).

The growth of urban centers put pressure on its hinterland to cover its productive deficits (discussed below). The need to expand agricultural and pastoral production at this time had a lasting impact on the landscape. Farmers, herders and their animals moved across the extensively cultivated plain on local and intersite roads and tracks, and fields were manured with settlement-derived organic debris. The traces of both can be recovered by offsite archaeological techniques, and will be treated in detail in Chapter 5.

Despite the importance of the initial phase of urbanism (ca. 2600-2500 BC), it has proven to be difficult to reach in excavations, primarily because of later third millennium deposits capping it on most of the excavated sites (e.g., at Tell Brak; D. Oates and J. Oates 2001). Only at Tell Leilan, where it is labeled as Leilan IIId in the local site chronology, has it been excavated in an urban context. In a 200 m^2 exposure on the acropolis, structures interpreted as administrative storerooms have been excavated. In or near the storerooms, the excavators found almost 200 sealings for doors and containers (Calderone and Weiss 2003). In the lower town area to the southeast of the high mound, a wide thoroughfare in a residential area was excavated (Weiss 1990). The excavator argues that these excavations demonstrate the strength of the new state in the form of centralized elite-controlled storage and a deliberately planned lower town (see below).

The mature indigenous northern Mesopotamian state polities which emerged following this transitional period (variously called ED III, EJ III, Brak phase L, or Leilan phase IIa; see Table 2.1), and the period of Akkadian domination which followed it (also called EJ IV, Brak phase M, Leilan phase IIb), have received more attention than any other phase in the history of the Upper Khabur basin (for recent overviews, see Akkermans and Schwartz 2003:233-287; Stein 2004). The focus has been inordinately concentrated upon urban centers; excavation into these levels has been undertaken at almost all of the major urban sites (Brak, Chuera, Mozan, Leilan, Hamoukar, Hawa, Taya and Khoshi) as well as smaller secondary centers (Beydar, Chagar Bazar, Arbid and Muhammad Diyab). Smaller sites have only been investigated within the frame of major rescue campaigns in advance of dam construction, in particular the Khabur dams above and below Hassake and the Saddam Dam on the Tigris.

Until recently, the goals of these excavations has been the recovery of monumental architecture, in particular palaces, temples and city walls; during the earliest excavations, areas of domestic architecture were often abandoned as unprofitable (Tell Chuera has been a notable exception; see Pfälzner 2001:325-348). On the major urban centers, the high mounds have received a disproportionate amount of attention, especially when one considers that they rarely exceed 15% of the total settled area of the site. These are the oldest areas of settlement and have therefore been reserved for elite use. More recently, the household as a socioeconomic unit and the organization of early cities has become a research interest (Pfälzner 2001; Schloen 2001). Despite this promising change in direction, at the current state of knowledge we know a great deal about the socially and politically dominant but demographically small elite groups, and very little about the lives of the majority of the ancient population (Pollock 1999).

2.5. Akkadian Conquest and Control (ca. 2600-2400 BC)

Royal inscriptions from southern Mesopotamia record the conquests of the Akkadian kings in northern Mesopotamia, dating from the dynastic founder Sargon but intensifying under his grandson Naram-Sin (Frayne 1993; Westenholz 1999). A measure of archaeological confirmation came with the unearthing of the Naram-Sin "Palace" at Tell Brak (Mallowan 1947), which was constructed of mudbricks stamped with the name of the deified king. Destruction levels across the northern plains, in particular at Ebla and Brak, have been attributed to the campaigns of the two kings.

Despite the far-reaching political and economic transformations which have been attributed to the conquest and the hypothesized "imperialization" of the Upper Khabur basin, both epigraphic and archaeological evidence for this period is extremely ambiguous. Only at Brak can archaeological stratigraphy be firmly tied to an Akkadian king: the CH sequence abuts the eastern Naram-Sin building, which has allowed the excavators to tie the ceramic sequence to its construction (Oates, *et al*. 2001). As should be expected, pottery types show a gradual evolution which disregards sharp chronostratigraphic boundaries (Oates 2001b). As a result, it is difficult to ascertain forms which can act as solid Akkadian markers; most types were in use through two or more stratigraphically-defined periods. The monumental temple/administrative complexes at FS and SS were certainly in use during the presumed time of Akkadian political control, but may have been constructed prior to its onset. Other scattered evidence in the form of tablets and a sealing of the Akkadian governor of Gasur (Eidem, *et al*. 2001) lend further evidence for real Akkadian control at Brak.

Elsewhere in the basin, evidence of direct control is less straightforward. Sealings bearing the name of Tar'am-Agade, daughter of Naram-Sin, have been found at Tell Mozan (Buccellati and Kelly-Buccellati 2002), but her presence there could be attributed to either a diplomatic marriage or administration; the excavators now assume that Mozan remained independent during the Akkadian conquest (Buccellati and Kelly-Buccellati 2001). Epigraphic evidence at Leilan is limited to a fragmentary tablet and an inscribed sealing (Weiss 1997:343), although a broad range of Akkadian impacts have been hypothesized (see discussion below; Weiss and Courty 1993).

Regardless of these issues of political control, this mid- to late third millennium phase of mature urban societies in the Upper Khabur basin was characterized by great social complexity in several forms: labor mobilization to construct massive city walls, terraces, palaces and temples; increased specialization in the production of pottery, metals and other crafts as well as administrative and religious tasks; and intensification of agricultural and pastoral production. Although cities reappeared in the basin in later periods (Shubat-Enlil, Guzana, Nasibina, etc.), this was the most pervasive phase of urban settlement that it would ever support.

At some point at the end of the third millennium BC, the cities of northern Mesopotamia were depopulated, in some cases permanently, within the span of a single ceramic phase. When later settlement is to be found on these sites, in all cases it represents a clean break from the third millennium levels. Almost all aspects of this transition are debated. Some see this abandonment as complete and simultaneous across the basin, either at the end of the Akkadian period (e.g., Weiss and Courty 1993) or in its earliest phases (Courty 2001). Others believe that the timing of the collapse varied throughout northern Mesopotamia, and that some areas may not have been abandoned at all (Wilkinson 2000b; Akkermans and Schwartz 2003:284-287). The cause or causes are also hotly contested. Initially, an abrupt aridification event of volcanic origin was proposed (Weiss, et al. 1993; Courty and Weiss 1997), but more recently the soil micromorphological evidence has been reinterpreted as resulting from an extraterrestrial impact event (Courty 1998, 1999, 2001). Others (see especially Wilkinson 1994, 1997) suggest a combination of agricultural overextension and a run of poor rainy seasons could have contributed to systemic collapse.

Certainly Brak (Oates, et al. 2001; J. Oates and D. Oates 2001) and Mozan (Buccellati and Kelly-Buccellati 1988:44-45; Dohmann-Pfälzner and Pfälzner 2001) remained settled; these were the capitals of the post-Akkadian kingdom of Urkesh and Nagar (Matthews and Eidem 1993). As the ceramic indicators become better understood, post-Akkadian occupation is now being recognized at other major settlements in northern Mesopotamia, such as Taya (Reade 1997), Nineveh (McMahon 1998; Gut, et al. 2001), Tell al-Hawa (Ball*, et al*. 1989), Arbid (P. Bielinski, pers. communication) and now Hamoukar (Chapter 4.1).

2.6. Ecosystemic Models of the State in Northern Mesopotamia

To understand the formation, operational dynamics, and dissolution of the indigenous northern Mesopotamian state and its Akkadian-administered successor, most researchers working in the Upper Khabur basin have adopted a historical approach which focuses on the remains of the governing institution itself; the consequences have been a combined body of excavation data which is heavily biased toward the elite minority. Much of this work has been primarily descriptive in nature. Such a culture-historical approach has been much criticized by proponents of processual archaeology, with good reason; however, the recovery of primary archaeological data (ceramic sequences, architectural stratigraphy, artifacts, etc.) makes possible processual studies of sociopolitical change, and is a necessary first step in the understanding of how ancient societies developed and reproduced themselves.

Two models in particular, however, have gone beyond description. The first concentrates on the formation of the state as a centralized political entity, with an emphasis on control of the staple economy as the basis for power; the second focuses on the economic operation of third millennium states, but from a logistical perspective. In both models, it is the staple economy which drives the urban system, and both models are firmly rooted in the ecosystemic approach discussed in Chapter 1. Beyond these similarities, the two models differ sharply in their assumptions about the nature of urbanism and the state.

2.6.1. The Centralized State Model at Tell Leilan.

The first model was developed primarily by Harvey Weiss, one of the earliest modern archaeologists to undertake excavation and survey in the Upper Khabur basin.

The model originated to explain the evolution of settlement at Tell Leilan but has been extended to cover the Upper Khabur basin. In the ten years since it was published in its most detailed form (Weiss, et al. 1993; Weiss and Courty 1993), it remains controversial in the Near East (Akkermans and Schwartz 2003:283) but is often cited as established by physical scientists and archaeologists working in other regions.

This model, which I will refer to as the Centralized State Model (CSM) for convenience, is a descriptive ecosystemic approach which highlights the abrupt transitions between stable equilibria; research has focused primarily on the origins and collapse of urban state power, both indigenous and imperial. It is simultaneously historical in its attempts to accommodate epigraphic data from southern Mesopotamia but ahistorical in that the new sociopolitical configurations that result from the abrupt transitions appear to pay little attention to prior conditions. In all stages, the CSM assumes strongly hierarchical political organization.

Because of its importance to the CSM, a review of sociopolitical evolution at Leilan is worthwhile. The earliest state government at Leilan (IIId, 2600-2500 BC) manifested itself in the form of rapid urban expansion: the 15 ha Period IIIc city grew to 90 ha. Deliberate urban planning by this nascent state is proposed based on the Lower Town South excavations, which revealed a 4.5 m wide sherd-paved street without direct access to the residences which lined it (Weiss 1990). The staple economy was already controlled by the state at this early stage. Two hundred square meters of storerooms were constructed on the high mound (Weiss 2003) and were filled with processed cereals (Weiss*, et al*. 1993:997). The ultimate cause behind the formation of this state is nearly identical to the proposed economic motivations behind the earlier Uruk Expansion:

> Trade relationships with southern Mesopotamia transformed local political and economic structures (chiefdoms) into stratified states whose elites functioned, or found economic support, within the context of political and economic relationships structured within southern Mesopotamian interests… In the case of the Habur Plains, the exchange of Anatolian mineral resources seems a likely medium for the local transformation (Calderone and Weiss 2003:201).

In Leilan Period IIa (ca. 2500-2300 BC), further centralization of state power manifested itself archaeologically in two ways. Social and political inequalities were institutionalized by the construction of a wall around the high mound, "to protect and isolate the elite, their wealth, and their administrative power from the residents of the Leilan Lower Town and Leilan region villages" (Weiss and Courty 1993:138). A major development in craft production at this time was the final abandonment of the Ninevite 5 tradition of ceramic decoration in favor of new mass-produced forms; this change in production "suggests that containers were serving new purposes influenced or controlled by state authority for state standards of measurement—capacities and areas for agricultural production, distribution, collection, taxation, storage, and reinvestment" (Weiss 1997:343).

Although not necessarily acting in tandem, the equidistance of Brak, Leilan and Mozan has been used to suggest territorial zones of roughly 25 km radius (Weiss 1992b). The even distribution of large centers, dendritic patterns of small settlements with their territories, and linear arrangements of sites is interpreted as "agro-production optimizing locations" (Weiss 1992b:93).

By late Early Dynastic III times in southern Mesopotamia, settlement limits had been reached and could not be extended through the rearrangement of water rights; in this context, a postulated decrease in Euphrates River flow served as "the accidental accelerator of imperial expansion" (Weiss and Courty 1993:146-150). The Akkadian conquest of the north was driven by the need to acquire northern agricultural products, in order to feed a dangerously overpopulated southern homeland but also to convert the shipped surplus cereals into wealth through exchange for labor (see also Weiss 1986:71; 1997:343). The trade in high value luxuries or raw materials which inspired initial state formation in Leilan IIId appears not to have been significant: "Akkadian imperialism was based on extended grain revenues, not exotic timber harvests" (Weiss 2003:595).

Akkadian "imperialization" of the Upper Khabur basin has been recognized through five primary features at Leilan during Phase IIb (Weiss, et al. 1993:998-999; Weiss and Courty 1993:139-141; Weiss 1997:343-344). Based on settlement pattern data, the Akkadian rulers "streamlined the regional administration of production" by removing the populations of potentially competing centers and relocating them to Leilan (Weiss 1997:343). They employed this new labor source in part to construct a massive city wall, designed to protect and legitimize imperial power. From central storerooms, the commoner population of the lower town was provided with rations that had been pre-cleaned, based on the absence of stems, rachises and non-seed plant parts in the paleobotanical remains. Agricultural production was intensified by the stabilization of watercourses "to counter the effects of rapid siltation and [to] maintain an efficient water flow" and to facilitate a supplemental summer crop (Weiss and Courty 1993:141). The introduction of a highly standardized open container, dubbed the "sila bowl," is taken as evidence of ration distribution using imperial units of measurement (Senior and Weiss

1992). A recently proposed sixth feature of Akkadian control is the introduction of non-indigenous cult practices in place of those of the previous state rulers (Weiss 1997:344).

Akkadian intensification and exploitation of cereal production and its riverine shipment south to Sumer and Akkad continued, apparently without internal dissention, until it collapsed under the effects of an extreme aridification event (Weiss*, et al.* 1993:999-1003). This event caused not only the collapse of Akkadian imperialism in the north but also loss of political control in the southern homeland, under the combined weight of the end of surplus cereal shipments and the arrival of the Guti, who had been displaced from the north by the deterioration of environmental conditions. One hundred years later, the lingering effects of this abrupt climate change spelled the end of the succeeding Ur III state, when a parallel migration of Amorites arrived (Weiss and Courty 1993:142-144). More recently, it has been proposed that almost every archaeologically documented Old World civilization either faced extreme stress due to this event or also collapsed (Weiss 2000; Courty and Weiss 1997).

The Centralized State Model is the earliest and, in terms of synthetic presentation, the most widely published. It is also noteworthy for stressing the economic productivity of northern Mesopotamia and for reintroducing the environment as an influencing factor on early states, after a period of academic disfavor. However, it can be critiqued on both evidentiary and theoretical grounds.

Syntheses of the CSM have been forthcoming since the early 1990's but the publication of supporting archaeological data has been meager. The greatest difficulty in evaluating the CSM stems from the fact that the Leilan ceramic typology for Periods IIId through IIa, upon which much of the dating of archaeological stratigraphy and all of the regional survey depends, remains unknown and therefore untestable. The crucial ceramic distinction between Periods IIa and IIb is only vaguely defined; in the only direct discussion a total of eleven sherds are illustrated (Ristvet and Weiss 2000: Fig. 3). Other discussions of ceramic sequences at Leilan (e.g., Senior 1998; Calderone and Weiss 2003) describe gradual transitions between the phases; this should come as no surprise, but it does lead one to question the veracity of the fine chronological subdivisions, particularly in settlement pattern data using surface assemblages.

To circumvent problems of relative ceramic chronology, Leilan data are frequently tied to absolute dates in the form of radiocarbon assays. Such determinations are a solid means of dating when interpreted properly (e.g., Wright and Rupley 2001); however, in the CSM they are uncritically tied to a historical chronology (the "Middle Chronology"; Brinkman in Oppenheim 1977:335-348) which is by no means universally accepted (see Zettler 2003:19-20 and Section 2.2 above). In this chronology, the end of the First Dynasty of Babylon is traditionally placed at 1595 BC; by backward dead reckoning, the Akkadian dynasty lasted from 2334-2154 BC. The recent study by Gasche and colleagues (1998) combines archaeological, textual and astronomical data to redate the fall of Babylon to 1499 BC, which correspondingly would shift the Akkadian dynasty forward a century. Adopting Hallo's (1957-71) reduction of the "Gutian Interregnum" to only 40 years would further lower third millennium chronology; if both Hallo and Gasche *et al*. are followed, the Akkadian dynasty began around 2200 BC (Gasche, *et al*. 1998:92). Reade's reassessment (2001) of the Assyrian King List concluded with the same 1499 date for the fall of Babylon; his own backward reckoning places the beginning of the Akkadian period at 2180 BC (+/-40 years, given the uncertainties about the length of Sargon's reign). If the Gasche-Hallo-Reade chronological revisions are accepted, much of the "Akkadian" evidence at Leilan becomes pre-Akkadian, and the aridification event would therefore precede the conquest, rather than causing its end (a conclusion in agreement with the recent micromorphological reassessment; Courty 2001). Regardless of one's position on these somewhat arcane chronological issues, this brief review should highlight the provisionality of the Middle Chronology and the dangers of using it to interpret purely archaeological remains.

In addition to the issue of chronology, there are also ambiguities in the archaeological data used to support the CSM. Strong elite control of the staple economy in Period IIId is based on storerooms on the high mound. No plan of third millennium levels on the acropolis has ever been published; however, in a photograph (Weiss 2003: Fig. 23), a hearth is clearly visible in the center of the room, which suggests a more mundane domestic function. State planning of and investment in the creation of the lower town is also questionable; the "sherd pavement" of the street is more likely to be the scatter of household debris which is typical of streets and other exterior spaces in ancient Near Eastern cities, rather than evidence of centralized investment and planning. Direct Akkadian control is presumed based on a single unpublished tablet and a sealing inscribed by an Akkadian *šabra* official. It is unclear if the sealing was used on a door or a container; if the latter, it could have originated elsewhere.[3] Wasters of the so-called "sila bowl" were found on Period II sites throughout the Leilan hinterland (Stein and Blackman 1993:40-41); while bowl size was standardized within firing events, compositional and metric analyses between batches suggests multiple independent workshops (Blackman, *et al.* 1993). Combined, these observations make it unlikely that ceramic production was state-controlled, and therefore unlikely that these bowls were part of a rationing scheme.[4]

The interpretation of archaeological data at Leilan is conditioned by the ecosystemic basis of the CSM, in particular its emphasis on hierarchy. The state is all-powerful; it maintains a tight control not only on the production of luxury items such as metals and textiles but also more mundane crafts such as pottery and even cereal agriculture, the production of which is intensified under state coercion. The state has the ability to remove established populations at will, in complete disregard for local structures of kinship and authority: the indigenous Period IIa states dictated settlement in optimal positions for agro-production, and the Period IIb imperial administration at Leilan depopulated entire secondary centers for political purposes. Under such centralized control, the bulk of the population plays no role in societal evolution; the only agents are elite decision makers acting in their own political and economic interests.

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[3] This applies equally to the seal of the Akkadian governor of Gasur (Nuzi) found at Brak Area FS.

[4] Despite the importance of this ceramic form for the CSM, it is not entirely clear which mid- to late third millennium open form is meant by the term "sila bowl." A series of photographs (Weiss 1997: Fig. 3) show stacked kiln wasters of two very different shapes: a shallow bowl with convex sides and a taller straight-sided beaker. The latter was used in Akkadian (Phase M) levels at Brak but the former is predominantly of earlier (Phase L) date (Oates 2001b:182-183, 193).

Despite such oppression, the CSM supposes no internal conflict either within the urban social fabric of Leilan or between the producers of its agricultural hinterland and the urban-based consumers. Once formed, northern Mesopotamian state societies existed in a stable equilibrium. The internal operational dynamics are not elaborated, but the external stimuli which are the source of socio-political change are treated in detail. The state originated under the stimulus of trade with a more complex neighboring society, and further economic and political transformation was introduced by invaders from that same society. Collapse was also inspired by forces external to the system. Whether it was general aridity, volcanism, or meteorite impact, climate change was a force which drove social change. Climate is now blamed for the collapse of the Uruk Expansion (Weiss 2003:606) and is now being applied in the New World as well (critiqued in Erickson 1999).

The nature of the proposed collapse is derived from the emphasis on a strongly centralized political hierarchy in the CSM. Collapse was total, resulting in the abandonment of the basin by its entire population, sedentary and nomadic alike (Weiss 2000). No consideration is given to the possibility of decomposition into smaller and more decentralized elements, or even a transition to a more resilient non-sedentary mode (e.g., Adams 1978). In the CSM, climate further reduces the importance of human agency, which was already limited to a few elites: in addition to climate-triggered abandonment, low Euphrates floods inspire the Akkadian conquest of the north.

Although applicable to many other models of early complex society throughout the Near East, these critiques thus firmly place the Centralized State Model in the ecosystems approach. Simultaneously with the CSM, another model of early northern Mesopotamian states was developed which shares some assumptions of ecosystems theory but otherwise differs considerably.

2.6.2. The Dynamic Structural Model.

To understand how the massive population concentrations at third millennium cities were able to form and to sustain themselves, T.J. Wilkinson has developed an evolving set of models, which I will refer to collectively as the Dynamic Structural Model (DSM) for simplicity, which focuses on the mechanics of agricultural production and labor (see especially Wilkinson 1994, 1997, 2000c). Although this study presents the CSM and DSM as competing models, they are not entirely comparable constructs and differ substantially in their intended explanatory power. The CSM focuses primarily on the evolution of political control, but because the extent of that control is envisioned as very broad after the appearance of the state, it includes the other aspects of society that the state is presumed to influence (the staple and prestige economies, social relationships, and settlement patterns). On the other hand, the DSM, in its various incarnations, was intended as a specialized model of the dynamic relationship between population, land use, and settlement; only recently have external trade and pastoralism been introduced (Wilkinson 2000c). As will be discussed below, the sociopolitical aspects, which are deliberately left untreated by the CSM, can be neatly addressed via Schloen's Patrimonial

Household Model.[5]

Despite these important differences, the DSM and CSM are similar in several ways. In particular, both focus on the staple agricultural economy, with an emphasis on the role of the environment. However, the DSM attributes more significance to changing land use strategies and the ability of even highly urbanized settlement systems to adapt to climatic stress. In both models, urban society crossed thresholds between equilibrium states; the CSM emphasizes external destabilizing inputs, whereas the DSM is primarily concerned with internal mechanisms which promote stability.

Wilkinson's "first principles" approach (1994:484) prioritizes the productive potential of the land surrounding early urban settlements, based on the human biological need to consume food and principles of least effort (Chisholm 1962). Based on data from studies of traditional dry farming in semi-arid areas of the Near East (see especially Wilkinson 1997:69-86), the DSM considers the dynamic interaction between environment (soils and the amount of and variation in rainfall), settlement, and land use strategies. Different iterations of the DSM have focused on the relationships between population and land use alternatives at a single settlement (Wilkinson 1997), and between labor, land use, and carrying capacity in a multiple-settlement urban system (Wilkinson 1994). In both, variation in rainfall (and by extension, unpredictability of crop yields) serves as a major limiting factor.

The variable inputs are derived from traditional Near Eastern agriculture and

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[5] This review only considers Wilkinson's work up to 2000; most of the critiques presented here have already begun to be addressed by the Modeling Ancient Settlement Systems (MASS) Project, which is developing an agent-based model of northern Mesoptamian settlements (see http://oi.uchicago.edu/OI/PROJ/MASS/Introduction.htm.

Wilkinson's own fieldwork on the archaeological landscape (Wilkinson 1994:494-496). Third millennium agricultural territories in the Upper Khabur basin and the adjacent North Jazira plains of Iraq can be delineated by the terminal ends of ancient tracks (See Chapter 5 and Wilkinson 1993). These archaeologically defined territories generally have radii of three to five kilometers, which is similar to traditional agriculture; therefore the DSM assumes a maximum distance to field of five kilometers. In each settlement, 50% of the population will be engaged in agriculture within that territory, and each worker can harvest a maximum of 3 ha. Each person in the settlement consumes an average of 250 kg of cereals annually. If 50% of the population is engaged in agriculture, each worker must produce enough to feed himself and one other person; therefore his three harvested hectares must produce a minimum of 500 kg, or 167 kg/ha.

In an initial static model, population growth causes the production limitation to shift from labor to land at a threshold of 2,620 persons. At this point, the entire five kilometer catchment (ca. 7,850 ha) would be under cultivation, and additional population (surplus labor) would begin to consume surplus production (i.e., production above 167 kg/ha). When the population reaches 6,000-8,000 persons, it becomes necessary to import cereals from the surplus production of a neighboring settlement. If that settlement is small, it may have surplus to contribute. If it is large, it may be under similar productive stresses and might not have surplus production (Wilkinson 1994:496). The frictional effects of overland movement of grains means that shipping grain from a greater distance becomes very inefficient (Wilkinson and Tucker 1995:85; Wilkinson 2000c:15-16). To accommodate further growth, the inhabitants must either expand the cultivated territory or intensify production.

This initial model demonstrates how ceilings of population could be reached, at which point a negative feedback mechanism (insufficient food) would arrest growth, but it underemphasizes productive variation and does not take into account the agricultural land use strategies utilized in semi-arid dry farming. Wilkinson lists four strategies, in order of increasingly sustainable yields: cereals planted annually, cereals planted with an intervening fallow year, annual cropping in conjunction with the application of manure, and planting with an alternating fallow year in combination with the application of manure or composts (Wilkinson 1997:84). Annual cropping causes soil degradation in the long run by depleting nutrients in the soil. Use of fallow allows the soil to retain moisture, thus lessening the impact of a subsequent dry year, but does not address the issue of soil nutrients. The final strategy, manuring and fallow, provides a moisture surplus and replaces organic matter. Archaeological traces of ancient manuring can be found through off-site investigations, and demonstrate that this was a strategy used in the later third millennium BC (Wilkinson 1982; 1989; see also Chapter 5).

Wilkinson introduces these land use strategies into an alternative model (Wilkinson 1997:92-94), which shows that if adopted at key points of population stress, they would have permitted settlement growth up to the range seen archaeologically at Tell al-Hawa.

As mentioned above, urban settlements did not exist in a vacuum; shortcomings in production at the center could be offset by importing surplus from neighboring sites, with the sustainable size of the population at the center dependent on the size of these satellites. The optimum arrangement of such modular catchments was a pattern of six satellites with five-kilometer territories around the five-kilometer territory of the urban center. The center and its satellites would have been roughly ten kilometers apart, and the entire compound territory would have been fifteen km radius (Wilkinson 1994:501-502, Fig. 17). The additional labor and surplus production provided by the secondary centers permitted the central site to grow three to five times as large as it would have as a self-sufficient settlement. For example, without importing surpluses, third millennium Tell al-Hawa was viable only under conditions of unusually high annual productivity (yields of 800 kg/ha); with external contributions, it could sustain itself even in years of productivity as low as 400 kg/ha (Wilkinson 1994:496; Wilkinson and Tucker 1995:83-84). The productivity levels of dry farming in combination with the limitations of labor and bulk cereal transport suggest a maximum population of 11,734-14,374 persons in centers (a size of 72-114 ha, depending on density); this agrees well with a general limit of 100 hectares on site size in rain-fed areas of northern Mesopotamia (Wilkinson 1994:501-502).

Although initial discussions of the DSM hinted at a closed system of agricultural production, more recently it has been expanded to accommodate pastoral resources and the movement of wealth through trade (Wilkinson 2000c). At Ebla, the state administration was particularly interested in sheep and metals, to the point where some have assumed that agriculture was of little economic significance (Gelb 1986), and the commodification of animal products is seen as a factor behind the formation of the mid-third millennium *Kranzhügel* settlements (Lyonnet 1998; Kouchoukos 1998). Because of the archaeological near-invisibility of pastoralists, landscape studies can suggest where pastures may have existed, based on gaps in agricultural territories. On the basis of such negative evidence, the Upper Khabur basin appears to have zones of different intensity of pastoral occupation, generally increasing from the east (Iraqi North Jazira and eastern Khabur) to the southwest (the arid region around the Jebel Abd al-Aziz) (Wilkinson 2000c:8-11).

Although the staple economy, to use the terminology of D'Altroy and Earle (1985), has loomed largest in discussions of the dynamics of urban settlements, wealth derived from trade in commodities may have been significant in sustaining some of the more marginally located third millennium centers, in particular those on the south sides of the Jebels Sinjar and Abd al-Aziz (Wilkinson 2000c:12-14). Trade through the basin certainly existed in the early second millennium (Larsen 1976) and a road east from Nineveh into Anatolia was a recurring route of invasion a century later (Charpin 1992). In terms of the DSM, the pastoral and trade sectors of the economy may have provided more means of ameliorating shortcomings in the agricultural sector. Flocks may have been fed surplus cereals in years of plenty, and wealth items may have enabled some groups, particularly those in otherwise marginal areas, to "buy in" staples when necessary (Wilkinson 2000c:13).

The collapse of urban systems in the DSM does not exclude the possibility of abrupt climatic change as in the CSM but considers it far more likely that these systems fell victim to particular human-environmental interactions, especially when at its most productive (and therefore most brittle); in particular, disregard of the fallow year may have so depleted soil nutrients and moisture that if a center was simultaneously hit by a run of dry years and was unable to import surpluses, famine may have resulted (Wilkinson 1997:94). The DSM is hierarchical but it envisions collapse not as systemwide, but rather as a shift toward smaller and more resilient settlements (Wilkinson 1994:504). Ultimately, the highly interrelated human and environmental variables are very complicated and possibly not able to be modeled (Wilkinson 1997:100-101).

Wilkinson's Dynamic Structural Model shares several ecosystemic properties with the CSM for which it too can be critiqued, but in the former case, these criticisms are somewhat blunted by Wilkinson's hesitation to go beyond the avowed "first principles." The model as described thus far is hierarchical insofar as surpluses move from smaller outlying settlements into an urban center; however, neither the mechanisms for distribution at the center nor the basis of the economic relationship between the two sites is elaborated. Agency at the level of the producers or consumers is nonexistent; rather, the reified settlements themselves are the actors.

Whereas thresholds in the CSM are crossed under pressure from external factors (especially climate, trade and invasion), the basis for shifts in equilibrium in the DSM is primarily internal population pressure. In this sense equilibrium is not a population size but rather a consistent rate of growth; when a threshold is reached, either negative feedback causes a reduction in growth or new agricultural strategies are adopted which create a new threshold. Although individual actors do not figure prominently in the DSM, it hints at the possibility of individual decision-making with regard to adopting new land use strategies, which "should not be seen as discrete evolutionary steps but rather as a continuum that is progressively adopted through time. Therefore, for example, during stage B, some areas of any given territory will only be at stage A levels of production whereas others, (probably those nearest the central settlement) would be producing at stage C. Such factors would blur the stage changeover points on the models" (Wilkinson 1997:90). Such a nuanced view approaches more recent ideas of complexity and self-organization but is not elaborated.

The CSM is simultaneously ahistorical in that the inordinately powerful state sector is able to disregard previous social and economic conditions at will but historically descriptive in its attempts to interpret archaeological remains in light of royal inscriptions and historical chronology. The DSM, on the other hand, disregards the possible impact of political history altogether. The Akkadian conquest and control of northern Mesopotamia plays no role. If one considers the state to control or at least influence the staple economy of these settlements, then this would represent a serious shortcoming; however, if one believes that the Akkadian ruling elite did not manage the agricultural economy, then the ahistorical nature of the DSM makes little difference.

Despite these criticisms, the principles of the DSM apply whether individual households were buying surplus under market conditions or if a central institution was coercing surplus from producers and then redistributing it within the center. Because it does not assume the integration of political and economic systems, the DSM deliberately leaves this issue unresolved (Wilkinson 2000c:16).

2.7. Northern Mesopotamian Urban Society and Economy: Some Conclusions

In addition to interpretative and chronological problems which render it problematic, the CSM presupposes a powerful and centralized state government which dictates all aspects of society to a compliant and undifferentiated population. Such centralized power needs to be demonstrated rather than assumed. The DSM, on the other hand, is firmly grounded in ethnographic and archaeological data. It could be argued that some of the input values (e.g., kg consumed per person per year, productivity of manured fields, etc.) must be adjusted, but the overall structure of the model appears sound, and its principles will be used in the analysis of the archaeological survey data presented in Chapter 4.

What the DSM lacks is an understanding of the internal social and economic structure of the settlements which motivated the production of surpluses and enabled their movement between secondary centers and cities. This restraint is perhaps wise, given the difficulties of extracting meaningful social information from the rather laconic administrative documents which comprise our primary textual data source. This study will throw such caution to the wind and attempt to offer some hypotheses on the internal social structure of urban settlements, their economic dynamics, and the motivations of producers and consumers within and without. To do this, it is necessary to look briefly at contemporary areas where textual data offer more clues than are available in the Upper Khabur Basin, and then to consider the textual evidence from within the basin. In all areas, recent textual studies (especially when combined with archaeological evidence) conclude that these cities and their economies were often decentralized and kinship-based; centralized control of the luxury and staple economy fluctuated through time, but never approached the level of overarching control posited by the CSM. These studies support a conception of Bronze Age society as a loose hierarchy of households as described in Schloen's Patrimonial Household Model (Schloen 2001 and Chapter 1.7 above), although their author often do not exactly agree with its framework (e.g., Stone 2001).

Early reconstructions of the economies of third millennium cities in southern Mesopotamia were conceived as entirely controlled by powerful temple priests, the so-called "temple economy" (Deimel 1931; Falkenstein 1974); this view has been refuted on the basis that it was based on a single non-representative archive of tablets (Gelb 1971). More recent studies understand the socioeconomic organization of southern Mesopotamia to have been much more decentralized.

The best sources of potential analogy are the cities of southern Mesopotamia at a slightly later time (in the Old Babylonian period, roughly second quarter of the second millennium BC), because they are the most extensively excavated and because this was a time of relatively widespread literacy, when even the activities of smaller households were often recorded. In particular, Nippur and Mashkan-Shapir were both comprised of relatively autonomous neighborhoods based on kinship, rather than social classes: "That they were not divided on the basis of class seems clear since both textual and archaeological data have shown that an important official could live beside a humble fisherman, and that large, well-appointed houses were nestled among small, poor structures (Stone 1995:241; see also Stone 1987; 1997). In surface collections, evidence for most craft production was dispersed across the site, which suggests that it was organized at the level of the neighborhood rather than by central state rulers (Stone and Zimansky 1994). Even the transmission of the scribal arts, which are so closely connected to administration, was decentralized: at Ur and Nippur, scribal schools were found within "private" houses, rather than in large palace or temple contexts (Charpin 1986:420-486; Stone 1987:56-59). These kinship-based neighborhoods were referred to in Akkadian as *babtum*, a feminine form of *babum*, "gate" (Stone 1987; Postgate 1992:81-82; Schloen 2001). The link between kinship-based social organization and the *babtum* will be important for extending the PHM to Ebla and Tell Beydar.

The overall organization of Mesopotamian society into households of various scales led Gelb (1979:3-4) to propose a parallel with the Greek *oikos*, which could refer to the physical structure of a house but also a temple, a family, or a household. More recently, the *oikos* concept has been applied to third millennium southern Mesopotamia by Susan Pollock (1999; 2003):

> The temples, palaces, and estates—collectively referred to as oikoi (from the Greek word for "households") or "great households"—formed large socioeconomic units with a dependent (and unrelated, in kinship terms) workforce, managerial personnel, flocks of animals, pastures, fields, orchards, storage facilities, and artisans' workshops… Members of many families, from the wealthiest to the poorest, were also connected to oikoi not by kinship but by official or dependent relationships. Ties to oikoi ranged from part-time contractual obligations—for example, to help in the harvest or with a large construction project—to permanent labor obligations. Some permanent members of large households lacked any family attachments (Pollock 1999:118-119).

Within an *oikos*, membership came with obligations in labor or in goods but gave the member various levels of access to the resources of the household, based on status, age and gender. In some periods of strong economic control, members received rations of raw products, generally barley, oil or wool but occasionally processed commodities like bread, cloth, and beer (Pollock 1999:120). In other more decentralized times, the household distributed land, which could either be used by the member to produce these goods or rented to another in exchange for a portion of its yield. Individuals often had obligations to more than one household (Pollock 1999:117). For example, even in the highly centralized Ur III period, potters and reedcutters were employed only part-time by large institutional households, and often for labor tasks that had nothing to do with their craft expertise (Steinkeller 1987b, 1996).

Pollock's *oikos* model is very similar to Schloen's Patrimonial Household Model (2001), but a few significant differences exist. Whereas the extension of the household concept to larger social entities, as mirrored in the use of household terminology, is considered to be part of the deep-seated emic understanding of the social order by Schloen, Pollock views *oikoi* and kinship organization to be similar in name only, and that kinship terminology masked the exploitation of their members' labor and their surrender of the means of production to the *oikoi* (Pollock 2003:32). Pollock also makes a distinction between urban large households organized as *oikoi* and independent groups in the rural countryside which remained outside of them and more freely in control of their own labor and production (Pollock 1999:147; 2003). Schloen's notion that the entire society was ultimately considered to be the household of the king, or even the god above him, is more in line with Gelb's original conception:

> The city lived off the country, and the life of the country was intrinsically connected with that of the city. This point… is worth stressing here because of the rather persistent opinions about the sharp division between the city and the country, now current in certain circles. These ideas reflect literary dreaming,

rather than economic reality (Gelb 1979:4; see also Grégoire and Renger 1988).

In the political realm, a hint of decentralized patrimonial organization in mid-third millennium southern Mesopotamia can be found in a territorial dispute between the cities of Lagash and Umma (Cooper 1983). These are two classic examples of independent "city-states" which characterized the third millennium prior to consolidation under Sargon of Akkad. The dispute is documented in several carved monuments with scenes of Ningirsu, the god of Lagash, defeating the armies of Umma, and accompanied by a historical description of the conflict. It is revealed that Umma had repeatedly violated a border which had been established between the two polities by Mesilim, king of the city of Kish. Although the two city-states were politically and economically autonomous, they were clearly deferring to territorial assignments made by a third ruler. This situation is difficult to understand if one views Lagash and Umma as independent centralized states. Interpreted within the Patrimonial Household Model, however, the rulers of Lagash and Umma represent the heads of essentially independent households within the larger patrimonial kingdom of the king of Kish. In this decentralized form of the PHM, the economic and even military affairs of Lagash and Umma are conducted locally, but their kings ultimately respected Kish's patrimonial leadership and theoretical control over the land. This relationship must have been carried out at the level of luxury gift exchange (exemplified by the "Tresor d'Ur" at Mari) or even through non-material activities, rather than through the kind of economic exchanges which would have been recorded by the larger institutional households.

That an organization based on the *oikos* or PHM was not limited to southern

Mesopotamia can be demonstrated by the texts from Ebla, a 60 hectare city in western Syria. Ebla was at its zenith at the same time that Nagar (Tell Brak) was at the height of its control of the Upper Khabur basin (i.e., the EJ III period, Leilan IIa, or Brak Phase L). In his overview of the city and its rural territory, Archi proposes that the city of Ebla and its palatial sector were one and the same, i.e., the entire population of Ebla (some 20,000 persons) was subsumed under the palace; this all-encompassing urban palatial sector was opposed to autonomous villages who were occasionally obliged to contribute surplus to the palace but otherwise continued to exist in their hypothetical "original" (i.e., independent from the palace) social state (Archi 1992:25).

Archi's interpretation of the organization of Ebla itself is in accord with what would be expected from the PHM: the entire land of the kingdom was considered the patrimony of the ruler and was administrated as such. Because it appears to have administered not only luxury crafts but also the entire staple economy, Ebla would be an example of a highly centralized royal household such as the Ur III state in southern Mesopotamia. Archi's belief that the village economies of the hinterland were independent and free of obligation to the palace is contradicted by studies of the organization of the rural territory of Ebla by Grégoire and Renger (Grégoire and Renger 1988; Renger 1987) and Schloen (2001:267-283).

Despite claims that Ebla was a massive empire run by an efficient and rationalized bureaucracy (e.g., Pettinato 1981), examination of the principles of accounting in the Ebla texts shows many peculiarities (Grégoire and Renger 1988:217-218). Unlike Ur III accounts, which are well-dated and classifiable into discrete types, Ebla accounts lack descriptive colophons or even calendar dates. They tend to record distributions of radically different types of goods to persons of widely varying sociopolitical status. Finally, they frequently contain descriptions of the purposes of the distributions which serve no accounting purpose at all. Grégoire and Renger conclude that the great differences in accounting methods between the Ebla and Ur III administrations correspond to great differences in underlying economic organization as well (Grégoire and Renger 1988:218).

Grégoire, Renger and Schloen conclude that the patrimonial Eblaite state was administered like the household (or *oikos*) of its ruler. Archi had already concluded, based on personnel lists and quantities of goods in the Ebla tablets, that the palace subsumed all of the city of Ebla. Renger's more detailed analysis (1987), with reference to the carrying capacity of the surrounding landscape, makes it clear that the entire kingdom fell within the control of the ruler of Ebla's household. As ultimate owner of all of the land, he was entitled to grant its use, generally to other high-ranking members of his household or their children. These grantees in turn had their own households. Schloen (2001:277) cites the example of Ingar, who was a high-ranking servant who had been granted many estates. He was a member of the household of one of the sons of the vizier Ibrium, but he also had a household which contained at least four "servants."

Royal land grants from the king of Ebla to his sons, high officials, and other important individuals often include huge amounts of land, and sometimes include the land of entire villages (Archi 1982:217). Far from being an exceptional event, Schloen proposes that the many examples of grants of "houses" (written with the Sumerian logogram é) of various towns or villages are better understood as the granting of productive estates, encompassing the agricultural territories of the named places (2001:268-272). In addition to the linguistic evidence for such a meaning, the areas of land associated with the villages equate very well with a one to two-kilometer agricultural territory as documented by landscape archaeology (Schloen 2001:272-275, citing Wilkinson 1982). Although this may seem like a hierarchical means of extracting surplus from a nearly enslaved agricultural worker class, it is likely that they took little notice when their village "estate" was given by the ruler of Ebla. They probably held usufruct rights which allowed them to inherit the use of their fields and pass them on to their own sons:

> …we can account for all of the evidence by supposing that 'ownership' of individual farms and of entire villages alike was a matter of possessing the authority to dispose of their surplus production, and probably also of the labor services of their inhabitants more generally. And there is no reason to doubt that these inhabitants were, in both cases, ordinary village residents who themselves possessed customary hereditary rights as sharecroppers of the land they worked (Schloen 2001:269).

In some cases, the huge quantities of cereals listed on annual summaries (in at least one case, yearly rations for over 110,000 persons) might suggest that the ruler's household not only controlled the land but also directly managed its yields (Grégoire and Renger 1988:221-224). One would expect that if such were the case, state-controlled storage facilities would have been recovered by archaeologists, given the massive size required. However, despite a near total archaeological fixation on buildings of the large household institutions, no such facilities have been found. It is unlikely that they will be found, since the point of granting land or entire productive villages ("estates") to a member of the household is to give his household the material means to support itself. Redistribution certainly did occur, as attested by thousands of cuneiform texts. However, it was probably limited to the most immediate members of each household; sub-households were sustained by their share of the yield of the land that they had been granted by the higher households, whether the household of the ruler himself or the household of one of his sons or servants. It is important to recognize that administration and control of land does not require the direct control of its production; the PHM offered a highly efficient combination of household redistribution and self-sufficiency.

Despite differences in administrative style, both Ebla and the Ur III polity can be characterized as patrimonial states, albeit ones far toward the centralized end of the continuum. Furthermore, the PHM best describes not only these two examples but also third and second millennium societies in Mesopotamia in general (for further detailed discussion, see Schloen 2001:255-316).

It seems probable that the states of the Upper Khabur basin in the third millennium would have also been characterized by a patrimonial household form of social organization, rather than the bureaucratic and powerful centralized administration, as supposed by the Centralized State Model. In combination, the Dynamic Structural Model of the agricultural economy and the Patrimonial Household Model of ancient socio-political structure appear to offer the best framework for understanding the operational dynamics of northern Mesopotamian urban states in the third millennium BC. After reviewing the survey methodology (Chapter 3), this study will present field data (Chapters 4 and 5) for settlement and landscape in the basin. Survey data alone cannot test this model, so epigraphic evidence from Ebla and Nabada (Tell Beydar) will be reinterpreted to suggest a decentralized patrimonial organization for the kingdom of Nagar (Chapter 6) and finally a new model of the economic, social and political organization of third millennium urban states will be proposed (Chapter 7).

CHAPTER THREE:

FIELD SURVEY METHODOLOGY

Questions of society and settlement in the frame of early urban society demand a regional framework. It has long been established that such a scale is the most appropriate for archaeological research (Binford 1964). Data collection at the regional level is most effectively undertaken via a controlled surface survey, whereby scatters of artifacts are precisely mapped and used to reconstruct ancient settlement patterns.[1] In order to investigate the evolution of urban settlement, two separate field surveys were conducted in the Khabur River basin, both in conjunction with and centered around ongoing excavation projects.

3.1. Formation, Transformation and Preservation of the Archaeological Landscape

At the end of its occupational history, a site does not simply remain intact for future investigation but undergoes a complex set of transformations, both natural and cultural; these processes apply equally to the surrounding landscape. It is important to understand them, as these are the ways in which archaeological surface assemblages are

[1] For a recent overview see Banning (2002). A full review of the immense literature on archaeological survey is beyond the scope of this study.

formed (Wood and Johnson 1978:315-317), and they determined which survey methods were adopted by the Tell Beydar Survey (TBS) and the Tell Hamoukar Survey (THS).

3.1.1. Natural Transformations.

The increasingly common use of geoarchaeological methods in archaeology has resulted in a heightened awareness of natural transformations of the archaeological record and their importance in interpretation (see especially Rapp and Hill 1998; Schiffer 1987; Waters 1992; French 2003; papers in Davidson and Shackley 1976). The effects of such "n-transforms" (Schiffer 1987) at the site level have received a good deal of attention from geoarchaeologists working in semi-arid lands because of their impacts on the nature of surface assemblages, the primary means by which survey archaeologists assess ancient occupations (Kirkby and Kirkby 1976; Rosen 1986).

In most areas of the ancient Near East, the primary building material was mud brick (Sauvage 1998). Because unbaked brick is plentiful, inexpensive, and difficult to reuse, the leveling of old structures and the building of new structures atop them over hundreds or thousands of years led to the formation of mounded *tell* sites. In semi-arid lands with little or no natural vegetation, tells have been subject to the forces of wind and water erosion, both during their occupation but especially after abandonment.[2] These forces can result in substantial lateral movement of surface remains when the site surface

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[2] These erosional forces are much stronger in southern Mesopotamia, which has very little annual rainfall, than in northern Mesopotamia, where slightly higher rainfall results in sparse vegetation that anchors sediments and cultural material in place (Rosen 1986:31-33). Note, however, that the stronger aeolian erosion on the southern plains may actually be a stabilizing force in some areas: as wind deflation removes sediments, it leaves behind cultural material such as sherds, which form a protective cap over the site, effectively preventing further erosion (Stone and Zimansky 1994:447-448; Stone 2002:80).

is sloped (Rick 1976), as is the case with multi-period tells (Kirkby and Kirkby 1976).

Even in areas where vegetation stabilizes site surfaces, other transformational processes exist. A stable surface will eventually undergo pedogenesis, a complex interaction of physical, chemical, and biological processes whereby the natural and archaeological sediments of a site are transformed into a soil (Holliday 1992; Rapp and Hill 1998:29-30). A stable surface with a developed soil will attract vegetation and animals, both of which can disturb sites and bring buried artifacts to the surface (Schiffer 1987:207-212; Wood and Johnson 1978:318-333). Disturbance by animals is of particular importance in the Near East, where great depths of stratigraphic occupation can greatly obscure artifactual traces of the earliest periods of site occupation (Kirkby and Kirkby 1976:244-246). Blackham's study of mole rats at Tell Fendi in Jordan demonstrated that they can burrow to a depth of up to 1.5 m, and that much of this material is evacuated to the surface (Blackham 2000). Sites throughout the Upper Khabur basin are colonized by rodents and larger surface foragers such as dogs and foxes, who dig their burrows into site slopes. The resulting sherd-rich spoil piles downhill from the burrow entries were prime loci for ceramic collection in both the THS and TBS surveys.

Environmental processes at the regional level can also affect the visibility of sites and surface assemblages. In alluvial or topographically complex environments, it is important to assess the likelihood of aggradation of sediments; such deposits can obscure or completely cover ancient sites (Rapp and Hill 1998:59-66, 213-214; Brown 1997:219-253). In the extremely flat alluvial plains of southern Mesopotamia, the rivers run atop elevated levees; the floods that result from the periodic evulsions from these levees deposits the rivers' silt load atop sites, occasionally burying them altogether (Wilkinson 2003; Buringh 1960; Adams 1981:10, 36). Near Nippur in the center of the floodplain, an Ubaid site was found at a depth of 4 m (M. Gibson, personal communication). In hilly environments, runoff resulting from rainfall can move sediments downhill, covering over sites in the valleys below (Wilkinson 1999).

In the Upper Khabur basin, the effects of river alluvium are limited to the active floodplains of the two perennial rivers (the Khabur and Jaghjagh Rivers), and to a lesser extent, the wadi floodplains (Courty 1994). Although invisible to the eye at ground level, the slope of the plain is steep enough that the watercourses have been incised into the plain; this minimizes the likelihood of the rivers' escaping their channels and depositing their suspended silt loads atop nearby sites. The interfluvial terraces, which make up the majority of the basin, have remained mostly stable in the Holocene, or even been slightly eroded (Wilkinson 2002a:94; Ferring 1992:7-9).[3] Furthermore, the deposition of erosional materials by runoff rainfall appears to be limited to the margins of the basin, particularly the areas of the slopes of the Jebel Abd al-Aziz (Hole 1997; Kouchoukos 1998), the Jebel Sinjar (Courty 1994:24), and uplands at the base of the Tur Abdin foothills (Wilkinson 2002a:90). There is, however, a dynamic zone of aggradation in the wadi floodplains; although this zone is rarely more than a hundred meters wide, it has attracted a disproportionate amount of settlement and therefore must be studied carefully

[3] This stability has had consequences for the archaeological record; Wilkinson estimates that in the North Jazira of Iraq, soil formation may have entirely homogenized low sites older than 7,000 years (Wilkinson and Tucker 1995:5-6, Fig. 3). The effects of such pedogenesis on the surface remains is less drastic.

to determine if archaeological evidence has been obscured or removed. In general, the Upper Khabur basin as a whole, and particularly the central areas surveyed by the TBS and THS, shows remarkably little erosion and very limited alluviation, giving it near ideal surveying conditions.[4]

3.1.2. Cultural Transformations.

There are myriad ways in which an ancient site can be disturbed through subsequent human activity, from simply breaking up a surface assemblage by walking on it to flooding it entirely behind a massive hydroelectric dam. In the last hundred years, new technologies for earthmoving and construction have put sites more at risk for damage than at any other time in the past. On a smaller scale, the cultural processes which bring sherds to the surface of sites include the excavation of foundation trenches, pits (for latrines, wells, and drains), the removal of site material for building materials, and deliberate excavations, both licit and illicit.[5]

All of these processes, with the exception of controlled archaeological excavation, occurred in the past as well. Indeed, ancient disturbance was crucial for keeping ceramic material from the earliest levels of occupation in the most active surface layer. For example, at a hypothetical multi-period settlement, Late Chalcolithic well digging might

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[4] For a more detailed discussion of the geology and geomorphology of the Upper Khabur basin, see Chapter 2.1.

[5] Pre-modern excavations deposit enormous quantities of sherds from early strata on sites' surfaces. For example, the early excavations of the University of Pennsylvania at Nippur and Mallowan at Chagar Bazar and Tell Brak produced extensive dumps which are not always recognizable; therefore the surface assemblages of these sites are difficult or impossible to interpret (Gibson 1992:33; McMahon, et al. 2001:204).

have brought Halaf sherds to the surface at the time, while Akkadian terracing could have taken those Halaf sherds out of the Late Chalcolithic level and brought them closer to the later surface. These ancient disturbances could have dramatic effects on the distribution of earlier artifacts. Terracing of ancient settlements was a very common method of flattening tell slopes in preparation for new construction. At Tell Brak, for example, late third millennium terraces and early second millennium foundation trenches were infilled and leveled off with fill which often contained a homogenously southern Uruk ceramic assemblage (Oates and Oates 2002); as these terraces eroded, the Uruk sherds behind them were eroded and dispersed, making the late fourth millennium surface sherd scatter very difficult to interpret. Ancient excavations of sites for brick-making also redistributed earlier artifacts, as objects erode from the bricks. This process has been documented at Nippur, where the builders of a Parthian fortress excavated a five-hectare brick pit into Uruk and Ubaid levels of the site (Gibson 1992). As the Parthian bricks eroded, Uruk clay sickles and wall cones and Ubaid figurines were scattered across the site, in addition to diagnostic pottery; an uninformed interpretation of these scatters would find a 100 ha Ubaid site (Gibson 1992:36-39).

Perhaps the human activity with the greatest impact on the surfaces of archaeological sites is plowing. Given the longstanding importance of agriculture in the Middle East, Europe, and North America, it is not surprising that so many archaeological sites have been impacted by the plow. Many specialized studies on the effects of plowing on the surface assemblage have appeared (e.g., Ammerman 1985; Hirth 1978; Roper 1976), upon which we need not elaborate here, except to say that the lateral movement of plowzone sherds is not as drastic as might be expected, so that surface assemblages still can be assumed to be closely connected to underlying strata (Roper 1976; Lewarch and O'Brien 1981:308-311). It is important to realize that while mechanized disc plowing is a new phenomenon, plowing in general is quite ancient, and it is very likely that the surfaces of abandoned sites have been brought under cultivation and plowed for thousands of years.[6]

3.1.3. Landscapes of Survival and Destruction.

On a broader scale, landscapes can be generally classified as landscapes of survival and destruction. This concept was originally devised by Christopher Taylor (1972) and greatly elaborated by Williamson (1998). The fact that the English landscape was complex and had been much transformed was already recognized by Crawford (1953:51):

> The surface of England is a palimpsest, a document that has been written on and erased over and over again; and it is the business of the archaeologist to decipher it. The features concerned are of course the roads and field boundaries, the woods, the farms and other habitations, and all the other products of human labour; these are the letters and words inscribed on the land. But it is not easy to read them because, whereas the vellum document was seldom wiped clean more than once or twice, the land has been subjected to continual change throughout the ages.

Taylor added a more sophisticated spatial dimension in recognizing that erasure was not evenly distributed across the landscape. Concentrations of sites in Britain are often not actual ancient settlement patterns but survival zones where a lack of subsequent

[6] Plowing of abandoned sites in antiquity will be discussed in the context of field scatters (Chapter 4.2).

settlement and cultivation had left windows of preservation; elsewhere, an absence of Roman sites may be more related to destructive Saxon or Medieval settlement and agriculture than settlement location choices in earlier times. Wilkinson has applied the concept to the Middle East:

> [S]ettlement is rare in deserts or in many uplands, but where settlement or off-site activity did take place, their traces have a high probability of survival because there would be little subsequent activity to remove them. The desert, therefore, constitutes a landscape of survival. On the other hand, in moister areas where conditions are more conducive to sustained long-term settlement, later phases of occupation either obscure earlier traces (if they rest upon them) or effectively erase them as part of a constant process of recycling… As a result, as rainfall and human activities increase, other things being equal, a larger amount of the settlement and landscape record will be lost by being recycled, obscured, removed, or disturbed (Wilkinson 2000b:229; see also Wilkinson 2003).

The Upper Khabur basin is one of the most productive agricultural zones in northern Mesopotamia, and one would expect it to have attracted long-term sedentary occupation, making it a typical landscape of destruction. It is certainly true that the near continuous occupation of some sites, which led to the formation of multi-period tells, would have obscured the traces of the earliest settlement (Wilkinson 2000b:229-230). However, since the end of the third millennium, a well-documented shift of settlement away from tell sites and toward lower towns and smaller villages on previously unoccupied land (Wilkinson 2000b:236; Wilkinson, *et al*. 2003) has resulted in the dispersion of the sedentary population and the apparent abandonment of certain agricultural intensification strategies following the late third millennium (see Chapter 4) might have meant less ground disturbance by plowing. Textual evidence for parts of the basin being the realm of pastoral groups appears as early as the second millennium (Kupper 1957); grazing is much less destructive of sites than agriculture.

In the last millennium, when increasing populations and new agricultural technologies were altering landscapes around Damascus, Aleppo, and Mosul, the Syrian Jazira was the domain of small rural farming villages and sheep and goat pastoralists. In the 19th and early 20th centuries, the majority of the basin was entirely given over to nomadic tribes; a few villages of Kurdish farmers clung to the northern edge of the plain, along the Tur Abdin foothills, where they paid a "brotherhood" tax (*khawa*) to the larger Arab tribes, such as the Shammar, for protection (Fig. 3.1; Montagne 1932; de Vaumas 1956:70-72; Gibert and Fevret 1953:7-10). The early aerial photographs of Poidebard (1934) from the early French Mandate period visually confirm the textual descriptions of Montagne (1932): the landscape was almost entirely devoid of settlements or agricultural field boundaries, and the only visible roads or tracks were the small braided paths of sheep and goat herds. A description of the hinterland of Tell Beydar from June 1926 notes its complete depopulation but rich agricultural potential (Brossé 1929). In 1929, the French officer in command at Hassake estimated the population of the entire region at only 40,000 (de Vaumas 1956:73).

This phase of low settlement density (and thus low impact on the archaeological landscape) was reversed beginning in the second quarter of the 20th century. The expansion of settlement and cultivation began rapidly following the "pacification" of the Jazira by the French in 1926. Chechen villages began to appear along the Upper Khabur between Ras al-Ain and Hassake, and Armenians were settling the lower Jaghjagh River (Montagne 1932:55-56). With the start of World War II, capitalists based in Aleppo began to contract for agricultural rights with the Kurdish aghas or Arab shaykhs who controlled the land. In this context, grain production more than tripled from 199,100 ha in 1937 to 643,000 ha in 1954, when all cultivable land was occupied and the land rush over (de Vaumas 1956:75; Wilkinson and Tucker 1995:13). Cotton was first grown in the region in 1948 and had expanded from 140 ha to 3,300 by 1950, when the Korean war pulled some American producers from the market (Gibert and Fevret 1953:86-88). By 1954, the population had ballooned to almost 240,000 persons (de Vaumas 1956:73). A parallel and contemporaneous southward expansion of settlement and the limits of agriculture has been documented for the Iraqi North Jazira and the Sinjar Plain (Wilkinson and Tucker 1995:12-14).

Because of its geomorphology and recent settlement history, the ancient landscapes of the Upper Khabur basin are surprisingly well preserved. In terms of the natural environment, geological, geomorphological, and climatic conditions have given the basin the preservational advantages of a semi-arid steppe zone without the normal conditions of aeolian and water erosion. In cultural terms, the basin has fared equally well. Taylor's British examples of landscapes of preservation are all relatively marginal uplands which were only occasionally used (Taylor 1972; Williamson 1998:16); the Upper Khabur basin appears to be an example of a highly fertile area which avoided the destruction that accompanies continuous settlement by being turned over periodically to non- or semi-sedentary pastoralist groups whose impact on the land was minimal.

Thus, in the terms of Schiffer *et al.* (1978:6-7; see also Terrenato and Ammerman 1996), the Upper Khabur basin is generally characterized by high *visibility*, meaning that the environmental conditions and recent settlement history discussed above make it more likely that sites will be recovered. Visibility is lower in certain places, such as the aggrading river floodplains or in cotton fields, and at certain times, such as the spring, when many fields are under ripe crops. Furthermore, sites in the basin are generally highly *obtrusive*, meaning that the nature of the sites themselves make it more likely that a given survey method will detect them (Schiffer, *et al*. 1978:6). Again, there is variability in obtrusiveness: even the most coarse vehicular transects would have extreme difficulty in overlooking tell sites, but low prehistoric mounds may be more easily missed (Wilkinson, *et al*. 2003). However, almost *all* sites in the basin proper exhibit some mounding, however slight, and the further presence of dense sherd scatters and distinctive anthropogenic soils on sites add to their obtrusiveness. In a standard pedestrian survey of the type common in the Americas and eastern Mediterranean, some small low mounds might be missed, but even these sites are highly visible under the remote sensing-intensive methodology utilized by the TBS and THS (see below).

3.2. The Properties of Near Eastern Archaeological Survey Design

The design of an archaeological survey requires decisions on a number of properties or variables, which affect the nature of the results and the interpretations that can be made of them (Schiffer, et al. 1978; Plog, et al. 1978; Banning 2002:22-25). I will review these variables and discuss their place in the methodologies adopted by the Tell Beydar and Tell Hamoukar surveys.

3.2.1. Definition of the Survey Universe.

Ideally, the limits of the area to be surveyed will be co-terminous with a geographic, cultural, or political entity. Some processual archaeologists have even suggested that an arbitrarily defined universe is not worth studying (Plog*, et al.* 1978:384). Such programmatic statements are not helpful in the Middle East, where the definition of survey boundaries can be a sensitive political issue, defined by local antiquities officials rather than by foreign research strategies. In any case, it would be nearly impossible to properly survey a unitary cultural or political entity, because these evolve through time: a territory which was an entire kingdom or ethnic zone at one time may be only a small part of a much larger entity at another time. For example, the area of Uruk in southern Mesopotamia was the center of a highly urbanized settlement system in the fourth millennium BC, but four thousand years later that same region was a sparsely settled rural outpost within a much larger political system centered in Iran (Adams and Nissen 1972:59-63). To complicate matters further, such a scale change could occur within a single ceramic period. Geographically defined regions are no less imperfect. Floodplain-based societies frequently interact with groups in nearby highlands, particularly in matters of trade in natural resources (e.g., Stein 1999; Algaze 2001).

The Tell Beydar Survey was arbitrarily defined by a circle of 12 km radius (452 km^2), with the highpoint of Beydar itself at the center. The Tell Hamoukar Survey was also arbitrarily defined, by a 5 km distance from the edge of the University of Chicago Oriental Institute excavation concession. Because the concession included the immense "southern extension" (THS 7, Khirbat al-Fakhar), the area is egg-shaped, totaling 125 km^2. Both of these survey universes are geographical heterogeneous, and neither at any time corresponded to a political or cultural entity.[7] These facts will be taken into consideration in the interpretation of the settlement pattern data below.

3.2.2. Sampling vs. Full Coverage.

All archaeology involves sampling at some level, insofar as the excavator must choose what part of the site to dig and which region to survey. The 1960's saw the rise of probabilistic sampling: "the selection of the part of the archaeological record to be investigated in such a way that probability theory can be used to evaluate the inferences made from that part to the whole from which it was selected, in terms of the probability that the inferences are correct. The idea then is to ensure that the sample selected is representative of the whole" (Shennan 1997:362).

At the regional level, probabilistic sampling determines which parts of a survey universe are to be investigated. Such methods are common in European and almost universal in North American survey, where they are thought to be necessary for practical reasons. In these often temperate climates, both visibility and site obtrusiveness are quite low, so a sampling approach allows smaller areas to be investigated at a high intensity, with the results being extrapolated to the survey universe as a whole, within reasonable budgetary limits (Plog*, et al.* 1978). The arid or semi-arid climates of the Near East, coupled with millennia of timber clearance, agriculture, and overgrazing, have produced conditions of high visibility and sites of high obtrusiveness (see above), so that sampling

[7] The TBS, however, may have approximated the area of the "province" of Nabada in the mid-late third millennium Kingdom of Nagar; see Chapter 6.3 below.

has not often been thought necessary.

The main advantage of a full coverage approach over a sampling strategy is that it allows for the recovery of the full hierarchical size range settlement patterns (Sumner 1990). Sampling strategies provide an accurate view of the distribution of settlements when they are highly numerous and uniformly distributed across the landscape; however, when settlement is nucleated, the likelihood of not recovering a center is increased (see Bintliff 2000:201 for Greek examples). This is the so-called "Teotihuacan Effect," where rare or unique phenomena are missed (Flannery 1976:131-136). Furthermore, Near Eastern archaeologists have traditionally been less concerned with estimations of total population than with questions of settlement patterns, questions that can only be answered with a full coverage approach (see papers in Fish and Kowalewski 1990).

Probabilistic sampling at the level of the site has been attempted in Near Eastern archaeology, most notably in the Keban Reservoir survey of Robert Whallon (1979; 1983) in southeastern Turkey. Whallon applied a four meter grid to the surfaces of five sites and randomly chose enough squares for a collection of 10% of the site area; in the case of the larger site of Tepecik, only 6% was collected. At one site, a random 10% collection was made from a circular grid, where circular bands of four meters width were divided up. On the Tell Mozan lower town, a 7% random sample of 25 m grid squares was selected and 100 m^2 of each full collected (Thompson-Miragliuolo 1988).

The Keban Reservoir survey also utilized systematic sampling, a method that has found much more acceptance in the Near East. A probabilistic sample of collection units may result in uneven coverage, whereas a systematic sample guarantees that sample distribution will be even by positioning them at set intervals. The probabilistic argument against systematic sampling is that the sample intervals might coincide with a repeating pattern in the distribution of material to sample, and thus either sample 100% of that material or miss it all entirely, neither of which is representative of the actual distribution (Banning 2002:116-117). Furthermore, because the positions of the samples were not probabilistically determined, the degree to which the results are representative cannot be determined.

Whallon's systematic method involved laying out "gridded strips," lines of collection units which stretched across the diameter of a tell; in several cases, multiple strips were used, radiating out in several directions from the summit to the edge of a mound (Whallon 1979:15). In total, this method was applied to fifteen sites. The gridded strip method assumes a certain "layer cake" model of tell strata: occupation levels are superimposed directly atop one another, such that sherds of that layer will be most common on the site surface at its eroding edge; such sherds may also be found below that point due to the effects of gravity, but they will be rare or absent at a higher level. A variation of this method was applied to sites in the Tell Leilan survey of 1987 (Stein and Wattenmaker 1990; Stein and Wattenmaker in press). Sixteen sites were collected through radial transects of 100 m^2 circular sample units, placed at irregular intervals.

Neither Whallon (1979; 1983) nor Thompson-Miragliuolo (1988) attempted to use their probabilistic samples to make estimations of the full sherd population of the sites. Whallon favored probabilistic sampling over gridded strips, but only because the former provided a more even coverage of the total surface than the latter; indeed he concluded that a simple non-probabilistic systematic sampling method would be even more ideal, since archaeologists are more interested in mapping the spatial distribution of sherds than in estimating their total numbers on the surface (Whallon 1979:291).

The TBS and THS surveys adopted a varied collection methodology, employing several sampling strategies within a full coverage framework. At the level of the survey universe in both areas, full coverage was necessitated by the goals of recovering complete settlement patterns. In the past, full coverage surveys have been most successful in high visibility areas with low topography and highly obtrusive sites (Ammerman 1981:64-65), such as the Upper Khabur basin. The use of CORONA satellite photographs allowed the surveys to take advantage of soil color, an obtrusive property of sites which is very apparent from a vertical perspective (see below).

At the level of the site, several methods were employed for surface collection. Despite Whallon's misgivings about gridded strips, it was decided to apply this method to several of the smaller sites in the TBS area. At Tell Sekar Foqani (TBS 39), three transects composed of squares of $100m^2$ were extended from the edge of the flat summit and all sherds collected from each (Fig. 3.2). At two other sites, Tell Effendi (TBS 55) and Tell Jamilo (TBS 59), a series of opportunistically placed $100m^2$ collection units were placed across the surface on topographically discrete areas (Fig. 3.3). In these latter two instances, the results from these sampling methods were being tested against the results of the earlier low-intensity collections of the 1997 TBS season and the results of the full coverage approach of Lyonnet (2000), whose earlier survey had collected several tells in the TBS area, including Effendi and Jamilo.

Given the size and topography of Hamoukar itself, examining every square meter of its surface would have been prohibitively time consuming in both collection and ceramic processing, so it was decided to sample the site according to a non-probabilistic systematic scheme (Ur 2002b:15-17). Such strategies have been applied to other large urban centers, such as the Maya city of Sayil (Smyth 1998) and the Greek *polis* of Phlius (Alcock 1991). A 100 m grid was imposed on the 105 hectare mounded area of the site, and one $100m^2$ sample unit was collected from the center of each (Fig. 3.4). Although a metric site grid had been established for positioning excavation trenches, the surface collection used the Universal Transverse Mercator (UTM) projection grid (zone 37 north) to locate the northwestern corner of each sample unit by means of handheld Geographic Positioning System (GPS) receivers. The UTM grid has several benefits. It is almost infinitely extensible, without resorting to negative coordinates. Those coordinates are given in meters north and east, rather than degrees, minutes and seconds, which makes them much more useful for measuring distances and areas. Finally, a GPS receiver can be used to navigate to a position very easily; positioning via tape and compass is not feasible on a site as large as Hamoukar, and theodolite positioning is time consuming and difficult, given the presence of village houses.

A GPS receiver is, however, inherently less accurate. At the time of the Tell Beydar Survey (1997-1998) and Hamoukar surface collection (1999), the U.S. Department of Defense systematically degraded the accuracy of the GPS satellite network for non-military purposes. In the Upper Khabur basin, where up to ten satellites were visible at any one time, this meant a positioning error which could be estimated at

30-40 m. After this policy, called "Selective Availability," was removed on 1 May 2000, the positioning error in the basin was reduced to 5-10 m. Given the spatially inexact nature of surface assemblages, both pre- and post-Selective Availability positioning errors were considered to be acceptable.

In many cases, collection at the intended position of the sample unit in the center of the grid square was not possible. The village at Hamoukar (now called al-Hurriya) consists of some 800 persons living in low density house compounds over an approximate area of 40 ha. On several occasions, the center of a grid square fell within an animal pen or a house courtyard; collection in such household contexts was determined to be unnecessarily intrusive. In any case, walled courtyards and outdoor activity areas associated with household compounds are carefully maintained; most surfaces are regularly swept clean of all debris, including sherds. In other instances, sample units fell on paved or gravel tracks. In these circumstances, and on a few occasions when sample units fell on relatively undisturbed tell surface with very low sherd density, the position of the unit was adjusted to the closest undisturbed location with a reasonable assemblage. This method could therefore be accused of lacking methodological rigor, but it was decided that a set of somewhat opportunistically located, yet productive, sample units would be of greater utility in documenting the occupational history of the site than a rigidly systematic set of samples, some of which may contain too few sherds to be of analytical use. Gallant justified a similarly flexible strategy in the Lefkas-Pronnoi survey because it is "clearly advantageous over the frequently assumed situation wherein if a field is surveyed and no material is found, then none is thought to have existed, a situation attributable either to the fact that no material exists or that none could be seen (1986:406)."

Within each unit, collection was not limited to the standard diagnostic forms (rims, bases, handles, decorated sherds, etc.); all body sherds larger than 1 cm were collected, as well as lithics, kiln slag and ceramic wasters, and basalt fragments.

Ultimately, 110 sample units were collected from the 105 ha mounded area.[8] The total area of all samples was 11,100m^2, slightly more than 1% of the site. In four places (collection units 117, 126 and 127), this systematic method was augmented by opportunistic areal collections, for the purposes of confirming the presence or absence of certain periods that were not firmly documented in the sample units (see Fig. 3.4).

The majority of sites on in the TBS and THS areas were collected by full areal coverage, generally following the methodology used in the Iraqi North Jazira (Wilkinson and Tucker 1995). Sites were spatial subdivided into collection areas, usually on the basis of topography. Discrete mounded areas, spurs defined by eroding gullies, and central high points were all candidates for separate collection. In general, gullies were used as boundaries for sub-areas and collections within them were avoided, with the understanding that sherds from active areas such as these will have traveled further from their point of original deposition than sherds found on a more stable surface. However, because they are erosionally active, gullies tend to have a higher density of sherds, and they were deliberately targeted on sites where sherd density was otherwise too low to

[8] This area includes the high mound and the lower town. The 300 ha "southern extension" was collected via a similar sampling strategy in the 2000 season. As it predates the time of interest of this dissertation, it will not be discussed here (see Ur 2002a:62-65; 2002b:17-19; Wilkinson 2002a:99-104).

provide a reliable ceramic dating. Ideally, collection areas were kept to under 1 ha, and flat or otherwise topographically homogenous areas of a site were often arbitrarily divided if they exceeded that size. Collection area corners and significant points along area boundaries were marked with high visibility nylon flags and positioned with the GPS; these points were later connected in a GIS program to allow accurate measurement of collection area surfaces. Collections were made by walking slow transects at varying intervals. For highly mounded small collection areas, transects tended to be tightly spaced; in larger areas of less mounding, transects were widely spaced to evenly cover the area. Unlike the strategy adopted for the collection of Hamoukar itself, only diagnostic sherds (rims, bases, handles, and decorated pieces) and artifacts were kept, with no attempts at "vacuuming" the surface. It was intended that sherd collections be representative but not unmanageably large. Therefore, some areas were collected fully but at low intensity (see below), and it is possible that small or deeply buried occupations were not detected.[9]

3.2.3. Intensity of survey.

The intensity of survey can be understood as the relative amount of effort expended on a unit of space (Sumner 1990:93; Plog, et al. 1978). Intensity is generally inversely proportional to the size of the survey area. The earliest surveys in the Near East covered vast areas very rapidly, often relying heavily on aerial photography (see Sumner

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[9] Similar areal (full) collections have been conducted at 'Ain Dara in Syria (Stone, et al. 1999) and Tell Abu Duwari in Iraq (Stone 1990; Stone and Zimansky 1994, 2004), although these surveys collected regular 250m^2 grid squares rather than topographically defined units.

1990:87-91 for an overview). These early surveys were primarily intended to provide a quick assessment of the archaeological potential of a previously unknown region, and are better labeled "reconnaissance." The first modern surveys in Mesopotamia were low intensity surveys in southern Iraq (Adams 1965, 1981; Adams and Nissen 1972; Gibson 1972). The advantage to a low intensity methodology is that it allows a larger area to be surveyed because less energy is expended on each square unit. Thus the larger component (sites of greater size) of entire settlement systems can be recovered relatively quickly; however, the disadvantage to a low intensity approach is that the surveyor is much more likely to miss sites, particularly smaller ones (Redman 1982:377-378).

While even a low intensity survey will probably locate the larger political and economic centers, low recovery of village level sites skews our understanding of settlement hierarchies in periods of social complexity, and can dramatically impact reconstructions of prehistoric periods, when most or all sites were very small. For these reasons, the level of intensity in Near Eastern survey has increased in recent decades, although vehicle-based survey is still the norm (Meijer 1986:3-4; Weiss 1986:87 fn. 5). Walking transects are almost universally employed in New World (Plog, *et al.* 1978; Schiffer, *et al.* 1978), European and Mediterranean surveys (Alcock and Cherry 2004), where low visibility and site obtrusiveness make them a necessity. Perhaps because low visibility and obtrusiveness have been considered to be less of a factor in the Near East, few surveys have adopted pedestrian transects. An exception is the Tell Leilan Survey of 1987, where the narrow wadi floodplains were walked (Stein and Wattenmaker 1990, 2003).

Ultimately, the degree of intensity must be dictated by the research goals of the survey itself (Kowalewski and Fish 1990:262) as well as factors such as visibility and obtrusiveness. Both the TBS and THS intended to recover settlement patterns which would document the formation and decline of urbanism; therefore the rural settlement component was significant, and a high degree of intensity was necessary. Because of the extremely favorable properties of visibility and obtrusiveness which characterize the basin (see above), it was decided that an acceptable level of intensity to recover these smaller sites could be achieved *without* the use of pedestrian transects. In the Hamoukar area in particular, initial reconnaissance aimed at testing the utility of CORONA satellite photographs demonstrated that few if any sites were invisible from the air, under certain ground conditions (Ur 2002b).[10] Therefore it can be said that all parts of the survey area were fully and intensely studied using remote sensing data. Using imagery from five different CORONA missions, every square kilometer of the THS area was intensively investigated for sites and landscape features prior to on-the-ground fieldwork. During the survey itself, areas with potential sites were more intensively observed than areas which appeared to be devoid of settlement on the images.

Justification for this approach, and further evidence that it was not causing sites to be missed, came from a limited set of walking transects. These were conducted not for the purposes of identifying sites, but for the collection of off-site "field scatters" of pottery and other artifactual material at 200 m intervals (see Section 5.2). Nonetheless, field walkers were instructed to scan the ground on either side of them while moving

[10] The TBS relied mostly on SPOT imagery, which are much less effective than CORONA. The resulting differences in recovery rates between the two areas will be discussed below.

from one field scatter sample unit to the next, specifically looking for site-level sherd scatters, gray anthropogenic soils, and mounding. The 200 m interval between these transects would be considered very large by the standards of North American and Mediterranean survey (e.g., Mattingly 2000). Given the local conditions of visibility and obtrusiveness discussed above, and the fact that these transects were limited to high visibility fallow fields, I estimate that fieldwalkers could discern mounding at 100m on either side, anthropogenic soils at 50m, and site-level sherd scatters at 5m. Since even the smallest Neolithic sites in the THS exhibited some mounding, it is unlikely that any sites were missed during fieldwalking. Although not intended to recover sites, the field scatter transects served as a useful check on the CORONA-based preliminary site identifications: all sites noted in x km of transects had already been identified from the satellite photographs.

3.2.4. Definition of a "site."

It has been noted that "the decision whether or not a specific cluster is a site has frequently been based on the researcher's implicit assumptions about what the surface manifestations of a site should be. If the number of decision-makers in a survey is small, then the results should at least be consistent for that survey, but they will not be readily comparable to the results from other surveys" (Gallant 1986:417). The definition of a "site" is thus an etic one, based on the archaeologist's assessment of site boundaries, rather than any inherent quality of the archaeological remains themselves (see also Dunnell and Dancey 1983; Mattingly 2000). Functionally, sites are not limited to places of habitation; they can be temporary activity areas, industrial areas such as mines, or cemeteries (Wilkinson 2003). Some archaeologists have advocated moving the level of analysis from the arbitrarily-defined "site" down to the level of the surface artifacts of which it is composed (Dunnell and Dancey 1983); others have gone further to suggest that the "site" be done away with altogether, for analytical purposes (Thomas 1975). The most agreeable definition comes from Gallant (1986:416): "Sites are those areas with discrete accumulations of artifacts demonstrating higher levels of density and continuity in relation to the overall regional pattern of artifact distribution when visibility is not a distorting factor." Whereas other "formalized" definitions prescribe a minimum sherd density (usually around 5 sherds per square meter), this definition has the benefit of flexibility in the face of variable visibility conditions (see also Plog, *et al*. 1978:389).

Traditionally, most surveys have treated site definitions with what Gallant has called "benign neglect" (1986:408): a site is assumed to be too obvious to be explicitly defined. This is certainly the case for Near Eastern survey, where sites mean tells. However, intensive survey has found that the classic Near Eastern tell is only one of several site morphologies, and not even the most common one (Wilkinson 2003: Table 4.1).

Americanist, European, and Mediterranean definitions of the site have focused on the presence, absence, and relative frequency of pottery or other artifacts on the surface. The favorable conditions of visibility and obtrusiveness in the Near East in general and specifically in the Upper Khabur basin mean that sites have other properties that can be used for site definition, and which make the delineation of their boundaries perhaps less arbitrary than Gallant and others have suggested. Following the lead of the North Jazira survey, the TBS and THS used a combination of three variables: relative sherd density, site mounding, and soil color and texture (Wilkinson and Tucker 1995:15-17; Ur 2002a:61).

Sherd densities on sites in the Upper Khabur vary with the surface conditions but are normally at least 200 sherds per 100m^2. Slope erosion on tells and plowing on lower sites have resulted in some lateral movement, but probably not enough to radically misinform surface collection, given the correlation of higher sherd densities with the other two variables. In a single instance (THS 7, Khirbat al-Fakhar), a sharp decline in relative sherd density across systematic sample units was used to define the site's limits (Ur 2002a:64), but normally such assessments were made qualitatively and subjectively. Matters are complicated by the ancient practice of manuring, which involved the deliberate application of settlement-derived refuse onto the fields (see Chapter 5.2), but the resulting field scatters were generally of low density and occurred without the other two variables.

Site mounding is the property of sites which has traditionally been used to delimit ancient occupation. It appears that within the Holocene, pisé or mud brick have been the primary architectural media in common usage, and because it is easier and more efficient to make new mud bricks than reuse old ones, settlements are simply built atop the ruins of older ones, rather than recycling them. In the Upper Khabur basin, even the earliest Hassuna sites can still retain a meter or more of vertical height. Moundedness as a property of sites is apparent both on the ground and on CORONA photographs, where heights can be estimated by the size of the shadow cast by the mound.

Human occupation of a place disturbs land surfaces, breaks up soil structure, and introduces ash and chemical elements such as phosphates. As a result, in northern Mesopotamia, occupational sites are almost always characterized by a gray silty soil which stands out starkly against the natural reddish brown calcic xerosols of the surrounding landscape (Wilkinson and Tucker 1995:5-6). These distinct anthropogenic soils will blend into the reddish brown natural soils gradually, but a general point of interface can normally be discerned under conditions of good visibility (such as fallow fields). This soil interface is clearer from a vertical distance such as the high point of a mound or, ideally, from a satellite photograph. Indeed, it is this highly obtrusive property of almost all sites in the Upper Khabur basin, from high tells to low prehistoric mounds, which allows them to be identified on CORONA photographs with such clarity (see below and Ur 2003).

In an ideal situation, a site's boundary would be definable by a simultaneous shift in all three variables: when moving from the site to the unoccupied terrain beyond, relative sherd density would drop suddenly, soil color would change from gray to reddish brown, and there would be either an abrupt drop in elevation or the slope would decrease to zero. When all three variables could be tracked, it was clear that they were linked in precisely this manner. In practice, both surveys relied mostly on a combination of soil color changes (as defined by a site's signature on a CORONA photograph) and mounding (as defined by ground observation).[11] As demonstrated by Gallant (1986), different conditions of visibility have dramatic effects on sherd density, so ironically, the most crucial variable for site definition in most parts of the world was the least useful for the Upper Khabur surveys.

3.3. CORONA Satellite Photography and its Interpretation

With the declassification of the imagery from the CORONA program (McDonald 1997; Day, et al. 1998a), scholars in dozens of fields have gained a valuable research tool. CORONA was the United States' first intelligence satellite program, which was originally designed to give American military planners an estimate of Soviet nuclear missile capabilities. In thirteen years of operation (1959-1972), it produced over 800,000 images which covered 557 million square miles, the equivalent of the entire land surface of the earth almost ten times over (Day*, et al.* 1998b:6). During its existence, the program used an evolving set of cameras. The earliest (KH-1) produced photographs with a ground resolution of 40 ft. The last two cameras, used on KH-4A and KH-4B programs, had a highest resolution of 9 ft and 6 ft, respectively. Because the CORONA satellites carried film cameras, rather than digital sensors as is the current standard, the film had to be physically returned to earth via parachute, where it was collected out of the air by military planes. The photographs from the CORONA program were declassified by executive order on 22 February 1995 and can now be previewed and ordered via the

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[11] In several instances where low sites had been bulldozed for irrigated cotton fields, their boundaries had to be defined entirely by their signature on CORONA photographs.

United States Geological Survey (USGS) website.[12]

CORONA imagery is particularly valuable for archaeology, and studies utilizing these images are beginning to appear in print. David Kennedy used CORONA photographs from missions 1103 and 1104 (May and September 1968) to document several sites on the Euphrates in southeastern Turkey, most of which were either inaccessible or had been flooded by the Karababa Dam (Kennedy 1998). The cultural and natural landscapes of the Hellenistic-Islamic city of Raqqa have been studied (Challis*, et al*. 2002-2004), as have archaeological sites in western Iran (De Meyer 2004) and Siberia (Gheyle, et al. 2004). A joint University of Durham-Syrian Directorate General of Antiquities and Museums survey project has used CORONA images for site identification and landscape feature mapping in the Homs region of eastern Syria (Philip*, et al*. 2002). It was found that CORONA documented tell sites and low mounds, which were indicated on 1:50,000 maps, but also small sherd and tile scatters which were not otherwise documented. On the other hand, some small scatters could only be detected by fieldwalking (Philip*, et al*. 2002:112-113). Of particular interest is the project's landscape studies in mapping field systems and abandoned irrigation canals from mission 1108 (December 1969) and 1111 (July 1970) photographs. A preliminary report on the CORONA-based study of ancient road networks in the Upper Khabur basin (discussed in detail in Chapters 5.3-5.4) has appeared as Ur (2003).

In an environment such as the Upper Khabur basin, CORONA images can be used to great effect in identifying sites, mapping offsite archaeological features, and

[12] http://EarthExplorer.usgs.gov.

reconstructing ancient environments. High mounds are easily identified by the shadows they cast. However, even sites with little or no topographic expression can be recognized. For example, in images taken at the beginning of the rainy season in December, ancient sites appear as lighter spots. This signature is a product of the anthropogenic nature of the soils of sites, which have a different color and lack the developed soil structure of the surrounding fields (see above). These unstructured archaeological deposits shed moisture more effectively. Additionally, the mounded nature of most ancient sites means that moisture will run off their sloped edges more rapidly. These two factors mean that most ancient sites will reflect more solar energy than the relatively wetter surrounding fields, producing a lighter signature on CORONA images. Fig. 3.5 shows the signature of several sites of various morphologies.

CORONA photographs also record the traces of ancient tracks, known as hollow ways or linear hollows. These are broad linear depressions in the landscape, formed by the passage of human and animal feet (see Section 5.3). Moisture runs down the sloped edges of these features, collecting in the trough at the center. Furthermore, the relative wetness in these features encourages plant growth, particularly *Prosopis farcta*, a spiky perennial weed (Guest 1966:92-93). The increased moisture and subsequent plant growth absorb solar energy, causing the troughs of hollow ways to appear darker in CORONA imagery, while the well-drained sloped edges are drier and appear white. Thus the signature of a typical hollow way would be a dark line with whitish margins within a gray background (see Chapter 5.3 and Fig. 5.14). In some cases, the hollow way signature consists of only a dark band without the whitish margins, and when visited on the ground these hollow ways are no longer “hollow” although they still tend to support denser vegetation. It appears that erosion of the surrounding fields have infilled these hollow ways; presumably their dark signature can be explained by greater moisture retention in the now-buried ancient road surface. When these two signatures are related to their surrounding topography, the reasons become clear. Hollow ways with whitish margins tend to run parallel to the natural slope of the landscape, channeling runoff and maintaining their depressed morphology or even increasing it via runoff erosion. Hollow ways without margins tend to run perpendicular to the slope, causing them to act as catchment for eroding sediments; the resulting aggradation fills in the trough of the hollow way, although the soil of the buried road surface still retains moisture.

One aspect of CORONA imagery which is frequently mentioned as one if its greatest benefits to archaeology is its age (Philip, et al. 2002:110; Ur 2003). The CORONA program documented the landscape of the late 1960’s and early 1970’s. In the intervening three decades, modern human activity has done much to alter this landscape. Towns and villages have expanded, covering over ancient sites; roads have been built; and new crops and plowing methods have damaged sites and landscape features. These images have preserved many features which have been radically transformed or removed altogether. Cultivation in general and the expansion of irrigated cotton fields in particular in the THS area has resulted in the destruction of the microtopography of many hollow ways and has obliterated several sites. However, the CORONA images were produced before the recent expansion of cotton agriculture in this region, so these features and sites can still be mapped and their remaining traces documented. For example, THS 25, a

Halaf site, appears in the CORONA images as a very small light spot. When it was visited by the survey team in the Fall of 2000, it lay in the middle of a large fallow cotton field, which had eradicated its edges. Because the process of making the irrigation furrows had destroyed the mounding of the site, masked the lighter color of the anthropogenic soils, and reduced sherd visibility, it is possible that even intensive fieldwalking might have overlooked this site.

Preliminary site identifications based on CORONA imagery were tested in the field during reconnaissance in the 1999 season (Ur 2002b). This demonstrated the power of these images and provided ground control to accurately interpret them. Because of the demonstrated utility of the CORONA images, it was decided that a high level of site recovery could be maintained without fieldwalking. Therefore sites were visited directly by vehicle, without making systematic ground transects for the purposes of locating sites. However, systematic transects were made during field scatter collection, and these served to confirm this decision. No additional sites were identified during field scatter collection that had not already been identified through CORONA image interpretation.

3.4. Background to the Surveys and the Survey Regions

The two intensive surveys which provided the field data for this study were conducted under the auspices of two excavation projects centered on sites occupied during the third millennium BC: the town of Tell Beydar and the urban center of Hamoukar.

Tell Beydar is a 22.5 hectare *Kranzhügel*-type mound which was initially noted by aerial archaeologists in the early 20th century (Brossé 1929; Poidebard 1934). In 1992 it became the focus of the Syrian-European Tell Beydar Mission, a project of the Syrian Directorate General of Antiquities and Museums and the European Centre for Upper Mesopotamian Studies, directed by Marc Lebeau (ECUMS) and Antoine Suleiman (DGAM) (Lebeau and Suleiman 1997). Its initial occupation appears to have been in the early third millennium BC. The main mound was abandoned after the Akkadian period but reoccupied on a smaller scale in the Hellenistic period. A large (40 ha) lower town was settled in the Mitanni and Neo-Assyrian periods. The 1997-1998 Tell Beydar Survey was directed by T.J. Wilkinson and consisted of a 452 km^2 survey area in the form of a circle of 12 kilometers radius, with Tell Beydar at the center (Wilkinson 2000a, 2002b).

The landscape of the Tell Beydar Survey area is typical of the plain in general (see Chapter 2.1), with several local peculiarities (Wilkinson 2000a; Courty 1994). Tell Beydar itself sits immediately west of the Wadi Aweidj, one of a series of south-flowing wadis in the basin. The Wadi Aweidj is fed by runoff from the Tur Abdin foothills to the north, and ultimately drains into the Jaghjagh River just upstream from its confluence with the Khabur River. Several tributary drainages feed into the Aweidj above Tell Beydar. The floodplain of the Wadi Aweidj has been subject to alluviation during low-energy floods, which may have resulted in the burial of small low sites. West of the Aweidj floodplain rises a low undulating basalt plateau, known locally as the 'Ardh al-Shaykh, which is covered by thin soils and has few water resources. East of the Wadi Aweidj floodplain, the terrain rises, forming a watershed between the Aweidj and a smaller wadi which feeds into the Jaghjagh River upstream from its confluence with the

Aweidj. Although this watershed area has much deeper soils than the basalt plateau, they both are much drier than the wadi floodplains; consequently, archaeological sites are uncommon in the interfluve zone and rare on the plateau.

The 1999-2001 seasons of the Tell Hamoukar Survey were conducted under the auspices of the Syrian-American Tell Hamoukar Expedition, directed by McGuire Gibson (Oriental Institute of the University of Chicago) and Amr al-Azm (Syrian Directorate General of Antiquities and Museums) (see Gibson, al-Azm, *et al*. 2002; Gibson, Maktash, *et al*. 2002). The mounded area of Tell Hamoukar consists of a fifteen hectare high mound at the north edge of an extensive lower town; at 105 hectares in total, it is one of the largest sites in northeastern Syria (Ur 2002b). The Hamoukar "Southern Extension" is a vast 300 hectare low scatter of sherds and lithic debris immediately south of the mounded site (Ur 2002a:64). The boundaries of the survey were defined at five kilometers from the edge of the excavation permit, which includes the mounded site and the southern extension; thus the survey area is ovoid, covering 125 km^2.

Hamoukar sits at the far eastern edge of the Upper Khabur River basin, a few kilometers west of the watershed between the Tigris and Euphrates basins (Wilkinson 2002a). To the west, the parallel Wadis Rumaylan and Khunayzir flow south into a marshy area and ultimately into the Khabur River; however, within the survey area there are currently no reliable water sources. An ephemeral wadi drains out of the uplands northeast of the survey area to flow on the east side of Tell Hamoukar; today this wadi is entirely choked with irrigated cotton fields and no longer flows. Analysis of CORONA satellite imagery from May 1972 shows traces of another wadi which flowed to the west of Hamoukar, perhaps as late as the third millennium BC (discussed in Chapter 5.3). Today this feature has entirely vanished, with no topographic expression.

In both the TBS and THS areas, modern settlement and land use has impacted the archaeological record. In both areas, modern villages cling to the southern slopes of tell sites and cover over low mounded sites, making collection difficult or impossible. The mechanized disc plowing of grain fields has the ability to shift settlement debris across the surface of a site and can obscure field scatters. As Hassake province has become more integrated into the global economy, former wheat fields have been converted into irrigated cotton fields, which sometimes necessitates the dramatic alteration of the slope of a field in order to facilitate proper gravity flow; this renders field scatters inaccessible and in some cases has resulted in the obliteration of hollow ways and entire sites. Road and railway construction in the area has resulted in the leveling of sites. Built roads of gravel and asphalt are particularly destructive to hollow ways. Because modern villages tend to be on or adjacent to tells, the modern roads connecting these villages obscure the ancient roads connecting the tells. These issues are by no means unique to the Upper Khabur basin, and indeed large scale modification of the landscape as part of state-sponsored agricultural products has been going on for several millennia (Hole 1980:22-23). The ways in which modern settlement impacts the surviving remains of ancient settlement must be borne in mind when interpreting survey data.

3.5. Field Methodology of the TBS and THS

Both surveys were intended to be intensive and full coverage, for the reasons outlined above (Chapter 3.2). Most sites were preliminarily identified prior to fieldwork, based on their signatures on CORONA satellite photographs. Other clues to potential sites were taken from various other sources. Place names on maps with distinctive elements such as *khirba* and *tell* ("ruin" and "mound" in Arabic), or *gir* ("mound" in Kurdish) were useful indicators of where sites might be found beneath modern villages. Mound morphology could sometimes be identified on by enclosed contour lines on 1:25,000 and 1:50,000 scale maps. These potential sites were plotted on a GIS base map derived from topographic maps and registered CORONA imagery.

In recording sites, the aims of the team were to make discrete collections of surface artifacts within well-defined units which could be related to each other and to the morphology of the site as a whole (see above). This approach was intended to allow the accurate diachronic mapping of settlement within the site, as well as to document natural and cultural processes which may have had an effect on the surface distribution of material culture.

Field recording in both the TBS and THS made use of Geographic Positioning System (GPS) handheld receivers, although to different degrees. The United States Department of Defense maintains 24 satellites in evenly spaced orbits over the earth. Each of these satellites continually broadcasts its own position and time; if a receiver on the earth's surface can pick up signals from four or more of these satellites, its position can be derived by triangulation. Prior to the removal of Selective Availability in May 2000, all positions may have been off by as much as 100 meters; presently, when the horizons are unobstructed the positioning error can be lower than 10 meters.

GPS positions taken during the Tell Beydar Survey (1997-1998) and the first season of the Tell Hamoukar Survey (1999) were affected by Selective Availability. In order to minimize the deliberate distortion, all positions were averaged by taking continuous readings over a period of time and then averaging the northing and easting coordinates. The error was thus reduced, but still was approximately 20-30 meters, based on comparing these positions with ortho-rectified SPOT images. This positioning error was within acceptable limits for these seasons, when GPS points were used for general locations such as the center of a site. Only in the 2000 season of the Tell Hamoukar Survey, when the positioning error was as low as 4-5 meters, were GPS positions used for scale mapping of archaeological sites and features. In general, GPS receivers are very accurate in the Khabur basin because the landscape is relatively flat and the horizon is normally visible in most directions; while the signals of four or more satellites are required for a three dimensional position, positions based on strong signals for nine to ten satellites are not uncommon in this region.

In the case of the TBS, a single averaged GPS position was taken on the summit of a high mounded site or at the center of a low site, in order to map the site into the base map of the region. The site itself was mapped by pacing the long and short axes and then drawing an unscaled sketch contour map to demonstrate significant topography, disturbance, or other features relevant to the interpretation of the site and its surface artifact distribution. Based on this sketch map, the surface of the site was subdivided, and all diagnostic sherds, lithics, and other artifacts were collected from each unit. However, pacing and sketch maps are not geographically accurate, and the TBS plans and size estimates were later corrected by reference to ortho-rectified SPOT imagery and registered CORONA photographs.

In the case of the THS, the site map was produced using GPS positions. Initially the perimeter of the site was mapped by taking positions at 50-100 meter intervals around the site. The site boundary was defined by a subjective combination of mounding edge, sherd scatter density, and distribution of lighter anthropogenic soil. These positions were simultaneously plotted in the field notebook at a scale appropriate to the size of the site (e.g. 1:5,000 for a large tell with an extensive lower town, or 1:1,000 for a low prehistoric mound). Next the internal details of the site were positioned and drawn on the plan; the center or top of the site, existing survey benchmarks, erosional gullies, modern villages and roads, and any other notable modern or ancient features were considered to be significant. From this plan, approximate relative contour lines were drawn in order to give some idea of the general steepness of the slopes of the tell; for example, a gully would be represented by a series of re-entrant contour lines, and the lines of a steep slope would be drawn close together.

Once a scaled and detailed site map had been produced, the site surface was divided into sub-areas for collection according to the rules discussed above. These collections were processed according to a ceramic typology originally developed by Wilkinson and Tucker (Ball*, et al*. 1989; Wilkinson and Tucker 1995) for the Tell al-Hawa surface collection and the Iraqi North Jazira survey. It has been updated with reference to recent publications of ceramics (especially Oates, et al. 1997, 2001; Postgate, et al. 1997; McMahon 1998; Hole 2001) and the excavations at Hamoukar (Gibson, al-

Azm*, et al.* 2002:62-68; Gibson, Maktash*, et al.* 2002). The fourth millennium through early second millennium ceramic types are described and discussed in Appendix 3.

Using the methodology described above, almost 600 km^2 of the Upper Khabur basin was intensively investigated in the fall field seasons from 1998 to 2001, revealing a sequence of remarkably well-preserved ancient landscapes covering over 6,000 years. The settlement pattern results are presented in Chapter 4 and the "offsite" data is presented in Chapter 5.

CHAPTER FOUR:

SETTLEMENT PATTERNS IN THE UPPER KHABUR BASIN

The operational dynamics of complex societies cannot be approached without some understanding of the geographic distribution of population; the scale and pattern of ancient settlement provides important clues to the political and economic organization which produced it. Most importantly for northern Mesopotamia, the size of ancient cities and the distribution of settlement in their hinterlands could represent a sustainable economic system or one under the risk of collapse. The documentation of scale and distribution of settlement is therefore the first step in the reconstruction of how urban societies reproduced themselves. Toward this goal, two surveys were undertaken in the Upper Khabur basin, around the regional center at Tell Beydar (ancient Nabada) and the large urban site at Hamoukar. The survey methodologies were discussed at length in Chapter 3; the results of four seasons of survey fieldwork are presented below.

4.1. Systematic Sampling at Hamoukar

Settlement at Hamoukar began before and continued after the period of interest for this study. However, earlier phases of occupation established the initial conditions which were faced by the third millennium inhabitants, and subsequent settlement transformed the remains of earlier habitation. Therefore the following discussion of the collection results will cover all periods of occupation at the site.

In September and October 1999, the THS collected 15,901 sherds from 110 10 x 10 m collection units on the surface of Hamoukar. Several of these units were discarded after being tampered with (either by dogs or, more likely, small children) and had to be re-collected; the original units are not considered in determining sherd densities, although their diagnostics generally provided confirmation to the results of the systematic units. In addition, three point collections were made (units 50, 60 and 68) at positions where recent digging or plowing had turned up chronologically significant assemblages outside of the systematic grid. Finally, three non-systematic areal collections (units 117, 126 and 127), each between 0.3 and 0.5 ha, were placed to confirm unexpected results from systematic sampling (for collection unit locations, see Fig. 3.4). A preliminary report appeared in the journal *Iraq* (Ur 2002b).

From the surface of Hamoukar proper, the collection units had a mean average of 151 sherds per 100 m^2, from a low of 21 sherds/100 m^2 up to 398 sherds/100 m^2 (Fig. 4.1). Areas of low sherd density (<100 sherds/100 m^2) occur south of the high mound within the modern village, where courtyards and other exterior spaces were heavily trampled and swept clean of all debris, including ancient pottery. In other areas, intermediate sherd density (101-150 sherds/100 m^2) could be attributed to extreme trampling which broke up surface sherds into fragments below the size for collection; this is particularly true for the football field, a large and flat area at the northwestern corner of the lower town.

Areas of high sherd density (>150 sherds/100 m^2) include the high mound, the northeastern corner of the lower town, and points along the western edge of the lower town. In the case of the high mound, the high sherd density found along its southern slopes (especially units 30, 44, 49, 107 and 108) can be explained with reference to the general principles of tell erosion in the Near East. Slopes with a southern aspect erode more quickly than northern slopes, where vegetation arrests erosion (Rosen 1986:31). Along the western edge of the lower town, and to a lesser extent elsewhere along the site edge, elevated sherd densities are probably due to a combination of erosion and modern plowing; the large size of sherds with fresh breaks lend support to the latter cause. The northeastern lower town's high density also can be related to its recent history: this area featured a recently abandoned segment of the modern village which was no longer maintaining the exterior spaces as was the rest of the village.

The distribution of lithics across Hamoukar (Fig. 4.2) appears to be unrelated to either ancient patterns of behavior or subsequent transformations. A slightly elevated density was found on parts of the high mound but also on slight prominences on the eastern and western lower towns. This is particularly odd since the former is an area of Seleucid/Hellenistic settlement (see below). The wide but low density distribution of lithics (almost all production debris) is not surprising, given that lithic technology remained in use up to the end of the third millennium (e.g., contributions by Underbjerg and Rainville in Emberling and McDonald 2003:60-72) and perhaps even later. There also appear to be no significant differences in the patterning of obsidian versus chert or flint.

The distribution of ceramic processing debris (kiln slag and wasters) occurs across the entire site, again at a fairly low density (Fig. 4.3). Slag was much more common than overfired sherds. The wasters that were recovered in systematic collection were never identifiable by type. A few localized areas of dense kiln slag were found on the high mound and on the interior parts of the lower town, but substantial concentrations clustered along the eastern and western edges of the site. This is unsurprising, given that pottery firing is a fuel-intensive craft which produces ash and smoke. Although not detected by the systematic collection, informal observations in the area immediately southeast of the high mound found many fragments of stacked kiln wasters. This prominence probably supported specialized mass production of small bowls at the end of the third millennium.

4.1.1. Period 04 (LC1-2; Late Fifth-Early Fourth Millennium BC).

The earliest sherds recovered from systematic collection date to the end of the fifth or beginning of the fourth millennium BC.[1] In previous survey work in the basin, sherds from this time period were included as part of a fourth millennium BC "Uruk" ceramic horizon, although with some doubts about its precise contemporaneity (e.g., Meijer 1986; Wilkinson and Tucker 1995:43-44, 92; see also Lupton 1996). The recently proposed "LC" chronology now recognizes five ceramically distinct phases (LC1 through

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[1] One or two Ubaid or Halaf sherds have been recovered out of original context during the excavations of fourth and third millennium levels on the site (McGuire Gibson, personal communication) but none were found during the 1999 systematic survey.

LC5) within this horizon (Schwartz 2001; Rothman 2002). These earliest sherds at Hamoukar date to LC1-2, otherwise known as the Northern Early Uruk period (Oates 2002) or the Post-Ubaid period (Hole 2001). A series of radiocarbon dates from sites in the Upper Khabur basin and along the Middle Khabur place these ceramics firmly in the second half of the fifth millennium BC (Hole 2001).

Period 04 sherds can be found in very low numbers on the southern reaches of the lower town. These probably originate not from local settlement but from the massive "Southern Extension," a 300 ha area of variable sherd scatters and low mounds located immediately to the south of Hamoukar (Ur 2002a:62-64; 2002b:17-19; Wilkinson 2002a:99-104). This enormous site, known locally as Khirbat al-Fakhar and collected as THS 7, appears to have been a center of obsidian trade and tool manufacture, and demonstrates that the Hamoukar area already had interregional significance by the late fifth millennium.

4.1.2. Period 05b (LC3-5; Mid-Late Fourth Millennium BC): Local Types.

Fourth millennium BC ceramic chronology is complicated by the presence of intrusive ceramics stylistically of southern Mesopotamian origin, which constitute part of the Uruk Expansion (Algaze 1989, 1993; Stein 1999; Rothman 2001). Two morphologically and technologically different ceramic traditions were in use. An indigenous assemblage, characterized by reduced-core chaff-tempered ceramics, developed from the northern Ubaid tradition (Pearce 2000); a hard-fired sand-tempered assemblage is indistinguishable from contemporary southern Mesopotamian ceramics, and is often used to suggest the presence of colonists from the south (although the ceramics themselves may have been locally manufactured).

These two assemblages have comparable but not entirely parallel durations of use. The Santa Fe LC chronology (Schwartz 2001) recognizes an early to mid-fourth millennium phase (LC3) characterized by the chaff-tempered indigenous wares which predates the appearance of southern types. The LC4 period is equated with the southern Middle Uruk period, and is distinguished in the north by the presence of a conical cup with a pinched lip. The LC5 period coincides with the Late Uruk period in the southern Mesopotamian chronology and is characterized by the distinctive Uruk drooping spout. Because the hallmarks of the LC4 and LC5 periods are infrequently occurring intrusive elements, it is often difficult or impossible to subdivide the LC3-5 periods, especially from surface materials or an entirely local assemblage. As a result, the THS recognizes a single LC3-5 period for local ceramics (THS Period 05b) and a partially contemporary LC4-5 period for southern types (THS Period 05a) (Ur 2002b:20).

Period 05b indigenous diagnostics on Hamoukar are closely associated with the high mound and the areas immediately adjacent to it (Fig. 4.4).[2] Density is greatest on the heavily eroded southern slopes, for the geomorphological reasons discussed above but perhaps also because of a lack of subsequent occupation in this area. Period 05b sherds were also abundant in gullies along the northern slopes of the high mound, but were absent in the three collection units along the top of the mound (units 1, 3 and 4). This central void of sherds probably resulted from a capping of third millennium and later

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[2] In the distribution maps which follow, the shaded areas were interpolated from the collection unit points via the Inverse Distance Weighted interpolation method (Lo and Yeung 2002:326).

settlement (see below), which has reduced the visibility of sherds from the underlying fourth millennium layers. Beyond the high mound, Period 05b sherds appear in very low numbers immediately to the south and on a slight topographic prominence to the west. In such low densities, these sherds probably originated from erosion or relocation by disturbance in later phases of occupation. The presence of sherds on the western topographic prominence could suggest, however, that they may have originated from settlement refuse. To investigate this possibility, the non-systematic areal collection unit 126 was positioned on the northeastern slope of this area, but only two Period 05b diagnostics were recovered.

Because local fourth millennium sherds are poorly fired and can easily erode into shapeless lumps when exposed on the surface, it was conceivable that the sherd distribution of diagnostics was related not to ancient settlement but to differential preservation. To guard against this possibility, all body sherds of the distinctive Period 05b coarseware fabric (red to brown surfaces, black core, coarse chaff temper) were counted as well. The distribution of such body sherds mirrors the distribution of Period 05b diagnostics remarkably (Fig. 4.5). Of particular interest is the low density of body sherds surrounding the slight prominence west of the high mound, which suggests that this area was not occupied in the fourth millennium BC (an alternative explanation for this area's topography is offered below).

The interpolated distribution of Period 05b sherds shown in Fig. 4.4 shows 11.8 ha of dense scatter (three or more typed diagnostics per 100 m^2) and an additional 19.1 ha of low density scatter (1-2 sherds per 100 m^2), for a total distribution of roughly 31 ha.

However, after considering post-occupational natural and cultural transformative processes, it is likely that actual settlement was restricted to the 15 ha area of the high mound itself. Excavations in the Area A step trench (Gibson, Maktash, et al. 2002:50-51; Gibson, al-Azm, et al. 2002:12-16) indicate that settlement was continuous throughout the fourth millennium.

4.1.3. Period 05a (LC4-5; Mid-Late Fourth Millennium BC): southern Uruk Types.

The distribution of intrusive southern Mesopotamian types on the surface of Hamoukar is nearly identical to the distribution of the approximately contemporary local sherds (Fig. 4.6). The recovered sherds were almost exclusively from bevelled rimmed bowls (70 out of 88 sherds). Previous visitors to Hamoukar had reported abundant southern types and the Area A step trench produced the full grit-tempered southern assemblage (Gibson, Maktash, *et al*. 2002: Fig. 21) so their paucity was unexpected. It is possible that the sampling methodology simply missed areas with southern ceramics. To check this possibility, a non-systematic areal collection unit (117) was placed in a gully in the north slope of the high mound; it produced bevelled rimmed bowls but also many southern Uruk oblique-rimmed bowls (Wilkinson and Tucker 1995 type 140). However, visiting archaeological teams have made unofficial pickups and even systematic surface collections at Hamoukar for a number of years prior to 1999, and these appear to have targeted the southern Uruk sherds on the high mound (see discussion in Ur 2002b:15, 19-20); it is arguable that cumulatively these collections had an impact on the surface assemblage at the site.

Southern Uruk settlement appears to have been distributed across the high mound exactly as was indigenous settlement. The same caveats regarding the low density outlying sherds that were applied to local settlement applies equally to the Uruk settlement. If the Uruk ceramics can be interpreted to signal the presence of southern colonists on the site, it appears from the surface remains that they were in no way spatially segregated from the local population on the high mound. However, a distinct area of southern Uruk ceramics was found by the THS some 300 m north of the high mound (see Section 4.2 below).

Given the rarity of the most chronologically sensitive southern Uruk types, the spatial and chronological relationship between the consumers of the two ceramic traditions (if indeed they were separate communities) cannot be satisfactorily resolved without recourse to greater excavation data than is currently available. At present, it appears that southern Uruk settlement covered the same 15 ha area of the high mound as the indigenous settlement. A possible exception may be the southeastern spur of the high mound, where excavations in Area B have produced purely local material culture, excepting a few cylinder seal impressions (Reichel 2002). Hamoukar was thus already a substantial town in the fourth millennium prior to the arrival of southern colonists, and it presumably continued as an important locus of interregional interaction during the Uruk Expansion. However, the systematic surface collection demonstrates that it was much smaller than the contemporary settlements at Brak (Oates and Oates 1997; Emberling 2003) or Nineveh (Stronach 1994:89-90). Furthermore, the fourth millennium settlement is an order of magnitude smaller than some of the pre-1999 size estimations (reviewed in

Ur 2002b:15).

4.1.4. Period 06 (Ninevite 5 or EJ I-II; Early Third Millennium BC).

The first half of the third millennium BC remains difficult to study from surface collections, due to the nature of the ceramic assemblage. The most robust and frequently occurring types, such as pedestal and parabolic bases, crescent lug handles, and fine beaded rim cups, all remain in use for the entire Ninevite 5 period (Schwartz 1988), whereas the chronologically sensitive decorated types survive poorly on the surface of sites and are uncommon, perhaps because they were specialized fine wares (Stein and Wattenmaker 1990, 2003). Painted Ninevite 5 sherds, the best indicator of early Ninevite 5 occupation, are exceedingly rare in surface assemblages (Buccellati and Kelly-Buccellati 1988:44-45; Wilkinson and Tucker 1995:49). As a result, it is difficult to subdivide the Ninevite 5 period in surface assemblages; the distribution of Ninevite 5 sherds at Hamoukar (Fig. 4.7) represents sherds of all phases of Ninevite 5.

Of the 86 Period 06 sherds recovered at Hamoukar, only 17 (20%) were decorated; the majority were of the various non-decorated and long-lasting ceramic types which are less useful for chronology. They occurred across the entire mounded site in low density and in discontinuous patches (Fig. 4.7). The distribution on the high mound appears to be limited to the uppermost part of the high mound, above the 394 m contour line; the southwestern spur may have been unoccupied at this time, although the presence of a walled school compound here made collection difficult. Nonetheless, the units nearby produced large collections (see Fig. 4.1). On the lower town, Period 06 sherds were found predominantly at the plowed-out edges of the site; in particular, the southwestern and southeastern corners featured relatively dense surface assemblages. At the southwestern corner, a non-systematic point collection (unit 68) was placed to record an anomalous assemblage of some thirty large fragments of type 28 pointed base cups, which may represent one or more disturbed burials. Finally, a low density scatter in the center of the lower town coincides with a 2-3 ha topographically low area. If this enclosed depression represents an area of brick pits dug for the construction of later settlement in this area (see below; on enclosed depressions, see Wilkinson and Tucker 1995:32-35). it may be a window into earlier Ninevite 5 layers.

From the interpolated surface densities shown on Fig. 4.7, only 3.9 ha featured a dense distribution of Period 06 sherds, with an additional area of 24.8 ha of low density scatter. However, this distribution is unlikely to be entirely representative of early third millennium settlement at Hamoukar, for three primary reasons. Non-nucleated settlement, where patches of occupation are separated by intervening unsettled areas, is not known for any of the dozens of excavated Ninevite 5 period settlements. The nature of the Ninevite 5 ceramic assemblage, discussed above, is such that low density scatters must carry more significance than a scatter of comparable density from a period with more robust diagnostic types. Finally, subsequent occupation from the mid to late third millennium BC has certainly obscured the visibility of Ninevite 5 levels.

If these three points are accepted, the distribution of Period 06 sherds represents the places where Ninevite 5 levels are currently archaeologically visible. It is probable that settlement at this time covered the entire 90 ha lower town; on the high mound, settlement shrank to the area enclosed by the 394 m contour (roughly 8 ha), leaving the southwestern spur and the small Area B spur vacant. In total, settlement covered 98 ha.

When it is possible to be chronologically specific, the ceramics recovered are mostly late in the Ninevite 5 sequence. Of the decorated types, no painted sherds were found during systematic collection, although a few strays were found in the course of walking across the site. When decorated sherds were found, the majority were of the somewhat carelessly done late excised tradition typical of the terminal Ninevite 5 period at Leilan (Leilan IIId; Weiss 1990: Abb. 12; Calderone and Weiss 2003). At the current state of knowledge, it is impossible to estimate the size of early third millennium settlement at Hamoukar, although it was almost certainly limited to the high mound. The massive expansion of settlement, which formed the lower town, appears to be contemporary with the sudden urbanization at Tell Leilan, which grew from 15 ha to 90 ha in Leilan period IIId (ca. 2600-2500 BC; Weiss and Courty 1993:35-36), and Tell al-Hawa, where the expansion of settlement onto a lower town also occurred at this time (Ball and Wilkinson 2003:340-341).

4.1.5. Period 07 (later ED III to post-Akkadian or EJ III-V; Mid-Late Third Millennium BC).

Despite the important political and social changes (Steinkeller 1998) as well as climatic events (Weiss and Courty 1993) which have been proposed, it has proven difficult to subdivide this period in excavation contexts, let alone based on surface assemblages. The "sila bowl," which some consider to be an Akkadian period rationing standard (Senior and Weiss 1992), appears in both ED III and Akkadian contexts at Brak (Oates 2001b:193-194); it is better interpreted as a product of the increasing mass production and craft specialization of potters at the time of urban expansion in the mid-third millennium BC (Stein and Blackman 1993). Lyonnet attempted to make a ceramic differentiation between Leilan phases IIa (ED III) and IIb (Akkadian) for the Muhammad Diyab surface collection but noted that most of her types occurred in both periods; her survey of the western Upper Khabur basin includes them in a single phase (Lyonnet 1990:74-75; 2000:18-19), as does the survey of Stein and Wattenmaker (2003). At Tell Brak, the only site in the basin with a ceramic sequence that can be connected stratigraphically to a historical southern Mesopotamian ruler, it has been demonstrated that most types span two or more phases of the third millennium BC (Oates 2001b). This includes all of the most common Period 07 ceramic types.

It has been suggested that pottery production was decentralized under many independent specialists and not tightly controlled by large institutions via attached specialists (Chapter 2; Stein and Blackman 1993:53-55; Steinkeller 1996), so it is not surprising that existing ceramic traditions would continue unchanged by political shifts. Therefore, this study will follow Lyonnet, Wilkinson and Tucker, and Stein and Wattenmaker in treating the latter third millennium BC as a single entity.

Period 07 diagnostic sherds are distributed evenly and densely across the entire lower town and high mound (Fig. 4.8). Unlike the preceding period, ceramic types from this time are robust and distinctive. In particular, because of its fabric, calcareous stoneware (Type 33) can be identified easily even from body sherds; it comprises 25% of the diagnostic sherds recovered from this phase of Hamoukar's occupation.

Areas of low sherd density are limited to the southern and western slopes of the high mound, the northeastern corner of the lower town, and the area of the enclosed depression. The low density areas of the high mound may have been unsettled at this time, but other explanations can be offered for the latter two areas. At the northeastern corner of the lower town, the mid-late third millennium layers were sealed by Neo-Assyrian settlement, as suggested by the surface collection (see below) and now confirmed by three seasons of excavation (Gibson, al-Azm, *et al.* 2002:20). The enclosed depression may represent brick pits dug either during the construction of the mid-late third millennium lower town settlement or dug by later inhabitants of a settlement which may exist beneath the modern village.

As was done with the chaff tempered body sherds of Period 05b, the distribution of third millennium BC common ware body sherds (Type 303) was also plotted (Fig. 4.9), for comparison with the distribution of diagnostics. Fabrics throughout the third millennium are generally buff, yellow or a very light greenish color, fairly evenly fired and tempered with fine chaff and/or small amounts of sand. In general, fabric alone cannot be used to indicate settlement, but at Hamoukar this fabric type is distinct enough from the heavily chaff-tempered reduced core fourth millennium fabric and the heavily dark grit-tempered Seleucid-Hellenistic fabrics to be useful at a very general level. Overall, the distribution of Type 303 body sherds mirrored the distribution of mid-late third millennium diagnostics. Density was low within the modern village, as was overall sherd density (see Fig. 4.1), and also on the southern slopes of the high mound and on the northeastern corner of the lower town.

The dominance of calcareous stoneware (Type 33) leaves no doubt that Hamoukar was a massive urban settlement in the ED III (EJ III) and Akkadian (EJ IV) periods; all of the lower town and high mound was occupied, with the possible exception of the southern and western slopes of the high mound. Excavation thus far (Gibson, Maktash, et al. 2002; Gibson, al-Azm, et al. 2002) has confirmed this assessment: all trenches in the lower town (Areas C, E, G and H) have encountered remains of this period. On the northern high mound, the Area H step trench found later Ninevite 5 through the mid-late third millennium, but the excavations at Area B, at the southeastern corner of the high mound, found LC3-5 levels directly beneath the surface. Aside from the western and southern slopes of the high mound, where low sherd density appears to correspond to unoccupied areas, comparable low density in the lower town probably represents the effects of later occupation or brick pit excavation. The 90 ha lower town was densely settled, whereas only 8 ha of the 15 ha high mound appear to have been occupied.

Elsewhere in the Upper Khabur basin, mid-late third millennium high mound occupation consisted predominantly of major temple or palace institutions. The palace-temple complex at Tell Beydar covered the top of the central high mound (Lebeau and Suleiman 2003a). At Tell Brak, nearly every trench into third millennium levels has encountered some sort of monumental structure. Akkadian administrative complexes in Areas FS and SS (D. Oates and J. Oates 2001) and the Naram-Sin palace/fortress (Mallowan 1947:63-70), and a monumental pre-Akkadian (EJ III) complex has now been exposed in Area TC (Emberling, *et al.* 1999; Emberling and McDonald 2003). Excavation evidence thus far suggests that high mounds may have been reserved for such large institutions; the small area of abundant baked brick pavements exposed in Area A (Gibson, Maktash, *et al.* 2002:50) hints that Hamoukar may also fit this pattern. Such buildings probably included a much lower habitation density; therefore if the 8 ha of high mound occupation was only half as densely settled as the 90 ha lower town, the total ancient population of Hamoukar may have been 10,200-14,750 persons in Period 07, and probably at the end of Period 06 as well.

The question of post-Akkadian (EJ V) settlement on Hamoukar hinges to a large extent on the chronological interpretation of comb-incised decoration, which is very common in the final phase strata in the lower town excavations (Gibson, al-Azm, *et al.* 2002: Fig. 18). At Tell Brak it occurs in Phase M (Akkadian) and Phase N (post-Akkadian) levels, although at low frequency in both. However, Joan Oates distinguishes an elaborated Akkadian variety from a simpler post-Akkadian version which normally consists of a wavy band framed by two horizontal bands (Oates 2001b:164-165). It is this latter version (Type 32) which predominates across the Hamoukar lower town (Fig. 4.10). Other distinctive post-Akkadian ceramic types (Oates 2001b; J. Oates and D. Oates 2001) occur on the surface of Hamoukar but are too uncommon in the ceramic repertoire to make useful survey types. The distribution of Type 32 sherds is reminiscent of the Period 06 pattern; however, as the last phase of occupation of the lower town, it cannot result from the obscuring effects of later settlement. Taken at face value, the post-Akkadian pattern appears to be one of scattered pockets of low-density settlement across

38.7 ha of the high mound and lower town. Because there exists only a single post-Akkadian diagnostic type, however, each of its occurrences must carry proportionally more weight than would a single occurrence of a type for a period characterized by a more robust assemblage of survey types. Although I will resist the temptation to estimate a precise settled area, it seems reasonable to assume, given the data at hand, that post-Akkadian settlement at Hamoukar remained at roughly the same size or was somewhat reduced. The nature of that settlement cannot be determined from surface remains, although excavations into late Akkadian or early post-Akkadian levels on the Hamoukar lower town (Gibson, al-Azm, et al. 2002) do not suggest impoverishment.

Following the post-Akkadian period, Hamoukar was completely abandoned for at least one thousand years. Earlier visitors have reported early second millennium pottery (Van Liere 1963:120; Meijer 1986:19; 1990:34-35). However, no sherds of the distinctive and highly visible red-painted Khabur Ware were found in any of the systematic or non-systematic collection units in 1999. A possible explanation for this divergence of observations may lie in the Seleucid-Hellenistic sherds which cover a small prominence on the eastern edge of the lower town (see below). These sherds frequently have red-painted rims, which appear superficially similar to Khabur Ware; their abundant dark grit temper and rim morphologies, however, allow them to be distinguished from true Khabur Ware.

4.1.6. Period 11 (Iron Age/Neo-Assyrian; Early First Millennium BC).

Sherds datable to the Neo-Assyrian or Iron Age were distributed in a discrete area at the northeastern corner of the lower town, immediately east of the high mound (Fig. 4.11). The zone of dense scatter covered some 3.9 ha, surrounded by a 3.1 ha low density halo. Single Period 11 sherds were found in three collection units elsewhere on the site. Settlement at this time was probably limited to the area of dense scatter, i.e. the 4 ha on the northeastern lower town. Unlike the succeeding Seleucid-Hellenistic settlement, this area shows very little mounding above the general level of the third millennium lower town; nor can specific areas of borrow pitting be suggested.

4.1.7. Period 13 (Seleucid-Hellenistic; Late First Millennium BC).

The grit tempered, red-painted sherds of the Seleucid-Hellenistic period were restricted to a 5 m mound at the eastern edge of the lower town, with particularly high numbers of diagnostics in collection unit 47 (Fig. 4.12). This area was difficult to collect due to modern village house compounds; its northern end was entirely given over to animal pens and therefore uncollectible.

The interpolated grid suggests a 1.0 ha area of dense sherd scatter for this period, with a 3.95 ha halo of low scatter to its east and west; three isolated sherds were recovered elsewhere on the site. The distribution of abundantly grit-tempered orange body sherds (Fig. 4.12), in conjunction with the topography of this area, suggests that the entire 3.8 ha above the 386 m contour line was the product of settlement at this time.

The Seleucid-Hellenistic settlement transformed the site in other ways beside the formation of the eastern mound. It is likely that the mud brick materials for the construction of this village came from the area to the west, where a low depression separates the Seleucid-Hellenistic village from the Area B spur of the high mound. It could also be hypothesized that the agricultural territory at this time included not only the off-site areas around the northeastern lower town, but also eastern parts of the third millennium lower town which had lain abandoned for over 1,500 years. In Area H, the final phase floors were never found more than fifty centimeters below the modern surface and often much less than that (Gibson, al-Azm, *et al*. 2002:23), although elsewhere on the lower town, final phase walls were preserved to a much greater height. It could be proposed that this area was under cultivation not only at present but also in the late first millennium BC; the resulting aeolian soil erosion removed more of the walls and architectural collapse than in other lower town areas which were not cultivated until the modern era.

4.1.8. First-Second Millennia AD.

Hints of settlement from Period 14 (Parthian; Fig. 4.13) and Periods 16-17 (Sasanian-Early Islamic; Fig. 4.14) were found in the form of very low-density scatters with very patchy distributions. The very few typed sherds recovered in the systematic collection units clustered around the enclosed depression, the Iron Age village, and areas of the high mound. These densities are almost certainly low due to a poor understanding of post-Hellenistic pottery by the THS. There have been few excavations of Sasanian and Islamic sites in the Upper Khabur basin, so non-glazed ceramics from these time periods remain understudied. Sherd collections from the high mound, including the non-systematic collection in unit 117, and the areas of the modern village around the enclosed depression had high percentages of untyped diagnostics which, upon further study, may prove to date from these periods. Evidence for late occupation of the high mound also derives from the Area A step trench, where the third millennium BC levels were sealed by a Sasanian or early Islamic level and then an Islamic cemetery of recent origin (Gibson, Maktash, *et al.* 2002:50 and Fig. 23).[3] It is not possible to offer a suggestion as to the sizes of any of the post-Hellenistic settlements at Hamoukar without further intensive collection in the modern village, but if the topography of the high mound can be used as a guide, the settlement exposed in Area A may not have exceeded one hectare.

The development of Hamoukar thus spans over six millennia; each phase of occupation propelled the formation of the site onward and left its indelible mark. The bulk of the mound was formed as part of the process of urbanization which occurred at other sites throughout the basin in the mid-third millennium BC. However, it is potentially dangerous to interpret any single phase of occupation without understanding its debt to the settlements which predated it, and the impact of the actions of later inhabitants on the preservation or destruction of earlier settlements.

4.2. The Tell Hamoukar Survey

At the end of the third millennium BC, Hamoukar was among the largest urban settlements in northern Mesopotamia, but it did not exist in a vacuum. In the 2000 and 2001 field seasons, 61 sites were identified and collected within the 125 km^2 survey

[3] This cemetery was without surface markers and certainly predates the modern settlement, which has its own cemetery about 50 m southwest of Area A.

region (Fig. 4.15 and Table 4.1).[4] This averages 0.49 sites per km^2, a high recovery rate by the standards of traditional Near Eastern and Mediterranean survey but substantially lower than the rates of the walking transect-intensive modern Mediterranean surveys (Wilkinson, *et al*. 2003). The aggregate settled area encompassed 409 ha, or 714 ha if the low-density settlement areas of Khirbat al-Fakhar (THS 7) are included (see Section 4.1 above).

Overall, settlement was evenly distributed throughout the survey region. However, several patterns can be discerned, each with a probable connection to water resources. The present hydrology is the product of several millennia of changing patterns

Period		**No. Sites**	**Total Ha**	**Sites/ Sq. Km.**	**Settled Ha/ Sq. Km**
Period 05 LC3-5/Uruk	LC3-5	14	19.1	0.11	0.15
	Uruk	1	1.8	0.01	0.01
	LC3-5/Uruk	4	26.9	0.03	0.21
	Total	**19**	**47.7**	**0.15**	**0.38**
Period 06 Ninevite 5	Pre-urban	**4**	**9.9**	**0.03**	**0.08**
	Late Ninevite 5	**4**	**100.4**	**0.03**	**0.80**
Period 07 Mid-Late 3rd Mill	Permanent Nucleated	6	109.4	0.05	0.88
	Semi-Permanent(?)	9	10.2	0.07	0.08
	Total	**15**	**119.6**	**0.12**	**0.96**
Period 08 Khabur		**9**	**25.9**	**0.07**	**0.21**
All Periods	All Areas	**61**	**409.0**	**0.49**	**3.27**
	Excluding Low-Density	**61**	**714.0**	**0.49**	**5.71**

Table 4.1. Sites and settled area in the THS region.

[4] This total differs from the 67 sites previously reported (Ur 2002a:62; Wilkinson, et al. 2003:192); six areas of settlement which were previously considered to be discrete sites have been reassessed as sub-areas of other settlements.

of human land use. Currently there are no perennial watercourses in the area, and even the wadi which runs to the east of Hamoukar flows very infrequently; the dashed line in Fig. 4.15 represents the traces of its course on CORONA satellite photographs. More general indicators of the former hydrology of the plain are the areas of hatching in Fig. 4.15 and the following settlement distribution maps. These areas retained moisture in CORONA photographs, and denote the fine-grained wadi fills of formerly flowing but now relict wadis.

Parallel to the three northeast-southwest-trending drainages are three linear arrangements of ancient sites, which are positioned at the edge of the floodplain or within one kilometer of it. The easternmost line runs from THS 20 along the eastern side of the drainage (including, from north to south, THS 62, 28, 39, 40, 16, etc.) and then shifts to the opposite bank (THS 31, 41, 42, 45, 57, 59). A central alignment starts with THS 32 at the north and continues SSW through a number of small sites (THS 25, 24, 23, 21, 36, 11, 46, among others); these sites are not as clearly associated with a drainage but may be related to the narrow watercourse which ran past THS 47. The third drainage appears to be the broadest; it includes the large sites THS 4 and 43 within its floodplain, at the western edge of the survey region. These linear patterns include sites of many different periods and probably represent long-term exploitation of their associated watercourses.

The THS area hosted human settlement over eight millennia. The present study will limit itself to the evolving patterns of the fourth to early second millennia, with occasional discussions of later settlement which may have impacted the recovery of archaeological sites from this time span.

4.2.1. Fourth Millennium Settlement in the THS: Periods 05a and 05b.

At the end of the fifth millennium, the Hamoukar region was dominated by the massive spread of low-density settlement at Khirbat al-Fakhar, which was perhaps related to trade in obsidian (THS 7; Ur 2002a:62-64; 2002b:17-19; Wilkinson 2002a:99-104). Following its abandonment, the population in the fourth millennium (Periods 05a and 05b) was distributed evenly across the plain in nineteen settlements, most of which averaged around 2 ha (Fig. 4.16). Two sites were considerably larger: THS 1 (Hamoukar, 15.3 ha) and THS 57 (Khirbat Melhem, 8.6 ha). The distribution of these sites corresponds generally to the eastern and central drainages through the plain; the major exception is the large town at Hamoukar, which appears to sit on the watershed between the two.

The surface assemblages of four of these sites (THS 1, 35, 46 and 57) also contain sherds of the southern Uruk ceramic tradition. There are differences in relative densities amongst the sites: THS 1 was predominantly local in nature but with a substantial bevelled-rim bowl surface collection; THS 57 was predominantly southern but with local ceramics in all collection areas; the surface assemblage of THS 35 was overwhelmingly southern in character but still contained local types. Only one site (THS 21) produced exclusively southern sherds, but the collection was far too meager to draw any conclusions (5 sherds total). Although more sites can be characterized as purely local than have evidence of an Uruk colonial presence (14 of 19 sites purely local), Uruk settlement covered the two largest sites and is greater in total (28.7 out of 47.7 ha). Such a high density of intrusive southern settlement makes the Hamoukar region one of the most intensively colonized regions in the Uruk Expansion. In the Middle Euphrates, the best-studied locus of southern colonization, Lupton estimates 36.5 ha of intrusive settlement in a cluster which extended about 15 km north to south in a 5-10 km wide floodplain (Lupton 1996:54-56). In the nearby North Jazira Project area, Wilkinson recovered seven sites with major southern Uruk occupation totaling 49.7 ha (Wilkinson and Tucker 1995:43-45, Fig. 35). Taken together, the 78.4 ha of Period 05a settlement in the eastern Upper Khabur basin is more than double the settled area of the Middle Euphrates cluster. The intermixing of local and non-local populations in the Hamoukar area makes such direct comparisons problematic, however.

It is possible, if not probable, that not all of the sites in Fig. 4.16 were simultaneously occupied throughout Period 05b. Excavations at Area A at Hamoukar have demonstrated its continuous occupation throughout the entire fourth millennium. The earlier and later local LC ceramic types can be distinguished in excavations, by color and subtle formal criteria (Pearce 2000), but this gradual developmental sequence is difficult to apply to surface assemblages. However, at any given time during this span, it is likely that most of these settlements were occupied.

If it were not for the presence of an alien ceramic tradition, and almost certainly the non-local persons who used them, this settlement pattern of evenly spaced small sites would be interpreted easily as small self-sustaining agricultural villages in two or three clusters, with two larger towns among them. Uruk colonies, enclaves and outposts have often been supposed to relate to interregional trade in raw materials unavailable on the alluvial plains of southern Mesopotamia (see especially Algaze 1993, 2001). In this light, it is tempting to trace the development of fourth millennium settlement from the collapse of the previous pattern: the LC3 settlement at Hamoukar assumed the economic role of LC1-2 Khirbat al-Fakhar, albeit in a more nucleated settlement form; its success bred a similar expansion in size which ultimately attracted trader-colonists from southern Mesopotamia. The distribution of surface obsidian (Fig. 4.2) and the limited excavations in Areas A and B neither refute or confirm such a hypothesis, but it must be remembered that post-fourth millennium settlement overburden make data from the surface and small excavation areas more difficult to interpret than the exposed and plowed expanse of Khirbat al-Fakhar.

The economic, social, and political relationships between the indigenous population and the intrusive Uruk cultural element are difficult to assess. Archaeological means of identifying non-local ethnicities have been developed in recent years (e.g., Stein 2000), but these methods require levels of association that only excavation can provide, and which are not available for any sites in the THS region yet. However, the abundance of southern Uruk pottery in surface assemblages suggests that they were being consumed and replaced, presumably by people who were engaged in the activities for which these specific vessel forms had been developed, that is, ethnic southern Mesopotamians. In areas such as the Middle Euphrates, Uruk settlement appears to be almost entirely homogeneous in terms of its material culture (Sürenhagen 1986); the nearly coterminous distribution of Uruk and indigenous pottery at Hamoukar and Khirbat Melhem is more reminiscent of Hacinebi on the Turkish Euphrates, where Stein (1999) has persuasively argued that the lack of evidence for economic dominance and the frictional effects of distance meant that the Uruk settlers were present with the tolerance of their hosts. The settlement pattern in the Hamoukar area hints at a similar relationship of parity, but this tentative conclusion should be tested through excavation.

4.2.2. Ninevite 5 Settlement in the THS: Period 06.

The difficulties in identifying non-decorated Ninevite 5 sherds in surface assemblages was discussed in Section 4.1; these difficulties apply equally to the regional collection. The small quantity of Ninevite 5 sherds recovered by the survey (36 total sherds) consisted mostly of chronologically insensitive bases and beaded rims. The number of settlements shrank from nineteen to only four; settled area dropped from almost 50 ha to only 10 ha (Fig. 4.17). With the exception of Hamoukar itself, none of these settlements exceeded one hectare.

It is also difficult to assess settlement continuity from the fourth to early third millennia. THS 59 may have remained settled: it produced five painted Ninevite 5 sherds in addition to some "Terminal Uruk" painted bowl forms known from the Eski Mosul dam region (Type 20 in Wilkinson and Tucker 1995; Rova 1999-2000, 2000). Two of the other three settlements (Hamoukar and THS 8, Tell al-Sara) had also been occupied during the fourth millennium, although continuous settlement cannot be established.

As discussed in Section 4.1, Hamoukar contracted to about eight hectares in the early third millennium. It expanded to the dimensions shown on Fig. 4.17 very late in the period, probably some time between 2600 and 2500 BC, based on the contemporary expansion of Tell Leilan. None of the rather crudely excised decorated types of this time were found on the other three sites, so there is no evidence that Hamoukar had any neighbors within the survey region at the end of Period 06.

For most of the Ninevite 5 period, the Hamoukar region consisted of only a handful of very small hamlets and one minor town. In this way it mirrors the settlement systems in the Leilan area and the southwestern half of North Jazira Project survey areas. Around Leilan, there were also only four sites within five kilometers of Leilan, although their total settled area was substantially higher (Stein and Wattenmaker 2003:363-365, Table 1 and Fig. 4). It is more likely that the sparseness of settlement in the Hamoukar area is directly connected to the near total abandonment of the region southwest of Tell al-Hawa (Wilkinson and Tucker 1995:49 and Fig. 37), given the nearly contiguous positions of the survey regions. There appear to be no good environmental reasons for such an abandonment at this time; if anything, the early third millennium BC was a time of increased rainfall (Hole 1997). The abrupt linear dropoff in settlement in the North Jazira Project area suggests a cultural or political reason, which cannot be detailed on the basis of settlement pattern data alone.

4.2.3. The Mid to Late Third Millennium: Period 07.

In the second half of the third millennium, all four Period 06 sites remained settled, and new small settlements appeared at Tell Tamr (THS 4) and Umm Adham (THS 44). Sherds of this time period were abundant on the surfaces of these six sites for an aggregate area of 109.4 ha (Fig. 4.18, labeled in boldface). With the exception of THS

3, all are high mounded *tell* sites, which is the classic morphology of sites of the third millennium BC in northern Mesopotamia (Wilkinson 2003:100-111; Wilkinson, *et al*. 2003). Three of these tell sites (THS 8, 44, and 59) are arrayed along the eastern drainage; settlement along wadis is the predominant pattern of third millennium sites elsewhere in the basin.

However, Period 07 sherds were found on far more sites than just the main tells: in all, 31 out of 61 sites had at least one diagnostic sherd. Clearly this distribution of sherds cannot be taken at face value to represent nucleated ancient settlement. In a preliminary report, it was proposed that many of these diagnostics arrived via ancient manuring, when the surfaces of abandoned sites were put under cultivation in the mid-third millennium BC (Ur 2002a:68-69). The basis for this assessment was not only their infrequency but also their battered condition. This applies to the surface collections from 16 of these 31 sites. The remaining nine sites (Fig. 4.18, labels in parentheses) also had small assemblages but in less abraded conditions. Most were less than one hectare in size.

The simultaneous appearance of small low- or non-mounded hamlets and a major urban center appears to be unique to Hamoukar. Urban expansion at Tell al-Hawa (Wilkinson and Tucker 1995: Fig. 37) resulted in the extinction of small satellites, rather than their formation. The Leilan survey showed that Leilan's expansion was accompanied by a corresponding expansion of nearby Tell Muhammad Diyab but no new settlements were founded anywhere within the survey region (Stein and Wattenmaker 2003:365).

On these hamlets, the low sherd density suggests an ephemeral occupation in which relatively few ceramics were consumed. Similarly structured surface assemblages of the early second millennium were found on small sites along the Khabur River, where they were interpreted as the traces of occupation by non-sedentary nomads (Lyonnet 1996:371-372). This is an attractive interpretation; nomadic groups may have returned seasonally to the Hamoukar area, where they may have exchanged animal products for cereals or manufactured goods.

As an alternative interpretation, these small settlements may have supported seasonal encampments of agricultural laborers. These should not be envisioned as hired wage laborers but rather entire families who may have camped out amongst the fields during important points in the agricultural calendar, as is common today in some regions of Syria (T.J. Wilkinson, pers. communication). Wilkinson's model of urban staple economy (1994; see also Chapter 2.6) assumes that farmers will not travel beyond five kilometers from their homes to their fields; therefore a maximum of 2,620 persons would be required to cultivate Hamoukar's maximum territory. If half of Hamoukar's population were able-bodied laborers, it would have an under-utilized agricultural labor force of at least 2,380 persons.[5] Several of these small sites (THS 28, 39 and 60) are located almost five kilometers to the east of Hamoukar; if these were temporary camps for Hamoukar-based agricultural workers, it could have expanded the agricultural territory of the city by

[5] Assuming a population of at least 10,000. Able-bodied agricultural laborers would number 5,000, of which 2,620 would be required within the territory of five kilometers. Thus at least 2,380 persons were "surplus labor." If Liverani (1994) is correct that a much higher percentage of the population was engaged in agriculture, then this surplus figure would need to be increased proportionally. Note that studies of urban-based agriculture on the irrigated southern plains assume much smaller proportions of agricultural labor .

locating some of its labor more efficiently. Of course other nucleated satellites would have existed beyond Hamoukar's hypothesized five kilometer territorial maximum (probably at Tell Antar and Tell Taif), but these smaller sites (with correspondingly smaller populations) may have been experiencing labor shortages (Wilkinson 1994:501-502). The temporary emplacement of Hamoukar-based surplus labor within or at the edge of their own agricultural territories would have allowed these neighboring settlements to cultivate more land and also may have provided in-field locations for processing and transportation of their surplus cereals back to Hamoukar.

These two explanations are by no means mutually exclusive. Indeed, the presence of pastoral nomads might have been welcomed not only because of the opportunities for exchange but also because of their potential as temporary agricultural workers. These small settlements might represent both seasonally present pastoralists and temporary laborer camps. In an urban hinterland such as Hamoukar's, the former would represent a more efficient use of locally available labor; however, we have no way of knowing if "full employment" was a valued economic condition in the third millennium BC.

Off-site archaeological investigations have provided empirical evidence for the agricultural economies of early states, in particular ancient roads (Van Liere and Lauffray 1954-55; Wilkinson 1993; Ur 2003) and manuring practices (Wilkinson 1982, 1989). The field evidence for such features, in the forms of hollow ways and field scatters, respectively, was closely associated with sites of Period 07 in the Hamoukar region, and will be discussed in detail in Chapter 5.

It might be suggested that if these ephemeral sherd scatters are interpreted as settlement, even on a temporary basis, it could be possible that other areas of low-density sherds, which have been interpreted as the traces of manuring, also might have derived from similar settlement (see especially comments to Wilkinson 1994). This scenario is unlikely, because the definition of a site involves more variables than sherd density alone (reviewed in Chapter 3.2). Low-density scatters of small, highly abraded sherds recovered from unmounded areas of reddish-brown soils were interpreted as field scatter. Scatters of larger sherds exhibiting similar low density but also fresh breaks almost always occurred in association with areas of mounding and grayish anthropogenic soils.[6] Despite the low sherd density, the other two variables still suggest ancient settlement.

The timing of the collapse of urban systems has been hotly debated. It has already been argued that Hamoukar remained settled well into the post-Akkadian time of the Kingdom of Urkesh and Nagar, based primarily on the abundance of Type 32 comb-incised decoration (See Section 4.1 above). This type was not limited to Hamoukar; it occurred in quantities of three or more at all of the other major Period 07 occupations (THS 4, 8, 44 and 59). However, the hypothetical non-permanent settlements may have ceased to be used by this time; only THS 39 produced a single sherd. On the other hand, the settlement system had certainly collapsed by ca. 2000-1900 BC, since no sherds were found of what is known as MB I in Southeastern Anatolia (Kaschau 1999). A distinct set of these types, which have now been identified in the Upper Khabur basin at Chagar Bazar Area D Phase I (McMahon, *et al.* 2001:205-210), were explicitly searched for in an attempt to trace settlement continuity, but none were recovered from Hamoukar or any

[6] In several instances (THS 33, 39 and 49) mounding was barely perceptible, but anthropogenic soils were always present, especially on CORONA satellite photographs.

other site in the THS region.[7]

4.2.4. Early Second Millennium BC: Period 08.

When settlement resumed in the Hamoukar area, it returned to all of the sites that had been occupied on a permanent basis at the end of the third millennium (Fig. 4.19); however, Hamoukar was not resettled, and it lay abandoned for a millennium. At the same time, people returned to several sites which had not been settled since the fourth millennium or earlier (THS 16, 20, 32, and 60). In a single case (THS 53) a wholly new settlement was founded. In total, the survey documented nine sites covering a total of 25.9 ha.

Within the survey region, the focus of settlement shifted to Khirbat al-Abd (THS 16), which would remain the largest town in the area for the remainder of the second millennium. Important towns immediately outside the survey area (and therefore not systematically collected) include Tell Antar (now known as Tell Mas'ud Kabir) to the northeast, Tell Mas'ada to the east, and Tell Hadi on the Wadi Rumaylan to the west. The former site was visited by Meijer and produced a single Old Babylonian tablet surface find (Meijer 1986:19, 44-45). It is notable that with the exception of THS 8, all of these sites lay within 2 km of the survey limits, leaving a very large vacant span around the former city at Hamoukar; this region went from intensive utilization at the end of the third millennium to abandonment or possibly pasturage (Fig. 4.20).

The most common diagnostic for this time is painted Khabur Ware (332 out of

[7] Note, however, that some were found on sites in the TBS region (see Section 4.3 below).

479 sherds, or almost 70%). Excavations at Tell al-Rimah have proven conclusively that this type of painted decoration continues well into the time of Mitanni political dominance, and that it therefore cannot be used as a strictly "Old Babylonian" diagnostic type (Postgate, *et al*. 1997). Therefore Period 08 should be understood to encompass both the Old Babylonian period and the early part of the Mitanni period. Site morphology may offer clues to subdivision. Elsewhere in the basin, excavation has shown that Khabur Ware on high mounded sites is to be dated to the earlier second millennium, whereas extensive lower town areas of settlement are more commonly Mitanni or later (Wilkinson 2002b). In the Hamoukar survey region, therefore, the Khabur Ware at the low and extensive Khirbat al-Abd may indicate an early Mitanni town; the high mound Khabur Ware (from THS 4, 8, 44, 59), on the other hand, may result from earlier second millennium occupation.

Distribution of sites in Period 08 is matched closely by the results of nearby surveys.[8] The Leilan survey covered some 706 km^2 and produced 55 sites for 0.08 sites/km (Weiss 1986: Figs. 11-12), and the North Jazira Project found 42 sites in 475 km^2 for a density of 0.09 sites/km (Wilkinson and Tucker 1995). Meijer's extensive survey of the eastern half of the basin noted a great abundance of painted Khabur Ware sherds on 166 sites in total (Meijer 1986: Fig. 34; 1990).

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[8] The following analysis uses data from the 1984 survey around Tell Leilan (Weiss 1986), because it includes sites and aggregate areas for Leilan II (Period 07) and Leilan I (Period 08). However, it should be noted that there are substantial differences between the 1984 survey and the 1987 reassessment (Stein and Wattenmaker 1990, 2003). For example, Stein and Wattenmaker identify 22 sites covering 214.83 ha (2003: Table 1), whereas Weiss identifies only 15 sites covering 161.48 ha (Weiss 1986: Fig. 12). The seven additional Leilan II sites added by the 1987 survey were all small, averaging only 1.9 ha. More disconcerting for the following analysis is the fact that the 1984 survey recognized 55 Period 08 sites but the 1987 survey only recognized 20 (Stein and Wattenmaker 1990: Table 1).

4.2.5. General Trends in Settlement in the THS Area.

In the limited window of settlement history examined in this study, the THS area exhibited considerable volatility (Fig. 4.21). The close of the fourth millennium brought a sharp reduction in settlements (79%) and total settled area (79%); only 3 of 19 settlements were also occupied in the succeeding Period 06.[9] Only one of these three (THS 59) had ceramic evidence of settlement continuity. In the last century (2600-2500 BC) of this half-millennium long period, Hamoukar grew by some 90 ha, or almost one hectare per year. Given the close connection of hollow ways to sites of Period 06 and the association with particular points on the Hamoukar lower town, the network of ancient roads preserved as broad hollow ways may have begun to form at this time (see Chapter 5.3).

The hyperurbanization of the THS area continued throughout the second half of the third millennium (Period 07). Raw figures for total settled hectares would seem to suggest little growth from late Period 06 to the end of Period 07, here reckoned at a span of six hundred years: of only 20 ha of new settlement, over half may have been of non-permanent character. However, there is little evidence that Hamoukar (or any of its satellites) maintained a consistent density of settlement throughout this time span. The abrupt initial growth in late Period 06 may have been characterized by broadly spaced house compounds, or even the formation of a handful of non-contiguous village-like clusters of households (which themselves may have been low density). At some point, a

[9] This uses the "pre-urban" statistics for Period 06; see Table 4.2.

social stricture against further expansion must have come into being, at which point the only option available was to increase settlement density. Although the distribution of Period 06 sherds at Hamoukar (Fig. 4.7) might be used to argue for such a developmental sequence, it must remain hypothetical until tested via excavations on the lower town.

In the later third millennium, Hamoukar itself comprised 82% of the settled area. It is certain that this urban center dominated its hinterland, but the image of settlement derived from the THS is probably too limited. At only 5 km from the edge of Hamoukar, the survey's boundaries probably approximate the maximum agricultural territory of the third millennium city, if the assumptions of Wilkinson's Dynamic Structural Model (See Chapter 2.6) are correct. What is missing are the major secondary centers whose agricultural surplus would have been necessary to sustain Hamoukar's population in years of poor to average yield. Tell al-Hawa's four secondary centers (Kharaba Tibn, Abu Kula, Tell al-Samir, and Tell Hamad Agha Kabir) are all 9-12 km distant; only two sites fell within 5 km of Hawa, one of which (site 20) only had a "trace" of later third millennium occupation (Wilkinson and Tucker 1995:Figs. 37, 54). Leilan only has three sites within 5 km in Period 07; its three major satellites (Dougir, Wulayqi, and Qarassa) are all 9-14 km distant (Stein and Wattenmaker 2003).[10] If similar distances also characterize Hamoukar's major satellites, they are probably to be found at Tell Koz on the Wadi Khunayzir and Tell Rumaylan (Fig. 4.22). The THS area probably represents only the urban core of the Hamoukar settlement system and its most intensively utilized

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[10] However, the substantial (43 ha) Muhammad Diyab is just over 5 km away from Leilan. This probably caused considerable difficulties in provisioning the two towns, which together represented over 130 ha of settlement (Stein and Wattenmaker 1990:15-16; Wilkinson 1994:499).

hinterland. This limited window will make it difficult to analyze fully the economic system which would have supported urban populations at Hamoukar.

Unlike Hawa or Leilan, Hamoukar was not resettled following the urban collapse at the end of the third millennium; the site and its surrounding land occupied a void in the landscape. Third millennium settlement and land use altered the landscape in a way that influenced subsequent human activity in the region up to the present. As two examples, all of the major permanent third millennium sites currently host modern villages, and hollow way depressions are a favorite location for modern cotton fields.

4.3. The Tell Beydar Survey

In the 452 km^2 survey area, the 1997 and 1998 Tell Beydar Survey field seasons recognized 83 sites covering 246 ha of settled area (Fig. 4.23 and Table 4.2). This distribution averages 0.18 sites/km^2 and 0.54 settled ha/km^2, which in both cases is low compared to the 0.49 sites/ km^2 and 3.27 settled ha/ km^2 in the THS region. Lower rates of settlement may of course be due to lower average annual rainfall than the Hamoukar area (see Fig.2.2). However, these figures may be skewed by the presence of the Ardh al-Shaykh, a large expanse of basalt that occupies almost the entire southwestern quadrant of the survey area and substantial parts of the northwestern (shaded gray in Fig. 4.23). These undulating uplands are characterized by thin soils and minimal water resources, and probably served as a hunting and grazing resource in most periods (Wilkinson 2000a:3). Its eroding eastern scarp has proven to be a window of preservation of fragile features like rock art and desert kites now that agriculture has been extended beyond the lower alluvial areas (van Berg and Picalause 2003). The basalt plateau comprises 30% of the survey region but only 5% of the archaeological sites are located on it. Of these four, three are within 500 m of its eastern edge; only TBS 23 is located firmly within it. If the 136 km^2 of basalt plateau are excluded from the calculations, total settlement in the TBS region would amount to 0.26 sites/km^2 and 0.78 settled ha/ km^2.

Period		Sites	Total Ha	Sites/ Sq. Km.	Settled Ha/ Sq. Km
Periods 04-05 LC1-5/ Uruk	Local	27	47.1	0.06	0.10
	Local + Uruk (LC4-5)	2	2.6	0.00	0.01
	Total	**29**	**49.7**	**0.06**	**0.11**
Period 06 Early 3rd Mill	Sites with Ninevite 5	5	10.1	0.01	0.02
	All Period 06 sites	**12**	**45.3**	**0.03**	**0.10**
Period 07 Mid-Late 3rd Mill	Permanent Nucleated	15	62.1	0.03	0.14
	Semi-Permanent(?)	5	7.4	0.01	0.02
	Total	**20**	**69.6**	**0.04**	**0.15**
Period 08 Khabur	Permanent Nucleated	1	3.9	0.00	0.01
	Semi-Permanent(?)	6	11.5	0.01	0.03
	Total	**7**	**15.4**	**0.02**	**0.03**
All Periods	All Areas	**83**	**246.0**	**0.18**	**0.54**
	Excluding basalt plateau			**0.26**	**0.78**

Table 4.2. Sites and settled area in the TBS region.

As in the THS area, settlement in the Beydar region is closely related to watercourses. 35% of all sites are located within 1000 m of the Wadi Aweidj floodplain; other sites cluster along the Wadi Fekka at the northwestern edge of the survey region and along a small wadi at the eastern edge. Settlements exist on the interfluvial areas east of the Wadi Aweidj and in an alluvial basin surrounded by basalt northwest of Beydar, but they are distributed at a much lower density and are much smaller (with the exception of TBS 43).

The TBS area has generally avoided major landscape development, both ancient and modern. Unlike the THS area, there is no evidence for irrigation, with the possible exception of small scale channels within the Aweidj floodplain. The exception is the recently completed impound dam on the lower reaches of the Aweidj, which has flooded several sites just beyond the TBS's southern boundary (in particular, Tells Kashkashok, Abu Hujayra, and Abu Hafur) and is accompanied by a grid of cement-lined canals in the region to the southeast. Aside from these recent developments, the ancient landscape is remarkably well preserved; in particular, the plain between the Wadi Aweidj and the Wadi Khanzir to its east still hosts the densest network of ancient roads in the entire basin, from multiple time periods (discussed in Chapter 5.3).

The TBS benefits from data from several preexisting excavation and survey projects. Most important are the excavations at Beydar itself, not only on the third millennium *Kranzhügel* but also on the Late Bronze and Iron Age lower town (Beydar II) and the small Ubaid component (Beydar III). This includes an assessment of settlement distribution based on surface observations (Lebeau 1997). To the south, salvage work in the inundation zone has revealed third millennium levels at several sites, with particular success at Abu Hujayra (Martin 1998).

Additional tell sites in the broader western basin were examined by Bertille Lyonnet as part of her extensive survey (Lyonnet 1996, 2000). These include several sites within the TBS area[11] as well as several sites immediately beyond it which the TBS did not collect, including Tell al-Shur (no. 27), Tell Dibak (no. 31), Tell Hanou (no. 33), Tell Bati (no. 37), Tell Aswad Tahtani (no. 29), and Tell Ain al-Abd (no. 13). Within certain constraints (elaborated below), Lyonnet's data can be used to extend the analysis beyond the TBS. Lyonnet has published preliminary assessments of third to early second millennium occupation in the form of distribution maps (Lyonnet 1996, 1998) and tables (Lyonnet 2000: Table 4). This study will make reference to her chronological assessments, particularly when treating sites from which the TBS was unable to obtain large collections.

4.3.1. Late Fifth and Fourth Millennia: Periods 04 and 05.

The TBS followed the North Jazira Project survey by treating as a single chronological unit the ceramic traditions here subdivided into Periods 04 (LC1-2) and 05 (LC3-5). Therefore it is highly likely that not all of the 29 sites (49.7 ha) shown on Fig. 4.24 were occupied simultaneously.[12] Despite this chronological issue, settlement still appears relatively sparse compared to elsewhere: the 0.06 sites/km^2 in the TBS region is less than half of the settlement density in the THS area for Period 05 alone (0.15 sites/km^2).

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[11] The eight sites collected by both Lyonnet and the TBS are Tell Beydar (TBS 1 = Lyonnet 15), Bergui al-Buz (TBS 22 = Lyonnet 30), Tell Khatun (TBS 32 = Lyonnet 16), Tell Hassek (TBS 43 = Lyonnet 28), Tell Effendi (TBS 55 = Lyonnet 17), Tell Jamilo (TBS 59 = Lyonnet 14), Tell Ghazal Tahtani (TBS 63 = Lyonnet 51) and Tell Khazna (TBS 65 = Lyonnet 52). The last site is called Tell Boughaz by Lyonnet, but the published site location, sketch map and the report ceramics make it likely that the same site is meant.

[12] TBS 82 (=Beydar III) has been left off of Fig. 4.24, although its uppermost levels are equated with LC 1 (Suleiman and Nieuwenhuyse 2003).

Settlement sizes at this time are all uniformly small when they can be confidently estimated and generally are less than three hectares. The exceptions appear to be TBS 55 and 59 at 8.5 ha and 3.7 ha, respectively, where both the TBS and Lyonnet (2000:30) both found trace amounts of fourth millennium ceramics. However, any early occupation at these sites is capped by substantial third millennium settlement, which makes it difficult to accurately determine the extent of earlier settlement.

The impact of the Uruk Expansion phenomenon on settlement in the TBS region is much reduced compared to the eastern basin. Only two sites (TBS 34 and 38) produced bevelled rim bowls and a limited amount of other southern Uruk diagnostic types. The level of interaction between ethnically distinct groups is open to question. These sites are located at probable territorial boundaries between sites (Wilkinson 2000a:10); for example, TBS 34 is midway between indigenous settlements at TBS 32 and 35. Such a location suggests that they were deliberately placed close to, yet separate from, established settlements. To complicate matters, coarse chaff-tempered bowls and jars were found on both of these sites; although not of the classic Period 05b types, they are probably contemporary indigenous wares. Therefore it remains open to debate whether these two very small sites (1.0 ha and 1.8 ha) were occupied by small groups of Uruk colonists in local settlements or whether local settlements were engaged in a limited amount of trade with southerners living elsewhere beyond the TBS area. In either case, it is certain that southern Uruk influence was nowhere near as great as in the THS region.

4.3.2. Early Third Millennium: Period 06.

Both numbers of sites and total settled area were diminished by the early third millennium. By combining the results of Lyonnet's survey and the TBS, twelve sites were occupied in this span (Fig. 4.25). Period 06 occupation was recognized by the TBS on eight and by Lyonnet on four others within the TBS as well as eight additional sites within 5 km of the TBS survey limits. Although it appears that total settled area was reduced only slightly (from 49.7 ha to 45.3 ha), over a third of the Period 06 settled area was new occupation at Tell Beydar itself (17.0 ha).

In the eastern basin and in northern Iraq, this time period is generally referred to as Ninevite 5 on the basis of the distinctive decorative style found on finewares (see Chapter 2.3). However, this style is much less common in the western Upper Khabur basin, if not absent altogether in some areas. Lyonnet's survey found that decorated Ninevite 5 sherds occurred in the central basin but were not present to the southwest, along the Wadis Zerkan and Jirjib and the Khabur River itself (Lyonnet 1996:368-369). The infrequency of Ninevite 5 types was noted by the TBS as well. As a result, archaeologists are deprived of the most recognizable diagnostic type for early third millennium occupation. The five sites where Ninevite 5 sherds were found are marked with an asterisk on Fig. 4.25. A few other Period 06 types were found (especially beaded-rimmed fineware cups and bowls, crescent-lugged holemouth cooking pots, a parabolic fineware bases), but also at low frequency.

Lyonnet recognized a non-decorated early third millennium assemblage at four sites (TBS 22, 32, 59 and 63) where the TBS found no evidence of Period 06 occupation.

In several cases these are characterized as "occupation majeure" (Lyonnet 2000: Table 4). It is not clear what ceramic types lay behind these designations, so they must be considered tentative pending a more detailed publication.

At the top of the settlement hierarchy is Beydar itself, which appears to have been first settled in this period .[13] The entire mounded area was occupied at this time (EJ I-II), although it has been excavated only in limited areas (Suleiman 2003). While the 9.6 ha central mound and 7.4 ha outer ring show signs of habitation, a mechanical cut through the 5.5 ha internal circular depression makes it clear that no settlement existed in this seasonally inundated space (Suleiman 2003:305). At 17.0 ha of settled area, Beydar already dwarfed the other settlements in its hinterland at the beginning of the third millennium BC.[14]

Attributing sizes to the other Period 06 occupations in the TBS area is more difficult. Recognizable early third millennium sherds were extremely rare at all other sites, none of which produced more than two or three diagnostic sherds of this time period. To some extent this may be a result of the earlier collections by Lyonnet, who employed an intensive full collection methodology (Lyonnet 1996:364-365). As a result, Fig. 4.25 represents inhabited sites but does not necessarily reflect the extent of that occupation. With the exception of the larger sites (TBS 55 and 59), all are simple conical

[13] Lebeau (1997:10) notes rare Halaf, Ubaid and "Urukéen" sherds out of context in the high mound excavations but cautions that they might have been brought to the site in mudbricks made elsewhere.

[14] This figure excludes the extensive 40 ha Mitanni and Mid- to Neo-Assyrian lower town (Beydar II). Note that others have estimated these sizes differently. Beydar has been estimated from 29 ha (Lebeau and Suleiman 1997) to 14.5 ha (Lyonnet 2000). Lyonnet has attributed substantially smaller sizes to all of the sites she visited in the Beydar area. For example, Effendi and Hassek were both measured at 1.50 ha; the TBS estimated these sites at 8.5 ha and 7.4 ha, respectively.

mounds, so the area of settlement in Table 4.2 is reasonably accurate.

The early third millennium landscape in the TBS region is one of small and dispersed villages, with a single center at Tell Beydar. If the low density of Period 06 sherds on the other settlements reflects a low intensity of settlement (rather than just a poor understanding of the local ceramics), then Beydar may have been surrounded by small seasonally-inhabited sites such as proposed for the smaller sites around Hamoukar in Period 07 (see Section 4.2 above). A possible connection between the *Kranzhügel* settlements and pastoral nomads has been proposed by several authors (especially Kouchoukos 1998; Lyonnet 1998), which would strengthen such an interpretation of these low density occupations. Until the local Period 06 ceramic assemblage is better understood and early third millennium levels excavated at Beydar and elsewhere, the nature of the seemingly ephemeral settlements in the TBS area will remain uncertain.

4.3.3. Mid to Late Third Millennium: Period 07.

The debate over the relative ceramic chronology of the third millennium has been "très animée et passionée" (Lebeau and Rova 2003:7), particularly with regard to the differences between the local ceramic traditions of the central basin (defined by Tell Brak's sequence) and the western basin (defined at Tell Beydar). In general, the relative chronological sequences are in agreement (compare Oates 2001b; Rova 2003); however the connection between ceramic assemblages and historical periods is in dispute. For example, several ceramic types dated as "Akkadian" (EJ IV) at Beydar are considered "Post-Akkadian" (Phase N) at Brak. To confuse matters even further, there exist real morphological differences between the central and western basin pottery traditions which make direct comparison difficult.

At Beydar itself, the periods of maximum expansion (EJ IIIa and IIIb) correspond to the time that the large palatial complex was in use; settlement shrank to somewhat impoverished occupation on the high central mound in the Akkadian (EJ IV) period, and was limited to very ephemeral settlement in the *Temple carée* in the early post-Akkadian or EJ V (Lebeau and Rova 2003). Unfortunately, the TBS could not be as precise in its assignment of surface assemblages to individual phases of the EJ sequence due to considerable overall continuity in the EJ III-V ceramic sequence. In particular, the important transition between EJ IIIa and IIIb "does not involve major changes in fabric types, morphologies and decoration, but rather a gradual and progressive transformation of the ceramic assemblage, with the increase in some types and morphological features to the detriment of some other ones, with a largely stable basic repertoire" (Rova 2003:396). In this study, Period 07 in the TBS area encompasses EJ III through EJ V; in the case of a few sites, settlement can be attributed to an individual phase of the EJ sequence, but this is not yet possible for all Period 07 sites.

With these chronological caveats in mind, the settlement pattern of the mid to late third millennium shows expansion in the number of settlements and total settled area (Fig. 4.26). As in the Leilan and THS regions, all Period 06 settlements remained occupied; eight new settlements were founded for a total of 20 Period 07 settlements covering 69.6 ha. In addition to the 17.0 ha center at Beydar, this also included major villages at TBS 43 (7.4 ha), TBS (8.5 ha) and TBS 52 (7.1 ha). The remaining small villages ranged between one and four hectares (for a detailed discussion of the Period 07 settlement hierarchy, see Chapter 6.3).

On most of these sites, Period 07 ceramics are abundant and represent the dominant component of the overall surface assemblage. However, five sites produced only a handful of Period 07 sherds within larger assemblages of earlier types. As already described for Period 07 in the THS area and Period 06 in the TBS area, these minor occupations may be traces of non-permanent settlement, perhaps by seasonally present pastoralists (seasonal agricultural labor camps are less likely in this area of lesser urbanization). These five sites average around 1 ha; three of them cluster in the enclosed plain east of the Wadi Fekka.

The close relationship of Period 07 sites to wadi courses has resulted in a strongly linear pattern. The seven sites along the Wadi Aweidj are spaced at intervals of 2.5-3.0 km (with the exception of TBS 32 and TBS 1, which are 6.0 km apart). The line of three Period 07 tells (TBS 39, 40 and 41) along an Aweidj tributary are spaced at 2 km intervals. Settlement distribution in the western survey area is less regular but also closely related to seasonal drainages, as is TBS 55 in the eastern survey area. On the other hand, two small sites (TBS 10 and 22) are positioned on the interfluvial area east of the Aweidj; settlement at these locations may be related more to communication routes than to water resources.

With the exception of the five settlements of possible non-permanent habitation, all of the Period 07 sites in the TBS area are closely connected to hollow ways, although their patterning differs from the contemporary network in the THS area. Hamoukar itself was the focus of several major routes, but the other sites in the THS region had less clearly connected systems. In the TBS area, almost all permanent nucleated sites are closely associated with multiple tracks, which radiated outward like the spokes on a wheel. Hollow way patterning in the TBS area will be discussed in detail in Chapter 5.

Despite a substantial growth in population (as evidenced by increased site numbers and settled area), and despite a large area of unproductive agricultural land, the settlement of Period 07 remained well within the limits of sustainability. Although it is still reckoned at 17.0 ha in the mid to late third millennium, Beydar itself may have shrunk; excavations on the northern outer wall suggest that it was used for a cemetery in EJ II-III rather than for habitation (Lebeau 1997:9). A comparison of the potential cultivated areas and required sustaining areas of Period 07 settlement in the THS and TBS will be undertaken in Chapter 5.

The collapse of Period 07 settlement in the TBS area appears to have been as complete as elsewhere in the basin and was decidedly longer-lasting. The timing of the collapse is another point of contention. Lebeau sees the Akkadian (EJ IV) presence at Beydar limited to the 9.6 ha high mound itself (Lebeau and Rova 2003: Tableau IV) and of little consequence elsewhere in the region (pers. communication); some occupation of Beydar itself may have continued into the early post-Akkadian period (EJ V) in one area of the Field F palatial complex (Lebeau and Rova 2003:8). Comb incised decoration, the primary post-Akkadian diagnostic in the eastern and central basin, is very rare at Beydar (Rova 2003:440-443, types D.IN.03 and D.IN.04; Pl. 9, type S.LJ.08) and only a handful of examples have been found by Lyonnet in her survey of the western basin (pers.

communication). On the other hand, infrequent examples of two slightly later types were recovered from the surfaces of five sites in the TBS region.[15] These two types, a soft-shouldered collared storage jar and an incurving bowl with a rolled rim in a dense sandy fabric, are found in levels variously called MB I (Kaschau 1999) or EB-MB transitional (Level III at Kurban Höyük: Algaze 1990) in southeastern Anatolia. It may be possible to suggest, therefore, that the Period 07 settlement system began to decay earlier in the TBS area than elsewhere in the basin, but it also retained some sparse and difficult to characterize settlements after that process was well under way.

4.3.4. Early Second Millennium: Period 08.

The early second millennium resettlement of the TBS area (Fig. 4.27) was on a more modest scale than contemporary resettlements in the Leilan, North Jazira Project and THS areas (Wilkinson 2000a). Only a single site (THS 39) produced a surface assemblage which could be interpreted as the remains of permanent settlement. Five other sites (TBS 10, 14, 41, 47 and 60) produced only slight traces of painted Khabur Ware. Lyonnet (2000:37) recognized a minor Period 08 occupation at TBS 63 that was not detected by the TBS. In total, Period 08 ceramics were found on seven sites for 15.4 ha of settled area, but only 3.9 ha could be characterized as permanent occupation. In the areas immediately adjacent to the TBS, Lyonnet found substantial settlement at Tells Dibak and Hanou (Lyonnet's sites no. 31 and no. 33) and minor occupation at Ain al-Abd and Aswad Tahtani (nos. 13 and 29).

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[15] These sites are TBS 4, 39, 43, 52 and 55.

The nature of the sherd assemblages and their distributions in the TBS area and the western basin in general suggests that the Beydar area may have been an interface zone between settled agriculturalists and pastoral nomadic groups, which are well known in the Mari texts (Kupper 1957; Luke 1965). Lyonnet noticed similarly ephemeral traces of Khabur Ware on sites along the Khabur River, which she interprets as "occupation de type nomade" (Lyonnet 1996:370-372, Fig. 5; 1998:185-186). The three substantially occupied sites on Fig. 4.27 are clustered at the northernmost (and therefore wettest) part of the Beydar region. It seems likely that by in beginning of the second millennium, the resettlement of the Beydar region was limited to its northern edge, while the rest of the area remained a pastoral resource for historically known non-sedentary groups.

4.3.5. General Trends in Settlement in the TBS Area.

The relative population dynamics from the fourth through the early second millennium are similar between the THS and the TBS (Fig. 4.28): the large numbers of small villages in the fourth millennium were followed by a drastic reduction in the early third millennium; population growth and nucleation of settlement on tells in the mid to late third millennium ended in both areas with a collapse, to be replaced by an early second millennium population only a fraction of its size.

The specifics of settlement development show important differences, however. The intrusive Uruk presence in the TBS area is minor compared to its density on and around Hamoukar. The expansion of settlement in Period 07 appears to have occurred mainly in the major villages rather than at Beydar, which had already achieved its maximum spatial dimensions in Period 06, and no settlement in the TBS area approaches the size of Hamoukar. The timing of the collapse of Period 07 settlement in the TBS region is debated but appears to begin earlier than throughout the rest of the basin. Finally, the Period 08 resettlement of the THS area was on a smaller scale that the previous urban phase but it still consisted of permanent village settlement; the reoccupation of the TBS area appears to have been primarily in the form of non-permanent occupation of existing tells or prehistoric small mounds by pastoralists.

In both areas, the intensive collection methods employed in this study have been able to identify trace occupations during certain periods. Whether they are interpreted as temporary nomadic settlement or seasonal encampments of kinship-organized groups of agricultural laborers, they hint at variability in modes of settlement that traditional low-intensity survey is poorly equipped to recognize.

In the above discussion of settlement patterns, it has been noted that in both the TBS and THS regions, Period 07 settlements were closely associated with the archaeological traces of ancient land use known as field scatters and hollow ways, as predicted by the previous fieldwork of Wilkinson (e.g., 1982; 1993). Analyses of their distributions and their significance for the intensity and organization of agricultural and pastoral land use are presented in the following chapters.

CHAPTER FIVE:

OFF-SITE ARCHAEOLOGICAL PHENOMENA AND THEIR INTERPRETATION

Ancient human activity was at no time limited to the localized areas archaeologists label as "sites." The activities that took place in settlements (e.g., mudbrick construction, craft manufacture and consumption, food preparation and consumption) tend to be more visible archaeologically than the activities that took place beyond their limits. The latter activities (agriculture, animal husbandry, and trade, to name a few) were far less spatially intensive but critically important within the larger economic life of the inhabitants. Field methods developed within the last few decades have made the reconstruction of such activities possible. This chapter will first describe the evidence for low-intensity off-site activities in the past and then will relate them to the distributions of population as documented by the surveys of the Beydar and Hamoukar regions. Analyses of settlement and off-site data suggest that the landscape at the end of the third millennium was being exploited intensively not only by the inhabitants of urban sites such as Hamoukar but also by farmers and herders in regional centers and small agricultural villages. Despite the claims of the proponents of the Centralized State Model (see Chapter 2.6), there is no solid evidence that this intensification was controlled by the ruling elite. This chapter reviews the archaeological field data; an alternative understanding of agricultural intensification, organized at the level of the household, will be proposed in Chapter 7.

5.1. Field Scatters as Indicators of Agricultural Intensification

As survey archaeologists have moved to study the landscape with increasing intensity, they have noticed that artifactual material is not restricted to obvious archaeological sites but can be found in the fields beyond at lower density. This material is mostly comprised of sherds but also includes roof tiles, kiln slag, and lithics. In any given regional context, the density of these "field scatters" appears to be conditioned by several factors, most generally proximity to archaeological sites. Variation in density between regions is correlated with environment (Bintliff and Snodgrass 1988): wind erosion in semi-arid regions can remove soils but leave sherds behind, resulting in very high density; in temperate areas, higher rainfall can result in the burial of surface artifacts. As a result, the "halo" around a Roman site in England (average rainfall 750 mm/year) might be less than 1 sherd per 100 m^2, but over 2000 sherds/100 m^2 in Oman (80 mm/year) (Bintliff and Snodgrass 1988: Fig. 2; Wilkinson 1982).

Field scatters were first recognized in western Europe where, ironically, they are the least visible archaeologically (Wilkinson 1989:31-32; Gaffney, et al. 1985). They have been most systematically studied in association with medieval Islamic sites in coastal Iran and Oman (Wilkinson 1982, 1988), Roman-Byzantine southeastern Anatolia (Wilkinson 1990b), and Bronze Age northern Mesopotamia (Wilkinson 1989:16-23;

Wilkinson and Tucker 1995). In the 1970s and 1980s, survey methods became increasingly intensive in the Mediterranean, to the point where all modern survey projects not only record off-site scatters but use the same intensive methods for the collection of traditional sites (Bintliff and Snodgrass 1985; Alcock, et al. 1994; papers in Francovich and Patterson 2000).

How, then, are these scatters to be interpreted? Prior to intensive and systematic investigation of off-site areas, the presence of cultural material beyond site limits was generally explained as the result of chance events, such as "the mythical donkey off whose back pots are supposed to have fallen, leaving trails of sherds in otherwise unimportant zones of the landscape" (Bintliff and Snodgrass 1988:507). Such an explanation cannot account for the large quantities of sherds in field scatters and the extensive areas covered by them, as revealed by modern full-coverage techniques. The low density of the sherds has led some to interpret the scatters as evidence of low-intensity activities which were undertaken outside of the settlement (Gaffney, et al. 1985), and others emphasize the ability of natural erosion and plowing to relocate artifacts from settlements into the surrounding fields (reviewed in Bintliff and Snodgrass 1988:507-508; Alcock, et al. 1994:143).

The most plausible explanation, which takes into consideration the ubiquity of the scatters as well as their spatial patterning, is that field scatters derive from ancient manuring practices (Wilkinson 1982; Bintliff and Snodgrass 1988). Cultivation removes nutrients such as nitrogen and phosphorus from the soil, which results in decreasing yields; manuring can reintroduce nutrients to maintain or elevate agricultural productivity. Manuring can be done directly by pasturing animals on the fields to be manured. This is of little value in semi-arid regions, where dung dries out quickly. In order to be effective, manure should be composted; therefore, manure and other organic material was first collected at a settlement and then taken out to be distributed on the fields.

Settlement-based composting of animal, human, and other types of organic wastes and their use as fertilizer are well documented by historical and ethnographic data from the Near East and China (reviewed in Wilkinson 1982:324-325; 1989:40-41) and in the Classical World (Alcock, et al. 1994:145-157). The mechanism for the incorporation of sherds and other artifacts is described by Wilkinson: "...byres were emptied, cess pits cleaned, and streets were systematically scoured. These 'night soils', or composts of them, were then hauled from the settlements and spread in a zone adjacent to the city. Such enterprises inevitably incorporated a miscellany of artifacts into the manure and all but the largest of these artifacts would eventually be spread on the fields as part of the manure" (Wilkinson 1982:324). At several Classical towns in Greece, excavated household byres have been found full of sherds and roof tiles; where soil analysis has been undertaken, results have shown extremely high levels of phosphorous, as would be expected if organic wastes had been composted in them (Ault 1999). A nineteenth-century byre in Philadelphia was also packed with non-organic household debris; the excavators argue that this material was deliberately introduced so that liquid wastes would leach slowly (Roberts and Barrett 1984).

It is possible that in the hinterlands of the larger settlements, it was not composted manure that was being deposited but rather the ashes from burnt dung which had been used for fuel. Wilkinson's "agro-ecological" model for dung use states that when wood fuel is readily available, dung will be used for manure; when wood fuel is unavailable, dung will have to be burnt and thus will be unavailable for manure (Miller 1984; Miller and Smart 1984). Larger settlements, with larger cultivation requirements, will have less access to dung because their agriculturally transformed hinterlands have less pasture, the prime source for wood fuel. The ash which results from the burning of dung is still valuable for crop nutrition and would still be deposited on fields. However, because this ash be even more likely to derive from a settlement context, it is more likely to be deposited in conjunction with other inorganic settlement debris. Therefore, it could be proposed that high sherd levels reflect not only manuring but also the more intensive use of dung as fuel in a wood-poor environment.

In the Near East and in the Mediterranean, the "manuring hypothesis" has been met with both enthusiastic acceptance and considerable skepticism. The reaction has tended toward the latter in the Near East. Several scholars interpret off-site sherds as resulting from erosion or temporary dwellings (see, e.g., comments by Oates and Schwartz to Wilkinson 1994:510-511). For the Mediterranean area, a detailed critique of the "manuring hypothesis" has been presented by Alcock *et al.*, who note that "in the traditional model of Greek agriculture, manuring was down-played, but the danger now lies in the opposite direction" (1994:157). Unlike the Near Eastern critics who dismiss the possibility outright, they acknowledge that the manuring mechanisms proposed by Wilkinson, Bintliff, and Snodgrass did result in settlement debris in the fields, but they conclude that "the 'manuring hypothesis' is inadequate as the *only* explanation for off-site pottery distributions; whether it was nonetheless the *chief* factor… is still *sub judice*, and in any case probably varied substantially with time and place, in ways that would repay exploration" (Alcock, et al. 1994:157, emphasis in original; see also Gaffney, et al. 1985; Fentress 2000).

Wilkinson's field methodology in northern Mesopotamia (1982; 1989) has been based on a systematic sampling method. Around Tell Sweyhat, sherds were collected from 100 m^2 surface units; these units fell on transects at 500 m or 100 m intervals (Wilkinson 1982:328-329). In the Iraqi North Jazira, units were placed at intervals which varied between 300 m and 50 m; additionally, a hand-held clicker was used to record sherds while walking in between collection units (Wilkinson 1989:36; Wilkinson and Tucker 1995:20-21). In the North Jazira Project area, the transects radiated outward from the major sites; in the area around Kurban Höyük, collection units were placed on a grid (Wilkinson 1989: Fig. 3; 1990b:68-69). In the Mediterranean, a full-coverage approach is now taken as a given (Bintliff 2000; Mattingly 2000). Bintliff reacts negatively to sampling, stating that he "cannot support transect strip surveys where thin lines of information are separated by thick lines of ignorance, or transects where data are only collected from 'spot samples' at set intervals (say every 50, 100 or 200 metres)" (Bintliff 2000:201). Mediterranean surveys are generally conducted by groups of field walkers at 15-20 m intervals; collection units are defined arbitrarily or in a framework provided by the modern field boundaries. The intensity of full coverage methods such as these is accompanied by a corresponding reduction in the areas investigated. Using a sampling strategy, Wilkinson interpolates densities for some 117 km^2 around Tell al-Hawa (Wilkinson and Tucker 1995), whereas in the first three seasons of the highly intensive Boeotian Expedition survey, only 13.7 km^2 were explored (Bintliff and Snodgrass 1985:135).

When faced with the necessity of documenting field scatters over a 125 km^2 survey area with only three team members, the THS adopted a systematic sampling method, despite Bintliff's objections. Units were collected in transects separated by 200 m, and placed at 200 m intervals (Fig. 5.1). By Mediterranean full-coverage standards, these transects are very widely separated, particularly if the goal is site recognition. However, archaeological sites in the Upper Khabur Basin are rarely, if ever, defined by sherds alone; mounding, anthropogenic soils, and dense sherd scatters are the three criteria which define settlement sites (see Chapter 3). Based on experimental work in the 1999 season, it was estimated that a field walker could recognize mounding at 100 m, soils at 50 m, and site-level sherd scatters at 5 m to either side of a transect. At 200 m spacing between field walkers, therefore, all mounded sites would have been recognized. The terrain to either side of the transects was scanned during movement between 100 m^2 collection units, but the primary goal of the transects was field scatter documentation; the transects served to confirm generally that sites were not being missed by the remote sensing-intensive site recognition methodology.

It has been noted that variation in recovered sherds per area unit can result from differences in ground visibility; if sherds are obscured by fresh plowing or vegetation, low counts reflect collection conditions, rather than ancient behavior (see especially

Gallant 1986). In response, many archaeologists have coded the visibility of each collection unit or area and used this score to "correct" the raw artifact counts (e.g., Bintliff 2000; Gallant 1986; Gaffney, et al. 1991), although others have expressed skepticism in this method (Mattingly 2000). The THS attempted to circumvent this issue by placing transects and collection units in fields of comparable visibility (either fallow in the previous winter or harvested, heavily grazed and not yet plowed) while skipping over low visibility fields (especially recently plowed fields, ungrazed fields with dense chaff cover, and those with standing summer cotton crops). In this way, variation in visibility was greatly reduced, although not eliminated (see also Wilkinson and Tucker 1995:20-21). Sherd counts in the following section are therefore "raw," meaning that they are in uncorrected sherds per 100 m^2.

5.2. Field Scatters in the Hamoukar Region

In the 2000 season, the THS collected 496 field scatter units. Fifty-nine of these units were within the bounds of Khirbat al-Fakhar (THS 7), the 300 ha low-density settlement of the late fifth millennium (LC1-2). These units and several others which fell within 50 m of the edge of an archaeological site were excluded from the analyses that follow, leaving 418 units with a total of 15,801 sherds collected. Overall sherd density was high; no collection unit failed to produce at least a single sherd, and units with five or fewer sherds were rarer than units with more than 50 sherds in the THS area (Fig. 5.2).

The placement of field scatter collection units was dictated to a large extent by the desire to maintain comparable visibility conditions; as a result, the distribution of units

(Fig. 5.1) leaves many areas uninvestigated. Ultimately, almost 80 km of transects were walked. Within the 100 m viewshed of these transects, 1,857 ha were observed for mounding. Within the 50 m viewshed, 848 ha were observed for anthropogenic soils. Within the 5 m viewshed, 78 ha were observed for sherd scatter, and 41,800 m^2 of these were intensively collected.

When field scatter units are scaled for sherd density (Fig. 5.3). it is immediately apparent that the densest scatters occur within three kilometers of Hamoukar. Of the 84 units of 60 or more sherds/100 m^2, 76 fall in this zone. However, there is a substantial range of variation within those scatters (mean of 50 sherds/100 m^2 with a standard deviation of 45.6).

Areas of low field scatter density are generally distant from Hamoukar. In two places, these low densities seemed anomalous, given their proximity to sites of Period 07 (see below) and despite high visibility. Later analysis of georeferenced CORONA imagery showed that two such areas in the southern THS region (east of THS 59 and north of THS 44) fell within the valley fill of the easternmost drainage (Fig. 5.4a). Presently, these areas are entirely flat; the former wadi has been completely filled in with eroded sediment and is not visible on the ground (although it is visible further to the north near Hamoukar). Any field scatters in these areas have been obscured. In the following analyses, the 77 units which fell within the valley fill (as indicated by hatching on Fig. 5.3) have been excluded.

When diagnostic types can be recognized in sherd scatter collections, they are predominantly of Period 07; however, the great majority of the collected sherds are battered and abraded beyond recognition. A stronger method for their dating comes from spatial association with sites of known occupation dates. The association of dense field scatters with the large mid to late third millennium center at Hamoukar agrees well with Wilkinson's (2003:117-118) findings around other contemporary medium to large centers in northern Mesopotamia such as Kurban, Titrish, Sweyhat and Hawa. The other major periods of settlement expansion in the THS area occurred in the early first millennium BC (Iron Age/Neo-Assyrian Period) and in the second half of the first millennium AD (Sasanian-Early Islamic periods) (Ur 2002a). Major sites of these periods do not appear to be associated with field scatters. For example, an extensive area of high visibility was sampled between the 10.5 ha Iron Age settlement at Khirbat al-Shiha (THS 29) and the 34 ha Sasanian-Early Islamic town at al-Botha (THS 43; Fig. 5.4b). The few units of higher density around THS 29 might be interpreted as erosion (although manuring is not ruled out; see below). What is clear is that manuring on the massive scale associated with Hamoukar in the mid to late third millennium is not associated with the upper tiers of settlement in either the Neo-Assyrian or Sasanian-Early Islamic periods.

Settlement-derived manure or compost would have to be hauled out to the fields, and, beyond a certain point, it ceases to be economically feasible to transport: "Midden and manure-stack material is usually in short supply and heavy to transport. Its use will, therefore, tend to be limited to the more intensive arable land, as close as practicable to its source" (Hayes 1991:82). Therefore, if manuring produced the sherd distributions found in the fields, one would expect densities to be higher closest to the presumed center of manure production (Wilkinson 1982).

Sherd density per 100 m^2 was plotted by distance, both on a unit-by-unit basis (Fig. 5.5) and by average within concentric rings of 500 m intervals (Fig. 5.6).[1] Within 2 km of Hamoukar, sherd density averages over 80 sherds/100 m^2 but exhibits great variability. After a spike between 1500-2000 m, average density declines steadily and after another small spike at 3500-4000 m, plateaus around 20 sherds/100 m^2.

Density was also plotted by distance from the permanently occupied Period 07 settlements (THS 1, 4, 8, 44 and 59) (Figs. 5.7 and 5.8). Densities beyond 3500 m in these figures should be viewed with caution; given the distribution of Period 07 settlements, almost all areas of the THS region are within 3500 m of a site of that period (note the number of collection units in Fig. 5.8). For example, the tremendous spike in the average at 3500-4000 m is derived from a single collection unit less than 100 m from an almost completely leveled Halaf site (THS 25). Furthermore, study area edge effects are probably significant: the few units that are beyond 3500 m may be located closer to an unsurveyed Period 07 site beyond the THS limits. Bearing these caveats in mind, density still averages 80 sherds/100 m^2 within 500 m of Period 07 sites and declines gradually to 29 sherds/100m^2 at 3000-3500 m, beyond which density figures are not statistically reliable.

Overall, field scatters in the THS area are much more variable than those in the nearby North Jazira Project area (Wilkinson and Tucker 1995:21-23, Figs. 14-18). Around Hamoukar itself, field scatters are generally dense; this is particularly true of the fields to the northwest, northeast and far north (south of THS 22), where average density

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[1] Note that in Figs. 5.5 and 5.7, the maximum value on the Y axis (sherds/100m^2) has been set at 300 for display purposes, which excludes a single anomalous collection unit with 372 sherds/100m^2.

often exceeds 60 sherds/100 m^2. However, isolated areas of low density exist within these areas of high density, despite identical visibility conditions. In general, these high densities and their proximity support the manuring hypothesis for the area around Hamoukar itself.

Interpretation is more difficult around Hamoukar's Period 07 satellites. The fields around Tell al-Sara (THS 8) exhibit similar densities to Hamoukar itself, but their proximity to Hamoukar might mean that these scatters are related to Hamoukar rather than THS 8. No units were collected within 2 km of Tell Tamr (THS 4), and the units collected north of Umm Adham (THS 44) were almost all within the zone of aggradation of the eastern drainage. Thirty-nine units were collected on the plain north of Tell Naur (THS 59); their average density (23.5 sherds/100 m^2) is in excess of the "background" scatter around sites such as THS 43 and THS 29 (see above) but much lower than the manuring scatters in the vicinity of Hamoukar itself. Furthermore, they also show considerable variability without any obvious relationship to distance from Naur. This pattern appears to match that of the adjacent North Jazira area, where the satellites of Tell al-Hawa were investigated more intensively than were Hamoukar's satellites by the THS. Wilkinson found that Hawa's satellites exhibited manuring halos only to around 1 km from the site edge (Wilkinson and Tucker 1995:22, Fig. 60).

In other areas of the THS which display overall low sherd density, small patches of high density scatters could be found. Frequently, these were close enough to settlement sites that they could be explained plausibly as the products of erosion or recent smearing by plowing. However, it is equally plausible that they might represent more limited manuring strategies than were utilized by the mid to late third millennium farmers at Hamoukar. For example, the one or two high density collection units found immediately off-site near the Neo-Assyrian settlements at Khirbat al-Shiha (Fig. 5.4b) and THS 40 (see Fig. 5.3) might be interpreted as small-scale manuring of vegetable gardens. The 200 m interval sampling strategy employed by the THS was designed to document large scale manuring as already known from other third millennium towns and cities in northern Mesopotamia; a proper understanding of the variable scatters around these Neo-Assyrian sites and the Period 07 satellites of Hamoukar would require a higher-resolution collection methodology.

In conclusion, the fields to the west, north and east of Hamoukar were probably heavily manured during Hamoukar's major phase of expansion in Period 07 (Fig. 5.9). This zone of intensive cultivation extended between two and three kilometers from the site itself and possibly further. If this intensive zone also included the fields to the south, then the abandoned surface of Khirbat al-Fakhar (THS 7) would have also come under cultivation; unfortunately the THS had not developed a methodology for distinguishing third millennium field scatter from late fifth millennium settlement debris during the 2000 field season. Intensification via manuring around the Period 07 satellites is less unequivocal; some spatially limited manuring at a substantially lesser intensity probably occurred around Tell Naur (THS 59) and Umm Adham (THS 44) but is impossible to confirm around the others.

Due to time constraints, the Tell Beydar Survey could not include a program of field scatter sampling, but at the end of the 1998 season (September), two sample transects were collected in the fields east of the site (Fig. 5.10). Since Beydar is by far the largest settlement in the TBS region (17.0 ha), it was predicted that its hinterland would feature dense scatters contemporary with its expansion in Periods 06 and 07. In addition, the two transects were intended to demonstrate the effects of differential visibility on field scatter collection. The southern transect ran across fields which had been plowed in the spring and subsequently heavily trampled by herds; therefore visibility should have been high. The northern transect ran across recently plowed fields, which generally have low visibility due to the effects of bright sunlight on an uneven surface of large clods of soil.

The results of the exploratory Beydar field scatter transects were somewhat unexpected. In both transects, the highest collection units were immediately adjacent to the floodplain, where one would have expected scatters to have been obscured by alluviation. Beyond these units, density was substantially lower, firmly within the "background" range in the THS region and rarely rising above 10 sherds/100 m^2. Sherd density was lower along the northern (plowed) transect, but the difference in density between the two transects was not nearly as great as was predicted based on previous experiments (e.g., Wilkinson and Tucker 1995: Fig. 13). With no evidence of irrigation or alluviation in this area, it is possible to explain this pattern in two ways. Most literally, it might stand as evidence that manuring was not practiced by the inhabitants of Beydar. However, the presence of a large area of pasture on the basalt plateau may have meant that dung was in plentiful supply and that wood fuel was also available, in which case dung may have been applied directly without much inorganic settlement-derived inclusions. Even if the plateau was already a degraded pasture without trees or shrubs, large numbers of animals may have resulted in the situation that manure in excess of fuel requirements was available, and could be composted without being spent as fuel first. Given the small number of collection units, any of these interpretations remain plausible until a broader sample can be collected.

In conclusion, field scatters can suggest the area of *intensive* cultivation but not the total arable land, which could have extended much farther beyond it. This broader area of lower intensity cultivation can be approximated via a second off-site archaeological phenomenon, the hollow way.

5.3. Hollow Ways: Traces of Ancient Tracks and Roads

Unlike field scatters, the linear features which cross the plains of the Upper Khabur basin and elsewhere in northern Mesopotamia have been documented and correctly identified since the late 1920's (Poidebard 1934). Van Liere and Lauffray's pioneering study (Van Liere and Lauffray 1954-55; Van Liere 1963) already began to use their distributions for a broader understanding of ancient economy and society by the 1950's. The TBS and THS documented dozens of hollow way features on the ground, and subsequent imagery analysis has permitted the mapping of thousands of kilometers of roads and tracks in the Khabur basin alone.

5.3.1. Roads and Tracks.

An important terminological distinction between the two main types of routes must be made at the start. In archaeology in general, a dichotomy has been drawn between *roads*, which are formal, intentionally constructed features, and *tracks* or *paths*, which are the informal, non-constructed results of human or animal movement (Trombold 1991:3; Hyslop 1991:29; Crawford 1953:60-62). Formal features comprise a range of construction styles, from the simple clearance of rocks in some Peruvian and Chacoan examples (Hyslop 1984; Beck 1991:75-77) to the elaborate engineering of the Roman transportation network (Poidebard 1934; Taylor 1979; Greene 1986:35-36; Kennedy and Riley 1990:77-94). They tend to be very straight and of a defined width, and are likely to disregard topographic relief along their course.

Tracks, on the other hand, are informal paths of movement. While the movement along them is the result of intentional individual decisions, their formation as landscape features is the unintended consequence of the whole of these decisions rather than the product of a single action or decision. They tend to take the path of least resistance, which generally involves the avoidance of steep slopes or uneven ground. Unlike constructed roads, they are often redundant: two points may be joined by two or more parallel tracks, which form as the original path becomes waterlogged or otherwise difficult to use.

This study will diverge from this commonly used dichotomy by using the term "road" to describe the features which are today preserved as hollow ways. There are several reasons for this usage. Most basically, there is no dichotomy in the Upper Khabur basin; all ancient routes, and an overwhelming majority of routes at the present, were informal and non-constructed. The building materials for proper roads were non-local and, given the transportation technology of the main periods under investigation, prohibitively expensive to import. Another reason is the lack of redundancy of the hollow ways in the basin; rarely are two places connected by more than a single route, and when such is the case, the two are never parallel but are rather related to different wadi crossings or points of access to towns. Finally, the terms "track" and "path" have connotations about size, function, and means of transportation that I believe are not appropriate for the case at hand. As will be demonstrated below, the network in the third millennium Upper Khabur basin consisted of wide routes which carried a range of traffic (pedestrians, animals, wheeled vehicles) for a range of purposes. For these reasons, I will refer to these features as roads, with the understanding that they are not planned or constructed, as the term often signifies in archaeological literature.

5.3.2. Description of Hollow Ways.

Hollow ways[2] are linear depressions in the landscape which are best interpreted as the surviving traces of ancient tracks and roads. As archaeological phenomena, they can be found in diverse geographical contexts all over the world, but are best known in Britain, where research in archaeological landscapes has a long tradition, and where aerial photography as an archaeological technique was initially developed (Crawford 1953; Hoskins 1988; Taylor 1979; Hindle 1982; Muir 2000). When they still retain some topographical expression, hollow ways in Britain are often narrow and deep; when aided by water erosion, some can be as deep as 20 feet (Hindle 1982:11). Elsewhere, they are

[2] Also called “linear hollows” (Wilkinson 1993) or "routes rayonnantes" (Van Liere and Lauffray 1954-55).

preserved only as crop or soil marks (Wilson 1982). In the Costa Rican rainforest, a series of sunken footpaths has been documented; originally they were only 30-70 cm wide (Sheets and Sever 1991; McKee, et al. 1994). Elsewhere in the Middle East, ancient roads and tracks have been identified on the loess of the northern Negev (Tsoar and Yekutieli 1992).

In northern Mesopotamia, their depth ranges from as little as 50 cm to almost 2 m (Wilkinson 1993; Wilkinson and Tucker 1995). Widths may vary from 30-100 meters, but can be as large as 200 meters; however, their edges fade subtly into the surrounding landscape, making exact measurements somewhat subjective. Their patterning is most frequently in the form of radial systems extending outward from sites in a spoke-like pattern, which is closely associated with the central site (Van Liere and Lauffray 1954-55:136, 145). However, longer interregional hollow ways, which run through the areas of two or more sites, also exist (Wilkinson 1993:554-56; Wilkinson and Tucker 1995:26, Table 4).

Northern Mesopotamian hollow ways are distributed in a zone defined by a combination of formation processes, climate and environment, and land use contemporary with and subsequent to their period of use. These variables are highly interrelated. Most obviously, we only find hollow ways in areas which once supported the large and stable sedentary agricultural populations necessary for their formation; therefore they are most frequently found on alluvial soils in the broad floodplain basins with rainfall in excess of 250 mm/year, where early urban societies flourished. They are less frequent in the drier steppes to the south and the rugged foothills and mountains to the north; these environments favor dispersed pastoral societies over nucleated agricultural societies. Inextricably linked to such ancient population distributions are environmental conditions, most importantly the annual rainfall mentioned above. In the northern parts of the Jazira, orographic rainfall on the southern flanks of the Taurus Mountains and Tur Abdin foothills transports sediments down their deforested and eroding slopes and redeposits it on the northern edges of the fertile alluvial plains, obscuring any traces of ancient roads that might have existed. Because these northern parts of the Jazira experience higher annual rainfall, they have been more continuously occupied by agricultural settlements. The northern parts of the alluvial plains are thus a classic "Landscape of Destruction" because they have borne more agriculture, which has produced further localized redeposition of sediments through plowing and, in later periods, irrigation (see Chapter 3.1).

5.3.3. Previous Research on Hollow Ways and their Interpretation.

Although captured opportunistically in the photographs of Poidebard (1934; see also Nordiguian and Salles 2000) in the late 1920's and early 1930's, hollow ways in the Khabur basin were first systematically studied by Van Liere and Lauffray using thousands of aerial photographs (Van Liere and Lauffray 1954-55; Van Liere 1963). With the goal of understanding the rural organization of pre-Classical settlement in the region, they developed a morphological typology of sites and related them to the two general classes of hollow ways. The wider hollow ways were generally in radial patterns around tell sites, which their limited ceramic collections suggested were mostly Early and

Middle Bronze Age, while the narrower hollow ways were generally interregional and associated with Byzantine and Islamic sites. Although the larger tells were connected by hollow ways to small satellites, they saw very few interconnections between the major Bronze Age tells. Based on a combined assessment of site location in relation to soils and rainfall and associated radial road systems, they concluded that

> Cette répartition des agglomérations suffirait à prouver que les populations primitives de ces régions étaient purement agricoles à l'origine. La naissance des grands tells, aussi bien que de leurs satellites, fut fonction d'une économie rurale et jamais de contingences commerciales ou militaires, même si, dans la suite des temps, ils sont devenus place-forte ou lieu d'échange. La distribution des routes rayonnantes montre que les transports d'un district à l'autre existaient à peine (Van Liere and Lauffray 1954-55:136).

Thus the initial study of third millennium BC settlement and landscape concluded that the early cities and towns of the Khabur basin were organized in small non-integrated agricultural systems which had little or no external trade prior to the Hellenistic period.

Hollow ways became a focus of research again in a series of surveys and landscape projects undertaken by T.J. Wilkinson in several regions of Upper Mesopotamia (Wilkinson 1990a, 1993; Wilkinson and Tucker 1995:24-28). These studies involved interpretation of aerial photographs but included detailed ground measurement of hollow ways and studies of the effects of subsequent natural and cultural processes on their preservation. With regard to local radial patterns around third millennium BC sites, Wilkinson concludes that the routes had been formed by the passage of men and animals going to and from cultivated fields and pasture, although movement between settlement sites also contributed to their formation (Wilkinson 1993:559). In the most intensely researched area, the Iraqi North Jazira, most hollow ways were of the localized radially patterned type, but several interregional routes could be distinguished (Wilkinson and Tucker 1995:25-26, Table 4, Fig. 24). Intensive surface collection of the associated settlement sites allowed the radial systems to be dated by association to the late fourth through early second millennia BC, with most associated sites reaching their largest sizes in the mid to late third millennium BC (Wilkinson and Tucker 1995:54-55); this confirmed the more general dating of Van Liere and Lauffray. The large interregional hollow ways could also best be attributed to this range, although their use in other periods could not be excluded.

In the early 1990's, Thomas McClellan and colleagues conducted brief field investigations around Tells Jamilo (TBS 59), Brak, and Mansour in conjunction with SPOT satellite image analysis (McClellan and Porter 1995; McClellan 1996; McClellan, et al. 2000). Their work, which was based primarily on the maps of Van Liere and Lauffray, resulted in the most articulate critique of the interpretation of hollow ways as traces of ancient roads. The "road hypothesis" has four major arguments against it, according to McClellan: the radial pattern documented by Van Liere and Lauffray is not commonly associated with hollow ways elsewhere; the analog of Middle Eastern hollow ways with European ones does not hold up to scrutiny; only 38 of Van Liere and Lauffray's 573 lines (7%) lead to other sites; and the majority of the lines (78%) lead to nowhere, confirmed by McClellan's fieldwork (McClellan, *et al.* 2000:139). McClellan proposes as an alternative hypothesis that hollow ways were deliberately constructed water harvesting channels, designed to draw excess runoff rainfall in toward sites for drinking and irrigation water (McClellan, *et al.* 2000:143-51).

Each of McClellan's four arguments can be addressed. The fact that hollow ways are not found in radial patterns elsewhere is probably because landscape destruction elsewhere (particularly in Britain) has been much more pronounced. The plains of northern Mesopotamia are quite possibly unique in their preservation of Bronze Age communication routes; there are simply no other surviving ancient networks with which to compare the patterns of northern Mesopotamia. On the other hand, analogous *modern* radial systems are readily apparent. In Iraq, major urban places such as Erbil and important regional towns such as Qaraqosh display well formed networks of radiating roads (Fig. 5.11). Radial patterns of unimproved beaten earth tracks are the norm around most small villages in the Upper Khabur basin at the present. Indeed, such a pattern is simply the most efficient, given traditional agricultural technology and a flat uniform alluvial terrain (Chisholm 1962).

McClellan's critique of the analogy with European hollow ways is also unfounded. He cites the English landscape historian W.G. Hoskins (1988:26-29), who noted that "hollow ways" can be only the ditch formed by the creation of two parallel field boundaries. However, Hoskins did not intend this to be a blanket explanation of all such features: "It should be observed that this does not explain all 'hollow ways', some of which are true traffic routes, but it explains those that appear to go nowhere in particular and to peter out without reason" (Hoskins 1988:29). In Britain, excavation of hollow ways could be a part of their formation and was a direct result of the animal traffic these roads carried; for example, in Dartmoor, "one finds that the tracks themselves are cut much lower than the surrounding fields. This is partly the result of natural wear and partly that farmers actually dug out the mud and rubbish that accumulated in these tracks and used it for manure on their fields. Even lanes now carefully tarmaced still show from their sunken nature the results of this medieval agricultural habit" (Taylor 1979:145-46).

McClellan's last two arguments, that the small percentage of inter-site hollow ways and high percentage of dead-end hollow ways does not suggest a transportation function for these features, stem from his over-reliance on the data set of Van Liere and Lauffray and his implicit model of ancient human movement. McClellan himself (McClellan*, et al*. 2000: Fig. 3) noted the discrepancies between Van Liere and Lauffray's small scale basin-wide map (Van Liere and Lauffray 1954-55: Map 1) and Van Liere's larger scale maps of individual radial systems (Van Liere 1963). After a reassessment of the hollow way patterns based on CORONA satellite photography, it is now clear that the radial networks are much more integrated than the 1954-55 map would suggest (Ur 2003:109-111 and Section 5.4 below). Ultimately, these arguments are based on a settlement-centric understanding of the ancient landscape; the roads "leading nowhere" were in fact leading to the fields and pastures which sustained the inhabitants of the settlements (Wilkinson and Tucker 1995:27); indeed, in medieval Britain, Hindle notes that "few [roads] continued even to the parish boundary, let alone to adjoining villages" (1982:22).

McClellan's alternative interpretation, that hollow ways were channels to harvest runoff, can also be critiqued. From a morphological standpoint, hollow ways usually lack the upcast which characterize ancient and modern canals elsewhere in the Jazira, and their courses cross wadis, run over hills, and generally disregard topography in ways that would be impossible for flowing water (Wilkinson 1993:548, 554-55). It is certainly the case that hollow ways do channel runoff, whether intentionally or not, toward sites; however, the mechanism by which this runoff could have been applied to cultivated fields, as is suggested by McClellan, is not elaborated by him. Measured hollow ways around Tell al-Hawa and Hamoukar can approach 2 m in depth; without water lifting devices or dams, for which there is no archaeological evidence, it would have been impossible to use this water for irrigation. McClellan and his colleagues have recognized that the urban settlement system of the third millennium BC probably required some form of agricultural intensification, at least at times, to sustain itself. However, rather than his proposed water harvesting, intensification strategies were probably limited to manuring (Section 5.2) and periodic violation of fallow (Section 5.4).[3]

The pace of hollow way research has quickened in the past five years, with landscape investigations in conjunction with archaeological surveys around Tell Beydar (Wilkinson 2000a, 2002b; Ur 2003) and Tell Hamoukar (Ur 2002a, b, 2003) and geomorphological investigations in the immediate hinterland of Tell Brak (Wilkinson*, et al*. 2001). These new investigations lie within the area of Van Liere and Lauffray's mapping, but whereas McClellan's study relied heavily on their maps, these recent studies produced new maps of hollow ways based on geo-rectified CORONA satellite

[3] Canals certainly did exist in the basin (Van Liere 1961-62) and on the Khabur below it (Ergenzinger and Kühne 1991). An elaborate network of canals below Nisibin (modern Qamishli) irrigated the land between the Jaghjagh River and the Wadi Dara (Dillemann 1962: Fig. V, 53-54; Göyünç and Hütteroth 1997:61-61; pers. observation in CORONA satellite photographs). Smaller systems are visible on CORONA in the THS region (see below). However, these canals all appear to be Iron Age or later (probably mostly medieval). Furthermore, all run parallel to natural watercourses and none shows a radial pattern.

photography (see Chapter 3.3).

5.3.4. Hollow Way Formation.

Hollow ways form through a combination of compaction and erosion which results from the continuous passage of human and animal traffic across fine-textured soils (Wilkinson 1993:556-59; McKee, et al. 1994; Sheets and Sever 1991:58-63; Tsoar and Yekutieli 1992; Hindle 1982:11). In the Negev, Tsoar and Yekutieli (1992:211-12) have recognized two mechanisms for their formation. The hydrocompaction model, in effect during wet months, describes how a soil's consistency (its natural resistance to pressure) can be lowered by high moisture content, so that movement compacts the surface of the road. The aeolian transport model, predominant during the dry season, describes how human and animal traffic lifts silt and clay particles, which the winds are not strong enough to erode on their own; once lifted, the winds can then transport them. The end result is that the "reiteration of such erosion action on paths and roads reduces them to a lower level than the surrounding plain and gives the roads the appearance of a gutter" (Tsoar and Yekutieli 1992:212).

The continuous pounding of human feet upon the terrain is the most obvious agent of compaction and disturbance but not the only one, and quite possibly not the most important. Assuming that flocks were kept in settlements and not out on the steppe for extended periods of time, daily movement of animals from a settlement to the pastures beyond the cultivated area would have accounted for twelve times as much compaction/disturbance as the movement of farmers to and from their fields (Wilkinson

1993:559). Such "drove roads" are well documented in Britain (Taylor 1979:163-68). Herd traffic may explain in part why northern Mesopotamian hollow ways are so broad. More difficult to quantify is the impact of wheeled traffic on hollow way formation processes. Few third millennium BC wheeled vehicles have been excavated outside of the Early Dynastic cemeteries at Ur and Kish, where they are clearly associated with the highest social stratum. However, clay models of four wheeled carts and two wheeled chariots have been found in third millennium BC levels throughout Mesopotamia (Oates 2001a; Moorey 2001) and they are a frequent motif on the cylinder seals from Tell Beydar (Jans and Bretschneider 1998). The cylinder seal scenes might suggest that wheeled vehicles were limited in use to ritual and military events, but the relative frequency of the occupation of cartwright (nagar $^{\gamma\iota\Sigma}$γ{γιρ) in the Beydar texts (Sallaberger 1996b:95) may indicate that wheeled transport was employed not only for the textually documented visits of the ruler of Nagar with large teams of draft animals (Sallaberger 1996b) but also for much more routine local activities, such as the hauling of settlement-derived manure (see Sections 5.1-5.2 above) out to the fields and the movement of cereal harvests in to the settlements.

Of great importance in understanding the formation of hollow ways is the matter of constraints on movement by the presence of cultivated fields. In Britain, Richard Muir has observed that "where tightly confined by dwellings and private property defined by hedgerows the track was far more likely to develop a linear, deeply incised and rutted form than it was when traversing open, upland commons, where travelers were free to select whichever of several branches offered the easiest 'going', while stock being driven could spread unconfined across the drift or drove" (Muir 2000:113; see also Hindle 1982:21). Animals and people could not walk freely through fields under cultivation, but once they were beyond such fields, their movement, and therefore the accompanying processes of compaction and erosion, was not limited to a linear path. In theory, therefore, the terminal ends of radial hollow ways can serve as a proxy indicator of the limits of cultivation for that site (Wilkinson 1993; 1994:492-493). This method of delimiting the agricultural hinterland of a settlement will be discussed further below.

Natural processes can continue and exaggerate the processes initially begun by human and animal movement. In semi-arid regions this is commonly done via stream piracy or wadi capture, whereby the depressed trough of the hollow way redirects natural drainage along its course (Tsoar and Yekutieli 1992:212-14). Initially this might be a result of gully formation which advances up along a hollow way in a direction away from a natural drainage; when this process of gully elongation reaches another drainage branch, it may cause drainage to change course down the hollow way-originated new wadi (see examples in Tsoar and Yekutieli 1992: Figs. 5-8; Wilkinson and Tucker 1995: Fig. 25; Ur 2003: Fig. 4). A particularly clear example of this process can be seen along the hollow way which leads from Tell Teurbe to Tell Beydar, along the eastern bank of the Wadi Aweidj (Fig. 5.12). It appears as a typical hollow way for the first 6.5 km, but then it begins to intercept the runoff from the small gullies which drained the watershed east of the wadi. This runoff then flows along the trough of the hollow way; at the southern end of the road, near Tell Beydar, the hollow way has even begun to meander like a natural watercourse. In this manner, ancient roads can continue to perpetuate themselves, millennia after the collapse of the settlement system that created them.

5.3.5. Dating of Hollow Ways.

Ascribing a time of use to a non-constructed landscape feature can be exceedingly difficult. Without milestones or some other type of historical record, there is little inherently datable about a road or track. Furthermore, roads can have lives which extend far beyond the time of their construction; often it is a simple matter to maintain them, or they can continue as paths. The most pessimistic assessment of success comes from Christopher Taylor:

> The fact that they [roads] run from A to B means nothing. It may be that A and B, whether they are prehistoric circles, Roman villages or medieval cities, were placed where they are centuries before the route was established or, conversely, that the road or track was developed to or past the circle, village or city long after these were built (1979:xii).

Only rarely is direct dating of non-constructed informal routes possible. In Costa Rica, a multidisciplinary team of archaeologists and remote sensing specialists has used traditional aerial photography along with color infrared film to detect a network of narrow prehistoric footpaths (Sheets and Sever 1991; McKee, et al. 1994). In excavated sections, the stratigraphic relationship between these depressed features and tephra layers from a nearby volcano could be articulated. Because the volcano's eruptions have been precisely dated, the team could determine the relative beginning (by the latest tephra layer cut by the footpath) and end (by the earliest tephra layer to seal the footpath).

Archaeologists have developed other innovative dating methods for roads. Roads or tracks of different ages occasionally cross each other, producing a sort of relative stratigraphic sequence. In Peru, Colleen Beck (1991) has used such "cross-cutting relationships" between canals, roads, and other features as a form of stratigraphy. Such relative dating is possible in a few cases in the Upper Khabur basin as well.

In general, morphological dating methods are of dubious value. Road construction techniques can be remarkably conservative; in several areas of the New World, identical methods were used for 2,000 years (Beck 1991:75; Hyslop 1991:31-32). In the Middle East, Van Liere and Lauffray (1954-55) developed a morphological dichotomy between broad Bronze Age roads and narrow Byzantine-Early Islamic ones; more recent research with stronger ground control has confirmed the veracity of this method for the Upper Khabur basin (Ur 2002a; 2003 and below).

Despite Taylor's skepticism, most researchers have attempted to date roads through association with other archaeological phenomena. Several researchers in South America (Hyslop 1991:31-32; Schreiber 1991:247-248) have dated roads through association with sites and terraces of known date. In Britain, Roman roads have been distinguished from the morphologically similar 18th century Scottish roads via association with the dated quarries from which their construction material was derived (Crawford 1953:56).

Dating by association has been the method used by researchers in the Upper Khabur basin since at least the 1950's (Van Liere and Lauffray 1954-55; Van Liere 1963). However, the early researchers were often working before proper ceramic chronologies had been established. Modern systematic and intensive archaeological survey has found a recurring association with sites occupied in the mid to late third millennium BC, although because these sites are often multi-period, use in other periods cannot be ruled out (Wilkinson 1993; Wilkinson and Tucker 1995). The most recent surveys have borne out this dating in a qualitative manner (Wilkinson 2000a; Ur 2002a).

5.4. Hollow Ways in the Upper Khabur Basin

Building on the important earlier work of Van Liere and Lauffray (Van Liere and Lauffray 1954-55; Van Liere 1963) and Wilkinson (1993; Wilkinson and Tucker 1995), I have remapped two large zones of the Upper Khabur basin (Fig. 5.13). I initially focused on the areas within the Tell Beydar and Tell Hamoukar Survey areas and then expanded coverage to map roads from the surveyed sites to other known third millennium sites in the region. In the central basin, mapping covers the region between Tell Beydar, Tell Brak, and Chagar Bazar, with the Jaghjagh River as the eastern boundary. The western basin, from Tell Chuera to Ras al-'Ain and continuing to the western edge of the Ardh al-Shaykh plateau, has been less intensively mapped. In the eastern basin, the hollow ways around Hamoukar have been connected with those in the region of Leilan and the traces already mapped by Wilkinson in the Iraqi North Jazira.

Almost all hollow ways were initially identified by their signatures on CORONA satellite photography (Ur 2003). Their depressed troughs collect moisture and therefore appear as dark lines on the images, either as soil marks due to moist soils or crop marks due to differentially lush crop growth in these wet troughs. The inwardly-sloping sides of the hollow ways (see below) encourage drainage through their increased gradient relative to the surrounding terrain; therefore they appear as whitish margins, generally on either side of the hollow way. Occasionally this margin occurs on the northern side only, because this side is generally uphill throughout the basin but also because it is better situated to reflect sunlight. These margins are frequently absent, and ground observations have demonstrated that such hollow ways have been entirely filled in by locally eroded sediments.

Hollow ways can be distinguished from modern tracks, roads, and wadis in CORONA photographs (Fig. 5.14). Simple informal dirt tracks, generally no wider than 3-4 m, predominate at present within Hassake province, and were certainly even more common thirty years ago, when CORONA imagery was being acquired. Although often depressed as much as 50 cm below the surrounding fields, they are much shallower than hollow ways. Their relative narrowness and shallowness result in a small runoff catchment, so these modern tracks hold much less moisture than ancient hollow ways. Because they are in use, their surfaces are disturbed and vegetation-free. Bare earth has a higher reflectance than a vegetated surface. All of these factors result in a distinctive signature (a very thin white line; Fig. 5.14c) that can be easily distinguished from hollow ways (Fig. 5.14a-b).

Wadis and hollow ways have a similar (although unintentional) hydrologic function in that they both channel runoff rainfall. However, the main wadis in the basin were in existence prior to the Holocene (Courty 1994:35), much earlier than even the earliest Bronze Age hollow ways were; through time they have assumed the sinuous shape of watercourses in a low gradient alluvial environment. Hollow ways, on the other hand, remain highly linear, especially when running perpendicular to the slope of the terrain. In rare cases, hollow ways can exhibit secondary meandering features, given certain topographically and hydrologically ideal conditions, as was the case with the example between Tell Teurbe and Tell Beydar discussed above (Fig. 5.12).

This study used CORONA satellite photographs extensively to map hollow ways. After scanning at 1600 pixels per inch (ppi), the unregistered segments were warped via a second-order polynomial transformation into the Universal Transverse Mercator (UTM) projection in the ENVI 3.6 software program.[4] The registered images were then imported into ArcGIS 8.3, where the visible hollow ways were traced into a separate vector layer according to their signatures as described above. I attempted to use as many different CORONA missions from as many seasons as possible; very often, a fallow field which appeared to be devoid of hollow way traces would be found to contain one or more when observed in a wetter season or one in which the field was under cultivation.

Hollow ways as recognized on CORONA photographs have been subjected to ground investigation in both the TBS and THS areas. In 1997, the TBS field team measured profiles across two hollow ways immediately north of Tell Beydar (Wilkinson 2000a:5-7, Figs. 5-6); they were estimated to be 30-70 m wide and 50 cm deep. In the 1998 season, the Beydar-Effendi hollow way near the village of Ragho was briefly visited and photographed. Finally, the hollow ways immediately east of Beydar, leading

[4] UTM Zone 37 covers all of Syria excepting the eastern end of the Upper Khabur basin (up to 42° eastern longitude). The easternmost part of the THS area was therefore in Zone 38. For the purposes of this project, all imagery was warped into and displayed as UTM Zone 37, although in-field GPS positions were sometimes marked in Zone 38. Because ArcGIS 8.3 can automatically reproject vector layers, there should be little or no distortion on the THS maps.

to Tell Kaferu (TBS 10) and Tell Effendi (TBS 55) were observed and confirmed via GPS during a week-long ceramic study visit in the Fall of 2000 (Fig. 5.15). Although the 1998 and 2000 fieldwork did not produce profiles, the hollow ways investigated appeared to be on the order of 100 m wide.

The THS included hollow way profiling as part of its offsite program, which ultimately produced seventeen profiles. A simple method was used to measure them, employing only an optical level, a stadia rod, and a laser rangefinder. The level was set up on the plain on a line perpendicular to the hollow way. The height of the instrument was measured, and then elevations were measured off the stadia rod at roughly 10 m intervals along this perpendicular line. Horizontal distance was measured with the rangefinder, which was found to be accurate to +/-1m at distances up to 400 m.

In the following discussion, the nature and distribution of hollow way features will be described for the surveyed areas where ground control allows dating by association; based on generalizations from these and other surveyed regions such as the Iraqi North Jazira, the analysis will be extended to broader areas of the eastern and west-central Upper Khabur basin.

5.4.1. Hollow Ways in the THS Area.

The Hamoukar region is crossed by dozens of routes, used at different times and for different purposes (Fig. 5.16). These range in width from 40 to 120 m and in depth from 20 cm to 120 cm (see below). The majority are to be found in the southwestern quadrant of the survey region, between Hamoukar and the poorly drained Radd marsh area at the bottom of the Wadi Rumaylan. These generally run down the slope of the terrain, which drops at a general rate of 1.9 m/km on a NNE-SSW line. It is therefore tempting to attribute this remarkable preservation to their unintended hydraulic effects. On the other hand, a second lower concentration of linear features occurs to the east of Hamoukar and these features are almost precisely perpendicular to the slope of the terrain.

The variation in width was apparent from CORONA photographs prior to field survey. In order to develop the ability to interpret these images for areas where ground control was absent or unreliable, the THS included a program of hollow way profiling, as described in the previous section. The seventeen profiles, labeled A through O, are represented by double lines on Fig. 5.16. The survey intended to document on the ground the classification of these features into narrow and broad types, as initially proposed by Van Liere and Lauffray (1954-55), who suggested that the morphological distinction might be chronologically significant as well: the broad hollow ways appeared to be associated with Bronze Age tell sites, whereas the narrower routes were found in association with small "farms" of the first millennium AD.

Of the seventeen profiles, two (N at THS 11/36 and Q at THS 27) ran across hollow ways in places where later settlement had artificially deepened them (discussed below). Two other profiles (F and K) ran across a single hollow way in two places where it no longer had any topographic expression; although it was visible as soil or crop marks in CORONA photographs, by the 2000 field season (and probably millennia before), it had been entirely filled with sediment, probably at the same time that the adjacent small drainage became infilled.

In the remaining thirteen profiles, it was possible to measure widths and depths (Fig. 5.17). The broader hollow ways, as determined from imagery analysis, do appear to be wider than those that had been classified as narrow prior to fieldwork. They average 97 m wide, whereas the narrow class averages 45 m wide. Based on an admittedly limited sample of profiles, narrow hollow ways tend to be shallower than the average broad hollow way, but their depths fall within the range of variation of the broad class. It does appear that the narrow hollow ways are proportionally deeper; this is almost certainly related to their relative chronology, discussed below. Representative profiles of broad and narrow hollow ways are shown in Fig. 5.18. It should be noted that these measurements were taken across hollow ways at the modern ground surface. This is not equivalent to the ancient surface of the road, which could be buried beneath eroded sediments or even washed away; in the case of the former, the hollow way trough is likely to be shallower than the ancient road, and in the latter, the trough is probably deeper. Furthermore, determination of widths and depths depends on somewhat subjective assessments of the point at which the sloping sides plane out and the elevation of the original ground surface. Hollow ways in the THS region do appear to be roughly classifiable as broad or narrow, as initially suggested by Van Liere and Lauffray (1954-55); however, it is apparent that they display considerable variation in form which is related to location and preservation in addition to chronology.

The close association of hollow way features with sites of the mid to late third millennium has been firmly established by the work of Wilkinson (1993; 2003:115-116;

Wilkinson and Tucker 1995) and need not be elaborated upon here. Because many northern Mesopotamian tells feature continuous occupation from the mid-fourth to early second millennia (Periods 05 through 08), it is quite possible that their formation began earlier and their use continued later. The massive size of fourth millennium Tell Brak and its elaborate radial system of hollow ways is particularly suggestive of an early date (Wilkinson, et al. 2001; Ur 2003: Fig. 8).

The THS area shows much less chronological range in hollow way associations. Large Period 05 sites such as Khirbat Melhem (THS 57) are not unequivocally associated with hollow ways, nor is Khirbat al-Abd (THS 16), the large second millennium town (Periods 08-10). The majority of hollow ways of the broad class are associated with Hamoukar itself, which covered 105 ha in Period 07 (see Chapter 4.1). Hamoukar is of course a multi-period site, so any hollow way aligned with the high mound could have already been in use in the fourth millennium BC; this may be true of the linear features to the northeast of the site. However, the elaborate network of routes to the southwest of Hamoukar appear to be focused on a specific point at the western edge of the lower town, where a gully probably marks the location of an ancient gate or point of access (see the re-entrant contour lines between collection units 13 and 38 in Fig. 3.4). Fewer hollow ways are aligned with similar gullies at the southwestern and southeastern lower town edges. The 1999 surface collection has demonstrated that these parts of the lower town were only occupied in late Period 06 and throughout Period 07 (i.e., mid to late third millennium), suggesting that this was the time that the associated hollow ways were carrying traffic.

Hamoukar's Period 07 satellites have less unequivocal spatial relationships with hollow ways. One feature west of Hamoukar appears to align with Tell Tamr (THS 4) but fades out over 2 km distant from the latter site. Likewise, a major NS route from Hamoukar's putative western gate aligns directly with Tell Naur (THS 59) but fades out even farther away. Several routes align with Umm Adham (THS 44) but may be more related to its Sasanian-Early Islamic settlement (see below). Tell al-Sara (THS 8) has several routes associated with it but none conclusively link to another Period 07 site.

If the frame is expanded to include unsurveyed sites just beyond the bounds of the THS, intersite connections are far more apparent. One branch of the major southwest route from Hamoukar's western edge leads to Tell Taif, which also is directly connected to Tell Naur. Tell Amtar is surrounded by a radial pattern of hollow ways, one of which extends toward Tell al-Sara. The routes which run ESE from Hamoukar past THS 16 run toward Tell al-Samir, a major Period 07 town in the North Jazira Project survey area.[5]

The preceding discussion has been limited to the broad class of hollow ways; the narrower routes have an entirely different set of associations. In the THS area, the closest association is with the large town of al-Botha (THS 43; see Fig. 5.4b), which has an elaborate set of radiating routes to its northwest and two long and straight routes running to the southeast; one of the latter two routes articulates with the lower town of Umm Adham (THS 44). Umm Adham in turn is connected via a narrow hollow way with

[5] It is worth noting at this point that Tell al-Duwaym (THS 22) also appears to be connected via broad hollow ways with Hamoukar, Tell al-Sara (THS 8), and Tell Amtar. It was not collected in 2000 due to a hostile reception by the inhabitants of the modern village, which was very uncharacteristic for the region. However, its high mound morphology and hollow way associations suggests that it may have been occupied in Period 07.

Saudiya (THS 5) and a pair of unsurveyed sites to its southeast. All of the surveyed settlements in this network show major signs of occupation during the Sasanian-Early Islamic period, although Mid- and Late Islamic settlement cannot be ruled out at any of them. The limited set of well-dated narrow linear features in the THS region thus appears to confirm the earlier dating of Van Liere and Lauffray (1954-55). The relative dating of the two classes is also apparent from CORONA image analysis of the area north of Khirbat Melhem (THS 57), where a narrow hollow way can be seen to cut through a broad hollow (Ur 2003:107, Fig. 7). In general, the narrow hollow ways are proportionally deeper than those of the broad class; probably because erosion has had less time to fill them with sediment.

These tentatively-dated features allow other elements of the ancient landscape to be dated. For example, the major route running southwest from Hamoukar is joined by a second route to its south (Fig. 5.19); the combined route then crosses over the small drainage immediately to the north of THS 47. At the opposite side, the route splits, with a southern branch leading to Tell Taif and the northern branch disappearing into the floodplain of the Wadi Rumaylan. At present, this drainage has no topographic expression and is recognizable only from CORONA photographs. The proximity of the Period 04-early Period 05b site at THS 47 suggests that this drainage was flowing at least seasonally at the end of the fifth or beginning of the fourth millennium. Its continued flow into the late third millennium is implied by the hollow way pattern, which is suggestive of a river or wadi crossing.

The extent to which the preserved pattern of hollow ways is representative of the ancient network of roads can be evaluated through analysis of CORONA photographs. The central survey area, between the eastern and westernmost drainages, appears to have avoided any natural or cultural disturbances up to the 1960's. However, such disturbances do appear to be a factor in localized areas elsewhere in the THS region. It is immediately apparent that tracks through areas of wadi fill or alleviation areas either did not form or have been erased by alluviation (see Fig. 5.16). In the THS area, only 2.4 km (3%) of the 87.8 km of hollow ways inside the survey boundaries are within the floodplain zone. In the eastern Khabur basin, there are hints of localized irrigation systems, some of which encroach on the northeastern and western limits of the THS area (Fig. 5.20). At or above Ramadaniya, an offtake leaves the eastern drainage and runs to its west toward THS 20, where it weaves through the occupation mounding and continues to the south (Fig. 5.20a). The straightness of this feature leaves no doubt that it is not a natural watercourse, and its behavior within the archaeological site at THS 20 is more suggestive of a canal than a road. Settlement at THS 20 began in the Halaf period but reached its greatest extent in Khabur (Period 08), Sasanian-Early Islamic (Period 16) and later times; the sharp preservation of the canal feature argues for the latter dating.

Of potentially greater significance for the preservation of earlier landscapes is the canal system at and below Tell Mashhan, a small conical mound now covered by a substantial modern village (Fig. 5.20b). Mashhan appears to be on the course of a tributary drainage of the Wadi Rumaylan. At some point, probably now covered by modern settlement, a canal head distributed the water of this drainage into several offtakes, the largest of which runs west to Tell Hadi. A canal to the east ran into the THS area's eastern drainage; which raises the possibility that this drainage may be partly or wholly a cultural feature. It certainly explains why the extent of the dark soils in this area is so broad. Proposing a date for this irrigation network is difficult. Tell Mashhan is almost 3 km beyond the THS limits and was not formally collected, nor was the mound complex at the northwestern survey limits, although a brief inspection revealed Parthian ceramics. Tell Tamr (THS 4) and al-Botha (THS 43) both lay within the drainage/irrigation zone of these canals, and, like THS 20, both have major Sasanian and Islamic components (13 ha and 34 ha, respectively). Other irrigation systems like the one around Tell Mashhan can be found further to the north near Tell Rumaylan on CORONA photographs. The lacunae in hollow ways between Hamoukar, Rumaylan, and the Wadi Rumaylan (see Fig. 5.27 and discussion below) can be attributed to cultural transformations of the landscape, rather than an absence of roads in this zone in antiquity.

5.4.2. Hollow Ways in the TBS Area.

The characteristics of hollow ways in the Beydar area are identical to those in the Hamoukar and North Jazira survey areas. In 1997, the TBS team made measurements and profiles of several hollow ways immediately around Beydar, and the preliminary report includes a first attempt at CORONA-based hollow way mapping (Wilkinson 2000a). Subsequent GIS-based mapping with a larger dataset of CORONA missions has expanded this network to the entirety of the TBS region and beyond (Ur 2003 and below).

Unlike the THS area, where only Hamoukar was unequivocally associated with multiple hollow ways, every permanently occupied Period 07 site in the TBS region is associated with at least three and as many as seventeen linear features (Fig. 5.21). At Beydar itself, these features align with gaps in the inner and outer mound walls, which have been interpreted as gates (Lebeau 1997). Features of the narrow class are present as well, but are more difficult to interpret; they run south to north across the eastern interfluve without articulating with ancient settlements. The exception is a large undulating site west of TBS 55 which was unfortunately not collected; its morphology, however, is generally associated with sites of the Sasanian and Islamic periods (Wilkinson and Tucker 1995:15, 69). An interesting association not recognized elsewhere in the Upper Khabur basin is between hollow ways and a site of the Neo-Assyrian Period or Iron Age (Period 11). TBS 23 is a small single-period Neo-Assyrian site with three radiating hollow ways to its northeast (discussed in Wilkinson, et al. in press). Two of these routes are aligned with Beydar and Tell Hassek (TBS 43), which both have substantial Period 11 lower towns. This raises the possibility that some of the routes between the major Period 07 sites at Beydar, Hassek, and Effendi also might have been in use in the Neo-Assyrian period.

As mentioned above, landscape preservation in the TBS east of the Wadi Aweidj is unrivalled within the basin. However, the basalt plateau, which comprises 30% of the TBS surface area, only hosts 3% of the survey area's 316.3 km of hollow ways. The plateau would not appear to be an area of elevated erosion or aggradation of sediments, so the absence of hollow way traces is probably not related to problems of preservation. The plateau's thin soils may not be subject to the same processes of hydrocompaction which were instrumental in track formation in alluvial areas (Tsoar and Yekutieli 1992). A more likely reason stems from the probable nature of human exploitation of the plateau: its thin soils are poor for agriculture, so the area has probably been a pasture resource for millennia (Wilkinson 2000a). Because there were no cultivated fields to constrain them, humans and animals were able to disperse, and therefore paths did not form. It is possible that some cultivation was undertaken around TBS 23 in the early first millennium BC, however.

Perhaps because of near-ideal conditions of preservation, the radial patterns around Period 07 sites in the TBS area are much more regular than in the eastern basin around Hamoukar; even approaching the patterning seen in modern cases (e.g., the cases of Qaraqosh and Erbil in Fig. 5.11).

5.4.3. Economic Implications of Ancient Road Networks.

The radial patterns of hollow ways found around Period 07 settlements in the TBS area are primarily the products of their agricultural and pastoral economies. A large percentage simply fade out, generally between three and five kilometers from the site; these roads that "go nowhere" were not intended to go to any single destination; they conveyed farmers and plow animals out to their fields, and brought its yields back into the settlement. Sheep and goats were at least as important, if not more so; as they were led through the cultivated zone to the pasture beyond, their feet were responsible for most of the surface disturbance which lowered the track (see calculations in Wilkinson and Tucker 1995:27 and Table 5). These farmers and their animals did not choose to traverse these sunken paths for reasons of efficiency; in the wet season, they were muddy and difficult. Rather, they used these paths because their movements were constrained by the presence of agricultural fields to either side. Thus, in general, radial hollow ways can serve as proxy indicators for the zone of ancient cultivation; the terminal ends ("fade-out points") mark the interface between the arable zone and the pasture beyond (Wilkinson 1994:492-493).

Eight of the fifteen Period 07 sites in the TBS region were associated with radial patterns which were preserved completely enough to propose agricultural territories (Fig. 5.21). These hollow way-defined catchments are based on the terminal ends of *non-intersite* hollow ways; routes that continue directly to other Period 07 sites may have also been formed under constraints of cultivation but the efficiency of straight-line travel may have also been a factor in concentrating surface disturbance. Local landscape processes may have shortened or lengthened linear features, and these considerations were occasionally factored on a feature-by-feature basis. Ultimately, therefore, these catchments are primarily based on terminal ends but have been colored by somewhat subjective assessments of landscape evolution. These catchments do not represent a static area of cultivated land but rather a long-term average. The following analysis is limited to sites which have well-preserved radial route patterns and have been collected by the TBS.

In the TBS area, catchment size appears to be closely related to site size, and by extension, ancient population (Fig. 5.22). The major exception is Tell Beydar, which has a much smaller catchment than would have been expected from its estimated population.

The lines in Fig. 5.22 show predicted cultivated territory assuming that each worker could harvest 3 ha/season, 50% of the site's population was engaged in the harvest, and settlement density of 100 persons/ha (solid line) or 200 persons/ha (dashed line) (also assumed by Wilkinson 1994). These lines thus represent maximum agricultural production based on locally available labor rather than the needs of the settlement's inhabitants. If one assumes that settlements were occupied at the lower density (100 persons/ha), most settlements were probably cultivating at or above the maximum calculated in this study, with the exception of Beydar, which was cultivating 41% less than predicted. Even if one assumes a 200 person/ha settlement density, the five smallest settlements would still have been cultivating more than predicted by their available labor. Beydar thus appears to have been cultivating well below its potential, whereas the smaller settlements in its region were consistently producing above their potential, as was Tell Effendi (TBS 55).

Beydar's shortcomings could be an artifact of the overestimation of its population: parts of the central mound and outer wall were used for palatial buildings and cemeteries, respectively, which would lower its settlement density. On the other hand, it could signify the presence at Beydar of a substantial population of non-food producers, such as craftsmen, administrators, or religious specialists, who were resident at the site but did not directly participate in agricultural tasks. The overproduction suggested at the smaller settlements and Tell Effendi might result from an underestimation of the percentage of the population engaged in agriculture; for example, Liverani (1994) regards 50% agricultural employment as too low. But it is also possible that these settlements received a seasonal influx of surplus labor in the form of pastoralists.

Did Beydar actually need the surpluses that were being produced elsewhere in its hinterland? Fig. 5.23 compares hollow way-defined agricultural territories with estimated sustaining areas based on a number of assumptions: annual consumption of 250 kg, cereal yield of 500 kg/ha, and biennial fallow. The horizontal bars represent the range of estimated sustaining areas assuming 100 to 200 persons/ha settlement density, with diamonds marking 150 persons/ha. Almost all of the settlements in the TBS region would have been capable of fully sustaining themselves, even at a high settlement density

		Surplus/Deficit under Biennial Fallow (ha)			Surplus/Deficit without Fallow (ha)		
Site	Size (ha)	100 pph	150 pph	200 pph	100 pph	150 pph	200 pph
1	17.00	-214	-1064	-1914	636	211	-214
55	8.50	1894	1469	1044	2319	2106	1894
43	7.35	501	133	-235	868	684	501
52	7.10	-	-	-	-	-	-
39	3.89	-	-	-	-	-	-
59	3.68	579	395	211	762	670	579
41	2.71	820	684	549	956	888	820
35	2.45	-	-	-	-	-	-
60	1.75	585	498	410	673	629	585
4	1.68	891	807	723	975	933	891
63	1.38	-	-	-	-	-	-
10	1.20	-	-	-	-	-	-
37	1.17	-	-	-	-	-	-
40	1.16	-	-	-	-	-	-
22	1.12	415	359	303	471	443	415
Surplus Cult. (ha)		5470	3280	1090	7659	6564	5470
Surplus Prod. (kg)		2734820	1639978	545136	3829662	3282241	2734820
Add'l Population		10939	6560	2181	15319	13129	10939

Table 5.1. Estimated surplus and deficit agricultural production at settlements in the TBS region. PPH = persons per hectare.

(Table 5.1). Even Beydar, the largest town, would have been only barely below self-sufficiency at 100 persons/ha. At higher densities, Beydar would have required more substantial provisioning by its neighbors, but such densities are unlikely, for the reasons given above. Even assuming biennial fallow (as does Fig. 5.23), most settlements were producing considerable surpluses. At a settlement density of 200 persons/ha, Beydar's 1,914 ha production deficit could have been more than made up for by 3,004 ha of surplus cultivation at the other sites. In the more likely 100 persons/ha scenario, Beydar's minor 214 ha production deficit could have been matched by a 5,684 ha surplus from the other sites. These calculations only include eight of the fifteen Period 07 settlements; the other seven settlements (which account for less than 30% of the settled area) are mostly small villages which probably would have fallen among the other small surplus-producing settlements.

An attempt to define a hollow way catchment for Hamoukar using the same principles as in the TBS region produces a 5,202 ha territory (Fig. 5.24). This territory extends almost a full 5 km to the southwest, 3-4 km to the east and north, and a mere 1.4 km to the northwest.[6] Because of potential landscape destruction at the hands of later irrigation systems, the territory may have extended farther to the northeast and particularly to the northwest. Ninety-eight of Hamoukar's 105 ha were settled in Period 07, so its population may have ranged between 9,800 (assuming 100 persons/ha) and 19,600 (assuming 200 persons/ha). If each consumed 250 kg of cereals annually, a

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[6] Note that this territory includes the 300 ha of Khirbat al-Fakhar (THS 7). The proximity of this extensive low mounded site makes it certain that it was subjected to cultivation along with the rest of Hamoukar's hinterland.

hectare yielded 500 kg, and fields were fallowed biennially, the population would have had to cultivate 9,800 to 19,600 ha each year. Using the lower (and more probable) figure, Hamoukar's agricultural territory as defined by hollow ways only accounts for 53% of that area. If fallow were disregarded, the inhabitants would have required cultivation of only 4,900 ha, which is 302 ha *less* than Hamoukar's hollow way catchment. For comparative purposes, the entire 125 km^2 area of the THS region is 12,509 ha, so if all land was fully utilized, Hamoukar would be able to sustain its population. The labor for full cultivation was available locally at Hamoukar, but was inefficiently concentrated at that site. In this light it is interesting that four of the proposed temporary agricultural settlements (THS 28, 39, 33, and 49) sit on the eastern edge of the hollow way-derived catchment (see Fig. 5.24).

Wilkinson's DSM predicts that deficits in the center would be compensated for by surpluses at nearby satellites, as he has proposed for the Iraqi North Jazira. Unfortunately, the THS survey permit only allowed the immediate hinterland of Hamoukar to be collected. Therefore the major satellite settlements of Hamoukar remain unknown. It might be proposed, based on the presence of hollow ways, that sites like Tell Amtar, Tell Taif or even Tell Rumaylan may have been such satellites (see Fig. 4.22) but field evidence to confirm this is lacking at present. The TBS area offers a glimpse at the potentially high agricultural productivity possible in a less urbanized region. Future fieldwork might reveal a similar settlement system along the Wadi Rumaylan, the surplus production of which might have sustained Hamoukar.

Cultivators at Hamoukar may have been tempted to forgo the fallow year in pursuit of short-term gains in production. Some evidence for violation of fallow can be found in the presence of hollow ways. It was argued above that the constraints of agricultural fields were crucial to their formation. Agriculture has been economically important since the earliest known settlement in the basin, but the majority of routes appear to have formed in a window of 1,500 years between the late fourth millennium and the early second millennium. During this time, hollow way formation was not limited to major urban centers; sites as small as 1 ha have elaborate radial patterns associated with them. Why, then, have routes from most other times not been preserved? Obviously many factors go into hollow way formation, but it could be proposed that intensity of cultivation is what set this time period apart. Under low intensity cultivation, with half of the fields lying fallow, there would have been many opportunities for humans and animals to move about without damaging crops; however, if cultivation was intensive, with few fallow fields, more traffic would have been constrained to the spaces between them, and the processes of disturbance and compaction would have been similarly intensified. Although other factors must be accounted for, such as duration of use and the quantity and intensity of traffic, the quantity of hollow ways dated to a given period might be an indicator of violation of fallow on a scale not seen before or since.[7]

If all fields were cultivated, the agricultural territory in Fig. 5.24 would have sustained Hamoukar's population for a time, until the depletion of nutrients began to take a toll on yields. One method for ameliorating this nutrient loss would have been through

[7] These arguments may not apply to the other period of hollow way formation, the Sasanian-Early Islamic period; it is likely that the small features dating to this time are preserved simply because not enough time has passed to erase them. The roads and tracks of other periods of less intensive land use probably would resemble Sasanian-Early Islamic hollow ways, had they survived to the present.

manuring, which was practiced intensively around Hamoukar (see Section 5.2 above). In the TBS, the relatively low population appears to have made manuring with settlement-derived wastes unnecessary, whereas at Hamoukar, as at Tell al-Hawa (Wilkinson and Tucker 1995), manuring was an agricultural intensification strategy that reduced the risk in supporting large populations.[8]

Even with manuring to return nutrients to the soil, annual cropping still produces declining yields through time, due to the depletion of soil moisture reserves. A recent settlement study in the Wadi al-Hasa of Jordan concluded that the abandonment and failure to resettle an area can best be explained by human-caused soil degradation (Hill 2004). Both the TBS and the core of the THS remained abandoned by sedentists long after other areas had been resettled (Fig. 5.25). In the case of the TBS, this was the result of the dominance of pastoral groups organized into large and powerful tribes (Kupper 1957). In the THS, the zone of long-term abandonment coincides strikingly well with the most intensively cultivated area around the former urban center at Hamoukar, as defined by dense distributions of field scatters and the hollow way-defined catchments. It is not possible to rule out social or political prohibitions preventing the use of this territory. However, the coincidence between the intensity of cultivation in the late third millennium and the under-utilization of that same space in the early second millennium suggests that agricultural degradation may have discouraged the reoccupation of the central THS region.

All of these figures, for the TBS sites and Hamoukar, have been based on an

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[8] Manuring is not excluded in the TBS, however; see the discussion of the agro-ecological manuring model in Section 5.1 above.

annual yield of 500 kg/ha, with the intention of showing the economic functioning under typical conditions. However, yield is heavily dependent on the timing and quantity of rainfall each season (Wilkinson 1994, 1997), and a more dynamic model would have to take into account the high interannual variability in rainfall in northern Mesopotamia. Five hundred kilograms was chosen here as an average value; wet seasons would certainly produce higher yields and drier seasons would produce less if not fail altogether. Catastrophic events (Weiss and Courty 1993; Weiss, et al. 1993) or a run of dry years (Wilkinson 1994, 1997) might result in low yields or widespread crop failure. The surplus-producing TBS region would be in a good position to handle all but the most severe environmental fluctuations. Hamoukar, on the other hand, was either heavily reliant on surpluses from satellites beyond the THS region or was using short-term production strategies, which result in a fragile system that is poorly equipped to handle such fluctuations.

The previous discussion has focused almost exclusively on agriculture, which lends itself to modeling; however, the economic importance of sheep and goats in the mid to late third millennium is well documented through zooarchaeology (Zeder 2003) and ancient texts (Van Lerberghe 1996; Sallaberger 2004; Widell in press). A particular onager-donkey hybrid (kúnga in Sumerian) was especially important for trade in the region (see Chapter 6). It could be suggested that livestock are the key to understanding the apparent huge agricultural surpluses in the western Khabur basin: rather than feeding people, these surpluses (see Table 5.1) were intended as fodder for settlement-based herds (Danti 2000). Some clues are beginning to emerge for the presence of animals within settlements; for example, an open space near the palace at Beydar was covered with the footprints of sheep (Sténuit and Van der Stede 2003:226-227). This proposition must be further tested with new excavation methods designed to detect the presence of animals within settlements (for example, soil micromorphology and the study of micro-debitage; W. Matthews 2003; Rainville in Emberling and McDonald 2003); such data are not widely available at present.

5.4.4. Basinwide Patterns of Ancient Road Networks.

The majority of all ancient routes appear to be connected to local economic activities, generally in the form of cultivation and pastoralism, and previous researchers have taken this pattern to signify Bronze Age economic decentralization (Van Liere and Lauffray 1954-55). More recent research in northern Iraq has revealed interconnected local radial systems and even interregional routes (Wilkinson 1993; Wilkinson and Tucker 1995). Analysis of CORONA photographs over the entire Upper Khabur basin have revealed a similar arrangement.

At a local level, sites in the central and western basin are highly interconnected. For example, Tell Effendi (TBS 55) is surrounded by at least seventeen discrete radiating routes, nine of which are directly connected to or aligned with satellites (see Fig. 5.21). The 1.2-ha site of Tell Kaferu (TBS 10) sits on the watershed between the Wadi Aweidj and the unnamed drainage to the east. Hollow ways connect it directly with almost every Period 07 site in the eastern half of the TBS region. This interconnectivity, combined with an almost complete absence of non-intersite routes, suggests that its main reason for being was as a way station, rather than as a self-sustaining agricultural village.

These intersite routes are more than connections between towns and their immediate satellites; when considered at a regional level, these routes emerge as segments of larger "highways" running from site to site (Fig. 5.26). In general, these run from east to west. The north-south routes probably followed the wadis and have been subsequently obscured by alluviation. Numerous routes can be discerned, but four have been highlighted in Fig. 5.26 and Table 5.2.

Route	***Western Terminus***	***Eastern Terminus***	***Distance (m)***	***Preserved HWs (m)***	
a	Hanou	Chagar Bazar	24,560	16,761	68%
b	Sekar Tahtani (TBS 41)	Gir Zil Saghir	40,290	19,442	48%
c	Beydar (TBS 1)	Umm Hijara	39,683	24,967	63%
d	Jamilo (TBS 59)	Brak	40,128	16,818	42%

Table 5.2. Sample interregional routes in the central-western Upper Khabur basin and their degree of preservation on CORONA photographs. See Fig. 5.25 for route locations.

The busy landscape of the central basin gives way to a pattern of isolated radial networks in the western basin. Major intersite routes are much less common, and when they do occur, the alignments of tells and hollow ways are much shorter. The western basin matches the pattern initially described by Van Liere and Lauffray (1954-55), who interpreted it as the geographic imprint of self-sufficient agricultural settlements with little economic interaction. If lack of hollow ways signifies less constraint on movement by fields in antiquity, the western basin may have been characterized by a less intensive agricultural economy in the mid to late third millennium. The reconstructed ancient landscape lends further support to the importance of pastoralism in the western basin at this time (Kouchoukos 1998; Lyonnet 1998; Hole 1991).

The eastern basin and the adjacent Iraqi North Jazira area also exhibit radial patterns around Period 07 sites, but unlike the dozens of interconnecting routes in the central basin, there are only a few major regional routes (Fig. 5.27). Wilkinson recognized two such routes in the North Jazira: a northern route running through Hawa and a southern route through Tell al-Samir (Wilkinson and Tucker 1995: Fig. 24). Wilkinson's northern route disappears into the zone of poor preservation between Rumaylan and Hamoukar, but the southern route articulates directly with Hamoukar, where it appears to split into an upper route to Leilan and a lower route to Qarassa.

These interregional routes would have carried trade in raw materials and high value manufactured items. The positioning of the major urban centers along these routes in the eastern basin suggests that they played a key role. We have seen that the massive population of Hamoukar made it particularly vulnerable to annual fluctuations in agricultural productivity; the wealth from interregional trade may have provided them with a means of ameliorating short-term agricultural deficits by trading for them, perhaps with the wetter regions to the north (Wilkinson 2000c). Such measures would have been undertaken in dire emergencies only, due to the costliness of overland transport in bulk cereals. Although we have no textual documentation for precise trade routes in the third millennium BC, this east-west route through the eastern basin is well-known in the early second millennium, when it was an important segment of the Old Assyrian trade in tin and textiles which was constantly fought over by the powers of the day (Charpin 1992:102). The preserved interregional hollow ways suggest that this route (and by extension, trade) may have been equally important in the third millennium, and may have been an encouraging factor in the urbanization process at Leilan, Hamoukar and Hawa.

The implications of the local and interregional networks for an understanding of political organization are not clear. The interregional routes are frequently direct, particularly in eastern basin, as would be expected for communication routes dictated by a centralized authority, as in the Centralized State Model. On the other hand, these routes do not disregard local settlement; they run from site to site. These alignments raise an important developmental question: did the settlements inspire the routes, or did the routes encourage the growth of settlements along them? In the eastern basin, the strongly linear east-west arrangement of sites along the two major interregional routes suggests the latter, whereas the more meandering pattern in the central basin suggests the former. In both cases, route formation and settlement development were certainly recursive processes: sites and routes simultaneously influenced each other, and the two cannot be understood independently.

Ironically, it is the western basin for which we have the best textual evidence for a large political entity. The Kingdom of Nagar included Brak and Beydar (ancient Nagar and Nabada, respectively) and presumably the territory between them (Chapter 6). The ruler of Nagar and his entourage traversed these routes in donkey-drawn carts during their visits to the towns within the kingdom (Sallaberger 1996b:103-106). There was, however, no direct route from Nagar to Nabada; the ruler would have had to move from settlement to settlement. It appears that, at least in the case of Nagar, interregional movement was dictated by the local economic systems rather than by the political needs of the ruling elite at Nagar. The fuller implications of hollow way patterning for the evaluation of the CSM and the DSM will be discussed in Chapter 7.

5.4.5. Reuse of Hollow Ways.

After the collapse of the major urban centers at the end of the third millennium, the important interregional trade corridor continued to run through the Upper Khabur basin and the adjacent Iraqi North Jazira. Without the constraining effects of agricultural fields, this continued traffic would not have traversed the same physical roadbeds of the third millennium routes; they would have been damp if not waterlogged during some parts of the year. However, their general alignments were probably still followed, if not because of the roads themselves then because of the former settlements they connected, some of which were still inhabited or reoccupied. These current and former settlements would have been convenient navigational markers on a low-relief plain. In turn, the position of these mounds on the second millennium trade route would have created a higher probability of resettlement. In this manner, the initial conditions of the landscape of the third millennium would have created path dependency for subsequent settlement. Indeed settlement of the fourth millennium may have already set these conditions, which continue to the present in the form of preferential settlement of modern villages on ancient sites.

Hollow ways themselves were attractors for subsequent settlement because of their unintended impact on local hydrology. Their depressed morphology collected surface runoff during their use but also long afterward. In the THS area, several settlements grew up along hollow ways long after they had ceased to function as transportation corridors. To the northeast of Hamoukar, a small Late Bronze Age village (mid to late second millennium BC) formed on the south side of a broad hollow way which extended from Hamoukar's northeastern corner (Fig. 5.28a). A second hollow way from Hamoukar's western lower town (Fig. 5.28b) was first dug out for brick material by the residents of another Late Bronze Age village (THS 11); excavation of this borrow pit was resumed over a thousand years later by the residents of a Parthian settlement (THS 35). In both cases, profiles across the borrow pits were much deeper than profiles elsewhere along the same hollow ways.

The impact of mid to late third millennium urbanism on the landscape influenced settlement location hundreds or even thousands of years after its collapse. Ahistorical models of settlement location which are based purely on economic principles fail to consider the ways in which previous patterns of settlement and land use can have a significant impact on later decisions about where to settle. Purely economic criteria might encourage or discourage the choice of certain general areas, but in the Khabur basin, settlement decisions were not made assuming an empty plain.

Based on the archaeological settlement pattern data presented in Chapter 4 and the off-site data detailed in this chapter, a picture of the mid to late third millennium landscape has been developed. The following chapter will use these data to propose a reconstruction of the only textually documented political entity in the basin, the Brak-centered Kingdom of Nagar. The final chapter will synthesize this reconstruction of political organization with the reconstructed agricultural and pastoral economy from this chapter and compare it to the predictions of the CSM and the DSM.

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JASON ALIK UR

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CHAPTER SIX:

THE HISTORICAL GEOGRAPHY OF NORTHERN MESOPOTAMIA IN THE THIRD MILLENNIUM BC

The early use of writing for administrative record-keeping in Mesopotamia gives researchers a great advantage in reconstructing early political and economic systems. Texts can impart a greater chronological and geographic acuity than is possible in purely prehistoric societies, where the passage of time is hazy and social and political boundaries are imprecise.

We have seen in Chapter 2 that the landscape of northern Mesopotamia is highly variable, even within the superficially homogeneous Upper Khabur basin. For this reason, a more precise location of the early states and individual settlements would provide a valuable geographic frame in which to interpret economic and political data gleaned from archaeology and epigraphy. For the mid- to late fourth millennium, this is not yet possible for northern Mesopotamia, and indeed is still difficult for the protoliterate "core" of southern Mesopotamia. However, the written records which appeared along with the rapid expansion of towns and cities in the mid-third millennium BC allow the rough delineation of the indigenous early states of the north, the extent of Akkadian political control and its Hurrian successor, and the formation and fragmentation of regional states during and following Mari's control of the basin in the early second millennium.

In this chapter, I will use a combination of archaeology, epigraphic records, and Geographic Information Systems (GIS) to reconstruct hypothetical political units in the Upper Khabur basin and surrounding regions. The archaeology of the third millennium BC has been reviewed in Chapter 2, and Chapters 4 and 5 presented new data from survey and landscape archaeology. In order to synthesize these data with ancient texts, we must attempt to establish the location of the places and kingdoms mentioned in them.

6.1. Subir-Subartu as a Geographic Term

The general terms for the lands of third millennium southern Mesopotamia, Sumer and Akkad, are well established and correspond to real cultural (Steinkeller 1993) and geographical (Buringh 1960:121-23) differences. Such certainty does not exist for northern Mesopotamia at the same time. In some of the earliest texts from southern Mesopotamia, a land called Subir is mentioned, which is clearly to be placed somewhere to the north of Sumer; persons labeled as "Subarean" often bear ethnically Hurrian names, indicating a close link between the land of Subir and the Hurrian people (Gelb 1944). Regardless of the question of the ethnicity of Subir, it was localized by Gelb in the Trans-Tigridian area which would later be known as Assyria (1944:85-86).

In an inscription from Lagash, Eannatum describes the defeat of an invading coalition which included Elam, Urua, and Subir (Steible 1982:145-151). This text has been used as evidence of a localization of Subir in the Upper Khabur basin, and as part of historical reconstructions of archaeological data from that region (Weiss 1986:85-87; Weiss and Courty 1993). Subir/Subartu as the Upper Khabur basin has now begun to appear as an unquestioned fact in more recent assessments of north Mesopotamian society (see for example Dolce 1998). In response, several scholars have questioned not only this localization of Subir but its nature as a geographically specific place name (Michalowski 1986b, 1999; Steinkeller 1998). Prior to Naram-Sin (2254-2218 BC), Subir appears to have had a specific geographic referent: the region of northern Mesopotamia to the east of the Tigris River. But already it appears in a pre-Sargonic literary text signifying not a place but, with Sumer and Dilmun, the northern third of the vertically tripartite universe of the time (Michalowski 1999:306-308).

Later, in the inscriptions recording Naram-Sin's northern campaigns (preserved in Old Babylonian copies), Subir took on a second more general sense, now with geographic meaning, however vague. Steinkeller has characterized these different conceptions as "Subartu Proper" and "Greater Subartu," respectively (1998, esp. Fig. 3). Naram-Sin's Subir stretched from the Amanus Mountains of Turkey to the Trans-Tigridian Zagros, a large swath which included all lands north of Sumer that were known at the time. His redrawing of the known universe was based on the four cardinal points instead of the older tripartite division (Michalowski 1999:309-311). "Subartu Proper," or the geographically referenced Subir, was still limited to the Trans-Tigridian Assyrian heartland; it is likely that its political capital was Hamazi, an unlocated city whose importance earned it a turn at kingship in the Sumerian King List (Steinkeller 1998:78-85).

Thus far we have described Subir from a southern Mesopotamian point of view. To make matters more complicated, it appears that this geographic name had a slightly different meaning to the people of Western Syria and Northern Mesopotamia. The late third millennium Ebla texts make reference to a town called Shubartium or Shabartium, it has a ruler (en) but is politically dependent on the city of Nagar (Archi 1998:3-4). Shabartium as a city is not mentioned after this time, but in the early second millennium, a region called Shubartum can be found in the Mari letters. Around Zimri-Lim's fourth year, Northern Mesopotamia was threatened by an invasion by Ibal-pi-El II, the king of Eshnunna; a letter written by one of Zimri-Lim's officials in the Jebel Sinjar area paints a vivid picture of the geopolitical situation of the time, with considerable emphasis on the loyalties of the kings of Shubartum (Charpin 1992). According to Charpin's analysis, it was to be localized north of the Jebel Ishkaft, between the Tigris to the east and the kingdoms of Ida-Maras and Yussan to the west, and included the towns of Azuhinum, Hurrasân, Shirwun, Tupham, and Zurrâ (Charpin 1992:100-101). Little is known about most of these towns, but Azuhinum was the scene of a battle between Naram-Sin and a local ruler with the Hurrian name Tahish-atal, presumably at the time that Akkadian control was established in the third millennium (Michalowski 1986b; Steinkeller 1998). Shabartium and Azuhinum will be discussed further below. What appears certain is that for the Eblaites, Shabartium was a very real city with a real king, and in the time of the Mari archive, Shubartum was a very real land, situated at the eastern end of the Upper Khabur basin and extending to the Tigris.

The case of Subir should serve to caution modern scholars about the uncritical use of ancient "geographic" names:

> [G]eographical terms are not neutral, objective, descriptive indexes of natural landscape, but are subjective and emotionally loaded elements of a semantic subsystem. The scope of words such as Elam and Subartu waxed and waned as a result of political realities and ideological pretensions. They were reinvented again and again, played with and reformulated as part of larger semantic schemes (Michalowski 1999:305).

6.2. Cities of Northern Mesopotamia

Before attempting to place the Kingdom of Nagar into its geopolitical context, it is worthwhile to review what is known of Nagar and the other urban centers of northern Mesopotamia. Fortunately, individual towns appear to have maintained their names in a more specific manner than was the case with Subir/Shubartum. Although in most cases the textual material is infrequent, fragmentary, and difficult to interpret, the last twenty years have seen the establishment of firm ground on which to base the reconstruction of the historical geography of northern Mesopotamia. In the following section, I will review the evidence for the geographic locations of the major cities and kingdoms of the mid- to late third millennium BC and also what little is known of their sociopolitical organization and interaction between them.

6.2.1. Abarsal.

The important city of Abarsal (Archi 1989) is most famous for the treaty it signed with the state of Ebla, in which the dependent villages of each state and the rights and conditions of trade between them were established, generally to the greater benefit of

Ebla (Sollberger 1980). Although the second party to this treaty was initially interpreted as Ashur by Pettinato, it is now generally accepted to be *A-bar-sal*$_4$ or *A-bar-sìla* (Sollberger 1980:130). Abarsal was ruled by an en, engaged in frequent exchanges of luxury gifts with Ebla, and often hosted important Ebla officials (Archi 1989). In a letter in which King Enna-Dagan of Mari recounts his predecessors' military successes, we learn that Mari defeated Abarsal at the town of Zahiran in the reign of Iblul-Il (Edzard 1981; Bonechi 1998:224-26). Aside from this defeat, in geopolitics it appears to have been a regional power on par, for a time at least, with Mari, Ebla, and Nagar (Bonechi 1998:236).

The original suggestion of Pettinato of a Tigris location can be discarded along with his reading of the name. Edzard (1992:193) placed Abarsal to the north or northeast of Ebla in the region between Gaziantep to Urfa; Meyer (1996:166) and Astour (1988:147-148, n. 54) would both put it on the Euphrates in the immediate area of Tell Ahmar. The theories that Abarsal must lay along the Euphrates or some other perennial river are based on the fact that the Abarsal treaty mentions riverine trade between Ebla and Abarsal, therefore Abarsal must have been on the banks of a river. Since Ebla is also mentioned in this same text as engaging in waterborne commerce, but is decidedly *not* on a perennial river, I see no reason why Abarsal should by necessity be located on a river either. In all likelihood, both Abarsal and Ebla controlled towns on rivers, through which they traded with other kingdoms. The treaty with Ebla makes it apparent that the boundary with Abarsal lay at or east of the Euphrates, and Archi has proposed that Abarsal is to be found somewhere in the Jazira. His initial proposition was within the

Upper Khabur basin (1989:16-17), on the strength of an assumed location next to a river, but more recently he has proposed Tell Chuera as a likely location (Archi 1998). Although some plausible alternatives such as Shanabzugum have been proposed (Milano and Rova 2000), I find a location of Abarsal at Chuera to be convincing.[1]

6.2.2. Nagar.

The kingdom of Nagar features prominently in all third millennium archives from northern Mesopotamia. The earliest mention comes from Mari in the form of a statute dedicated by Mara-Il, king of Nagar, to Iblul-Il of Mari and his queen, Paba (Gelb and Kienast 1990:12).[2] The most extensive documentation comes from the Palace G archives of Ebla, where there are dozens of mentions of Nagar, mostly in administrative contexts related to the royal family of Nagar, diplomatic or commercial exchanges of luxury goods, and the movement of official representatives between the courts of the two kingdoms (Archi 1998; Eidem 1998; Eidem, *et al*. 2001; Sallaberger 1999).

The diplomatic relationship between Ebla and Nagar included phases of violent confrontation, economic exchange, and royal intermarriage. The internal chronology of the pre-Sargonic kings of Mari and Ebla and synchronisms between them have only recently been established with any degree of confidence (Archi 1996a, b), so the ordering of events remains subject to modification. However, Alfonso Archi (1998) and Jesper

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[1] Mario Liverani (1994) has proposed to locate Abarsal at Kazane Höyük on the Harran Plain of southeastern Turkey.

[2] The name in this inscription is written AMAR-AN, which Gelb and Kienast render as the Akkadian *Bur-ilum* (1990:12). Based on the writing *Ma-ra*-AN at Ebla, it should probably be read Mara-Il (Catagnoti 1998:44, 54).

Eidem *et al*. (2001:100-101) have proposed a preliminary sequence of events in the relations between Ebla and Nagar, which forms the chonological basis of the following summary.

The earliest appearance of Nagar in the Ebla texts is also the most informative about the kingdom of Nagar. An annual summary account of various expenditures of precious metals composed during the tenure of the Ebla vizier Arrukum (the earliest well-attested vizier who served at the end of the reign of Igrish-Halab and the beginning of Irkab-Damu) lists Nagar and several of its dependent towns:

> "'100 minas of silver (47 kg) for the king of [Nagar]: 3 expeditions. 6 minas 10 shekels of silver for his messenger: 10 expeditions. 40 minas of silver (18,8 kg) to buy [kúnga] mules. 2 minas of silver (940 gm) for fodder for the mules of the king…'" (Archi 1998:5)

In addition to sending silver and messengers to Nagar, this text lists other dependent towns that received silver in the same year: *Ga-ga-ba-an*^{ki} (3 expeditions), *Da-ti-um*^{ki}, *Ga-ga-ba-an*^{ki} (2 [additional?] expeditions), *Ba-na-i-*LUM^{ki}, *Dar*$_5$*-ha-um*^{ki}, *Da-ti-um*^{ki} (again), *A–ša*^{ki}, *Ša-bar-ti-um*^{ki}, *Na-ba-ti-um*^{ki}, and *Su-mu-na-ni-um*^{ki}.

Perhaps slightly later in the reign of Irkab-Damu, an unpublished text suggests that Ebla may have been victorious in battle against Nagar (Eidem*, et al.* 2001:100); this was followed by a series of diplomatic visitations of the vizier Ibrium of Ebla and the possible vizier *Hu-ra-*NE of Nagar to Tuttul (Tell Bi'a at the junction of the Balikh and the Euphrates), whose intermediate geographic position may have made it an acceptable place to sign a peace treaty (Eidem*, et al*. 2001:100). In the unpublished text TM.75.G.2465, the en of Nagar received 20 minas of silver, while his sons who accompanied him received 7 minas and the dependent ens who accompanied him received 5 minas (Archi 1998:5).

Some time after these events, the royal houses of Ebla and Nagar were united by the marriage of Tagrish-Damu, daughter of Ishar-Damu, the last king of Ebla, to UL-TUM-HU-HU, son of the king of Nagar (Biga 1998).[3] This event is surprisingly well documented, given that it is reconstructed entirely from only two summaries of textiles. The first, TM.75.G.1249 (Biga 1998:18-19), records various garments distributed to members of the Ebla court who were in the town of Armi to meet with envoys from Kish and the en of Nagar and his son. The en and his son then travelled from Armi to Ebla, where the final negotiations and arrangements for the wedding were made. This text is dated to the seventh month (*Za-'a-tum*) of the Eblaite calendar, thus October-November. Six months later in June or July, some small details of the wedding ceremony were recorded in the otherwise straightforward textile account TM.75.G.1250: Tagrish-Damu's head was anointed with oil by the prince of Nagar, all members of the wedding party were given garments (as well as many personal jewels for the bride), and a large entourage went off with her to Nagar (Biga 1998:19-20). This marriage was considered significant enough to name a year: DIŠ mu DU.DU *ma-lik-tum Na-gàr*[ki] "year of the departure of the (princess Tagrish-Damu as) queen for Nagar" (Archi 1998:5).[4] Shortly after their arrival, there was apparently another ceremony at Nagar, for which 42 jars of wine were sent from the Ebla stores (Archi 1993:23-26).

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[3] The reading of this name is uncertain; Catagnoti (1998:59) even questions whether it is a personal name.

[4] This was not, however, the most significant royal wedding for Ishar-Damu; after concluding this arrangement with Nagar, he married Hirdut, his daughter with his primary queen Tabur-Damu, to a son of the king of Kish (Biga 1998:21; Archi 1987a, b)

Although the relative sequence of these events is probably correct, we have no means of determining the time span involved. Eidem *et al*. conclude that:

> The presumed war, the treaty and the royal marriage seem likely to have been events that took place in fairly rapid succession and not too long before the end of the period covered by the Ebla archives (and therefore, perhaps, also the destruction of late ED III Brak). Thus the Nagar king Mara-il may well be the only ruler attested in our sources, and therefore a figure antedating Akkadian control of Nagar/Brak by little more than a generation (Eidem*,* *et al*. 2001:101).

In general, the Ebla texts paint a picture of frequent exchanges in luxury goods and high officials between the two courts. In addition to the gifts of silver and luxury textiles mentioned above, important administrative officials of the two states were routinely to be found visiting each other's courts. The final vizier of Ebla Ibbi-Zikir journeyed to Nagar and on to Kish, a trip for which we have an accounting of his provisions (Archi 1998:2-3). The ur_4-official NI-*zi* was the frequent recipient of goods from the Ebla palace stores, and it seems likely that he was frequently in residence there in some sort of ambassadorial capacity (Archi 1998:6-9). Besides silver and textiles, Ebla's exports were olive oil and wine. Nagar was constantly entreated to send the kúnga donkey-onager hybrid for which it was famous at Ebla.[5] Also much in demand were persons designated as HÚB.KI. Catagnoti concluded that they were cultic dancers, due to their frequent association with singers and other cultic personnel (1997:586); Archi relates the word to the Sumerian húb (to jump) and concludes that "it cannot be merely by chance that Nagar was the only centre for the provision of good mules, BAR.AN, or

[5] King Irkab-Damu of Ebla also pleaded with Zizi king of Hamazi to send kúnga hybrids (Pettinato 1991:240-41; cf. also corrections in Archi 1998:1 fn. 1). It appears that both the lands of Hamazi, which is to be located somewhere in the Trans-Tigris region of Assyria (Steinkeller 1998:79-82), and Nagar were favorable locations for the breeding of kúnga hybrids, perhaps because they were closer to the natural range of the wild onager.

that the HÚB.HÚB came only from there. They must have been specialists in the equestrian arts: horsemen whose ability was such that they could have seemed like acrobats to the Eblaites" (1998:10-11). After their arrival, HÚB persons from Nagar served as instructors to young HÚB.HÚB in the Ebla palace (Archi 1998:10).

The terse monthly and annual accounts from which this trade has been reconstructed often link Nagar with other towns that it appears to have controlled. We have already seen in the metal account TM.75.G.1872+, discussed above, that Nagar was mentioned with eight dependent towns; throughout the Ebla accounts, a total of seventeen towns are identified as part of the Kingdom of Nagar or very close by (Archi 1998:7-8; Eidem, *et al*. 2001:101). While most towns cannot be placed precisely, enough can be generally located to give us a rough idea of the extent of the kingdom of Nagar at this time. Two can be located with a high degree of certainty: *Da-ti-um*^{ki} and *Na-ba-ti-um*^{ki} are Tell Hamidi (Wäfler 1995) and Tell Beydar (Sallaberger 1998a, see below), respectively. The later Mari archives are helpful for generally placing *A-bù-li-um*^{ki} (later Abi-ili) to the north of Brak and *Zàr-'à-ni-um*^{ki} to the east of Brak (Eidem, *et al*. 2001:101). The name *Ga-ga-ba-an*^{ki} bears a striking similarity to the extinct volcano known today as Jebel Kaukab, and is probably to be located near it, in the region of Hassake (Catagnoti and Bonechi 1992). The other twelve names are otherwise unknown; at least two of them are derived from personal names which were common at the time in the region (*A-bù-li-um*^{ki} and *Ba-sa-hi-um*^{ki}) and may therefore be evidence of the recent settlement of non-sedentary groups (Archi 1998:8; Milano and Rova 2000).

The re-discovery of a sealing from the Mallowan excavations at Brak has led to the proposal that Brak is the location of ancient Nagar (Matthews and Eidem 1993; Eidem, *et al*. 2001:105 no. 3). The seal design features a bull-man fighting with a lion, and bears the partially-preserved inscription "Talpush-atili, Sun (god) of the country of Nagar, son of …" Mentions of a town called Nawar, probably the same as Nagar, appear in the Mitanni era tablets (ca. 1600 BC) from the palace at Brak area HH (Eidem in Oates, *et al*. 1997:39-46). The identification of Brak as Nagar/Nawar is not yet proven, but given the archaeological size and importance of Tell Brak, it seems almost certain to be correct.

6.2.3. Shekhna / Shubat-Enlil.

The city of Shekhna does not appear in the pre-Sargonic Ebla texts but it is mentioned in a later Akkadian list of personnel which was found in the courtyard of the Naram-Sin building at Tell Brak (Eidem, *et al*. 2001:106-107, no. 12). This tablet gives a list of towns and numbers of persons from them, which have been interpreted as labor contributions of the settlements of the Akkadian-controlled part of the basin, possibly for the purpose of constructing the fortress in which it was found (Charpin 1987:132). Later, in the time of Zimri-Lim, Shekhna served as the capital of the land of Apum in the eastern Upper Khabur basin. Its final mention appears in the name of the 23rd year of Samsuiluna of Babylon: "The year: Samsuiluna, the king, by the fierce power which Enlil gave him, destroyed Shahna, the capital city of the land of Apum, Zarhanum, Putra, Shusha,… -lazia(?) <and> … Iakunashar….Iakun-x" (Horsnell 1999:212).

The location of Shekhna was established when it was demonstrated that the cities of Shekhna and Shubat-Enlil were one in the same, Shekhna having been rebaptised by Shamshi-Adad in the early second millennium (Charpin 1987). Shubat-Enlil is well known from the archives of Mari, where it was clearly the capital of Shamshi-Adad's kingdom. That kingdom reached from Tuttul and Mari on the Euphrates, to the Upper Khabur, as far east as Ekallatum and Ashur, and even up the Lesser Zab to Shusharra on the Iranian border (Eidem 1992). Later, it was the seat of one of Zimri-Lim's vassal kings, and it continued as an independent kingdom even after the fall of Mari to Hammurabi (Eidem 1991). Although earlier scholars had thought that Shubat-Enlil was to be found at Ashur, already by the 1950's it was being suggested that it might have been in the Upper Khabur basin, particularly at Tell Leilan (Falkner 1957; Hrouda 1958; Van Liere 1963:119-120).[6]

Shortly after the start of excavations at Tell Leilan by Yale University, impressions of seals of servants of Shamshi-Adad and later kings ruling at Shubat-Enlil began to be found, which inspired the excavator once again to propose Leilan as Shubat-Enlil (Weiss 1985). Subsequent tablet finds have made the identification of Leilan with Shubat-Enlil (and by extension Shekha) almost a certaintly (See especially Whiting in Weiss, *et al*. 1990).

6.2.4. Urkesh.

In 1948, two bronze foundation pegs in the form of a snarling lion with its paws atop an inscribed flat plate were purchased independently on the antiquities market by the

[6] For a concise summary of early thoughts on the location of Shubat-Enlil, see Weiss (1985:271-272).

Louvre and the Metropolitan Museum of Art (Parrot and Nougayrol 1948; Muscarella 1988). The Louvre peg was purchased in association with an inscribed stone tablet, with which it was associated in antiquity as well. The inscriptions on the lion pegs and the tablet all commemorate the building of a temple by Tish-atal, endan of Urkesh, a ruler with a Hurrian name.

Although they had been removed from their archaeological context, Van Liere proposed, based on local information about the findspot of these artifacts, that Urkesh was Tell Shermola, a small and badly damaged tell immediately south of the modern town of Amuda (Van Liere 1957).[7] Van Liere's identification was doubted by Buccellati, who opened up the excavations at Tell Mozan under the suspicion that it might be the Hurrian city (Buccellati 1988). As the excavations of the "royal storehouse" in Area AK have proceeded, a range of inscribed sealings have been recovered, including many naming Tupkish, endan of Urkesh, and his wife Uqnitum (Buccellati and Kelly-Buccellati 1995-96, 1996). Although these names appear almost exclusively on container sealings, which, being attached to transportable objects, could have been sealed elsewhere, it does appear now that Mozan is the site of the city of Urkesh. Additional evidence for the importance of the ancient city has come in recent seasons, when sealings of Tar'am-Agade, the daughter of Naram-Sin of Akkad, have been found (Buccellati and Kelly-Buccellati 2002).

Urkesh, like Shekhna, does not occur in the Ebla archives but does occur in the Akkadian list of personnel from Tell Brak cited above (Eidem, *et al*. 2001:106-107, no.

[7] Van Liere actually proposed that Tell Amuda was Urkesh, but this site actually lies across the border in Turkey, and it is likely that he meant Tell Shermola (Buccellati 1988:36-37).

12). Although we have no textual data for the sociopolitical organization of either city or their relationships to the better-known towns of the Upper Khabur in the pre-Sargonic period, there is much archaeological evidence for their status as important urban centers at this time (reviewed in Chapter 2 above). Their absence from the Ebla metal accounts of Nagar's dependent towns will be used below to aid in the reconstruction of the political boundaries of the kingdom of Nagar.

6.2.5. Azuhinum.

Azuhinum appears in neither the Ebla texts nor the Akkadian labor list from Brak, but, like Shekhna and Urkesh, must have been a considerable political force in the basin in the late third millennium nonetheless. A year name of Naram-Sin commemorates the defeat of Tahish-atal at Azuhinum, in Subir.[8] Azuhinum and Tahish-atal both must have been very important to warrant mention by name in an Akkadian year-name. Azuhinum is also listed in a very fragmentary Old Babylonian copy of an Akkadian royal inscription, as one town among many, presumably a list of captured Hurrian cities from this campaign (Michalowski 1986a, b). Steinkeller (1998) has connected the two sources to reconstruct the route of Naram-Sin's campaign, which ran clockwise around the northern Jazira: up the Euphrates to Tuttul (Tell Bi'a), northeast across the Jazira to Urkesh (Tell Mozan), and then east to the Tigris and back to Agade. The battle with Tahish-atal at Azuhinum was fought after Urkesh but before reaching the Tigris.

Because of the archaeological indicators of Hamoukar's importance in the mid-

[8] "The year (when) Naram-Sin won a battle against Subartu in Azuhinum (and) captured Tahish-atal" (Gelb and Kienast 1990:51-52; translation after Steinkeller 1998: n. 54).

late third millennium BC, I have previously suggested that Azuhinum was to be located there; however, I did not dismiss the possibility that Tell al-Hawa could be ancient Azuhinum, if the early second Millennium references to an Azuhinum were to the Jaziran city, rather than a town of the same name in the region of Nuzi (Ur 2002a:71; Fincke 1993). It is now certain that there was an Azuhinum in the land of Shubartum at the time of Zimri-Lim, and that Shubartum designated the area north of the Jebel Ishkaft (Charpin 1992). We have documented the complete abandonment of Hamoukar at this time (Ur 2002b and Chapter 3), but Tell al-Hawa remained a very large site of 66 ha in the early second millennium (Ball*, et al.* 1989:34-35). Given the textual data for a Jaziran kingdom of Azuhinum in the early second millennium BC, it seems probable that it should be located at Tell al-Hawa; the ancient identity of Hamoukar remains uncertain.

6.2.6 Nabada.

Between 1993 and 2002, the excavations at Tell Beydar recovered 216 tablets, almost all from domestic contexts to the north of the large public building atop the central mound (Ismail*, et al.* 1996; Milano*, et al.* 2004). These tablets, which were written in an early dialect of Akkadian but with the heavy use of Sumerian logograms, are almost exclusively administrative in nature, primarily concerned with lists of persons, grain distributions, and various forms of livestock. The personnel lists are terse but, according to Sallaberger, "the function of these texts is not to be doubted: they register the monthly grain rations given to the workers of a public household" (1996b:89). They appear to revolve around five main "officials": Arrum, Arši-aḫu, ḪAL-ti, Tabla'alim, and KUR-ilum, who apparently authorize the distribution of grain rations to unnamed persons designated by a range of professions, most prominently the enigmatic lú-giš-DU. These men appear to be the most important, since they are always listed first, they receive the highest ration (120 sila per head, plus an extra 10 sila of še-RU), and they are the most numerous. Sallaberger has suggested that they could be plowmen but cautions that this is highly speculative as there are no other known attestations of this term (1996b:93-94). The second most common profession, the *ba-rí* udu, is also problematic, but likely to indicate some sort of shepherd; this group receives the second-highest ration (90 sila). In addition to these agricultural personnel, servants and household craftsmen are listed.

The second major group of administrative texts has been labelled "grain expenditure documents" (Sallaberger 1996b:99-106). As with the personnel lists, they are terse, listing the amount of barley given to persons and fodder for donkeys (including those of the en of Nagar) over the course of one month. Again the lú-giš-DU and the *ba-rí* udu figure prominently. When fodder was given out for travellers' donkeys, the duration of the visit was also recorded. The en of Nagar was the most important such visitor, and he came with large teams of donkeys, in one case as many as 88 of them (Sallaberger 1996b:104, Table 5).

Animals figure prominently in the administrative texts from Beydar (Van Lerberghe 1996; Sallaberger 2004). Accounts of hundreds of fleeces and the person responsible for them are common. Oxen in teams were distributed to persons and places, presumably for use in plowing. A range of equids is attested, including donkeys (anše-IGI, *E. asinus*, also attested in teams for plowing), onagers (anše-edin, *E. hemionus*), and an onager-donkey hybrid (anše-BAR.AN or kúnga). Neither of the last two varieties was used for plowing, presumably because the onager was untameable (and therefore used solely for breeding kúnga hybrids) and the kúnga was too valuable. At Ebla, kúnga hybrids were valued at up to 5 minas of silver, as much as 300 regular anše-IGI donkeys (Archi 1998:9-10; Sallaberger 1999:394-95).

Clues regarding the ethnic composition of the sphere of the Beydar tablets, which was probably limited to the western Upper Khabur basin, can be gleaned from this administrative archive. The language of the tablets, although generally hidden behind Sumerian logograms, can be identified as a pre-Sargonic dialect of Akkadian. Mimation of the nominative and genitive case endings, pronouns, prepositions, and conjunctions all suggest an underlying Semitic language (Talon 1996a). Occasionally the Semitic words for "hundred" (*mi'at*) and "thousand" (*lim*) were written out, instead of the more common Sumerian-derived base-60 numeric notation (Sallaberger 1996c). The strongest evidence for the Semitic/Akkadian ethnicity of the Beydar region comes from the roughly 350 personal names documented in the tablets (Talon 1996b; Catagnoti 1998). Most significantly, there are no unequivocal Amorite or Hurrian names. Although many are enigmatic, most can be understood as Semitic if not Babylonian. Interestingly, there are real differences in name-giving practices between the Beydar area and Ebla or Mari; the most typical elements of personal names (*-da-mu*, *Hadda*, *-li-im*, *zi-kir*, etc.) are entirely absent (see also Catagnoti 1998:61). Thus it appears that at the time of the Beydar archives, the Hurrian element of the population, for which the region of Urkesh and Nagar was known later in the third millennium, was either not yet in place or absent from the western part of the basin.

Unfortunately, there is no direct internal dating evidence for the Beydar tablets. The year or day is never written, although half of the tablets are dated to the month (Sallaberger 1996a). The associated pottery has been dated by Lebeau to the EJ IIIb period, but this is of limited chronological value since the tablets were found in a secondary context (Lebeau 1996). On stylistic and paleographic grounds, Sallaberger (1998b:31) has stated that "Der Vergleich mit den datierten Texten zeigt, daß aufgrund der angeführten Kriterien eine Datierung der Texte von Beydar in die Zeit von Enshakushana – Lugalzagesi – Sargon (vgl. Nippur und Adab) wohl auszuschließen ist," although he favors a date toward the start of that range. This early dating would be supported if the Pa_4-ba_4 mentioned in a Beydar tablet is identical to the wife of Iblul-Il, king of Mari (Sallaberger 1998b:36-37).

The ancient name of Beydar is not immediately apparent in the laconic grain accounts and personnel lists recovered thus far; however, by analyzing the thirty geographic names which occur in the archive, Sallaberger (1998a) has proposed a rough four-tiered administrative hierarchy. At the top is, of course, Nagar, which has been convincingly located at Tell Brak (see above). In the fodder expenditures, Nagar is the only place mentioned with an en, and it is never mentioned as a dependent settlement in the grain accounts or personnel lists. Below Nagar, there are three towns which clearly administer agricultural labor and animals: Nabada, ANmaLum, and Ishgar. In the personnel lists and grain expenditures, Nabada (when listed) always has the highest number of persons or animals. In one unique tablet (Ismail, *et al.* 1996: no. 73), personnel are either part of Nabada or "the land" (kalam^{ki}, presumably to be interpreted as the countryside beyond Nabada); no other places are mentioned. Sallaberger concludes that because of its special administrative functions, Nabada was the only second-tier center in the archive, and is probably to be identified with Tell Beydar (1998a:124-25). External support for Sallaberger's argument comes from the Ebla metal accounts, where diplomatic gifts to Nagar and its dependent towns were recorded (Archi 1998). Of the seventeen place names mentioned as part of the Nagar kingdom, only one also appears in the Beydar tablets: *Na-ba-ti-um*^{ki}. ANmaLum and Ishgar also had administrative functions but were below Nabada in the hierarchy and thus were third-tier centers. At least nine and possibly more villages comprised the fourth tier as simple agricultural settlements.

The editors of the Beydar tablets interpret the archive as the discarded administrative records of a public institution which was the local representative of the state based at Nagar; the five main persons named were the highest officials in the province within which Nabada/Beydar was the administrative center. They believe that the texts, although mostly found in a private house in Chantier B, undoubtedly originated in the monumental public building excavated in Chantier F at the top of the acropolis.

Their interpretation thus implicitly subscribes to the urban-rural and public-private dichotomies critiqued by Schloen's Patrimonial Household Model (2001). While I agree that these records appear to stem from some sort of elite admininstrative institution, I would propose that they could be better interpreted within the framework of the PHM (see also Chapter 1.7). The five main "officials" Arrum, Arši-aḫu, Ḫ̱AL-ti, Tabla'alim, and KUR-ilum) are not given official titles and are never explicitly connected to the palace of Nagar. I would propose that they were instead the patriarchal heads of five large lineages, who were responsible for making decisions about the use and distribution of the land, labor, and animals belonging to their respective kinship groups, which may have been organized around gates within the town. Within the personnel lists, many persons involved in production of grain are mentioned, but no persons involved in its processing, for example bakers or cooks; similarly, no specialized craftsmen are included (Sallaberger 1996b:99, 121). These persons were not mentioned because their activities took place within the individual households which were the basic social unit; once grains and other products had been distributed to the lineage heads, they were beyond the bounds of the larger institution, which had no concern over these day-to-day activities.

Nabada was clearly within the political sphere of Nagar, but the institution which produced the Beydar tablets was almost entirely concerned with local administration. Nagar and its ruler (the en) are generally mentioned in one context: when he was physically present at Beydar or in the immediate hinterland. During such times, the local institution was clearly responsible for the maintenance of his considerable teams of donkeys, which ranged up to 88 individuals (Sallaberger 1996b:104). This was a large economic burden, and it demonstrates the asymmetrical relationship between the en and the local elites at Nabada. The reason for the en's visit is rarely given, but one donkey fodder account indicates that he was visiting Nabada on the occasion of the meeting of the "assembly" (unken) and stayed for a number of days, unfortunately not preserved

(Ismail*, et al*. 1996: no. 106). If we understand Nagar and Nabada to be organized within the framework of the Patrimonial Household Model (as we have argued was common throughout the Bronze Age Near East; cf. Chapter 1), then the en was probably meeting with the local lineage leaders or shaykhs who were dependent members of his overarching household. Such face-to-face meetings were the context in which the personal ties of loyalty were constructed and maintained.[9]

Aside from this context, the Beydar tablets are otherwise entirely concerned with local labor and production. None of the standard "attached" craft specializations (e.g. metal workers, felters, weavers, woodworkers, stonemasons) are attested in the tablets; presumably these would have been based at Nagar. I would propose that this is because we are not dealing with a "public institution" but with a handful of large households (clans or extended families; see also Sallaberger 2004:18). The public-private distinction is anachronistic when these lineages were socially constructed with highly personal relationships. Although the editors of the Beydar tablets assume that their place of origin was within the palace at the top of the acropolis, it should not be forgotten that 140 out of the 147 tablets were found in a private house; the vast majority of administrative texts from Ur and Nippur were also found outside of a "public" context in "private" houses (Charpin 1986; Van de Mieroop 1992; Stone 1987). Furthermore, this archive contained four tablets which have been interpreted as school exercises (Ismail*, et al.* 1996: nos. 24, 62, 132, and 144). Although the findspot context cannot provide proof, it appears that

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[9] Initially it was thought that the "palace" at Nagar played a role in wool production (Van Lerberghe 1996:111). It now appears that the references to "é-gal" in sheep and goat tablets are actually to an individual (Sallaberger 2004:13 fn. 1).

not only were "official" records kept in a domestic structure, this was also the locus of the transmission of scribal knowledge.[10]

6.3. A Hypothetical Reconstruction of the third Millennium BC Kingdom of Nagar

The discovery of 147 administrative tablets at Tell Beydar between 1993 and 1995 provides a unique opportunity to integrate textual data on ancient settlement and land use with archaeologically documented sites and landscape features for the EJ IIIb Upper Khabur Basin. Archaeology can serve to ground the claims and boasts of ancient inscriptions as well as our modern interpretations of them, while the study of epigraphic materials can add a heightened chronological and historical acuity to vague archaeological materials. Any interpretation that synthesizes both data sources is much stronger than one that ignores or prioritizes one over the other.

6.3.1. The Limitations of Archaeological Survey Data.

Before we attempt such a synthesis, it is important to recognize the limitations of archaeological materials. Archaeology has great advantages: unlike the case with textual records, almost all social elements leave some recoverable trace in the archaeological record (although non-sedentary pastoral groups are very difficult to detect). However, these physical traces are often subject to a much wider range of intepretations than textual records.

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[10] School exercises were found by Mallowan in the private houses of Area ER at Tell Brak (D. Oates and J. Oates 2001:32). Scribal "schools" in domestic structures are also well documented in Old Babylonian Ur (Charpin 1986:420-486) and Nippur (Stone 1987:56-59).

The most significant limitation is one that is not unique to survey but central to all archaeological assemblages. Whereas epigraphers have chronologically sensitive tools such as paleography, prosopography, and sometimes even historical calendar datings at their disposal, archaeologists rely on relatively dated sequences of various types of material culture, often exclusively ceramics. Ceramics are not very chronologically sensitive, and they have never evolved in tandem with the political events which define the Mesopotamian historical chronology. The excavations at late third and second millennium Tell Brak and Tell Rimah, where dated tablets and historical inscriptions have been found in close association with ceramics, have demonstrated that few if any ceramic types can be limited to a single historically defined period (Oates, *et al.* 1997, 2001; C. Postgate, *et al.* 1997). Potters were probably part-time craft specialists who were unattached to elite political institutions; as such their products are unlikely to reflect political changes (Stein and Blackman 1993; Steinkeller 1996).[11]

Relative dating methods face an additional problem when ceramics are found in surface assemblages. In excavated contexts, the archaeologist can make use of diachronic fluctionations in type frequencies through stratified deposits, but the sherds which comprise a site's surface assemblage have gone through multiple post-depositional transformations which make type frequencies very difficult to interpret; sherds of all periods of occupation are combined in a single surface unit (Lewarch and O'Brien

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[11] There are considerable differences in ceramic repertoires between the western, central, and eastern zones of the Upper Khabur basin throughout the third Millennium BC (Lebeau 2000). Even when forms are distributed across the entire basin, there are differences in opinion regarding dating. For example, the recessed-rimmed tall beaker is an Akkadian (EJ IV) diagnostic at Beydar (Lebeau 2000: 177) but a Post-Akkadian (EJ V) type at Brak (Oates 2001b: 193-94). See Ur (2002a:70-71) on the difficulties involved in distinguishing ED III and Akkadian ceramics in surface assemblages.

1981:316-317).

For these reasons, the Period 07 sites around Beydar cannot be dated as precisely as the excavated strata at the site itself, particularly those strata featuring tablets. The textual records give a "snapshot" of the economic workings of an administrative institution at Tell Beydar, whereas the archaeological survey (Chapter 4.3) has revealed a palimpsest of settlements built upon settlements. Some of these settlements may be contemporary with the Beydar tablets but some might just seem contemporary because the span of their pottery surface assemblage includes the era of the Beydar tablets, but could be from an earlier or later time.

A final issue to bear in mind when intepreting survey data is how we judge the political and economic "importance" of a site. In other geomorphological contexts, material traces of ancient political power such as palaces, temples, and ritual spaces are visible without excavation, allowing a plausible political hierarchy to be reconstructed from survey data alone (for example, Montmollin 1989 on the Maya); such is not possible on the plains of northern Mesopotamia, where mudbrick palaces erode just the same as humble dwellings.[12] As a result, this and other studies of Near Eastern archaeological survey data have relied disproportionately on the size of sites to serve as the primary indicator of importance. In an economic sense, this practice is generally justified; large sites had larger populations which would have required more provisioning

[12] See, however, the attempt of Jan-Waalke Meyer (1996) to use, in addition to site size, the presence of a city wall and an acropolis as morphological indicators of sociopolitical rank. I find this approach unconvincing, since city walls cannot always be recognized without excavation, and known political capitals (e.g. Tell Brak) can be unwalled. Furthermore, a central high mound ("acropolis") is generally the unintentional result of hundreds or thousands of years of continuous human settlement in a single space, rather than the product of deliberately motivated political action.

than villages. However, it is an oversimplification to assume that small sites were politically unimportant. Chagar Bazar was a mere 12 ha in the early second millennium, but it served an important administrative function in the kingdom of Shamshi-Adad (Talon 1997). The 5 ha site of Sabi Abyad was the site of a Middle Assyrian fortress and agricultural estate on the empire's western frontier (Wiggermann 2000). Tell al-Raqa'i on the Middle Khabur was only 0.5 ha in the early third millennium but has monumental architecture which may have served as a center of agricultural surplus storage and shipment (Schwartz 1994b; see critiques in Hole 1991; Pfälzner 2002). On size criteria alone, none of these sites would have warranted undue attention from archaeologists.[13]

6.3.2. The Archaeological Hierarchy.

Within the 452 km^2 survey region, the Tell Beydar Survey (TBS) recovered seventeen sites for a total of 65.8 hectares of settled area in the mid to late third millennium BC (Fig. 5.21 and Table 6.1; see Chapter 4.3). At the apex of the TBS settlement hierarchy is of course Tell Beydar (ancient Nabada) itself at 22.5 ha. This topographically complex Kranzhügel ("wreath-shaped") site consists of a 9.6 ha central acropolis and a 7.4 ha mounded outer wall for a total of 17.0 ha of settled space. A backhoe section through the northern portion of the 5.5 ha internal circular depression revealed a sequence of thin lenses of water-laid clay to a depth of at least 4 m (Suleiman 2003), which suggests that this area was seasonally flooded and unlikely to have been used for residential purposes. When one considers that a substantial part of the central

[13] In fact, Chagar Bazar was chosen for initial excavation by Mallowan precisely *because* it was smaller, and therefore more manageable, than Tell Brak (Mallowan 1977:125).

acropolis was occupied by a public building which included at least three temples and several storage units, it appears that the residential population of Nabada may not have been substantially greater than some of its spatially smaller neighbors.

Three sites clustered in the general range of 7-9 ha (Effendi, Hassek, and Farfara), and five clustered around 2.5-4 ha (Sekar Foqani, Jamilo, Sekar Tahtani, Rajab, and Gir Daoud). At the base of the hierarchy were eight small villages or hamlets, all less than 2 ha.

It is possible to sketch mid-late third millennium BC settlement in the region beyond the boundaries of the 12 km radius which arbitrarily defined the limits of the Tell

Settlement Type	*Site Name*	*Period 07 Site Size*
Provincial Capital (> 15 ha)	Tell Beydar (TBS 1)	17.0 ha
Town (ca. 7-10 ha)	Tell Effendi (TBS 55)	8.5 ha
	Tell Hassek (TBS 43)	7.4 ha
	Tell Farfara (TBS 52)	7.1 ha
Village (ca. 2.5-4.0 ha)	Tell Sekar Foqani (TBS 39)	3.9 ha
	Tell Jamilo (TBS 59)	3.8 ha
	Tell Sekar Tahtani (TBS 41)	2.7 ha
	Gir Daoud (TBS 35)	2.5 ha
Small Village/Hamlet (<2 ha)	Tell 'Aloni (TBS 60)	1.8 ha
	Tell Rajab (TBS 4)	1.7 ha
	Tell Ghazal (TBS 63)	1.4 ha
	Tell Kaferu (TBS 10)	1.2 ha
	Tell Ghazal (TBS 37)	1.2 ha
	Tell Sekar Wastani (TBS 40)	1.2 ha
	Bergui al-Buz (TBS 22)	1.1 ha

Table 6.1. Archaeological settlement hierarchy in the TBS area. Site size refers to the spatial extent of surface sherds dating to Period 07 (EJ III-IV), based on controlled site collection.

Beydar survey area (Fig. 5.26). Immediately to the south, salvage excavations at Tell Kashkashok 3 (4.2 ha), Tell Abu Hujayra (2.4 ha), and Tell Abu Hafur (2.0 ha) have documented other contemporary villages and hamlets (summarized in Martin 1998).[14] Just beyond the edge of the TBS are the important sites of Tell Hanou (6.4 ha), Tell Bati (6.6 ha), and Tell Aswad Foqani (6.6 ha). Further toward Brak and Mozan are the important but unexcavated sites of Tell Bazari (8.0 ha) and Tell Cholma Foqani (22.2 ha). Sites are smaller and less frequent in the western basin, on the opposite side of the basalt plateau. However, there are several substantial tells in this area, including two sites larger than 20 ha on the Syrian-Turkish border.[15] However, only one other site exceeds 10 ha (Tell Abu Rassine); the others cluster around 1-2 ha.

Almost all of the Period 07 sites in the TBS area and in the Upper Khabur basin in general are associated with broad hollow ways (see Chapter 5.3-5.4). These features often radiate out from tells in a spokelike pattern, and are best interpreted as the traces of the ancient roads which conducted human and animal traffic between settlements and to and from fields and pasture (Van Liere and Lauffray 1954-55; Wilkinson 1993; Ur 2003). The distribution of hollow ways in Fig. 5.26 approximates the road network in the time of the EJ IIIb Nabada archives (i.e., Period 07, mid-late third millennium BC). As physical traces of the movement of farmers, herds and herdsmen, traders, and kings, they are important for understanding both the subsistence economy and political economy of the

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[14] The measurements in this paragraph are the result of a GIS-based assessment of CORONA satellite photographs of these sites and have not been confirmed by ground observation or formal site collection and recording.

[15] The westernmost (30 ha) is called Tell Chanafes on Moortgat-Correns' map of the Jazira (1972: Karte II). Both appear to have *Kranzhügel* morphology, based on CORONA satellite photographs.

Kingdom of Nagar.

6.3.3. The Hinterland of Tell Beydar and the "Province " of Nabada.

There are two major difficulties for synthesizing the archaeological and epigraphic record of the Beydar/Nabada region. The first is the pressing issue of contemporaneity. The workforce and agricultural accounts indicate that at least thirteen settlements (including Nabada itself) were administered by the institution at Nabada. An additional nine settlements are mentioned in contexts which are less clear; therefore we estimate that between thirteen and twenty-two settlements were within the province. Were all fifteen (or twenty, if the proposed semi-permanent occupations are counted) Period 07 sites in the TBS area occupied at that time? Given the problems of relating ceramic sequences to a historical chronology and the specific problems of the Khabur sequences, we cannot be certain that the "snapshot" created from the tablets is comparable to the palimpsest revealed by the TBS.

The second major difficulty is the uncertain size of the "province" of Nabada. For example, if the Period 07 sites are all contemporary with the tablets, then the province, with a minimum of thirteen settlements and a likely maximum of 22, may be even smaller than the surveyed area. On the other hand, if the archive does not record *every* town and village in the province (i.e., it selectively mentions some places but not others), then the province could be larger than the surveyed region. Given the small labor contributions of (or expenditures to) some settlements in the texts, it appears that even the least populous hamlets in the area were part of the administrative reach of the Nabada officials; therefore we assume that the tablets do reveal a reasonable approximation of the number of settlements within Nabada's administrative purview.

Using the textual material from Beydar/Nabada and archaeological survey data from the TBS area and the basin in general, we can arrive at an estimation of the size of the "province" of Nabada. Fifteen permanent Period 07 sites were found in the 452 km^2 TBS region, for an average of 30.1 km^2 per site (or 21.1 km^2 per site if we subtract the 136 km^2 of basalt plateau).[16] These figures agree with Wilkinson and Tucker's (1995) mid-late third millennium settlement density from the Iraqi North Jazira (20 sites in 475 km^2 for an average of 23.8 km^2 per site) and a sample area in the central Khabur basin between the Wadi Aweidj and Wadi Khanzir (38 tells in 875 km^2 for an average of 23.0 km^2 per site). If we assume an even 23.0 km^2 per settlement, Nabada province would have covered between 299 km^2 and 506 km^2, if it contained thirteen and twenty-two settlements, respectively.[17]

Nabada province was thus roughly equal to, or slightly smaller than, the size of the TBS area. This is not to say that the TBS area is spatially coterminous with Nabada province, only that the arbitrarily defined survey region contains roughly the same number of Period 07 sites as our higher estimate of the number of settlements administered by Nabada.

The textual and archaeological settlement hierarchies correspond fairly well

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[16] If the five semi-permanent occupations are included, these numbers would be 22.6 km^2 per site and 15.8 km^2 per site, respectively.

[17] Assuming the lesser density (26.6 km^2 per site), Nabada province would have been between 345.7 and 585.0 km^2; assuming the greater density (18.6 km^2 per site), it would have been between 241.7 and 409.0 km^2.

(Table 6.2). While Nabada was a unique administrative center, Beydar is uniquely large in the TBS area, being more than twice the size of the second largest site. Ishgar and

Rank	*EJ IIIb Textual Hierarchy*	*Period 07 Archaeological Hierarchy*
1	**Nabada** (provincial "capital": unique administrative center	**TBS 1 Beydar** (largest site; twice as large as any other site in TBS)
2	**ANmaLum** and **Ishgar** (administrative sub-centers)	**TBS 55 Effendi**, **TBS 43 Hassek**, **TBS 52 Farfara** (all larger than 7 ha)
3	Many settlements which contribute and receive less; **SuLum** and **Akhutu**	Many small settlements; four sites 2.5 ha or larger (**TBS 35**, **39**, **41**, **59**)

Table 6.2 Comparison of textually-based and archaeologically-based settlement hierarchies.

ANmaLum serve as administrative sub-centers; Tell Effendi, Tell Hassek, and Tell Farfara (between 7 and 9 ha) are all at least twice the size of the sites of the third rank.

Thus far we have considered the archaeological hierarchy of the TBS area from the criterion of size alone. An alternate approach is to consider the intensity of human movement associated with these sites, in the form of archaeologically attested hollow ways. These tracks are generally found in radial patterns which often terminate without connecting to another site, presumably marking the traffic to and from a settlement's agricultural fields and the pasture beyond them. Other intersite hollow ways represent local movement of surplus agricultural production, interregional trade in manufactured and luxury goods, and social and political movement for various reasons, including the visits of the en of Nagar to the towns under his control, as documented in the Nabada archive. A site with a strong radial pattern and abundant interconnections with surrounding sites was probably an economically productive site with possible administrative functions.

The sites with the greatest numbers of associated hollow ways tend to be the largest sites (Table 6.3); for example, the two largest, Beydar and Effendi, have the most roads, in both quantity and aggregate length. However, the hollow way hierarchy diverges from the size hierarchy in several interesting ways. Tell Effendi has an elaborate radial network, with more preserved hollow way distance than Beydar itself.[18] On the other hand, the large town of Tell Farfara (7.1 ha) can be associated with only one eighth the quantity of hollow ways as the similarly sized Effendi. This discrepancy suggests that population alone (as derived from site size) cannot explain the presence or absence of elaborated networks; Farfara was probably not a significant center of agricultural production or administration. The other TBS sites on the western side of the Ardh al-Shaykh are also associated with few hollow ways, a pattern seen throughout the entire western basin, which suggests that real differences in economy may have existed between the western and central-eastern parts of the Upper Khabur basin.

Site	*No. HWs*	*Total Len (m)*
55	21	44,773
1	26	30,075
59	18	26,404
22	11	17,455
43	14	15,224
4	13	14,230
60	13	11,883
35	5	10,042
10	5	8,483
37	6	8,135
41	6	7,994
39	5	6,864
40	6	6,830
63	3	2,786
52	4	2,345

Table 6.3. Period 07 sites and associated hollow ways in the TBS area.

The identification of Beydar with ancient

[18] This discrepancy may be because Beydar is so close to the Ardh al-Shaykh, a broad basalt plateau with thin unproductive soils; this area probably served as pasture where movement was unconstrained by agricultural fields, and therefore hollow ways may not have formed. The issues of hollow way feature preservation have been discussed at length in Chapter 5.3.

Nabada is strong, but any other proposed correlations of textually attested settlements with archaeologically known sites are highly speculative at this point. It is most tempting to suggest locations for Ishgar and ANmaLum at Hassek and Effendi, respectively, as both were large and closely connected to their satellites via roads. The en of Nagar visited ANmaLum but not Ishgar, so it may be that ANmaLum was on the route between Nagar and Nabada but Ishgar was not. On the other hand, sites of similar size and with elaborate preserved radial road networks exist just outside the eastern TBS limits at Tell Bati and Tell Aswad Foqani (both 6.6 ha and with 30 or more associated hollow ways); these sites were equally on the road to Nabada. SuLum was a religious center whose god lent his name to one of the months of the local calendar. We might therefore expect to locate SuLum at a site with a long history of continuous settlement up to the EJ IIIb period; unfortunately no less than eleven of the fifteen Period 07 sites in the TBS area were occupied in both the mid-late fourth and third millennia BC. Clearly more textual data is needed before even the most tentative identifications for Nabada's dependent settlements can be proposed.

On a more general level, we can make some broad statements about the Nabada area. Demographically, it probably carried a relatively low population: 6,000 to 13,000 persons, and certainly closer to the low end of that range, with 1,000 to 2,000 residing at Nabada itself.[19] Unfortunately, the labor accounts from Beydar are too fragmentary to allow further demographic estimation, but it is clear that relatively small numbers of

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[19] These figures are based on an estimate of 62.1 hectares of settled area and between 100 and 200 persons per hectare of occupied site. Since 62.1 ha includes EJ III and EJ IV, total settled area for either period was surely lower. The lower population estimate for Beydar/Nabada takes into consideration the large official complex on the central tell, which was mostly non-residential.

persons are involved. However, the need to move agricultural labor is in itself interesting. Labor was one of the major limiting factors in the extensive third millennium dry-farming economy (Wilkinson 1994). Since a large part of Nabada was either a seasonally flooded depression or was occupied by non-residential institutional buildings such as palaces, temples, and storerooms, its residential population may have been low; such imported labor may have been a prerequisite for fully utilizing its agricultural hinterland.

Spatially the province was small as well, probably less than a day's walk from Nabada to its farthest dependent settlement. The importance of animals in the tablets accords well with the Beydar hinterland; the Ardh al-Shaykh and the high inter-wadi ground to the east of the Aweidj floodplain would have been of low value for cultivation but an excellent pastoral resource. In particular, the well developed set of hollow ways leading from Tell Jamilo (TBS 59) up onto the plateau to its west (Fig. 5.21) suggests that the settlement may have been heavily involved in animal production.

6.3.4. The Geographic Extent of the EJ IIIb Kingdom of Nagar.

According to lists of metal expenditures from the palace at Ebla, Nabada was only one of at least seventeen towns within the kingdom of Nagar (Archi 1998). A plausible identification can be made of *Da-ti-um*^{ki} from the Ebla texts with Tadum in the Akkadian period workforce list from Tell Brak (Eidem, et al. 2001) and Mittani period Ta'idu; these place names are probably to be associated with modern Tell Hamidi, on the Jaghjagh roughly 15 km upstream from Brak (Wäfler 1995). The Ebla texts' *Ga-ga-ba-an*^{ki} is probably Kakkaban, also known from the same Akkadian list and almost certainly to be connected with the modern Jebel Kaukab, an extinct volcano east of Hassake at the confluence of the Khabur and Jaghjagh Rivers (Catagnoti and Bonechi 1992; Eidem, et al. 2001). A likely location of this town would be at one of the larger sites in its vicinity, such as Tell Aswad (8.7 ha) to the northeast or Tell Bazari (8.0 ha) to the northwest.

In all probability, these towns were at one time small neighboring polities that were subsumed into the expanding Nagar state. As such, the persons from these towns who received gifts of metals and other luxuries from the Ebla state should probably be viewed not as "officials" appointed by the en of Nagar as provincial governors but as minor rulers, local shaykhs or lineage heads who had been co-opted into the administration of the Nagar state but still maintained a considerable local autonomy, to the extent that they could directly receive gifts from a foreign ruler, rather than such gifts being centrally redistributed from Nagar by the en. The tribal nature of these towns can be seen in the frequent GN ending *–ium*; place names such as this, formed out of personal names, suggested to Archi that the Upper Khabur basin was characterized by both small states and tribal groups in the Ebla period as in the second millennium (1998: 8). Rather than a centralized political unit in the model of the later Akkadian or Ur III states, Nagar was probably a loose confederacy of small polities (some perhaps even semi-sedentary) with Nagar at its head.

With this confederacy model in mind, the province of Nabada was probably typical of the other small polities which now comprised the administrative units of the kingdom.[20] If we apply the simple square kilometer-to-settlement ratio we developed for the Nabada area to the entire kingdom of Nagar, we could arrive at a rough hypothesis for the scale of the state. Assuming that each of the eighteen "provinces" of Nagar (the seventeen mentioned in the Ebla texts plus Nagar itself) administered thirteen to twenty-two towns and villages as did Nabada, then the kingdom would have contained 234 to 396 settlements. This results in a total territory of 5,382 to 9,108 km^2, assuming 23.0 km^2 per settlement.

If such territorial areas are mapped as circles with Brak/Nagar at the center, the lower estimate would stretch from Beydar to the Radd marsh area, and the upper estimate would reach beyond Mozan[21] and Leilan (Fig. 6.1 solid lines). However, these territorial estimates assume a geomorphologically, economically, and politically flat landscape, which was not the case. Since neither Urkesh nor Shekhna are listed as dependencies of Nagar in the Ebla metal expenditure accounts, these large cities probably controlled independent polities in competition with Nagar (Archi 1998: 3). Similarly, Tell Chuera has been identified with the town of Abarsal in the third millennium (Archi 1998: 4; see also Archi 1989 and above), which was an independent kingdom in its own right and not part of the Kingdom of Nagar. Whether this identification is correct or not, at more than 60 ha Tell Chuera was certainly a significant economic power if not an independent political one. Together, Mozan, Leilan and Chuera present rough limits on the area

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[20] The most important provinces, and probably also the largest, were the three whose centers were listed with ens in Ebla's annual metal accounts: Shabartium, Abulium, and Asha.

[21] It is possible that Tell Mozan had a different, presumably Semitic, name in the EJ III period, and assumed the Hurrian name Urkesh with the arrival of a population with a Hurrian onomasticon in the late Akkadian period.

controlled by Nagar. By applying a simple Voronoi tesselation spatial allocation (Wheatley and Gillings 2002:149-151) to all of the major third millennium urban centers, we can propose a speculative divison of a large segment of Northern Mesopotamia into states (Fig. 6.1, dashed lines). This map serves as only a heuristic device, a rough idea of what these polities *may* have looked like if distance were the sole factor.[22]

A more useful approach is to map out the estimated territory of Nagar while respecting the basin's geomorphology as well as the probable territories of neighboring polities. Using the Voronoi Tesselation of Fig. 6.1 as a guide, the kingdom of 5,382 km^2 would have included the entire central basin and Middle Khabur valley, as well as the Ardh al-Shaykh plateau and slightly beyond (Fig. 6.2). The boundaries between Nagar and the territories of Mozan and Leilan would have been in the regions of Chagar Bazar and Tell Farfara, respectively. Our upper estimate of 9,108 km^2 would require an expansion of this area, perhaps farther up the Jaghjagh and encroaching on the territories of Urkesh and Shekhna as well as west toward Chuera and including the *Kranzhügel* sites on the south slopes of the Jebel 'Abd al-Aziz.

Obviously such territorial assignments are highly speculative, being based on a number of suppositions, some of which may be disproven with further research. Indeed, a polity as a sharply bounded geographic unit is a modern concept which would have been anachronistic in the third millennium BC, where other factors such as distance or travel time may have been more significant. However, these hypothetical territories do demonstrate the rather small size of the Nagar kingdom and give us an idea of the scale

[22] For a similar approach, see Weiss (1992a), to which can now be added Hamoukar and Tell al-Hawa.

of these early urban states. Their uncertainty highlights directions for further archaeological and historical research, particularly regarding the political and cultural sphere of the *Kranzhügel* settlements, the location and extent of the Abarsal polity, and the Middle Khabur zone of contact between Mari and Nagar.

As with our Nabada province, we can draw some very generalized conclusions about the demography and economy of the Nagar state. If we derive a figure for settled ha per km^2 from the TBS area and apply it to the estimated territory of Nagar, we could estimate an overall population of between 100,000 and 275,000 persons.[23] The Beydar region was probably settled less densely than northern parts of the territory with higher annual rainfall, and along the banks of the perennial rivers where irrigation may have been practiced; on the other hand, it was probably more densely populated than the western basin and the dry areas on the flanks of the Jebel 'Abd al-Aziz, so our estimate can serve as a coarse average.

The regular pattern of radial roads around tells on the plain between the Wadi Aweidj and the Jaghjagh River suggests that the core of the Nagar kingdom was characterized by extensive and sustained agricultural production (see Chapter 5.4 and Ur 2003), which lends further support to the earlier models of Weiss (1986) and Wilkinson (1994). However, the western basin and the 'Abd al-Aziz areas were less densely settled with far fewer hollow ways; pastoral production may have been a more important part of

[23] As with our demographic estimates of the Nabada area, these figures are based on 100 to 200 persons per hectare. In the future it should be possible to develop estimates based on more sophisticated demographic models of the ancient Near Eastern household (Schloen 2001:117-33) in combination with the results of broad exposures of third Millennium residential quarters, such as at Raqa'i (Schwartz 1994b) and Melebiya (Lebeau 1993).

the economy in these parts of the kingdom (Kouchoukos 1998).

Although only in the form of terse fodder distribution accounts, the Ebla and Beydar tablets allow us to imagine the en of Nagar and his retinue proceeding from town to town within his domain, stopping at various settlements along the way in order to visit small shrines and to cement the personal ties of loyalty with local elites, upon which the cohesion of his kingdom was based. We can see this movement in the surviving traces of intersite hollow ways. Despite its importance, there is no direct road from Nagar to Nabada, or to any of the other large contemporary sites. A traveler would have to cross the plain by moving from settlement to settlement. These patterns are indicative of the development of locally cohesive settlement systems; the en, based at Nagar, represented a final and possibly short-lived top layer of political control which had to respect pre-existing road networks and, more importantly, the agricultural systems and social networks that produced them.

Our reconstruction of the kingdom of Nagar has implications for its neighboring polities as well. The agricultural territories of Mozan, Leilan, and Hamoukar would have been constrained by the Tur Abdin foothills to the north and the Nagar kingdom to the south. These are, however, some of the wettest parts of the basin, and may have been able to support a denser population through greater agricultural yield. The nature and intensity of interaction with the foothills is a further question to be answered.

CHAPTER SEVEN:

CONCLUSIONS: POLITICAL AND ECONOMIC DECENTRALIZATION IN EARLY STATES IN THE UPPER KHABUR BASIN

This study has reviewed the archaeology of the Upper Khabur basin in the third millennium BC and the two most developed models for the development and operation of urban settlement systems. New data has been presented for one of the largest of these cities (Hamoukar) and for an important secondary center (Beydar), and their landscapes have been documented and analyzed. This chapter will present a final evaluation of the Centralized State Model (CSM) and the Dynamic Structural Model (DSM) in light of these data. In conclusion, I will propose a new model of the urban states of the Upper Khabur basin, based on Wilkinson's economic model of dry-farming states and Schloen's social model based around patrimonially organized households.

7.1. The Limits of Political and Economic Control

The CSM assumes that political expansion was based on a desire to control the production of agricultural staples, such as wheat and barley; control of labor was also a goal, but for the ultimate purposes of furthering agricultural production. In the case of the indigenous states of the mid-third millennium (EJ III), these products were redistributed locally in the form of rations to the bulk of the population, but they also were used to support the political elite and associated specialists (priests, administrators, manufacturers of prestige goods, etc.). With the Akkadian conquest, control of agricultural production remained the primary goal of the state, but now with the intention of using it to support populations in distant southern Mesopotamia. The CSM envisions an Akkadian state even more powerful and centralized than the indigenous polity (or, more likely, polities) that it replaced: it was able to relocate entire settlements in order to monitor them more closely, and could compel the population to intensify their production of staples. The agricultural labor force which bore the brunt of these demands presumably did not benefit from the expansion of surplus production, since it was being exported for consumption elsewhere.

On a theoretical level, the assumption of easily maintained centralized political control in this and other models with a basis in ecosystems theory has been critiqued (see Chapter 1). States are not smoothly running homogenous entities; they exist, often rather temporarily, as fragile agglomerations of groups with competing interests (e.g., Brumfiel 1992). They are therefore based to a far greater extent on consensus-building between rulers and local elites and lineage heads than has been appreciated. Michael Dietler has stated succinctly how it is often assumed that

> … once symbols of political power and status have been 'materialized' and authority has become institutionalized, that somehow stability and permanence have been achieved and the work of relational micro-politics is made redundant and unnecessary. This is, of course, the dream and the ideological projection of every state apparatus: a kind of institutional fetishism that displaces contingent relations between people into stable relationships between people and

> permanently reified 'objects.' But nothing could be farther from the truth. The nasty little secret of history is that states and empires are very fragile, volatile, and transitory—far more so than their buildings and monuments. They are a fluid *process* rather than a durable thing, and they depend on constant hard work in the micro-political struggles of negotiation and legitimation to survive and operate (Dietler 2003:271-272; emphasis in original).

These generalizations make the draconian productive demands on agricultural producers and their tolerance of involuntary relocation proposed by the CSM highly unlikely without robust archaeological data to support them.

Furthermore, centralized control is rarely if ever invariable throughout the geographic extent of a polity. Under pre-Iron Age technological conditions and military organization, the degree of political and economic control wielded by ruling institutions diminished with distance from the state's core territory (Stein 1999). It is therefore unlikely that the Akkadian conquerors, being based 600 km away in southern Mesopotamia, would have been able to control the Upper Khabur basin without considerable accommodation to preexisting local elites.

On the basis of these theoretical critiques, it would seem highly unlikely that ancient states would operate in the exploitative manner proposed by the CSM. Even the Ur III state, perhaps the pinnacle of centralized control in Mesopotamian history, loosely controlled many of the industries under its administrative purview (e.g., Steinkeller 1987b, 1996). It frequently relied on local lineages to administer dependent institutions, cities, and provinces (Hallo 1972; Steinkeller 1987a; Zettler 1984); some of these persevered after the collapse of the state itself (Zettler 1987; Reichel 2000). It would be expected that less obviously centralized polities would have an even broader kinship basis for political control, at least at the local level; in southern Mesopotamia, recent syntheses suggest that such was the case (e.g., Stone 1995, 1997).

Setting aside these theoretical issues for the moment, how does the CSM fare against the archaeological data in northern Mesopotamia? In Section 1.9, I proposed three primary archaeological criteria for centralized control of agricultural staples by ruling institutions. The first and most visible in the archaeological record was the architecture of storage in association with such institutions: storage facilities in palaces or temples. These certainly did exist in antiquity, for example the extensively replicated long magazines found in pharaonic mortuary temples in Egypt (Kemp 1989) or the Inca state facilities (D'Altroy and Earle 1985). Despite an archaeological dataset heavily biased toward monumental structures in northern Mesopotamia, there appears to be very little unequivocal evidence for centralized storage on the scale envisioned by the CSM. At Tell Brak, the capital of the indigenous kingdom of Nagar, several hybrid temple-administrative structures have been unearthed (Oates and Oates 1989; Oates, et al. 2001; Emberling and McDonald 2003). Some of their rooms certainly served a storage purpose, but their size suggests the scale of a large institution, not an entire city. The proposed cereal storage facilities at Tell Leilan are also of rather limited scale (200 m^2). Although they have not been published in plan, the extant photograph (Weiss 2003: Fig. 23) shows a clear hearth in the center; an alternative interpretation of this structure as domestic is therefore plausible (see Chapter 2.6).

Two other possible storage structures are more difficult to interpret. The first is the famous Naram-Sin "fortress" at Brak (Mallowan 1947), a large structure with long and narrow rooms around a series of courtyards. Unfortunately it was preserved almost entirely as foundations, rendering the interpretation of room function difficult. The other is the linear structure excavated in Chantier E at Tell Beydar (Sténuit 2003). Its substructure consisted of parallel narrow mudbrick features reminiscent of the "grilled" storage facilities of the Ninevite 5 period and earlier (Akkermans and Schwartz 2003:218-219). However, like the Naram-Sin structure, it was found entirely devoid of contents, including traces of cereals. Furthermore, although located on Beydar's central mound, it was not in direct association with the palatial structure in Area F. A mention must be made of the "Royal Storehouse" in Area AK at Tell Mozan (Buccellati and Kelly-Buccellati 1995-96, 1996); its storage function appears to be derived from the clay sealings found within it, rather than architectural evidence. While some commodities were certainly stored, we cannot be certain of their identities; perhaps they were more high-value prestige items rather than bulk cereals. It is possible, of course, that despite extensive excavation of large institutions, archaeologists have by chance failed to uncover storage depots, but at our current state of knowledge, there appears to be no unequivocal evidence for state-controlled centralized storage.

Some textual evidence exists for the second criterion, administered redistribution of staples in the form of rations. The issuing of rations to dependent laborers (or, alternatively, household members) is well known from many periods in southern Mesopotamia (Gelb 1965), and the Beydar tablets also record monthly payments to individuals which are in line with monthly quantities seen in southern Mesopotamia (Sallaberger 1996b). Large institutions therefore did control and redistribute cereals to household members, but it is increasingly clear that these rations were by no means their only income, and that their involvement with these households was of limited duration during the year (Postgate 1992:237-240). In other words, their level of dependence on such institutions was far from complete.

The archaeological evidence for such centralized redistribution is, however, susceptible to multiple interpretations. The CSM has revolved around the interpretation of the "sila bowl" (Senior and Weiss 1992; see also Chapter 2.6). Based on an analogy with the bevelled rim bowl of the fourth millennium (most recently discussed in Pollock 1999:94-95; 2003), proponents of the CSM see the standardization of production and volume capacities as indicators that these were used for the distribution of measured quantities of cereal rations to dependent labor (e.g., Weiss and Courty 1993; Weiss, et al. 1993). While there did exist great chemical and morphological standardization within firing batches (in the form of stacked kiln wasters), this was not the case when comparing individual samples from different production events; standardization is a result of organizational changes in manufacture as ceramic production became more intensified in the mid-third millennium (Blackman, et al. 1993; Stein and Blackman 1993). When archaeological contexts are available for these bowls, they appear in reception rooms of small households, which supports their interpretation as serving vessels (Ur and Colantoni in preparation). Ultimately, the archaeological and epigraphic data used to demonstrate the centralized distribution of rations to dependent laborers remains ambiguous.

The final archaeological criterion for strong central control of the staple economy is evidence for centralized promotion of and control of the intensification of production.

It has been proposed that the Akkadian rulers had the wadi courses straightened around Leilan, which would have "prevented wasteful, if not destructive channel meandering" (Weiss and Courty 1993:141), but it is not clear how this would have benefited intensified agriculture. On the other hand, a combination of excavation data and the landscape evidence presented in Chapter 5 suggests exactly the opposite, that the organization of intensification was undertaken at the level of the individual household, without any input of materials by rulers. The source of the motivation to intensify is very difficult to establish with archaeological data alone, but when interpreted within the framework of the Patrimonial Household Model, it can be proposed that each household had a strong motivation to increase its own cereal yields and animal holdings.

The archaeological data used to support the CSM is ambiguous, and its interpretation toward that end rests upon the *a priori* acceptance of a theoretically questionable understanding of the way state political structures were maintained. These same data can be used to support a new model based on the nested households organized on personal relationships couched in kinship terminology proposed by the PHM, and on the organization of cereal production and land use specified by the DSM.

7.2. The Household Basis of Social Organization in Northern Mesopotamia

The emic understanding of large institutions as households is apparent through the lack of specific terms for the palace or the temple (Gelb 1979). In Sumerian, the term translated as palace is é.gal, literally "great house," and the term translated as temple is é-DN, “house of DN” (where DN is the name of the deity to whom the temple is dedicated). The same lack of distinction is also apparent in the unrelated Semitic dialects of northern Mesopotamia.

This household model has archaeological support as early as the fourth millennium BC. The difficulty in categorizing large structures as temples or palaces mirrors the linguistic utility of the term é, "house" or “estate.” At Uruk, the Eanna area is known to have been a religious precinct based on epigraphic materials from the late third to mid-first millennia BC, and the excavators have assumed that its sacred nature extends back to the fourth millennium, when that part of the site contained massive tripartite buildings that they have interpreted as temples. However, these buildings differ only in scale and elaboration from smaller domestic structures found at other sites where residential areas have been excavated (Nissen 1988:98-99). These include, for example, Habuba Kabira , Brak TW (most recently, Emberling and McDonald 2003), and Hamoukar Area B (Gibson, al-Azm, et al. 2002). David Oates (1987) noted the difference between elevated Uruk temples, such as those at Uruk (Anu temple), Eridu, Jebel Aruda, or Tell Brak, and temples with similar ground plans but not constructed on high terraces, such as those in the Eanna precinct at Uruk. I would propose that the former, which tend to have podia within them, were temple households, whereas the latter were simply elite households. The main point is not to resolve this issue but to note that the difficulties in addressing it stem from the anachronistic assumption that divine and human houses were conceptually different, rather than just different in scale and ornamentation.

By the time of the urban centers of the mid- to late third millennium in northern

Mesopotamia, temple architecture does differ from that of non-divine households, but these temple complexes contain elements of domestic households, particularly in the realm of food preparation. For example, the Area SS complex at Brak has a monumental temple with what appears to be a typical (albeit large) courtyard house abutting it to the west and within the complex (D. Oates and J. Oates 2001:88-90, Fig. 91). In locus 4 was found a large oven. The slightly earlier monumental complex at Area TC has no obvious temple elements thus far in the excavations, but its scale makes it clear that it was a large institutional household (Emberling and McDonald 2003:37-41). Again, domestic facilities for storing and grinding grain and baking bread were uncovered; a pile of grain was even in the midst of a final cleaning at the time of the fire that destroyed the complex (Emberling and McDonald 2003:39). Although the excavators see production at a supra-household level in TC, there is no evidence of bulk cereal storage. It appears that these large households, whether conceived as the household of a god or the household of an important lineage head, were involved in basic economic activities for the benefit of their dependents (perhaps better phrased as household members).

The emergent epigraphic evidence for a socioeconomic organization based on the PHM in the Upper Khabur basin is not as robust as at Ebla (see Schloen 2001 and Chapter 2.7), but is highly suggestive. At present, it derives almost entirely from the Beydar tablets (Ismail, et al. 1996; Milano, et al. 2004). A traditional interpretation of the tablets found at Beydar might show a local provincial government closely administering labor, distributing rations, and closely supervising herds. A broad degree of control could be interpreted from the fact that Sallaberger's calculations from the personnel lists, in conjunction with archaeologically-derived population estimates, appears to suggest that the entire population of Beydar fell within the administrative purview of the institution that produced the tablets (Sallaberger and Ur 2004:58-59).

However, the degree to which the main institution at Beydar controlled the economic lives of these individuals is entirely unstated in the tablets, and an organization along the lines of the PHM is possible. The tablets mention no local ruler, but five "officials" (ḪALti, Arrum, Tablaʹalim, Arši-aḫu, and KUR-ilum) reappear frequently in the documents (Sallaberger 1996b). Although they are labeled as officials in the Beydar tablet publications, they are never given titles in the tablets themselves, despite their obvious importance. From the perspective of the PHM, this would suggest that their positions did not result from appointment to "offices" which existed independently of their office holders, but rather owing to their social status, resulting from kinship and presumably a lifetime of political negotiation and interaction. As an alternative to office-holders, they should be viewed as lineage heads or patriarchs of major family groups living at Beydar.

Elsewhere, where Schloen has described Bronze Age patriarchal household societies, there has been an apical ruler whose household was considered to encompass the entire polity; such a figure is missing in the Beydar tablets. Several explanations for this situation can be offered which are firmly within the PHM. Perhaps Beydar was ultimately ruled through the consensus of these five individuals, the “assembly” (unken) with which the ruler of Nagar occasionally met on his visits. Alternatively, the possibility remains that in the brief moment in time in which the Beydar tablets were written, a central patriarch was absent, perhaps due to his recent death, and none of the five lineage heads had managed to secure ascendancy; perhaps the repeated visits of the ruler of Nagar was designed to prevent that from happening. A final possibility arises from the laconic and informal nature of the records themselves: the ruler at Beydar may have left the administration of labor and animals to the heads of five large sub-households within his own, perhaps his brothers, uncles, or sons; his own role did not require his mention. Ultimately, there are several ways to interpret the organization of administration at Beydar within the framework of the PHM but no satisfactory understandings based on the CSM.

Unfortunately, patronymics are absent in the Beydar tablets, but a kinship basis for social organization can be suggested through indirect evidence. One tablet from Beydar (Ismail, et al. 1996 no. 5) lists men and their associated gates (written using the Sumerian logogram ká). Lists of persons and gates are known from elsewhere, such as the list of Amorites found at Eshnunna (Gelb 1968). Three gates are mentioned, with 28, 32, and 37 names.[1] Although the first two lines are damaged, it appears that they were being issued cereals (še) in quantities typical of monthly rations (60 sila), but the marks could also be interpreted as simple counting marks or an early form of the *Personenkeil* determinative. Nine gate names appear in the Beydar tablets (Table 7.1), although two (ká shu-ba-è and ká ^{d}UTU) are probably not at Beydar. When persons are listed or summarized in association with them, they range in number from 18 to 62 persons; in the three instances when a gate is mentioned twice in the tablets, it never is associated with

[1] This assessment assumes that the columns on the tablet's reverse side are to be read from right to left, a possibility mentioned by the editors (Ismail, et al. 1996:129-130).

Gate (ká) Name	*Tablet Reference*	*No. of Persons*
ká AN.GAR.KAŠ$_4$	1 i 1	(not mentioned)
	52 i 4	26 persons (not listed)
ká ^{d}Be-lí-ZI	52 i 3	29 persons (not listed)
ká DAG-É-IGI	5 i 3	28 persons (listed by name, each given 60 sila)
	52 ii 3	18 persons (not listed)
ká ⸢DU⸣-ba-GÍN	5 iv 1	32 persons (listed by name, each given 60 sila)
	52 iii 2(?)	30±x persons (not listed)
ká ga-Ḫ̮I×DIŠ-NE	52 ii 2	62 persons (not listed)
ká ša-NE-Lum	5 viii 1	37 persons (listed by name, each given 60 sila)
ká šu-ba-è	29 vi 1	(not mentioned)
ká ^{d}UTU	29 iii 1	(not mentioned)
ká ^{d}Be-lim	52 ii 1	22 persons (not listed)

Table 7.1. Gates listed in the Beydar tablets. References are to tablet number (Arabic number), column (lower case Roman numeral), and line (Arabic number) in Ismail, et al. 1996.

the same number of persons. The spatial arrangement of people within Beydar according to gates parallels the kinship-based *bābtum* organization found in southern Mesopotamia (Stone 1987:81-82; Postgate 1992).

The use of writing for administration is often considered to be a functional adaptation to the complexities of state-level political organization; by extension, its presence at Beydar might be interpreted under the CSM as a sign of centralized political and economic control which relied on written records rather than face-to-face personal interaction. However, the nature of the Beydar tablets suggests another possibility. It is certainly true that these records functioned to record the movement of goods and personnel within Beydar's central institution, but this may not have been the reason why writing was adopted and employed. The use of numbers, a local calendar, and idiosyncratic vocabulary and sign forms (see discussions throughout Ismail, et al. 1996) suggests that the scribes at Beydar were not closely connected to the wider world of cuneiform literacy in the late third millennium. The quantities involved also are very small and would not have necessitated writing as an accounting system; certainly many polities have administered larger economic systems without the use of writing. It could be proposed that the central institution at Beydar employed writing for the purposes of legitimation or status marking. Writing was a major component of the great ruling households of the day (e.g., at Mari, Ebla or Nagar). The rulers of the demographically small province of Nabada (see Chapter 6) were emulating the actions of their nominal leaders, taking on the trappings of kingship as they understood them. A similar conclusion was drawn for the adoption of writing at proto-Elamite Tepe Yahya (Lamberg-Karlovsky and Tosi 1989).

This brief discussion does not establish with certainty that Beydar and other settlements in northern Mesopotamia were organized along the lines of the PHM but it should demonstrate that a kinship-based social organization is a more plausible and less theoretically objectionable alternative to the rationalized bureaucratic model assumed by the CSM.

7.3. Staple and Wealth Economies

It is increasingly recognized that even in politically centralized phases of southern Mesopotamian history, the craftsmen mentioned in the accounts of the great institutions were not entirely beholden to them, with the exception of the manufacturers of prestige items (Steinkeller 1987b, 1996); the same can be said about ceramic production in northern Mesopotamia (Stein and Blackman 1993; Blackman, et al. 1993). Craftsmen are mentioned in the Beydar tablets but rarely with enough context to understand their level of dependency on the central institution (Sallaberger 1996b). In general, it appears that craftsmen in the third millennium Upper Khabur basin were periodically in the employ of larger households, but did not have their economic lives dictated by them. The exception appears to be specialists in luxury goods, discussed below.

In terms of the staple economy, we have seen that the proposed indicators of a strong centralized control by the ruling elite are all absent or ambiguous. In its place, the PHM's decentralized network of nested households offers an alternative understanding. Centralized control existed through control of all land by the patriarchal ruler, as part of his all-encompassing household. This hierarchical arrangement was, however, an ideal which was rarely if ever achieved. Although in theory all land was part of his patrimony, the use of which could be granted to members of his household, in practice these household members exercised varying degrees of autonomy over their land grants. The return to the ruler may have ranged from a substantial proportion of the yield to relatively inexpensive hosting or fodder obligations.

The latter arrangement appears to have characterized the relationship between

Nagar and Nabada. Although Nagar was a consumer city to an even greater extent than was Hamoukar, the Beydar tablets contain no evidence for the shipment of cereals to Nagar from Nabada or any of its surplus-producing satellites. Nabada did administer some labor in these satellites, but only a relatively small proportion of it (see Sallaberger and Ur 2004 and Chapter 6).

Nonetheless, the massive urban settlements of the third millennium such as Hamoukar and Brak would have required the importation of surpluses in order to remain viable settlements; even regional centers such as Beydar appear to have been consuming more than their own agricultural territories and labor were capable of producing. Even though other evidence for it is lacking, does this situation demand centralized administration of the staple economy? I would argue that a range of relationships of household dependency might supply the means by which surpluses could be transported from over-producing villages into under-producing cities. Patriarchs and household heads based in cities, but with landholdings around satellite towns or villages, could stipulate to the members of the sub-households who worked those holdings that a percentage of the yield was owed; this percentage could perhaps be increased in times of need. Rather than seeing these surplus shipment obligations as centrally directed, we should envision hundreds of individually arranged obligations between household heads and their members which, in aggregate, would satisfy the staple needs of the city's population.

The field data presented in Chapter 5 shows strong evidence for agricultural intensification around large cities such as Hamoukar in the form of settlement-based manuring and hollow way formation, and to a lesser extent around regional centers such as Beydar. The CSM would assume that such intensification was under the behest of the ruling elites for the purposes of either funding their own activities (in the case of Nagar and any other indigenous EJ III polities) or to ship the surplus elsewhere (in the case of the Akkadians). However, there is no textual or archaeological evidence for state involvement in intensification. The formation of depressed roadways (now surviving as hollow ways) has been interpreted above as a proxy indicator for both the intensive and perhaps fallow-violating cultivation which constrained their formation and also the intensity of human and herd movement in these enclosed spaces. These are not constructed features, designed and implemented by a central authority, as was the case in the Roman and Incan road networks; rather, they are the product of thousands of individual decisions about whether to go out to the fields or to take the herds out to pasture. Although their linearity and radial patterning may appear to be planned, they are an example of order emerging from the uncoordinated actions of many individuals, without the involvement of a higher coordinating power.

Hollow ways are indirect indicators of intensification; field scatters, while also indirect, require less inference as evidence for manuring. As with hollow way formation, there is no evidence for central coordination of this intensification method along the lines of, for example, the collection and redistribution of composted manure or organic-rich settlement debris. On the other hand, every household had access to one or both of these sources, whether from their own hearths, animal pens, or streets. Cross-culturally, there is evidence for household-based collection and composting of manure and organic debris

(Ault 1999; Wilkinson 1982; see also Chapter 5.1), and some domestic exterior spaces at Hamoukar itself may have served to collect such material (Ur and Colantoni in preparation). Again, the ordered halos of sherds around major sites of the third millennium were the result of individual households intensifying their production, rather than a centrally coordinated process.

The discussion thus far has been limited to agricultural production, but recent research has convincingly shown that herds were a significant component of the staple economy (Kouchoukos 1998; Danti 2000). Furthermore, the intensification of agricultural production, of barley in particular, might have been an extension of the intensification of animal production (Charles and Bogaard 2001). This scenario is particularly attractive in the case of the TBS region, where cereal overproduction in the satellites greatly exceeded the underproduction at Beydar itself.

If the ruling elite were not compelling the populace to intensify their production of agricultural and animal products, then why did they do so? The Dynamic States Model, derived from the work of Wilkinson (1994; 1997), establishes the need for such intensification in the context of large settlements, but stops short of proposing a mechanism. Into this gap can be placed the PHM. Although it is dangerous to propose universals of human behavior, one candidate might be the striving to enhance personal or familial prestige (Trigger 2003). Schloen's model (Chapter 1.7) places this social goal behind the patriarch's desire to expand his household, not only through his own biological offspring but through the addition of new members to his metaphorical household. This might include both individuals or entire sub-households. Such status enhancement may not require anything more than the manipulation of carefully constructed social relationships, but it can also rely heavily on the perceived ability of the patriarch to provide for his household. Such a perception would be fostered by a highly productive household estate, which could be manifested in conspicuous luxury items of prestige but also in great yields of cereals and abundant herds of animals. In good times, these products might be redistributed to household members during communal meals (Dietler and Hayden 2001; Bray 2003), which would also represent a prime context for the establishment and maintenance of these social relationships. In times of want, redistribution might be more direct; such times might be the moments when, through such actions, real shifts in sociopolitical hierarchies occurred. The successful patriarch or lineage head would ideally possess a combination of personal charisma and political skill as well as economic wealth. Although the former might be a rare gift, the latter would be potentially within the grasp of all households with access to arable land and pasture, so every household would have a motivation to produce a surplus exceeding the needs of consumption and risk avoidance.

7.4. The Political Organization of Third Millennium States in the Upper Khabur Basin

The metaphorical kinship basis for political relationships in third millennium northern Mesopotamia is revealed in the language of treaties between Ebla and its neighbors (reviewed in Schloen 2001:267-283). Although such terminology is not explicitly used either to describe relations between Ebla and Nagar or between Nagar and

Nabada, there are clues to the nature of the latter found in the Ebla and Beydar tablets suggesting a decentralized relationship. The PHM is a better explanatory framework for these data than the CSM.

In the tablets found at Ebla, Nagar is mentioned in several contexts which, although primarily administrative in nature, contain a substantial amount of background detail (Archi 1998; Sallaberger 1999; see also Chapter 6.2). From these tablets, it emerges that Nagar was at the head of seventeen other towns in the Upper Khabur region, all of which appear to have received diplomatic gifts of precious metals directly from the royal house of Ebla. This list included Nabada.

Two aspects of this arrangement suggest a loosely organized political structure to the kingdom of Nagar. It appears that the "provincial" towns of the kingdom received diplomatic gifts directly from the ruler of Ebla, although in lesser quantities than did the ruler of Nagar himself. Under a highly centralized political structure, one would expect that the ruler of Nagar would monopolize foreign affairs. Diplomatic gifts would be made exclusively to him; he would then redistribute them to dependent local rulers within the hierarchy of centralized control. The direct exchange of diplomatic gifts between these dependent towns of Nagar and the royal house at Ebla suggests that large towns within the kingdom exercised a considerable political autonomy which would be excluded by the CSM. However, in a decentralized form of the PHM, wherein real power resides at the level of the heads of the towns which make up the kingdom, such a structure can be accommodated.

Further supporting evidence comes from the titles of the rulers of Nagar's dependent towns. The ruler of Nagar was referred to with the title en, but in five cases, the dependent rulers were also given this title. If this title was limited to the office of the king, it would be expected that a powerful ruler would legitimize his authority through the monopolization of the title. It appears that Nagar's control over its dependent towns was not strong enough to deprive local rulers from using the term, or it may be that through the use of this title, the scribes at Ebla were reflecting the true power relations in the Upper Khabur basin. A parallel and not mutually exclusive interpretation might consider the title en to refer to any patriarchal head of a large household or regional polity, rather than being exclusively limited to a single apical ruler.

The political situation reconstructed thus far has been filtered entirely through the lens of Ebla. The evidence from the Beydar tablets agrees with a economically and perhaps also politically decentralized structure. The ruler of Nagar only appears in the Beydar tablets in contexts where he is physically present at Nabada. At such times, it appears that the large institution at Beydar was obliged to feed the teams of donkeys with which he traveled (Sallaberger 1996b; Widell in press). The Beydar administrative records are concerned entirely with local agricultural and pastoral matters and mention no shipments of cereals, animals, or any other commodity to Nagar or any other outside center. Economic and political autonomy is also suggested by the patterning of roads: although no direct route ran between Nagar and Nabada, myriad local tracks connected Nabada with its own satellites (see Chapter 5.4).

Although we lack the explicit use of metaphorical kinship terminology that would confirm it, textual and landscape archaeological evidence suggests that in the case of the

Nagar state, what centralized political control existed was weak and possibly ephemeral, being limited to a loose overlordship which did not include the ability to control foreign relationships or to extract tribute in any form. Unfortunately, without epigraphic data we cannot say if a similar political decentralization characterized such polities that may have existed at Mozan, Leilan, or Hamoukar. The CSM, which posits a strong and centralized state apparatus administering most if not all aspects of politics and economy, is not supported by these data, but the PHM can accommodate the shifting political hierarchy reconstructed here.

7.5. A New Model of Northern Mesopotamian Urban States

The research presented in this study has produced a picture of urban centers in northern Mesopotamia which hovered at the limits of economic viability without the influx of agricultural products from their smaller neighbors. Limitations of labor and dry farming cereal yields meant that larger settlements were not self-sustaining with regard to agricultural staples; however, the same general principles meant that the smaller satellite settlements could produce surpluses to offset these shortcomings. Archaeologically derived cultivation territories demonstrate these arrangements in the TBS and THS areas. The results of these analyses support the Dynamic Structural Model, based on the work of Wilkinson (1994; 1997).

The landscape features documented by this study confirm the association of agricultural intensification and third millennium urban centers, and demonstrate that this association extends to the sites at the uppermost limits of Bronze Age population agglomerations (as proposed by Wilkinson 1994). However, the state political organization and the intensified staple economy which supported the expanded populations of the urban centers were only indirectly connected. Under the Patrimonial Household Model favored here, the apical ruler theoretically controlled all land within his household, which is equated with the kingdom itself, but this control of land rights did not necessarily translate into the full control of its yields. Although the ruling household did take in cereals and animals and redistribute them to its most immediate members, the real basis of its power was the distribution of the productive land itself, so that it need not focus its attention on mundane issues of redistribution. The true business of archaic states was the maintenance of power and the suppression of competing factions (e.g., Brumfiel 1992; Stein 2001); in the case of northern Mesopotamia, these factions took the form of elaborated households which jockeyed for position in a constantly shifting hierarchy of nested households. If material items played a role in this scenario, they would have consisted of luxury items which were traded as symbols of prestige, as seen in the Ebla metal accounts.

Rather than dictated or motivated by them, the day to day activities of the majority of the inhabitants of urban centers would have proceeded largely beyond the concerns of the heads of the largest households. The intensive agricultural production and animal husbandry which we see in the archaeological record can be understood from the standpoint of each individual household; surpluses not only buffered the household against the uncertainty of the next season, they also supplied it with a means to enhance its prestige through communal meals (by analogy with the Arabic *mansaf*) but also through the ability to integrate other individuals and households within its social fabric in times of need.

The proposed new model of north Mesopotamian society in the third millennium ultimately rests within an ecosystemic framework, but with some important divergences from the manner in which it has been employed in the past. These urban settlement systems are still envisioned as being composed of interacting units whose behavior impacts the operation of other units. However, and in keeping with the PHM, rather than focusing on the behavior of reified entities such as “the state” or “irrigation agriculture,” this model places agency at the level where decisions are made: the household. This shift complicates the process of explanation, but such complexity mirrors the reality of ancient social, economic, and political life. Furthermore, while acknowledging that negative feedback can play an important role, particularly in human-environment interactions, this model highlights non-linear developments, wherein change results from unpredictable positive feedback. In this manner, it follows the lead of some of the initial proponents of influential ecosystemic models (e.g., Adams 2001; H. T. Wright 2000) and new research on modeling complex societies (MASS Project Members 2004).

This study has hopefully demonstrated the theoretical and empirical weaknesses of traditional models of highly centralized early states, at least in the specific context of northern Mesopotamia. I have endeavored to present an alternative model which addresses the theoretical objections to the CSM while remaining within the bounds of the epigraphic and archaeological data. By no means do I consider this alternative to be proven; to do so would require excavation-based data which does not exist at present. I have presented this model here as a starting point; it is intended to generate new hypotheses which could be tested via new research designs. In particular, the non-monumental areas of third millennium urban centers must be extensively sampled with the specific goal of addressing issues of household social and economic organization.

This model diverges considerably from existing models not only of Mesopotamian states but also other early complex societies. Although the specifics of the patrimonial household mode of social organization advocated by Schloen (2001) and applied in this study may not have cross-cultural applications, it is intended to fit within the body of studies which are moving away from elite-centric top-down understandings of early states and toward more sophisticated approaches in which all ancient individuals, powerful or not, had the possibility of playing a role in their society. I am hopeful that that study of ancient Mesopotamian society will also move in this direction.

APPENDIX A:

FIGURES

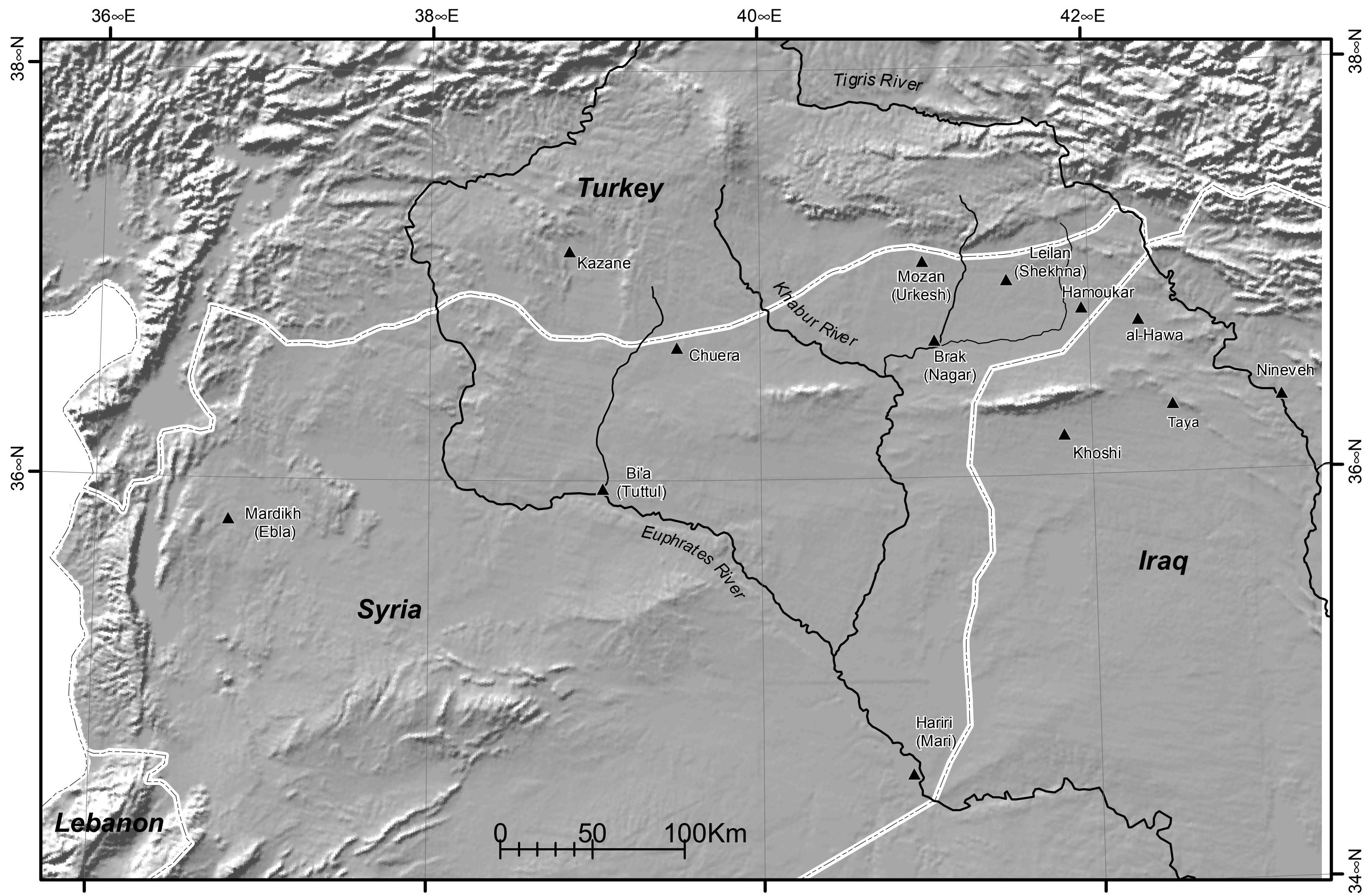


Fig. 1.1. Major urban sites of the mid- to late third millennium in northern Mesopotamia.

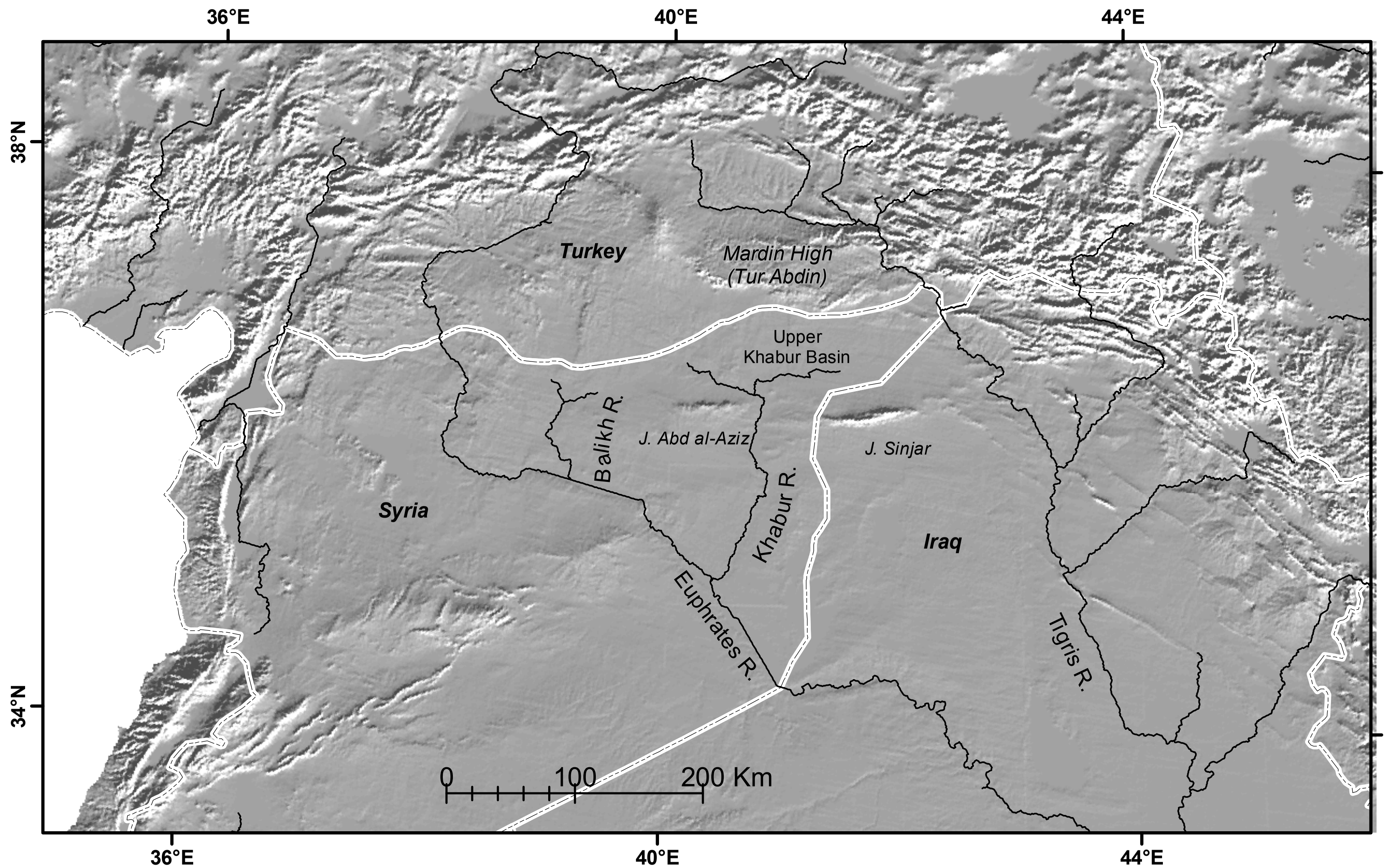


Fig. 2.1. The geography of northern Mesopotamia.

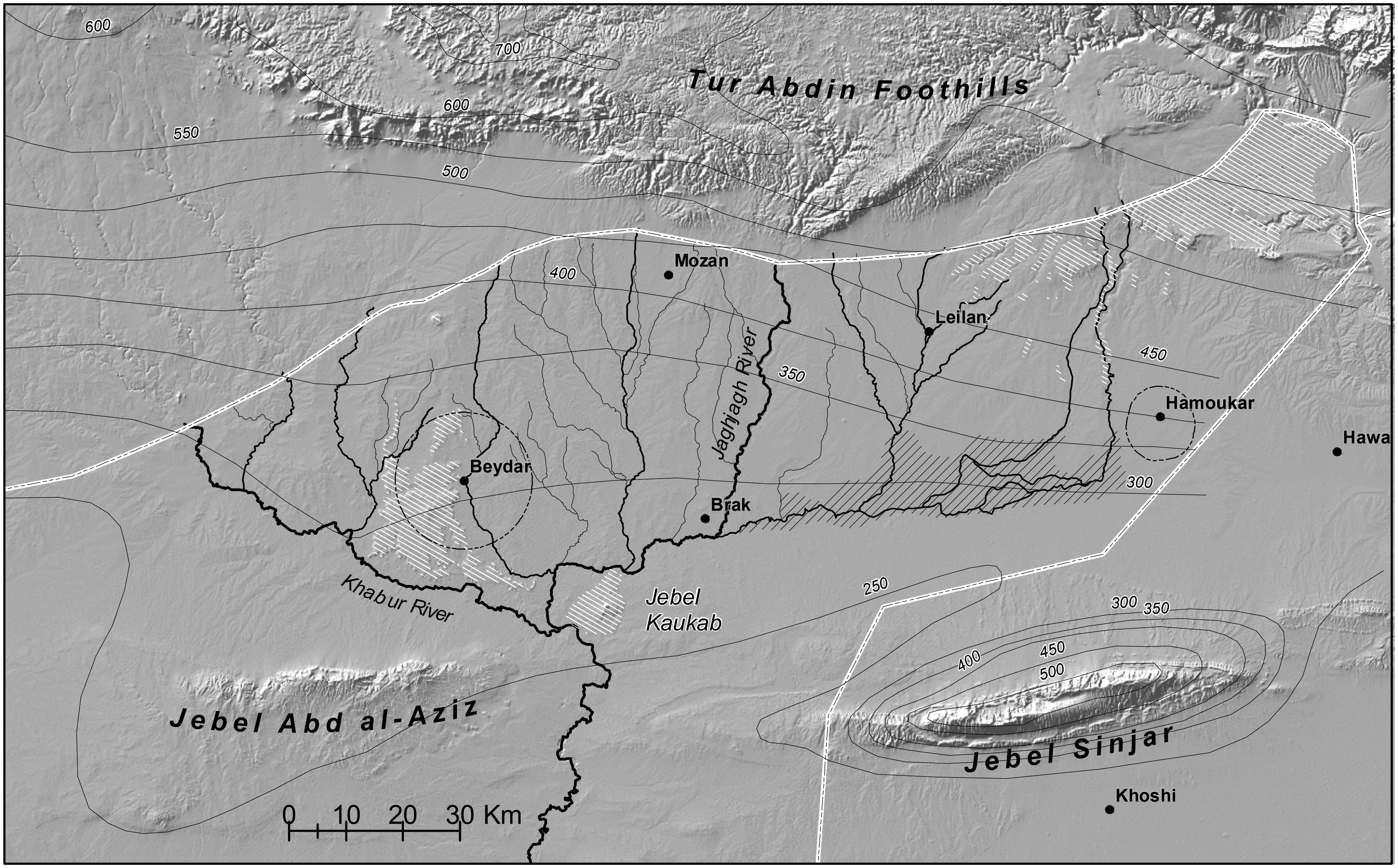


Fig. 2.2. The geography of the Upper Khabur Basin. Survey areas (dashed lines), rainfall isohyets (black lines), Syrian basalt areas (white hatching) and the Radd marsh (black hatching).

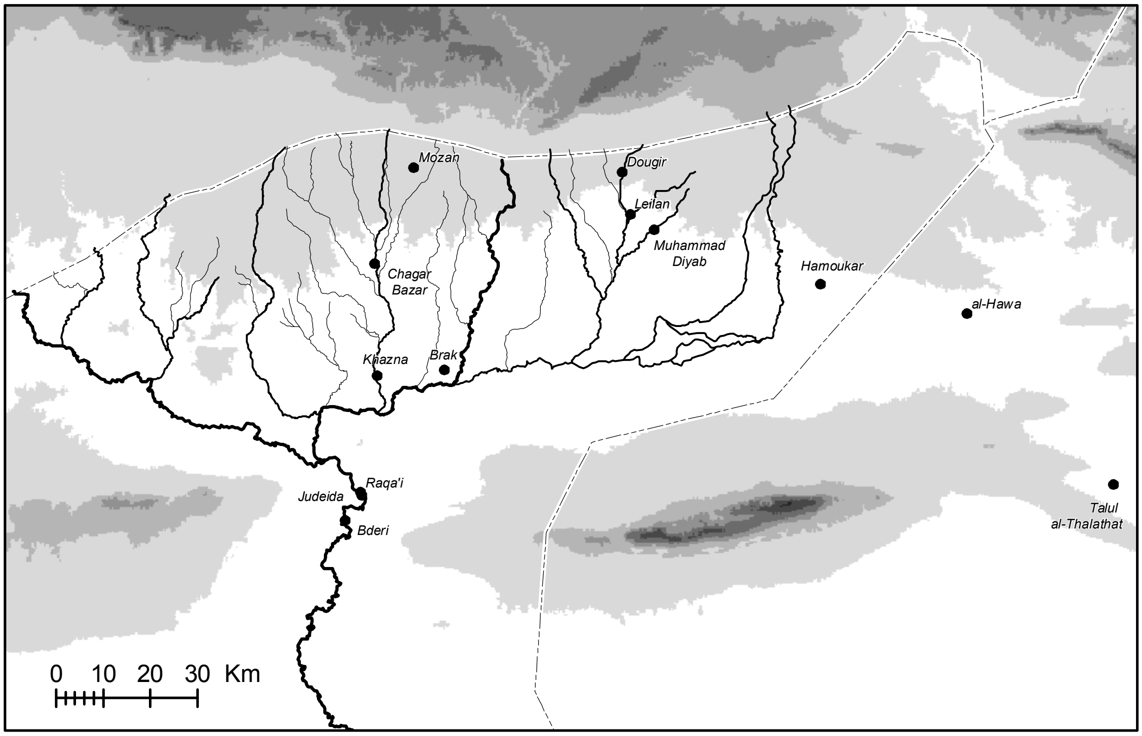


Fig. 2.3. Major sites of the Ninevite 5 Period (early third millennium BC).

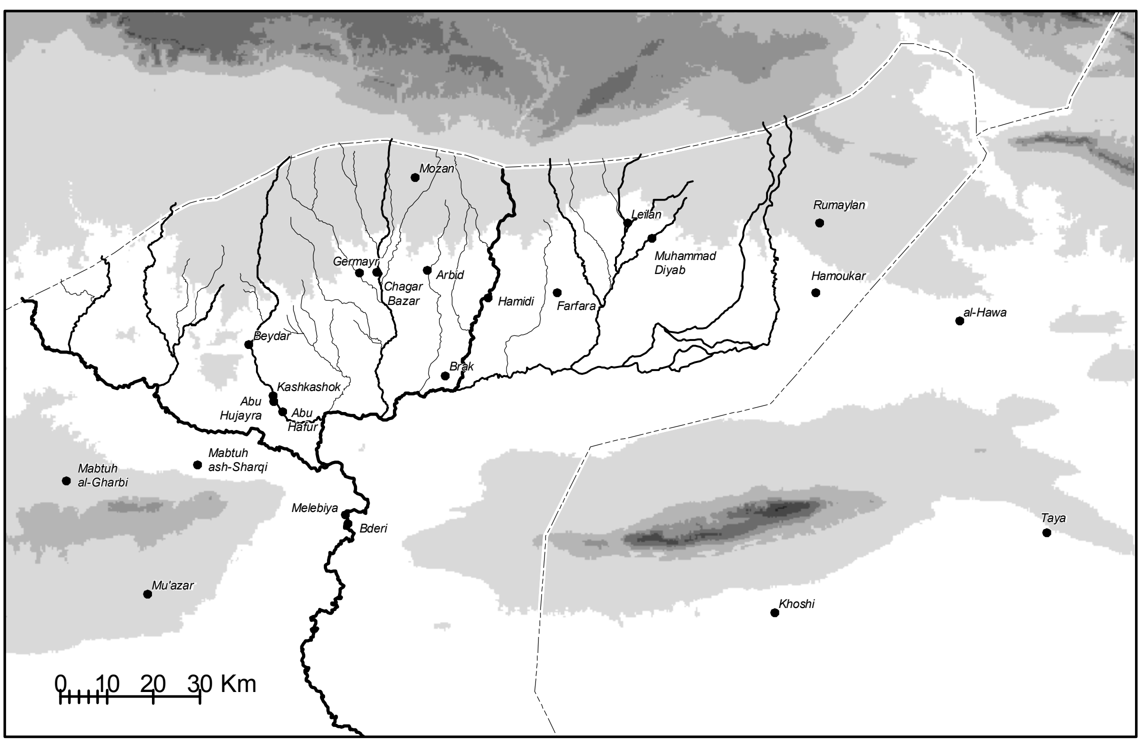


Fig. 2.4. Major sites of the mid to late third millennium BC.

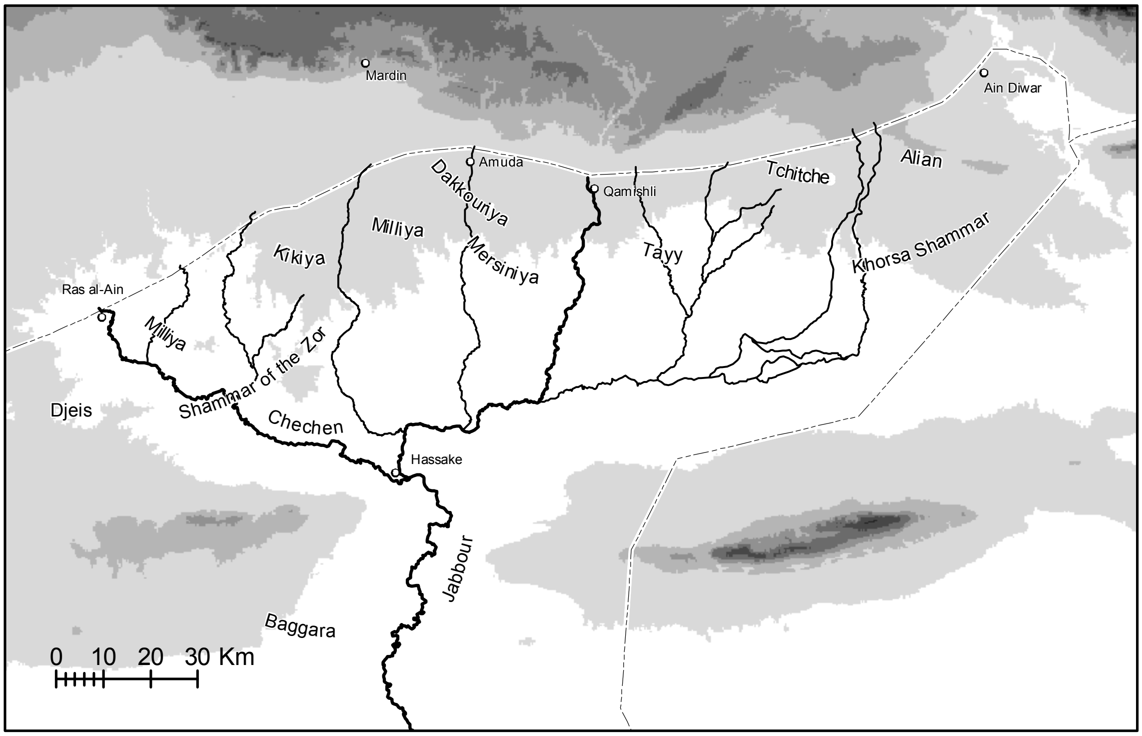


Fig. 3.1. Map of the Upper Khabur basin in the early twentieth century AD, with tribal territories indicated.

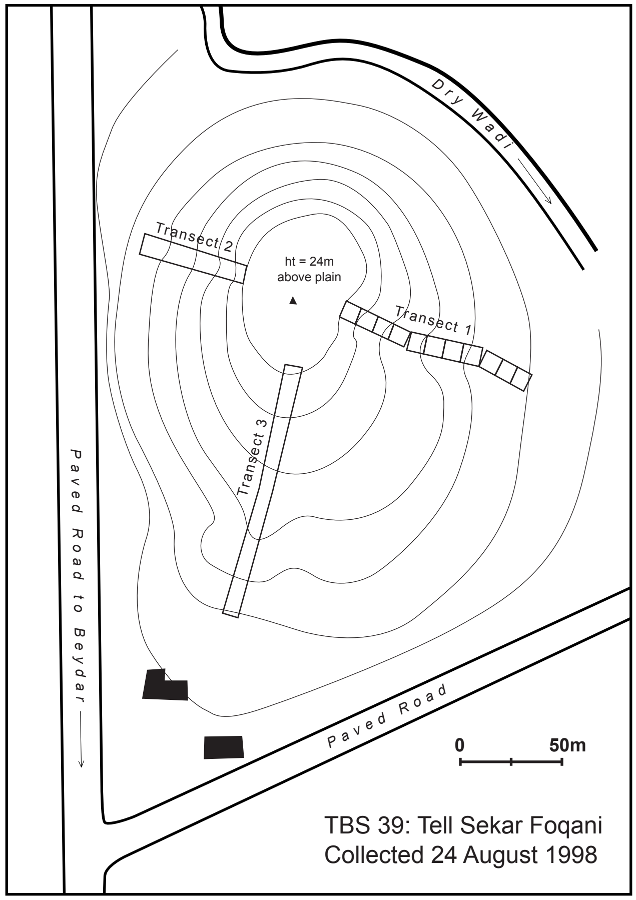


Fig. 3.2. Sketch plan of Tell Sekar Foqani (TBS 39) showing gridded strip collection methodology. Scale is approximate; contours indicate relative topography and slope.

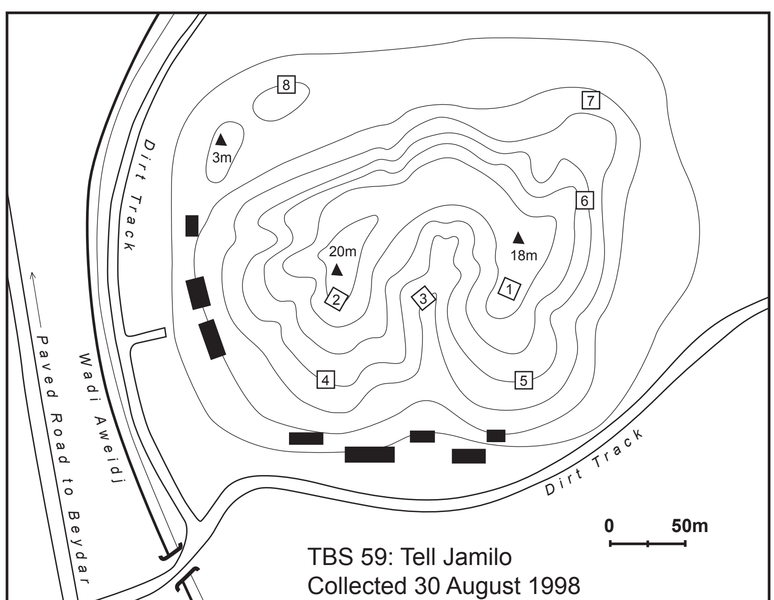


Fig. 3.3. Sketch plan of Tell Jamilo (TBS 59) showing opportunistically placed sample squares. Scale is approximate; contours indicate relative topography and slope. Elevations are in meters above plain level.

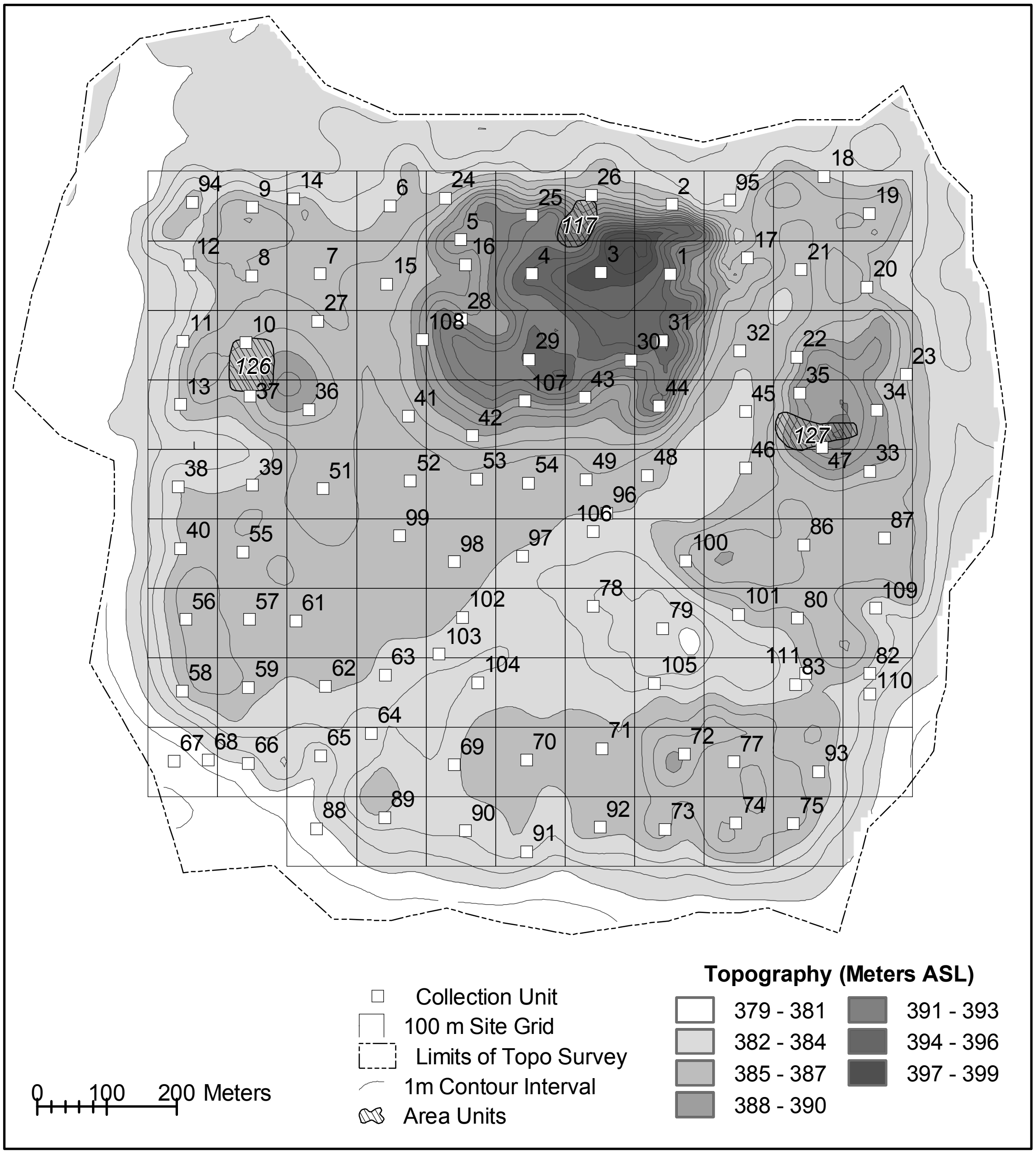


Fig. 3.4. Placement of systematic and non-systematic collection units at Hamoukar.

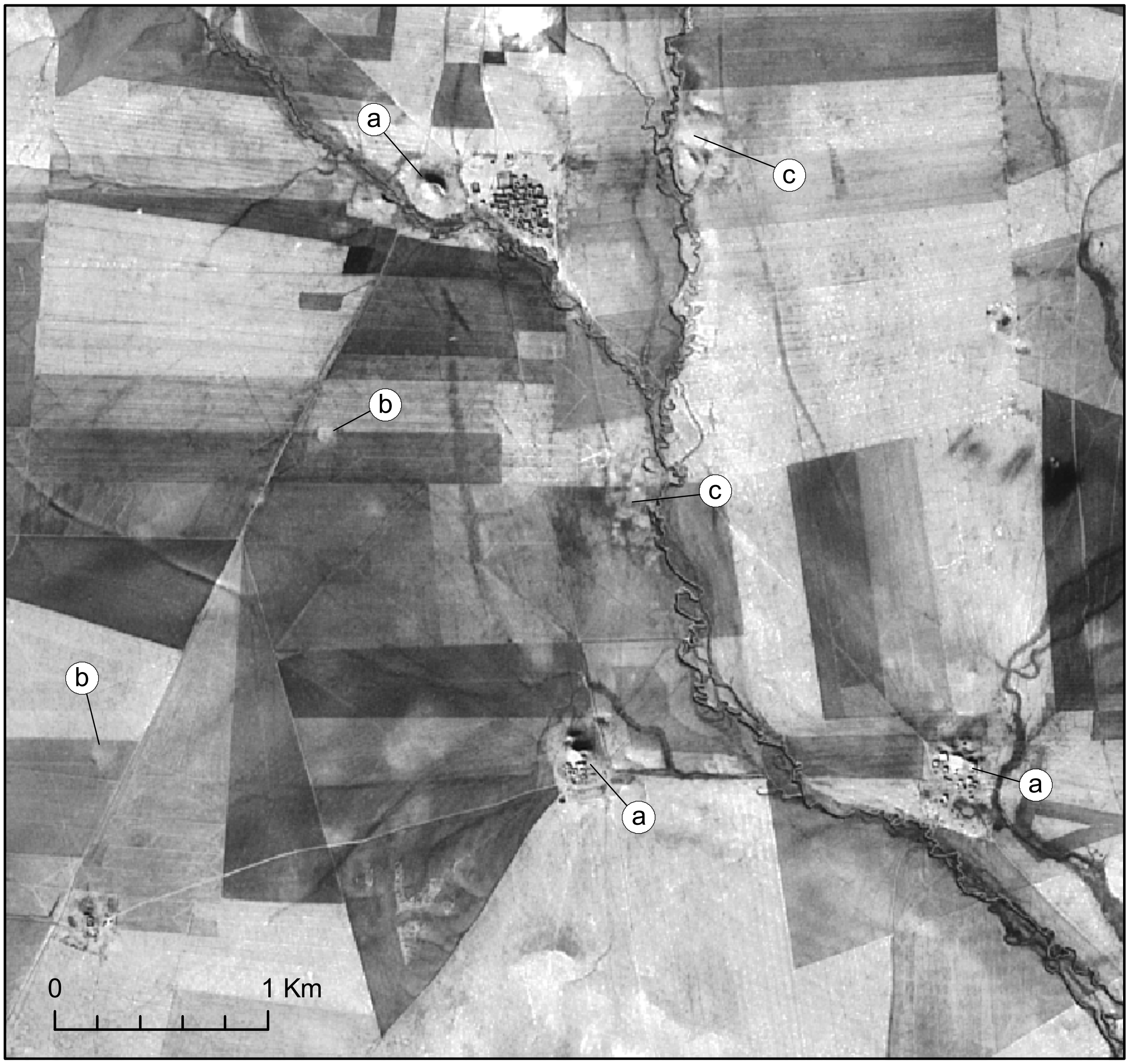


Fig. 3.5. Site morphologies found in the Upper Khabur basin and their signatures on CORONA satellite photographs. a. High mounded tells (note shadows on northern sides); b. low mounded sites, generally <2m high; c. complexes of low mounds and brick pits (generally first millennium AD and later). CORONA 1102-1025DF005.

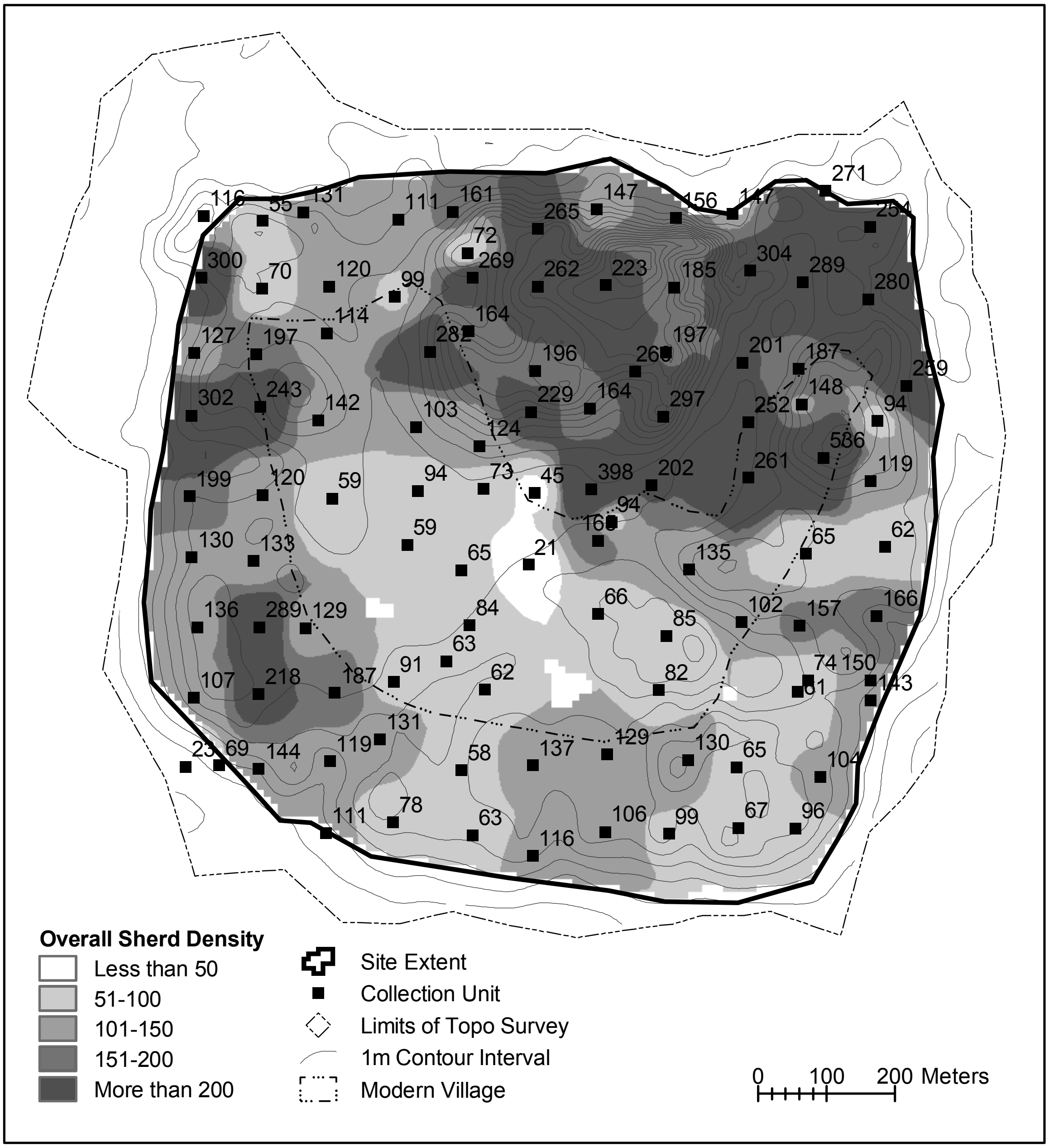


Fig. 4.1. Overall sherd density at Hamoukar, in sherds per 100 square meters.

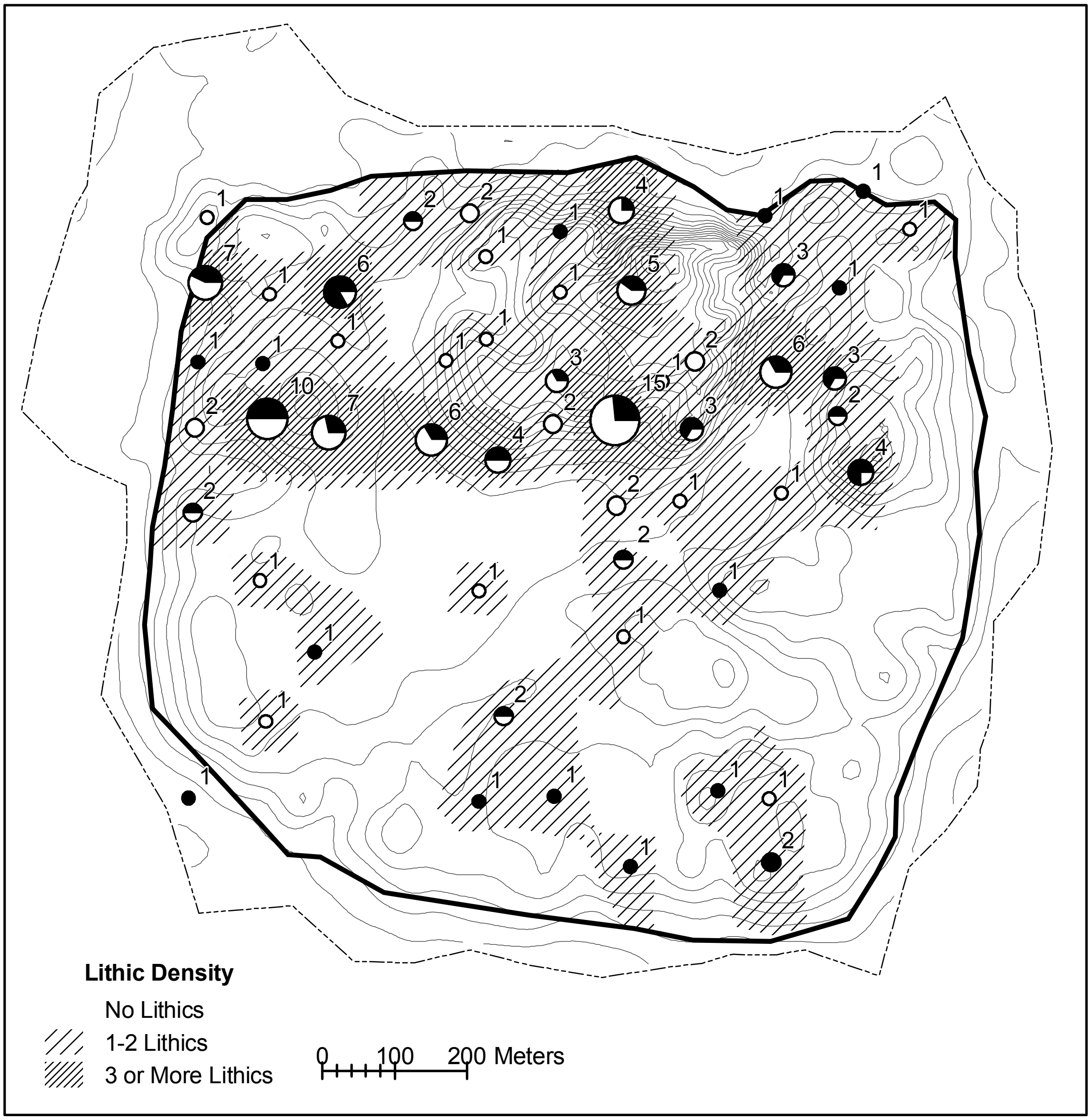


Fig. 4.2. Distribution of lithics at Hamoukar, in pieces per 100 square meters. Pie chart markers represent proportions of obsidian (black) and flint/chert (white).

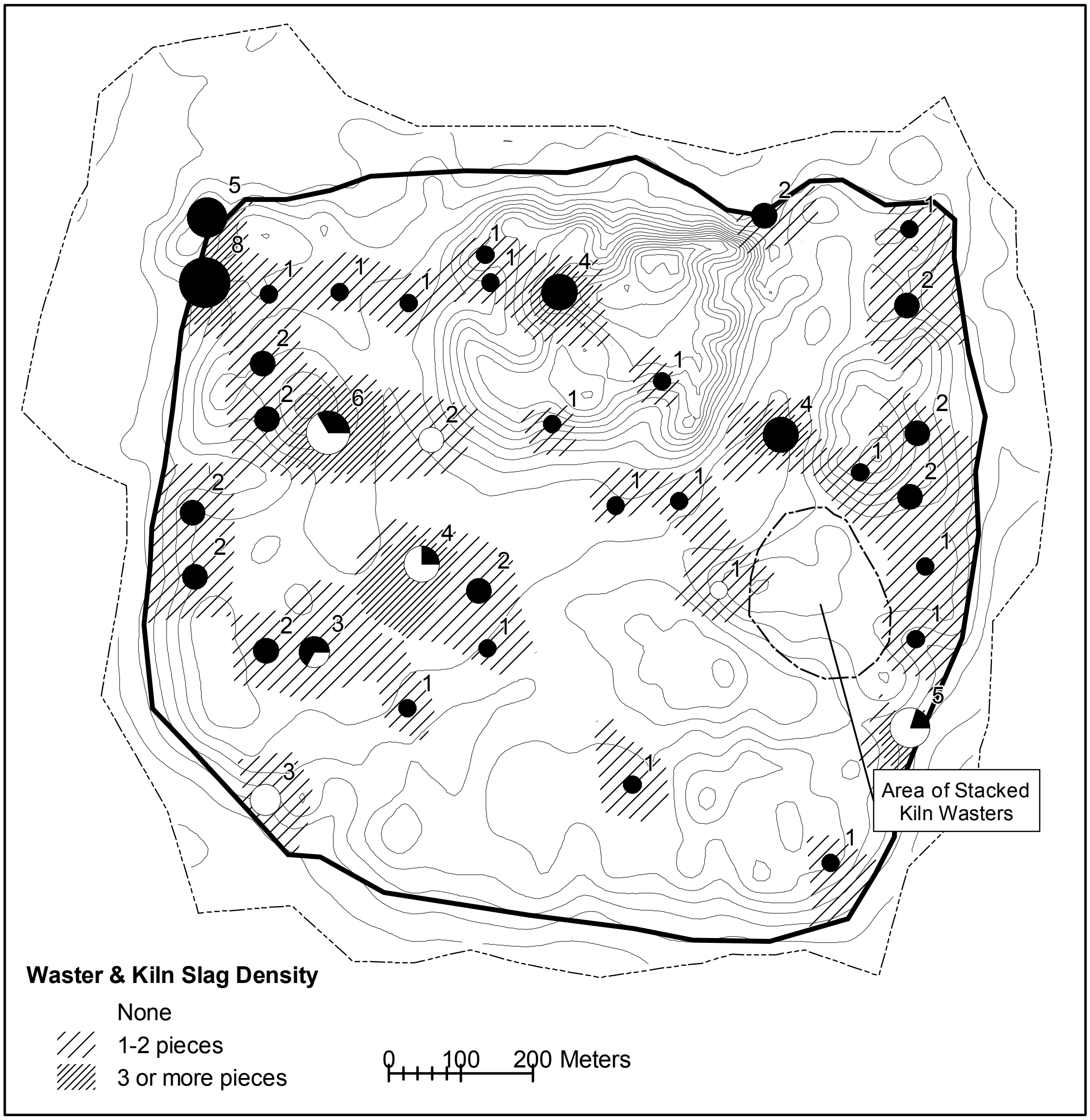


Fig. 4.3. Distribution of wasters and kiln slag at Hamoukar, in pieces per 100 square meters. Pie chart markers represent proportions of kiln slag (black) and wasters (white).

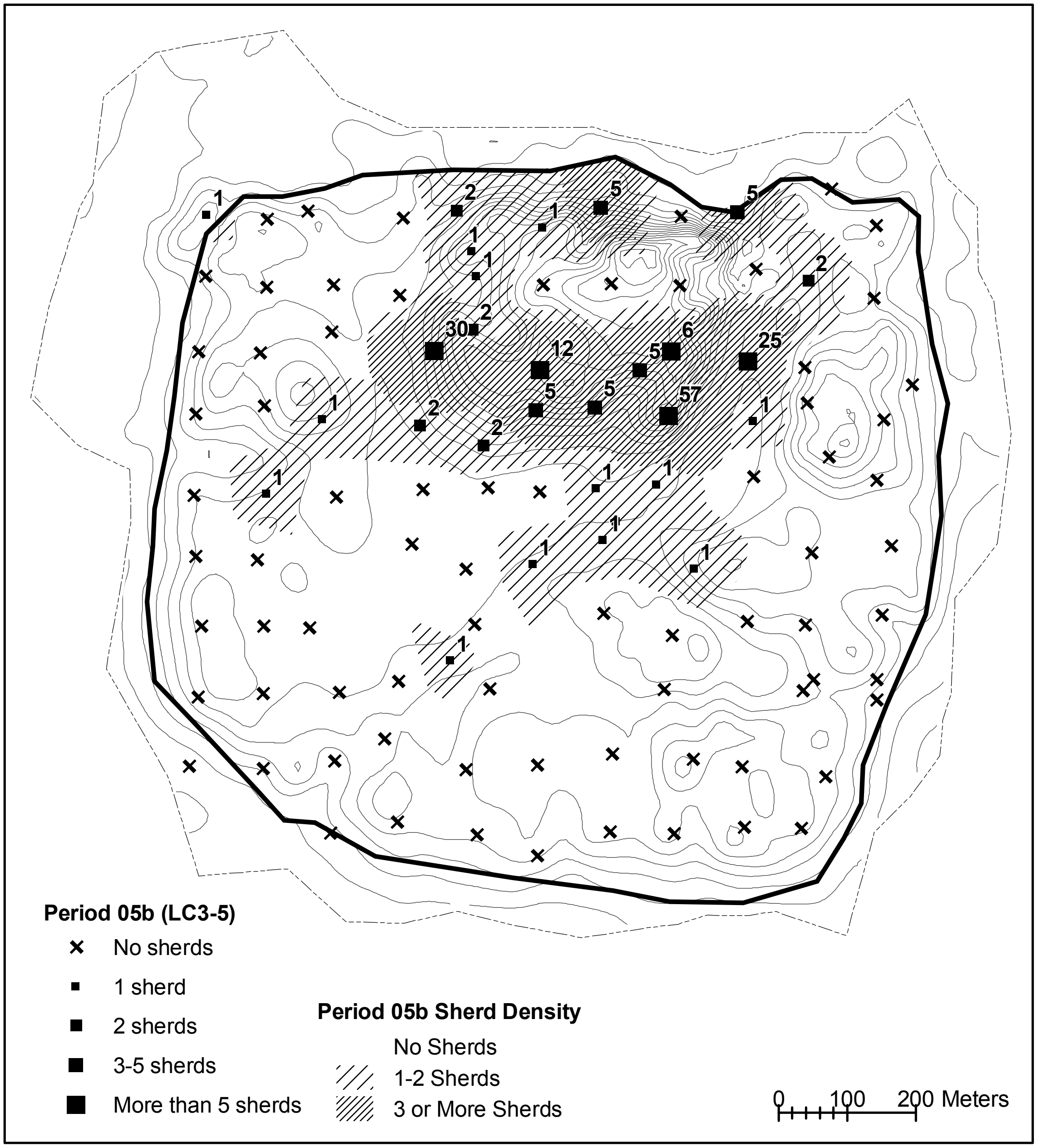


Fig. 4.4. Distribution of Period 05b (LC3-5) Sherds at Hamoukar.

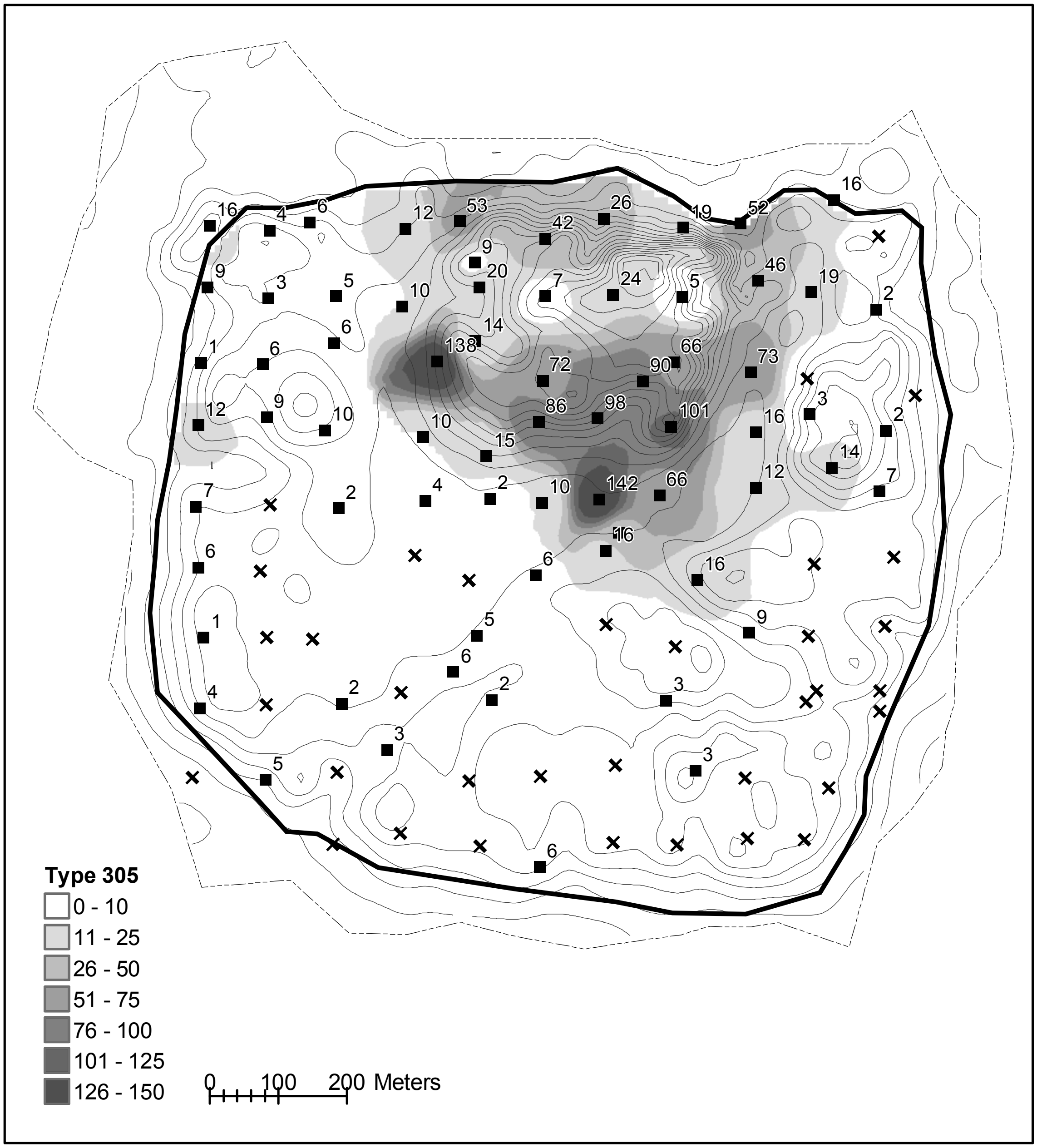


Fig. 4.5. Density of Type 305 reduced-core chaff-tempered body sherds at Hamoukar, in sherds per 100 square meters.

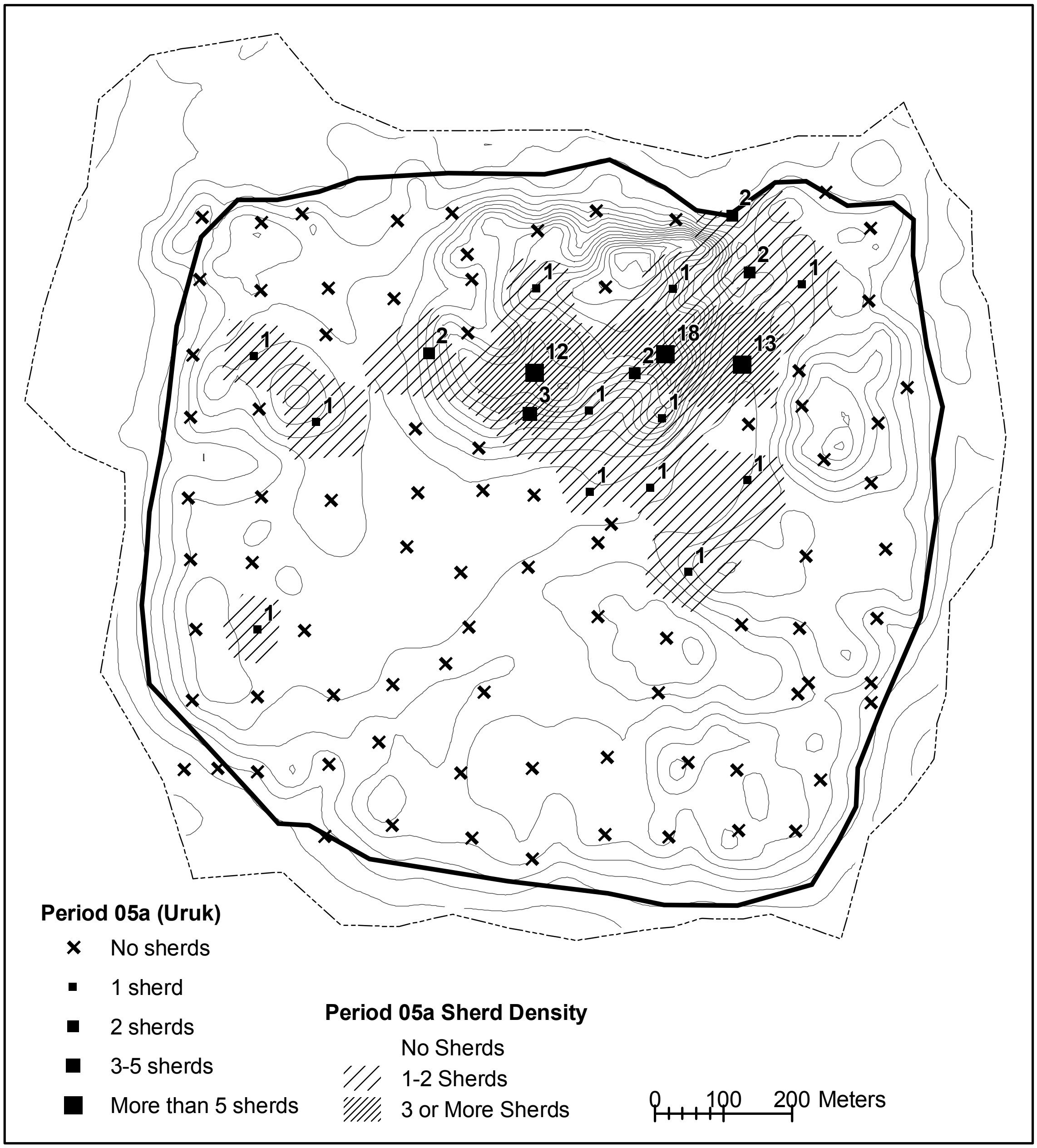


Fig. 4.6. Distribution of Period 05a (LC4-5 southern Uruk) sherds at Hamoukar, in sherds per 100 square meters.

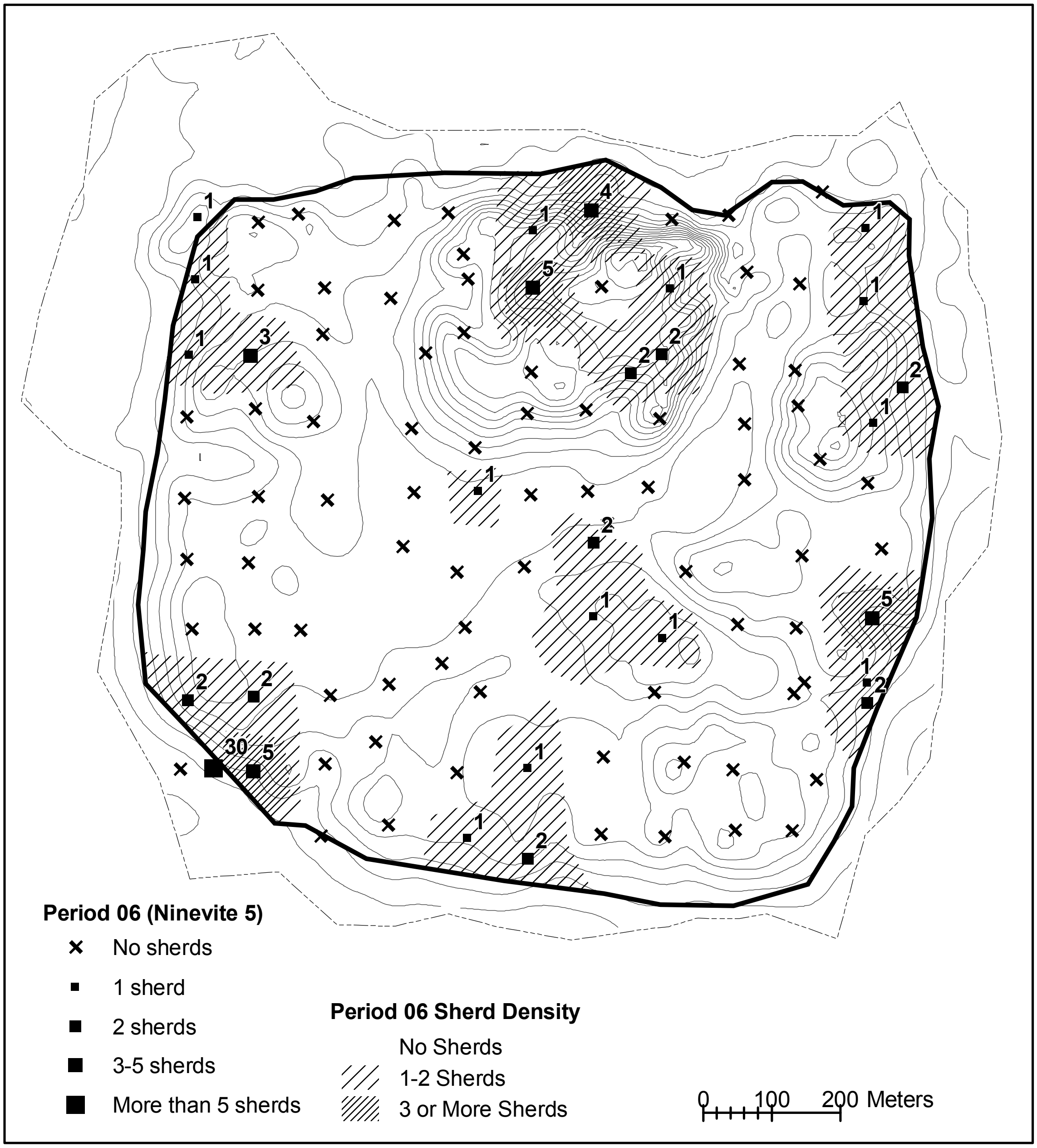


Fig. 4.7. Distribution of Period 06 (Ninevite 5) sherds at Hamoukar, in sherds per 100 square meters.

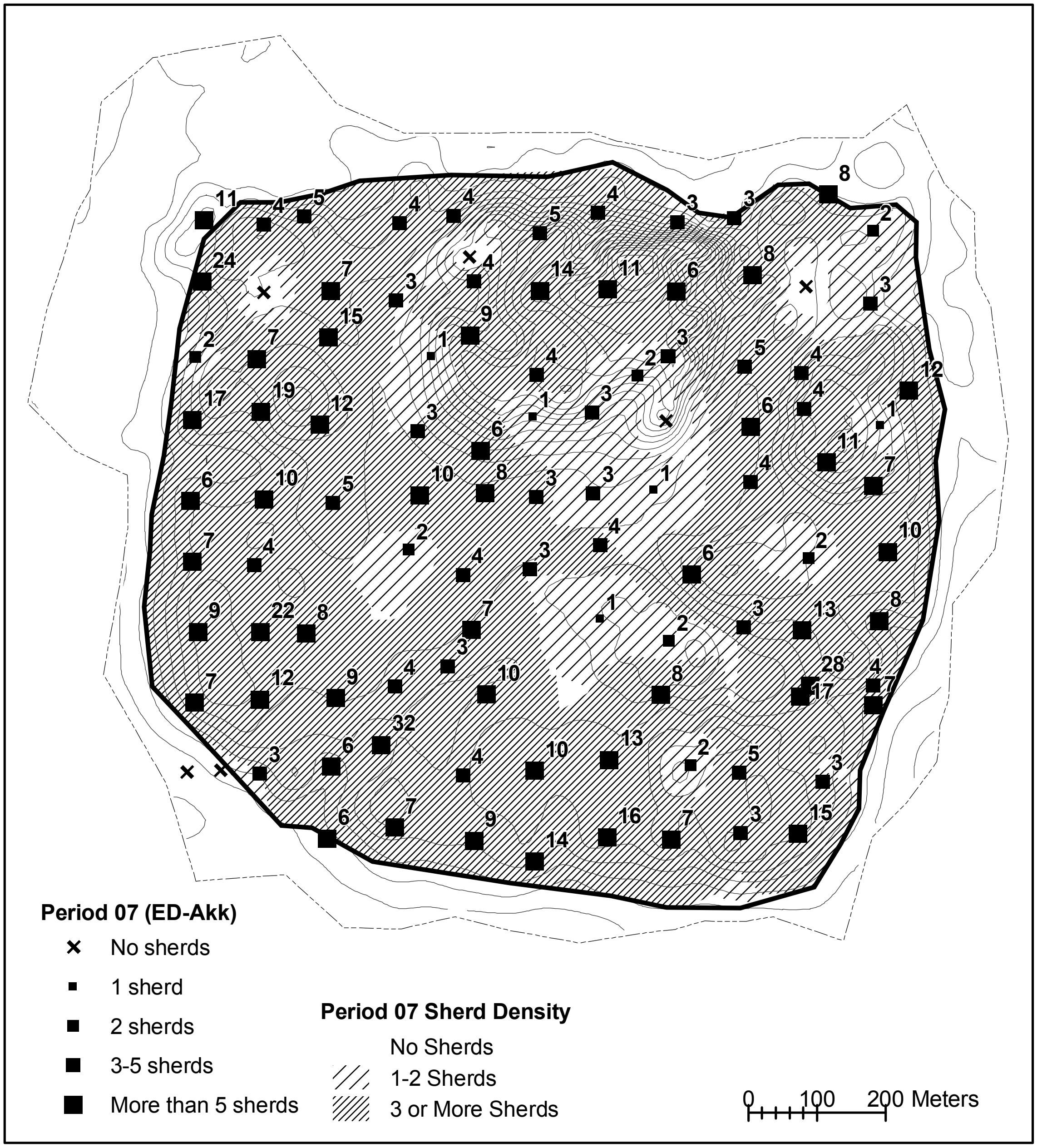


Fig. 4.8. Distribution of Period 07 (mid-late third millennium BC) sherds at Hamoukar, in sherds per 100 square meters.

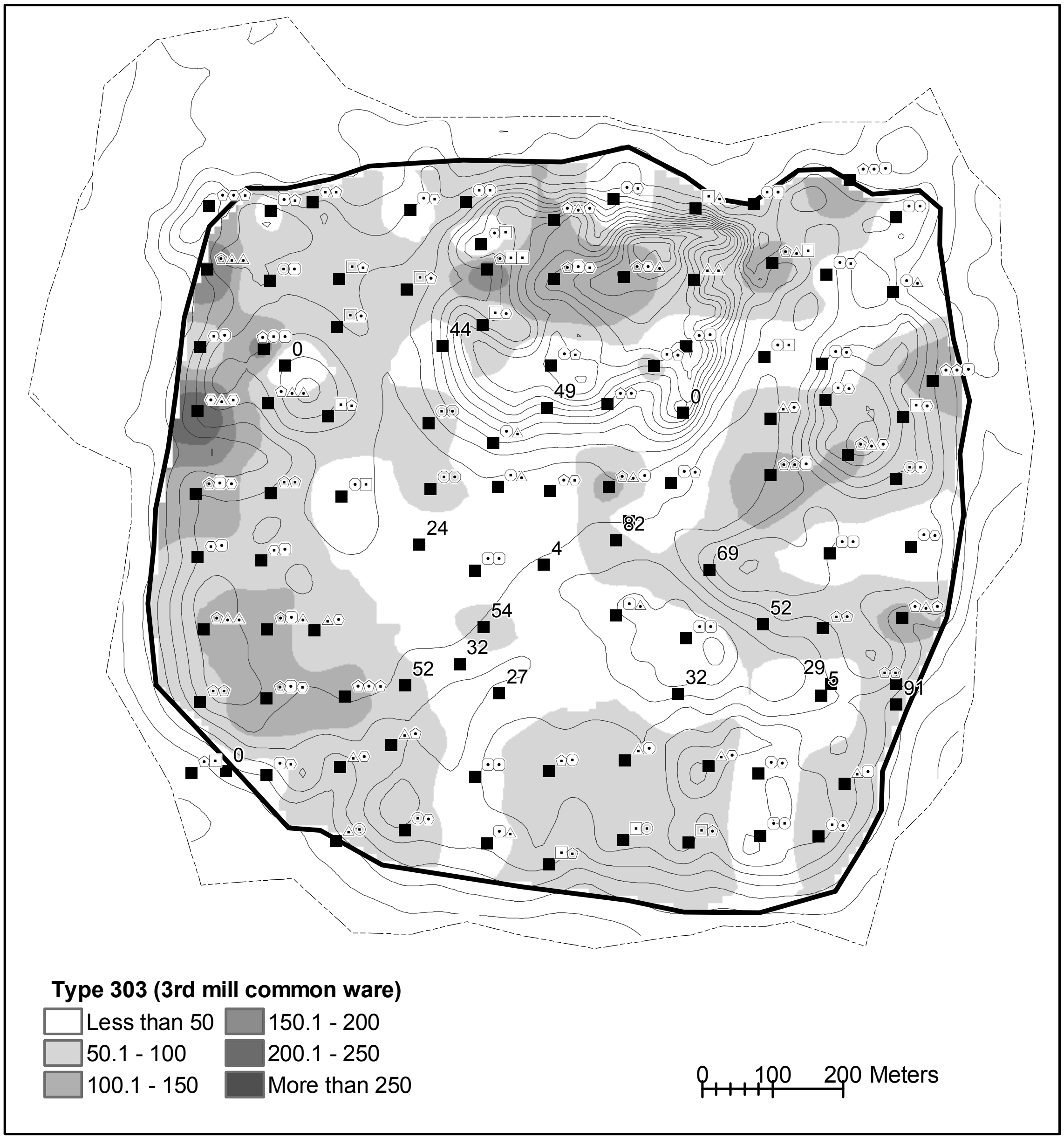


Fig. 4.9. Distribution of Type 303 common ware body sherds at Hamoukar, in sherds per 100 square meters.

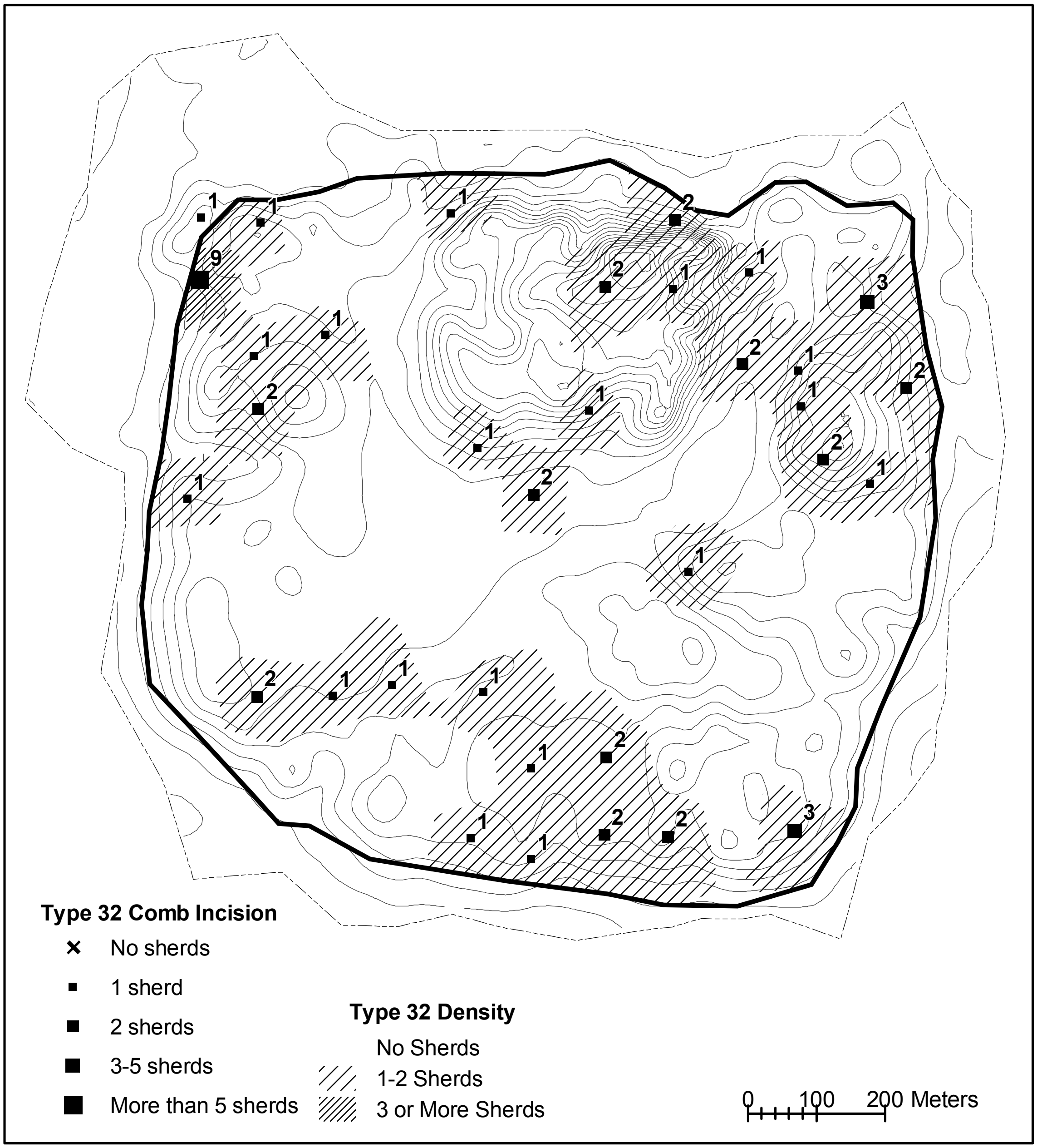


Fig. 4.10. Distribution of Type 32 comb-incised sherds at Hamoukar, in sherds per 100 square meters.

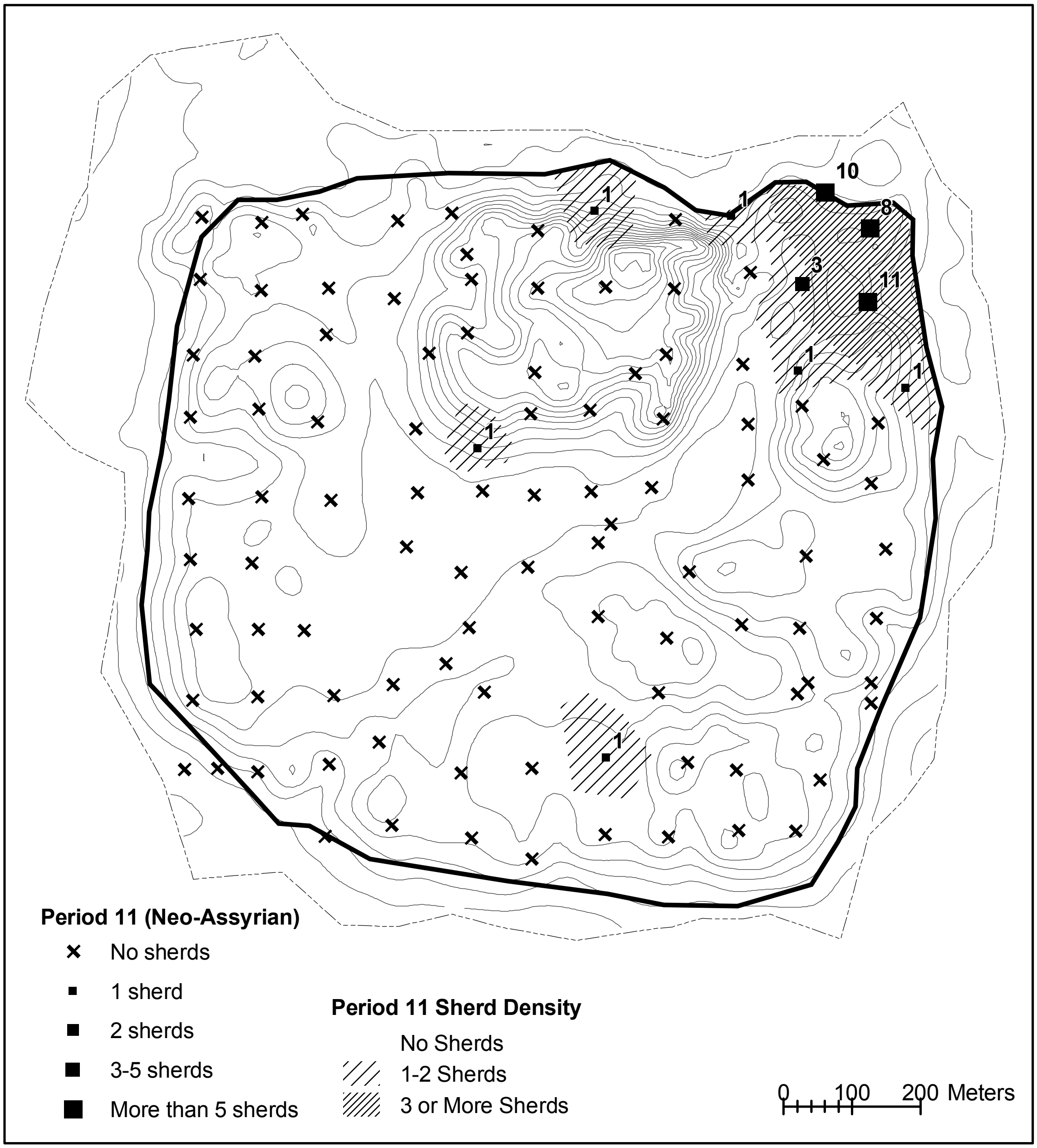


Fig. 4.11. Distribution of Period 11 (Iron Age/Neo-Assyrian) sherds at Hamoukar, in sherds per 100 square meters.

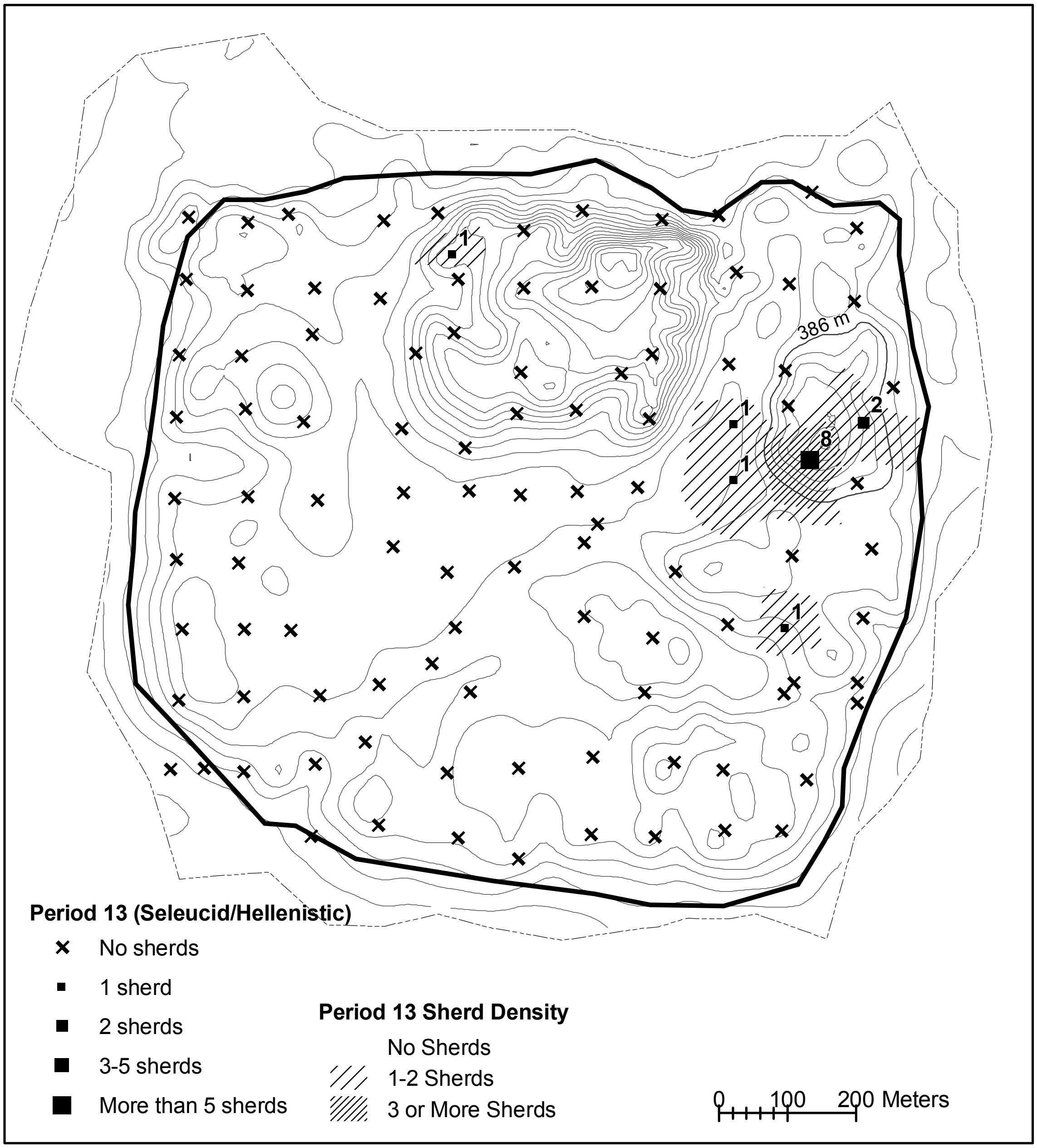


Fig. 4.12. Distribution of Period 13 (Seleucid-Hellenistic) sherds at Hamoukar, in sherds per 100 square meters.

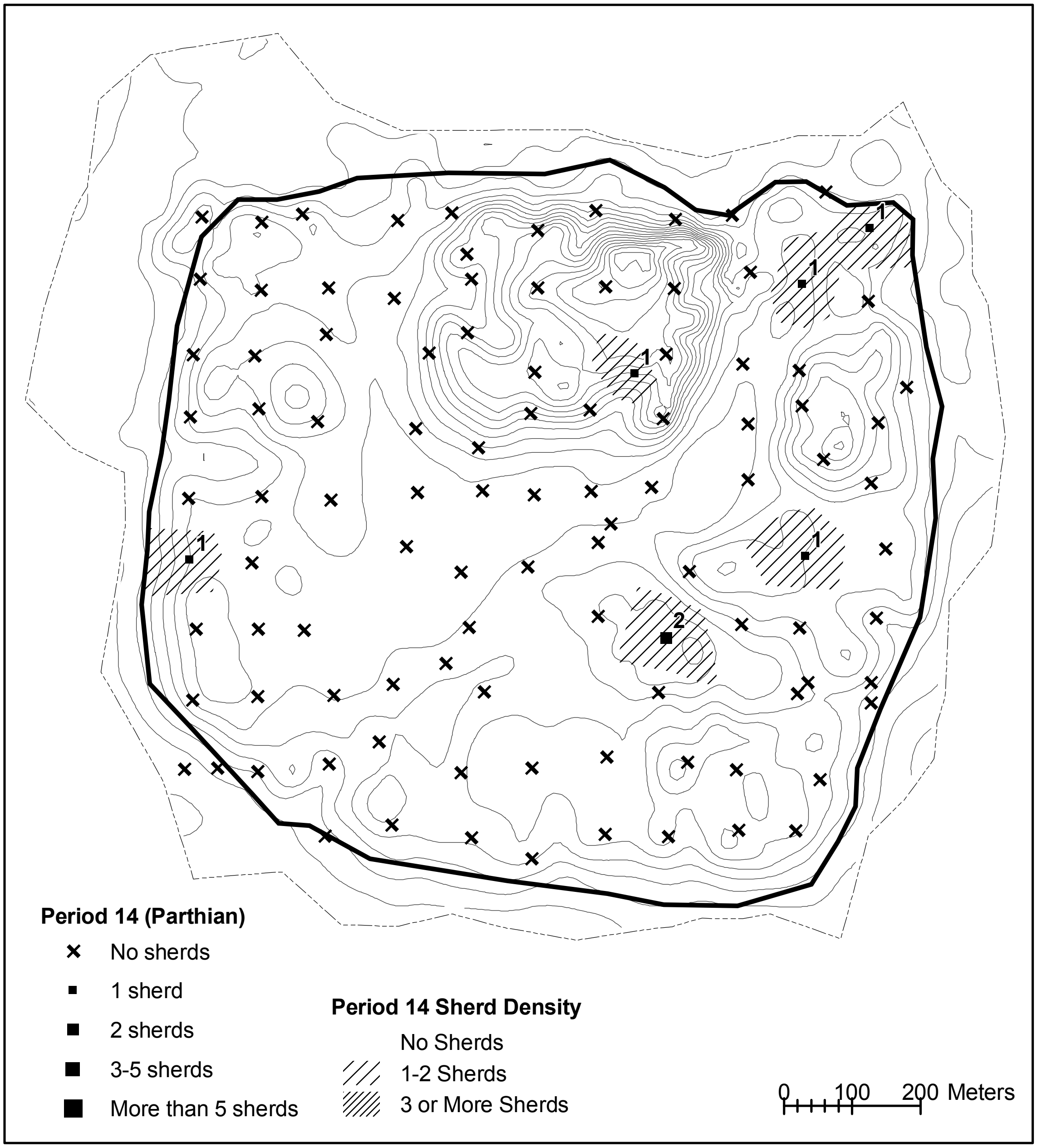


Fig. 4.13. Distribution of Period 14 (Parthian) sherds at Hamoukar, in sherds per 100 square meters.

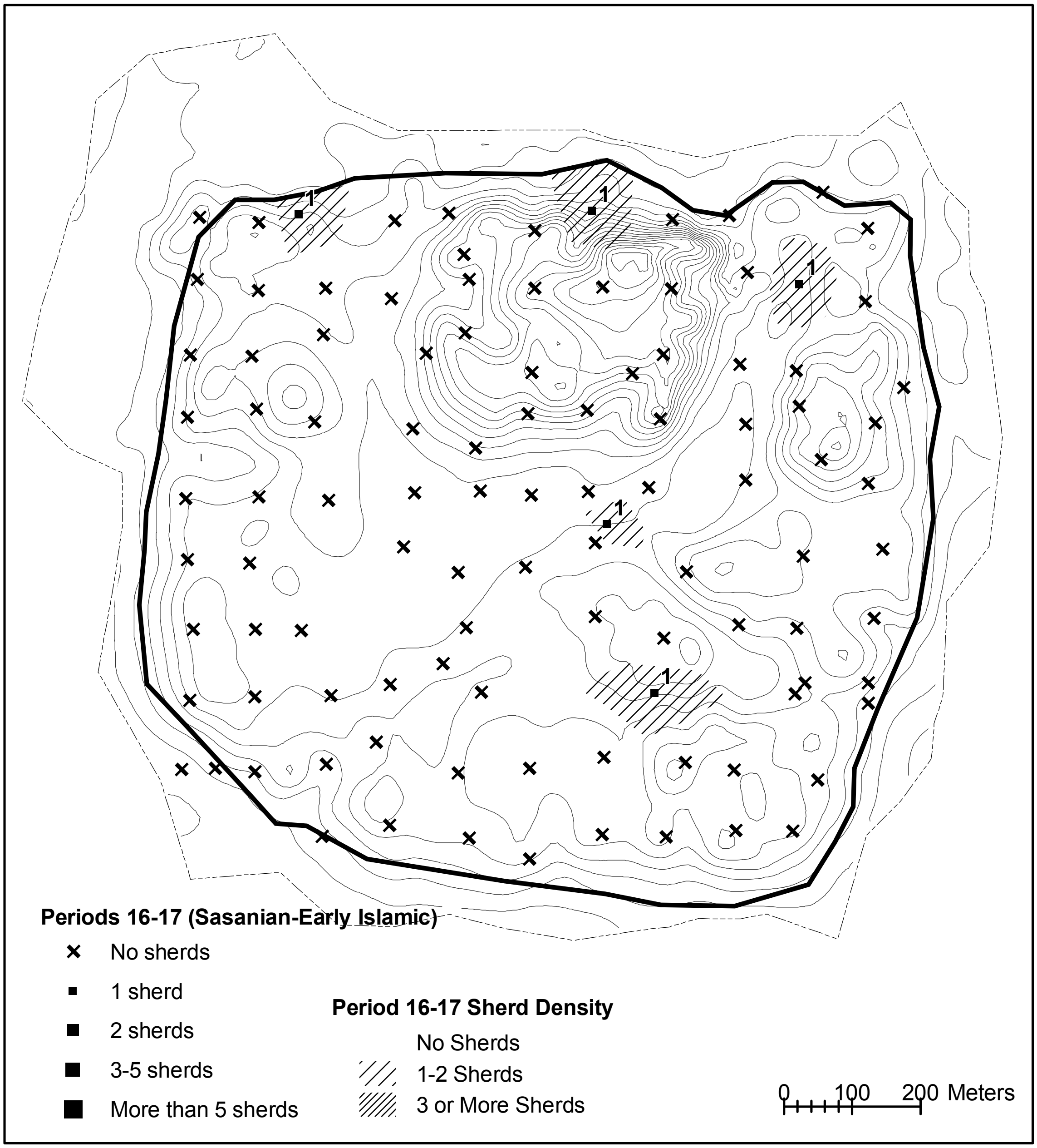


Fig. 4.14. Distribution of Period 16-17 (Sasanian-Early Islamic) sherds at Hamoukar, in sherds per 100 square meters.

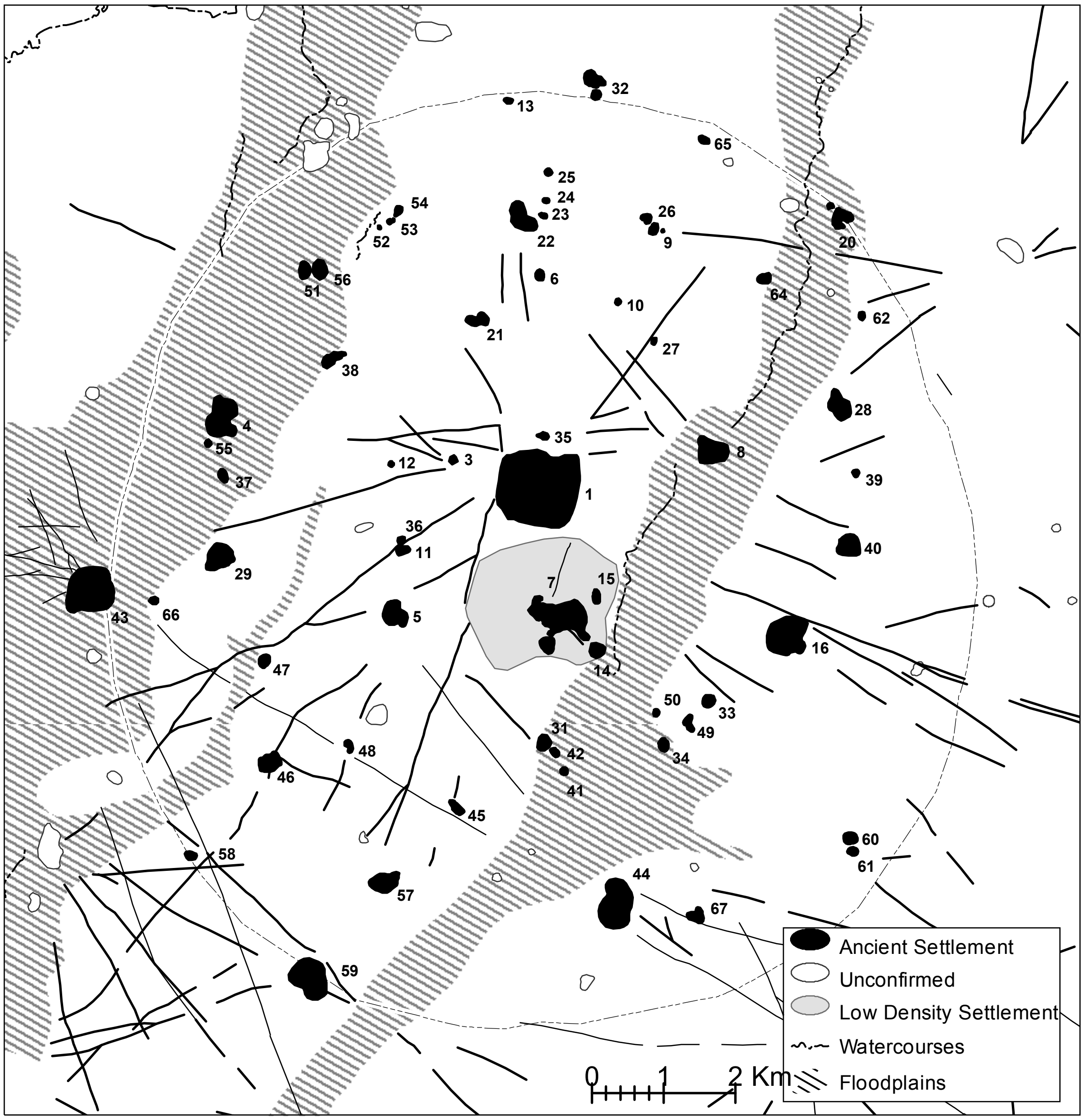


Fig. 4.15. THS Area. All ancient sites and hollow ways.

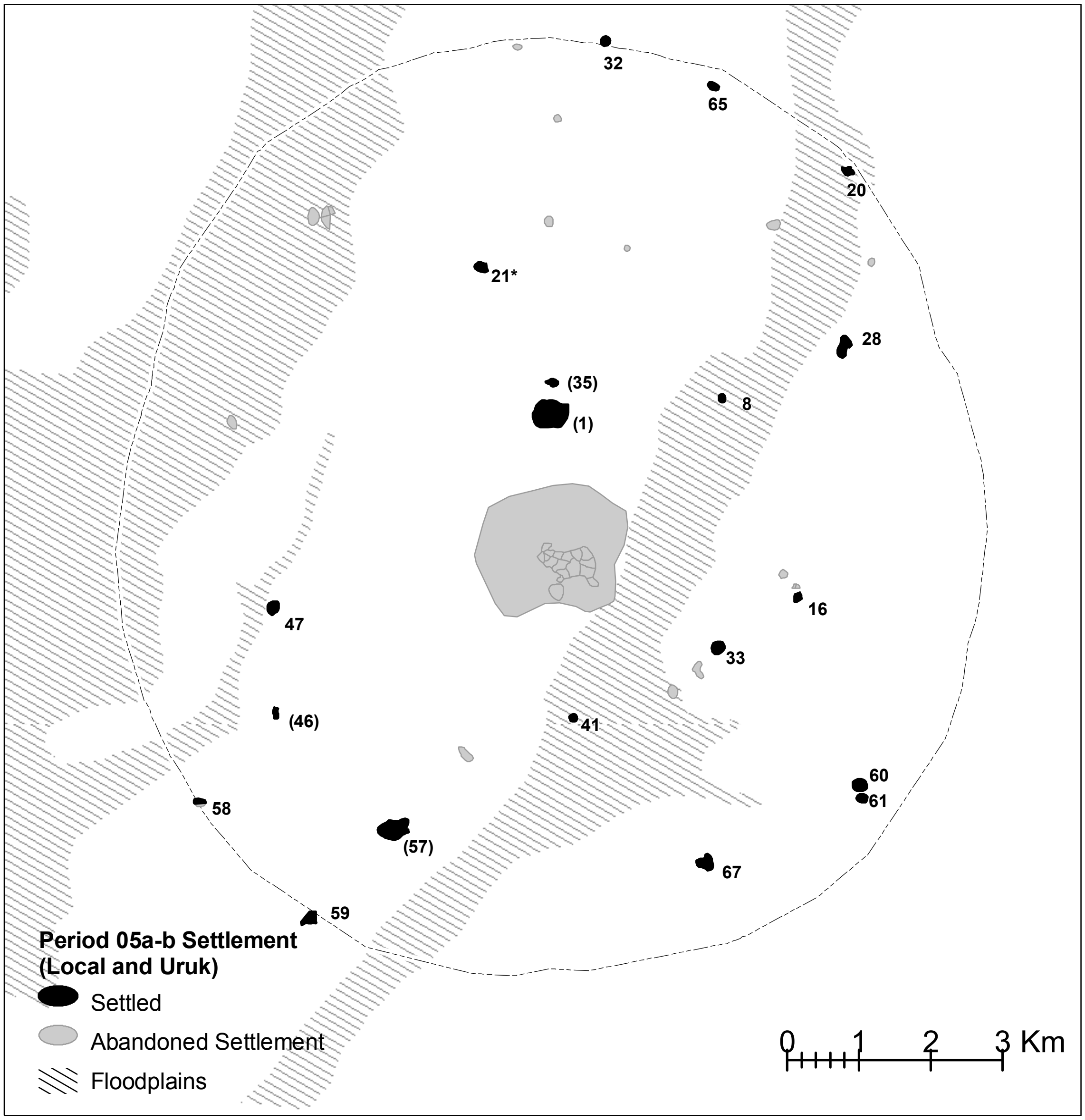


Fig. 4.16. THS Area, Periods 05a-b. The mid to late fourth millennium landscape. Occupied sites (black) and abandoned settlement (gray). Sites with purely southern Uruk assemblages marked with an asterisk. Sites with both Uruk and local ceramics in parentheses. All other sites purely local in character.

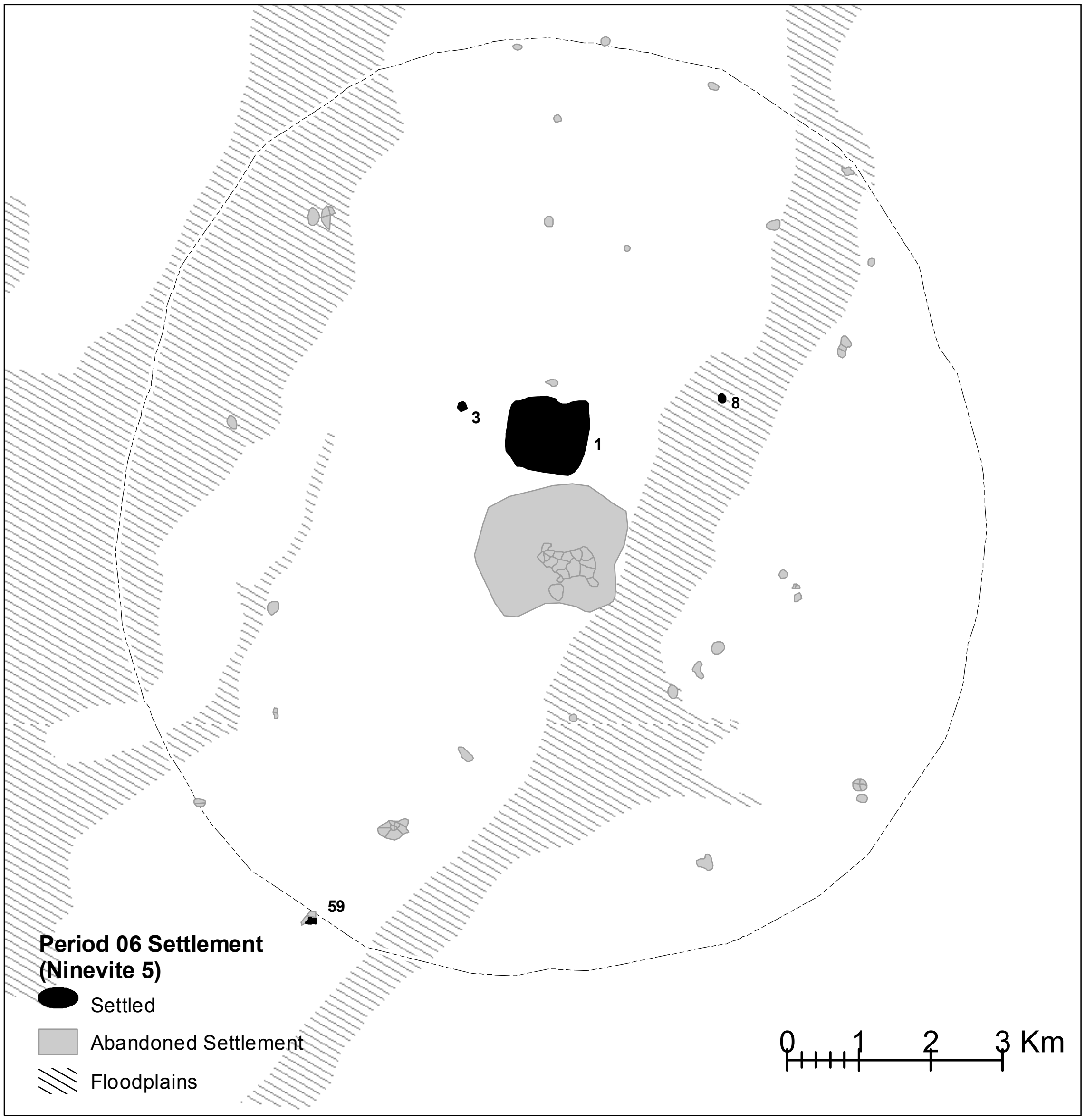


Fig. 4.17. THS Area, Period 06. The early third millennium landscape. Occupied sites (black) and abandoned settlement (gray).

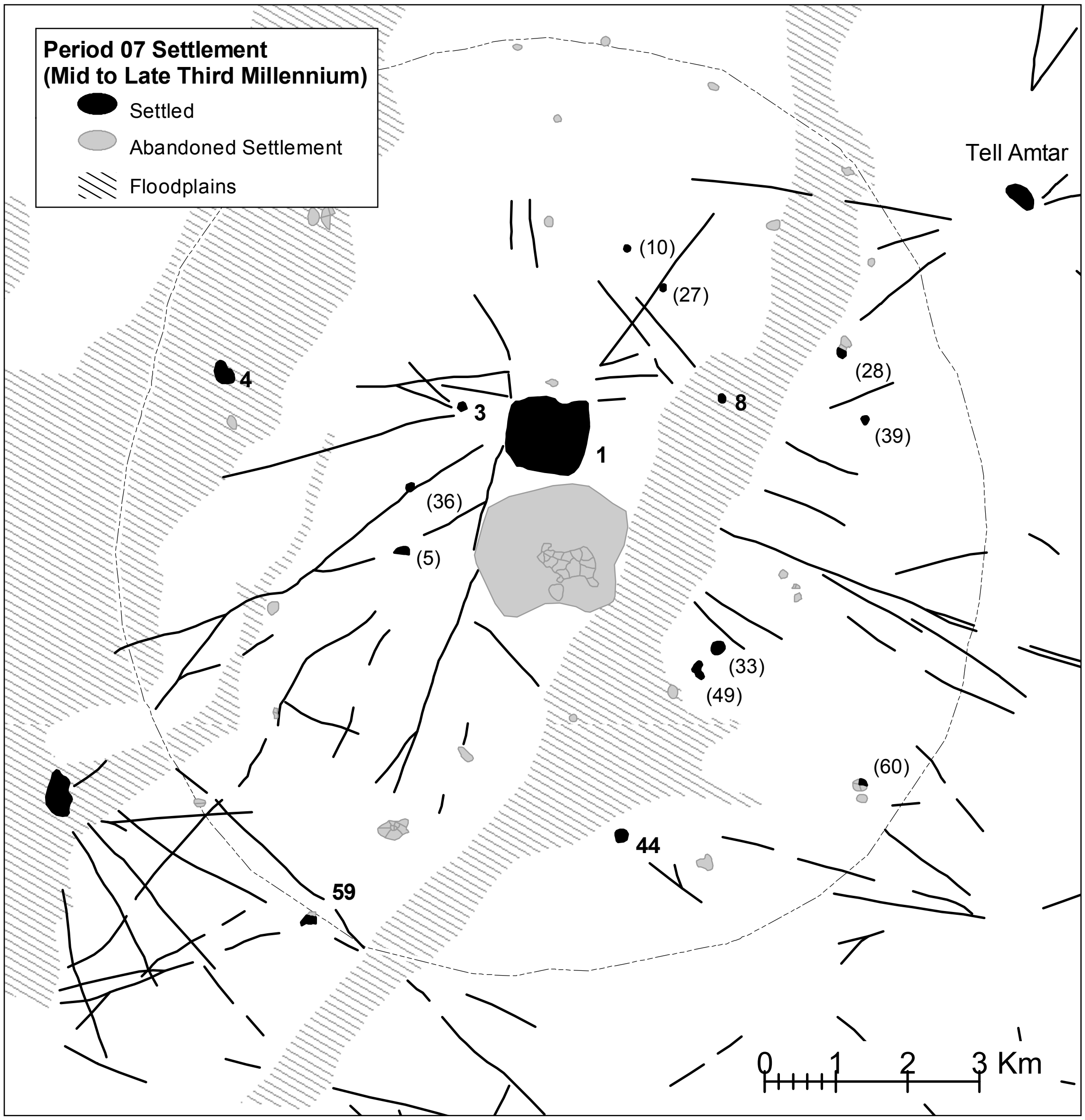


Fig. 4.18. THS Area, Period 07. The mid to late third millennium landscape. Occupied sites (black) and abandoned settlement (gray). Possible non-permanent settlement labelled with parentheses. Linear features are broad hollow ways.

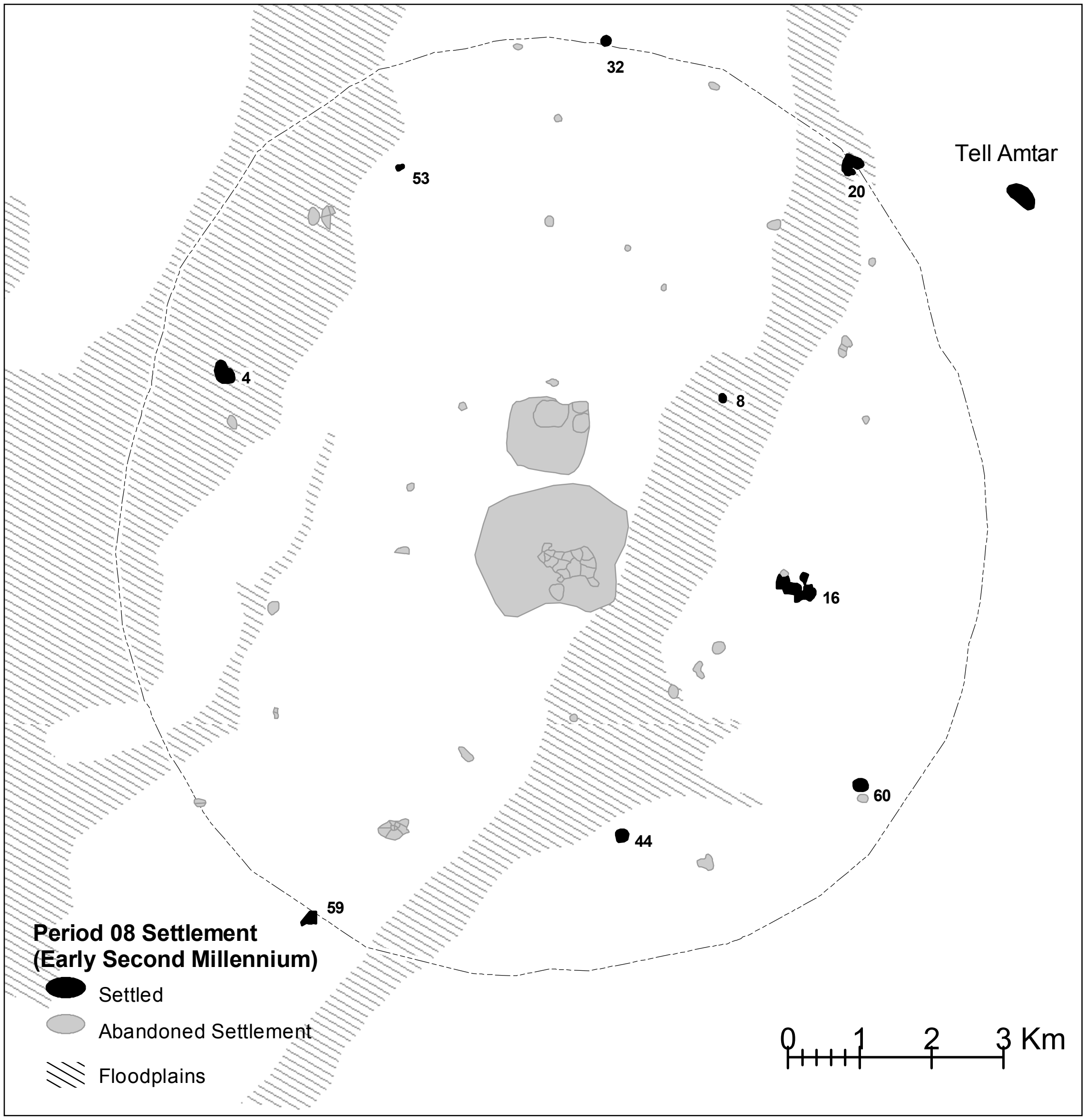


Fig. 4.19. THS Area, Period 08. The early second millennium landscape. Occupied sites (black) and abandoned settlement (gray).

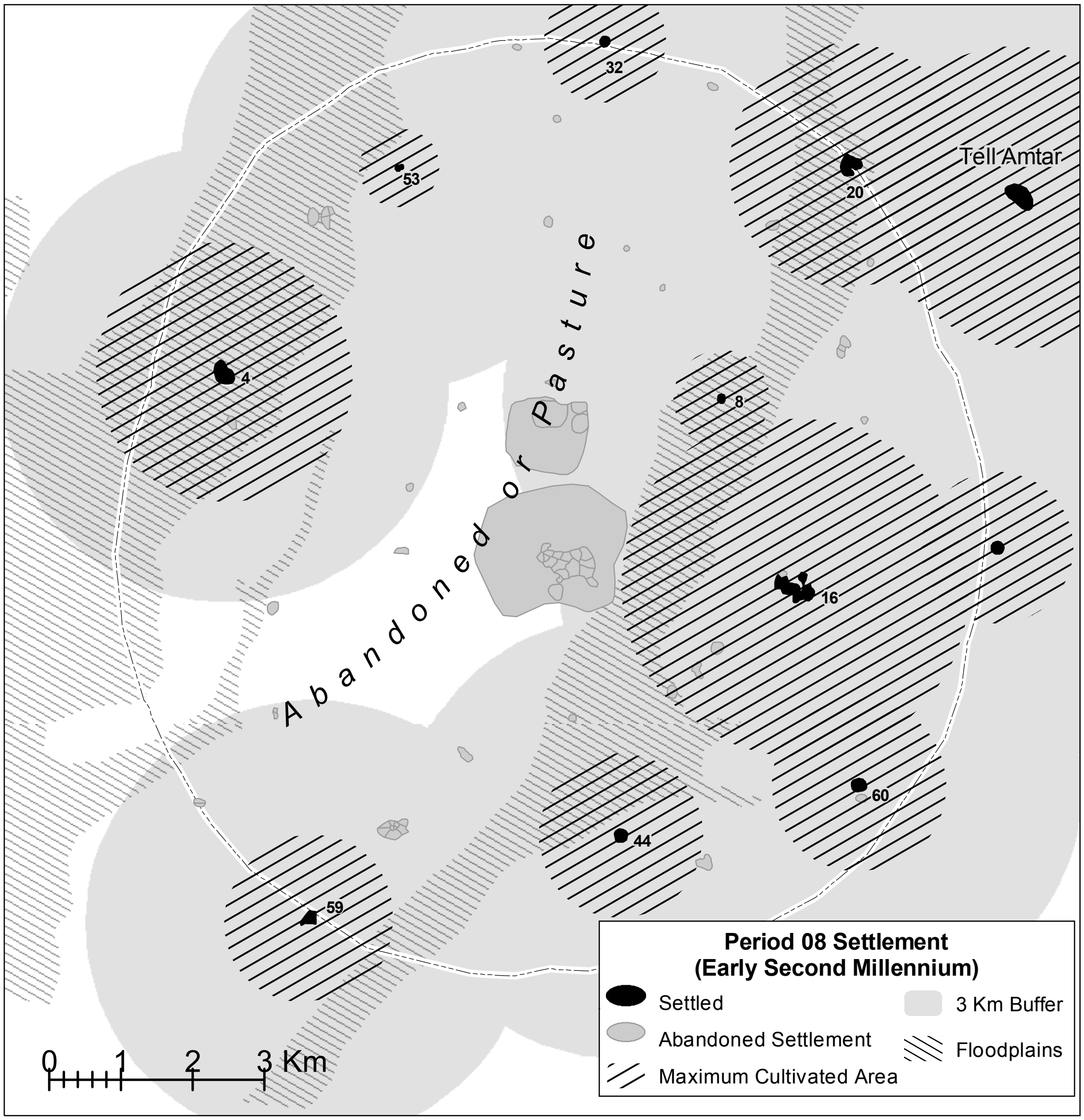


Fig. 4.20. THS Area, Period 08. Landuse in the early second millennium. Occupied sites (black) and abandoned settlement (gray). Maximum cultivation based on 100 persons/ha, 50% of the population engaged in harvesting, and a maximum harvested area of 3 ha/person/year.

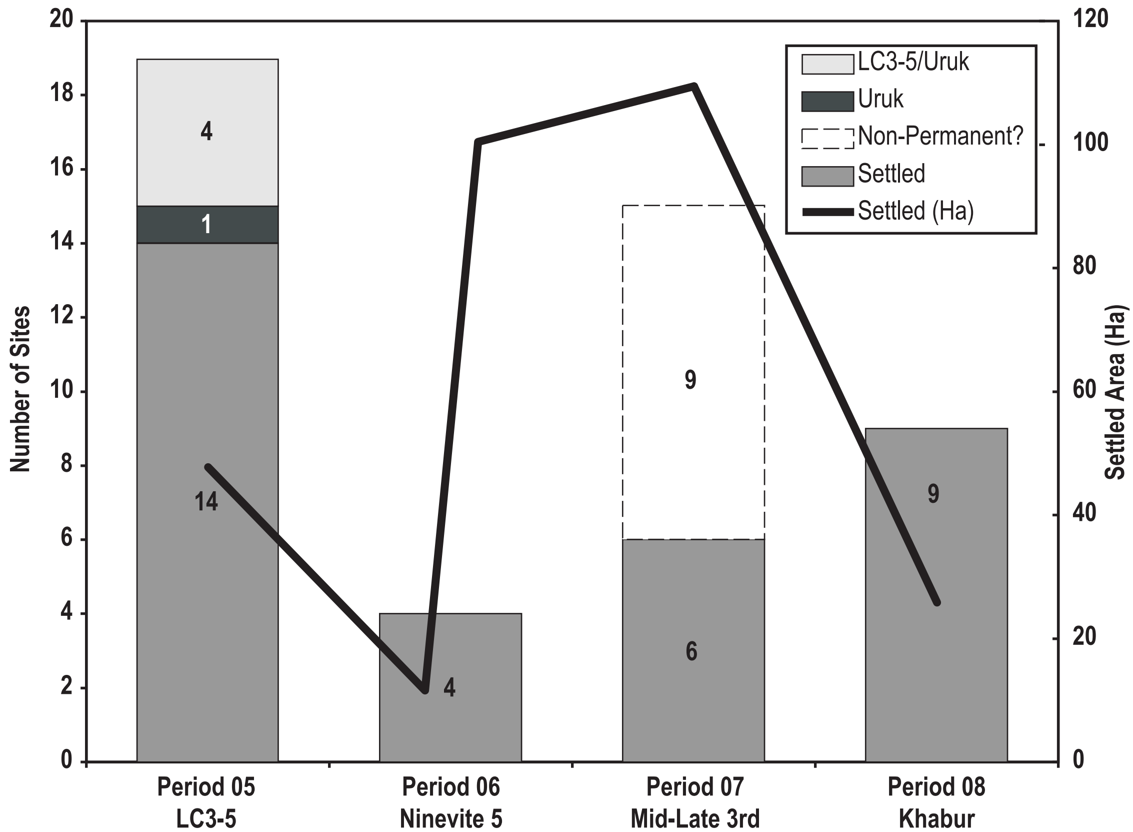


Fig. 4.21. Site histogram and settled area in the THS region. Number of sites (bars) and total settled area in hectares (line). Dashed bar represents possible seasonal settlements of agricultural laborers or pastoralists. Period 06 settled area accounts for both pre-urban (early Period 06) and urban (late Period 06) Hamoukar.

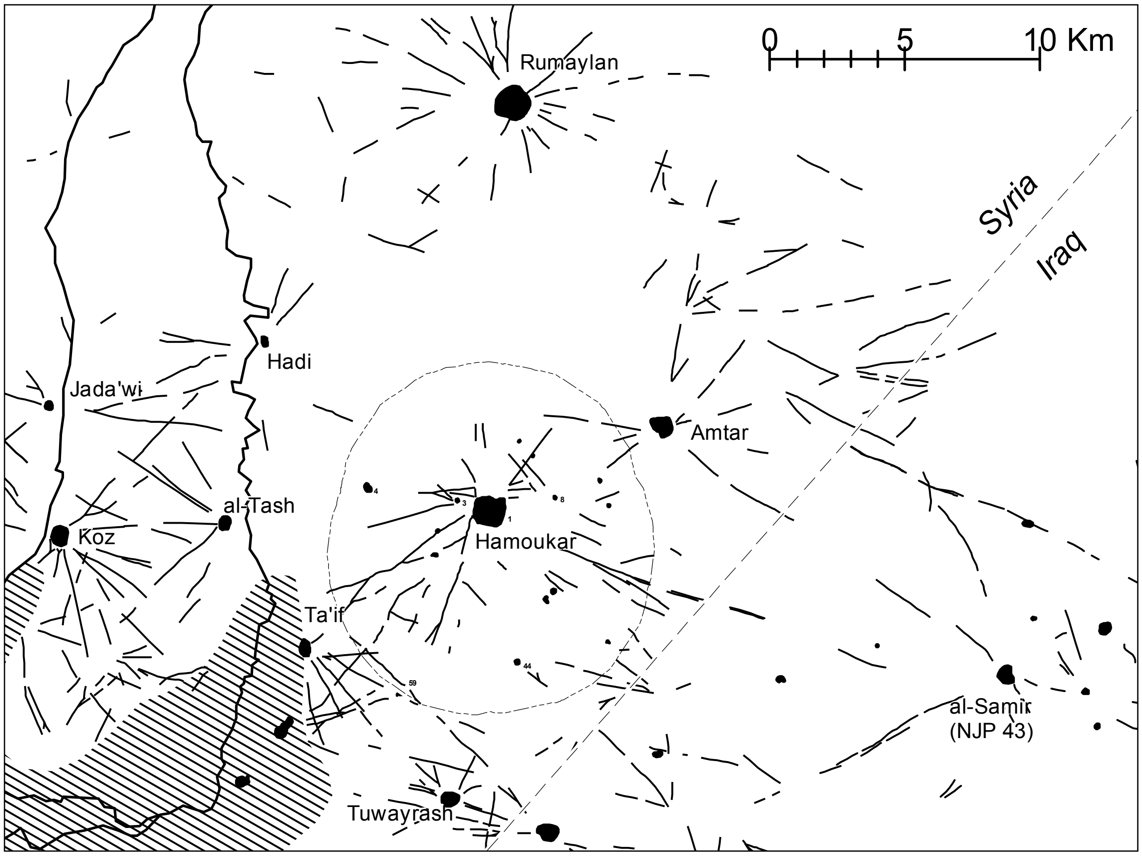


Fig. 4.22. Eastern Upper Khabur basin. Linear features are broad hollow ways. Period 07 occupation at sites outside of the THS and NJP limits is unconfirmed.

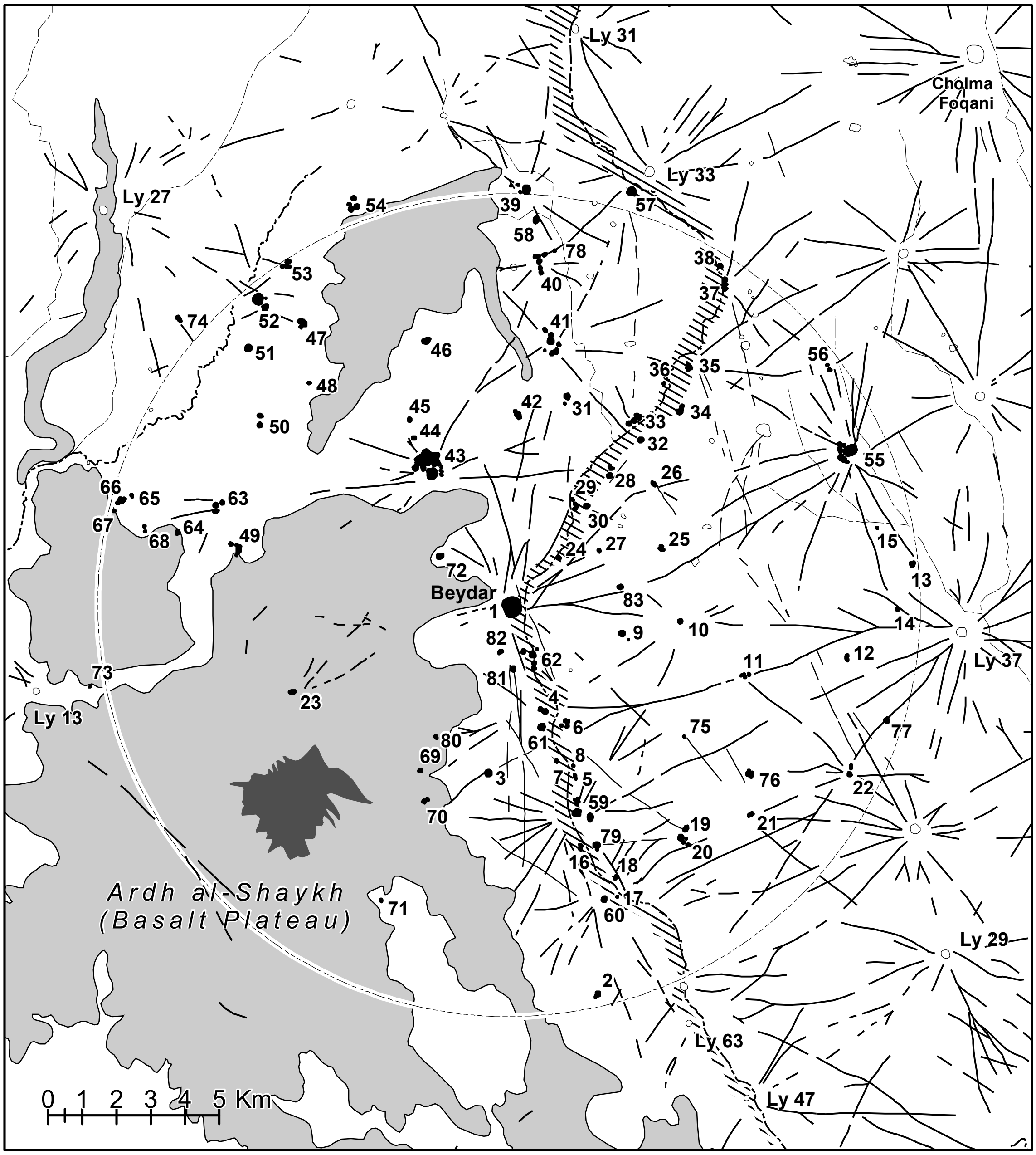


Fig. 4.23. TBS Area. All ancient sites and hollow ways. Collected sites (black) and unconfirmed sites or sites beyond survey limits (white).

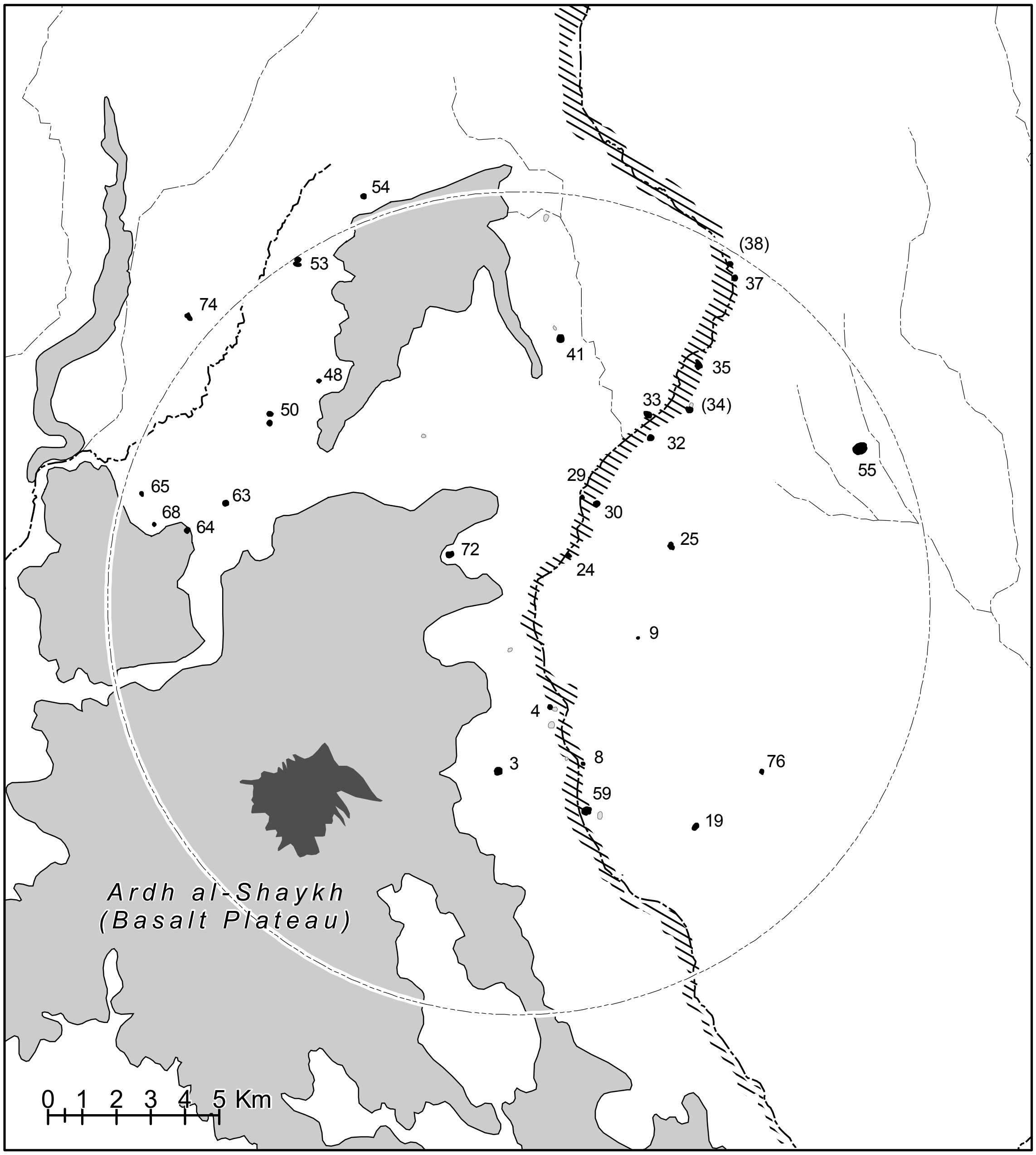


Fig. 4.24. TBS Area, Periods 04-05. The late fifth to fourth millennium landscape. Occupied sites (black) and abandoned settlement (gray). Sites with both Uruk and local ceramics in parentheses. All other sites purely local in character.

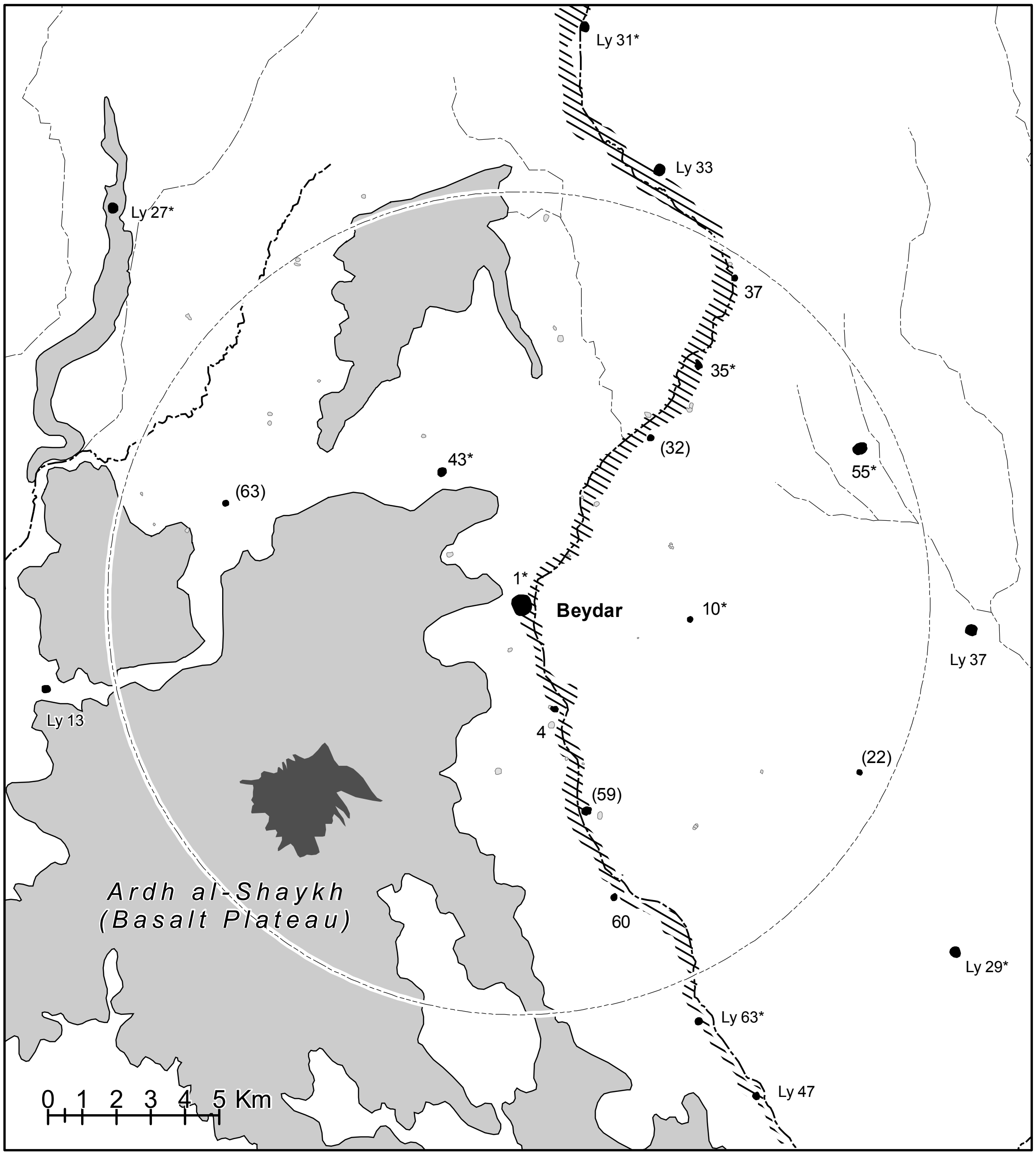


Fig. 4.25. TBS Area, Period 06. The early third millennium landscape. Occupied sites (black) and abandoned settlement (gray). Decorated Ninevite 5 reported at sites marked with an asterisk (*). Early third millennium occupation reported by Lyonnet but not the TBS at sites with labels in parentheses.

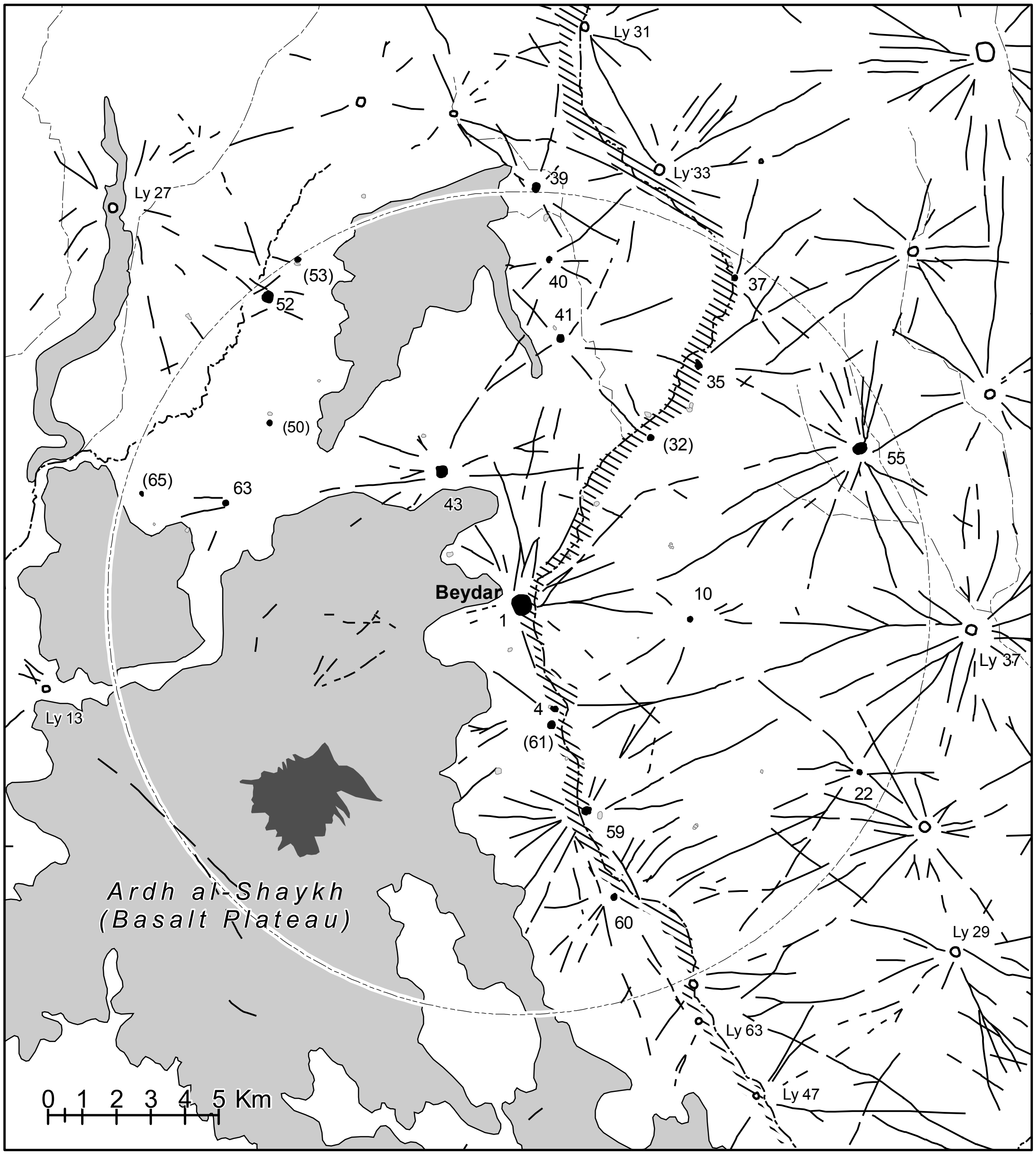


Fig. 4.26. TBS Area, Period 07. The mid to late third millennium landscape. Occupied sites (black) and abandoned settlement (gray). Sites with minor or non-permanent occupation are labelled in parentheses.

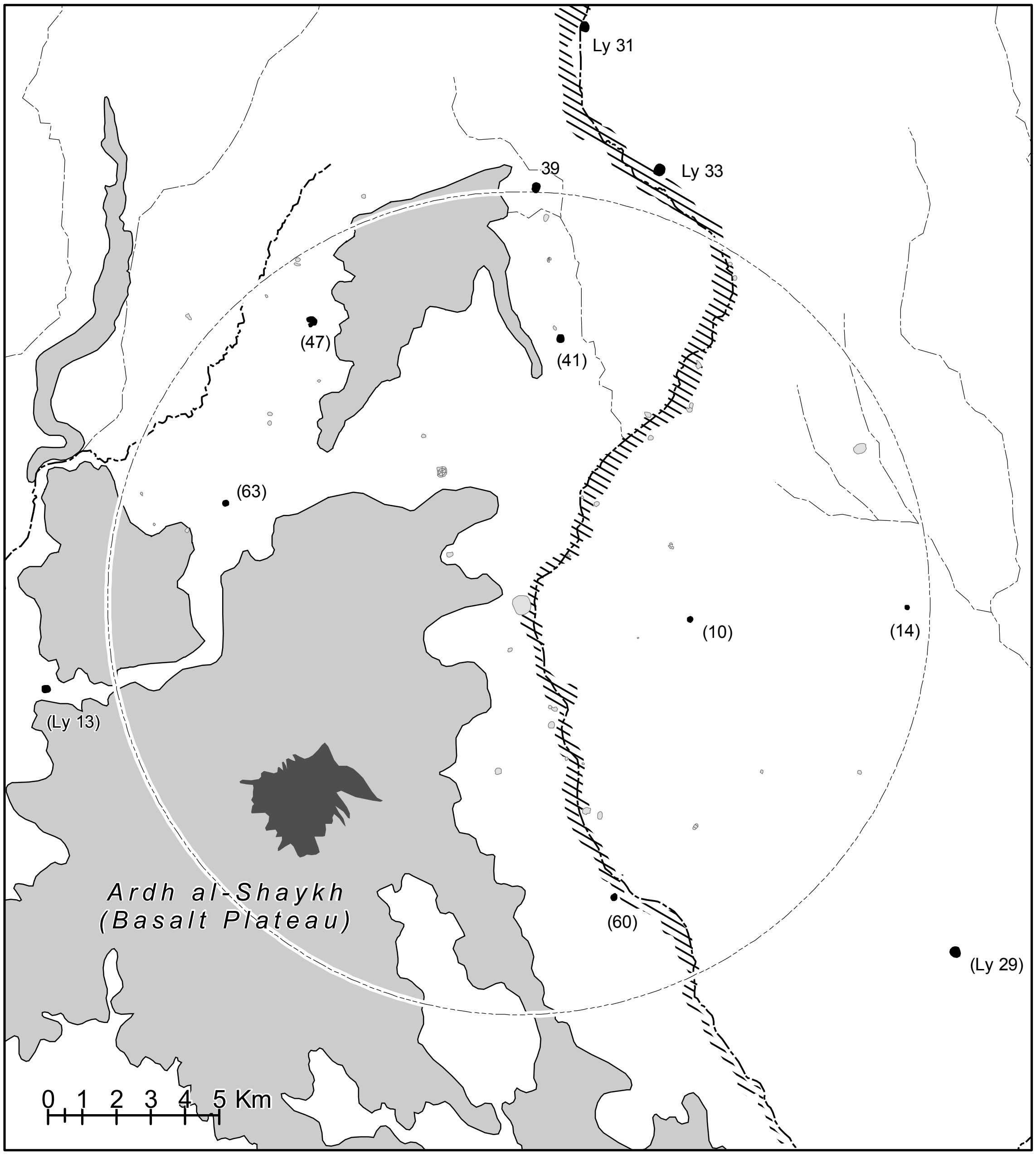


Fig. 4.27. TBS Area, Period 08. The early second millennium landscape. Occupied sites (black) and abandoned settlement (gray). Sites with minor or non-permanent settlement are labelled in parentheses. Note: Period 08 occupation at TBS 63 (=Ly 51) was observed by Lyonnet but not by the TBS.

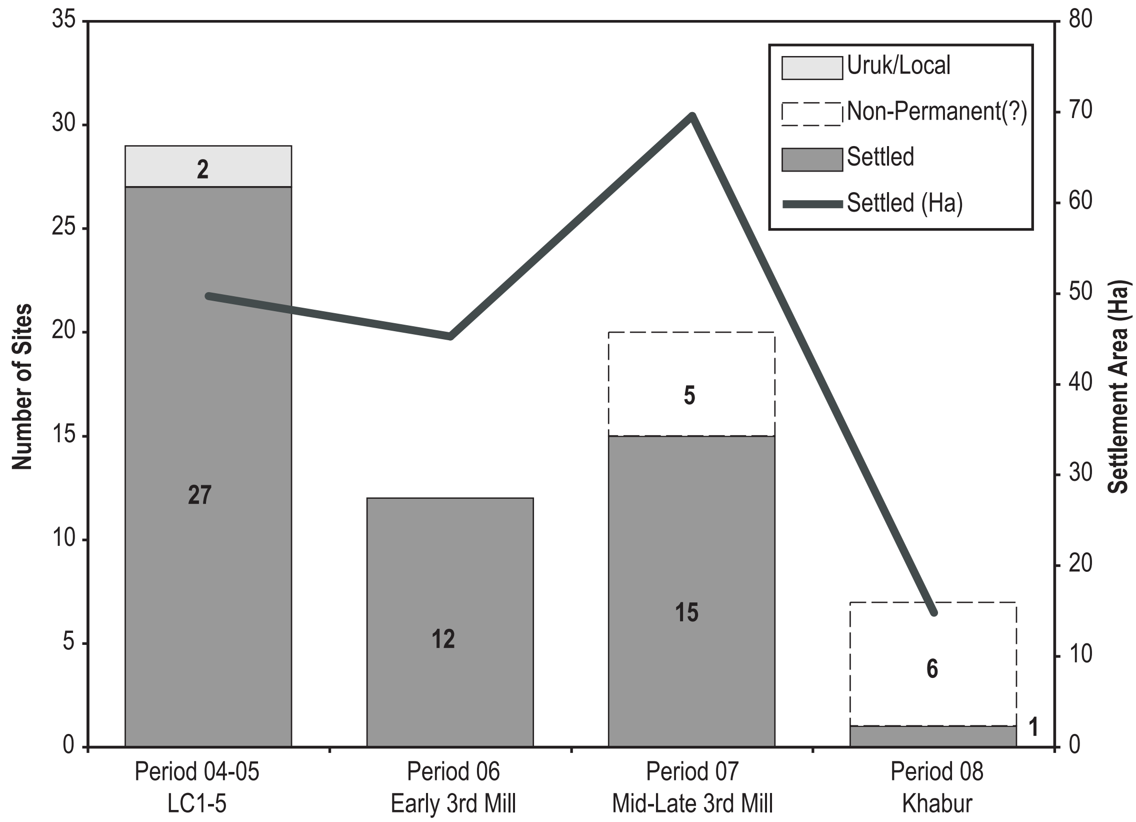


Fig. 4.28. Site histogram and settled area in the TBS region. Number of sites (bars) and total settled area in hectares (line). Dashed line represents minor or non-permanent occupations.

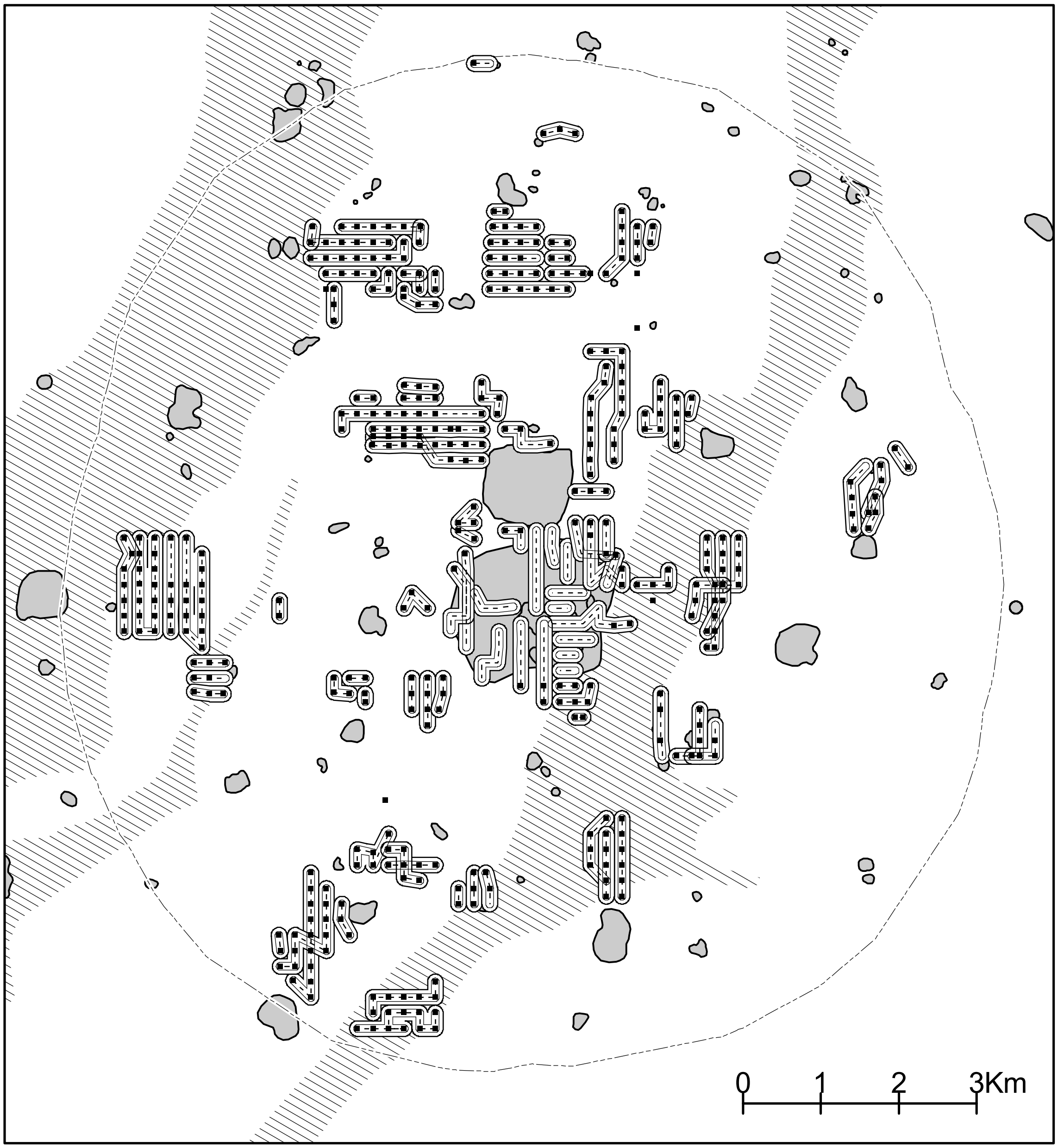


Fig. 5.1. Field scatter collection transects in the THS region. Dashed line represents the transect; inner buffer represents archaeological soils viewshed of each fieldwalker (50 m); outer buffer represents mounding viewshed (100 m). Black squares are 10 x 10 m collection units.

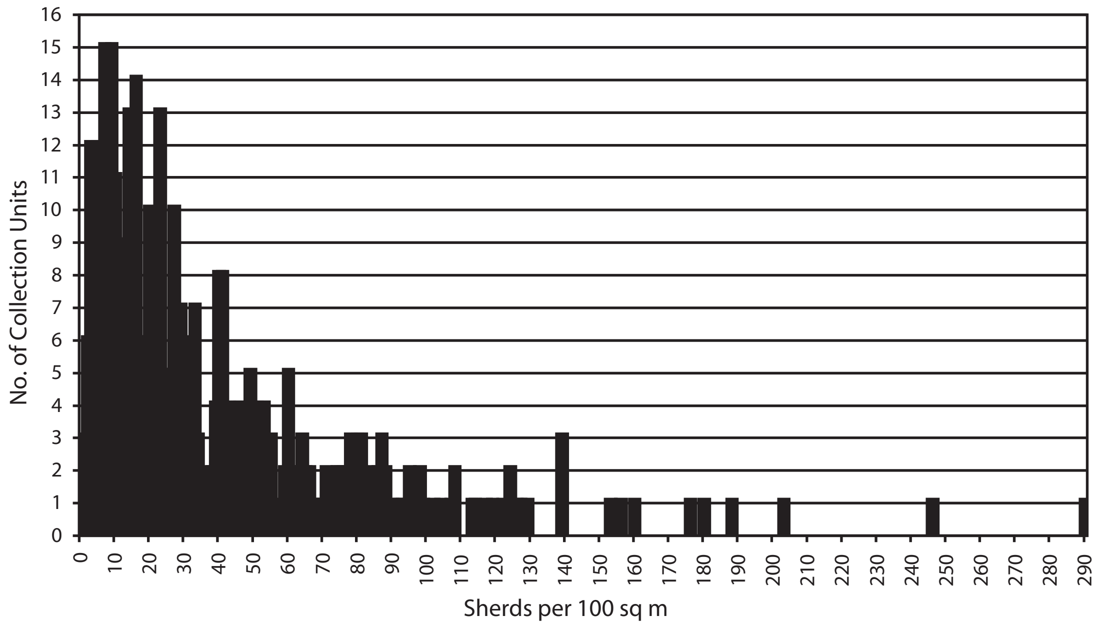


Fig. 5.2. Field scatter histogram.

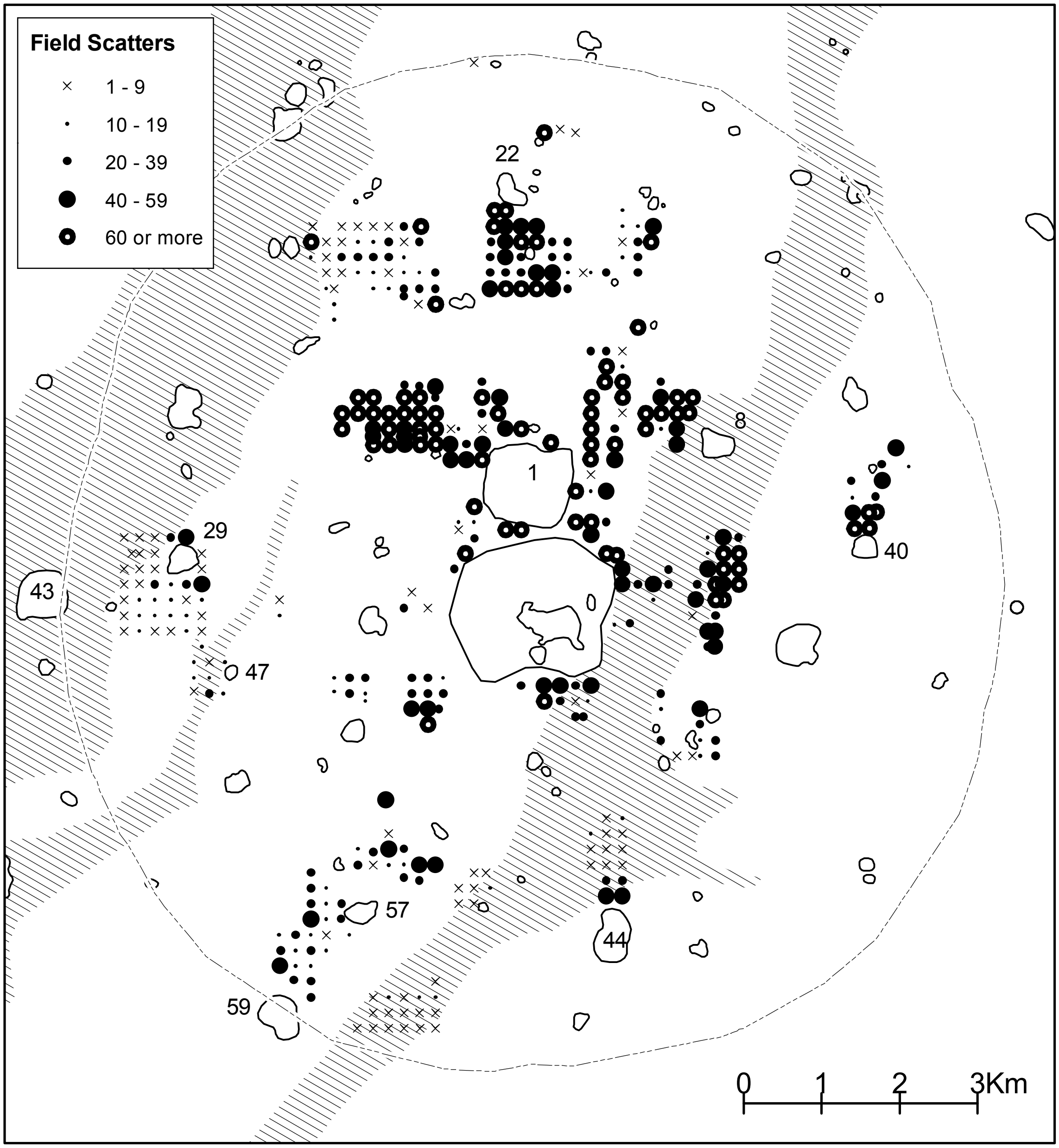


Fig. 5.3. Field scatter collection units in the THS region, scaled for sherd density. Counts are in sherds per 100 square meters.

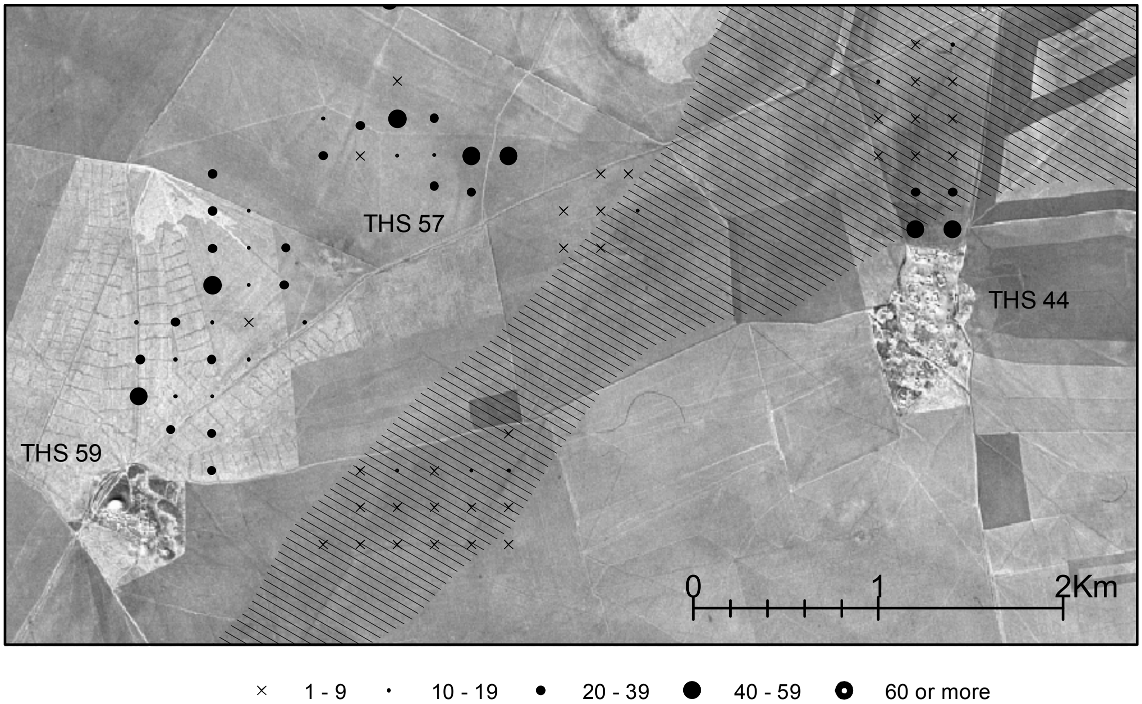


Fig. 5.4a. Field scatters in the southern THS region. Densities in sherds per 100 square meters. CORONA 1108-1025DA006 (6 December 1969).

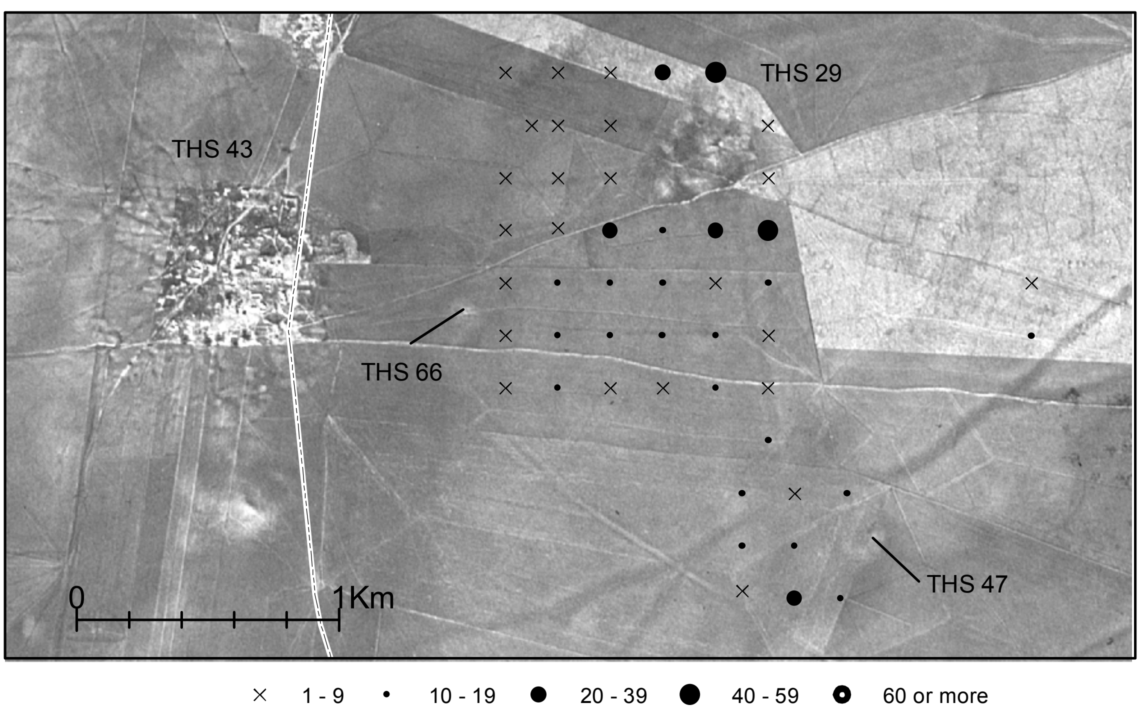


Fig. 5.4b. Field scatters in the western THS region. Densities in sherds per 100 square meters. CORONA 1108-1025DA005 (6 December 1969).

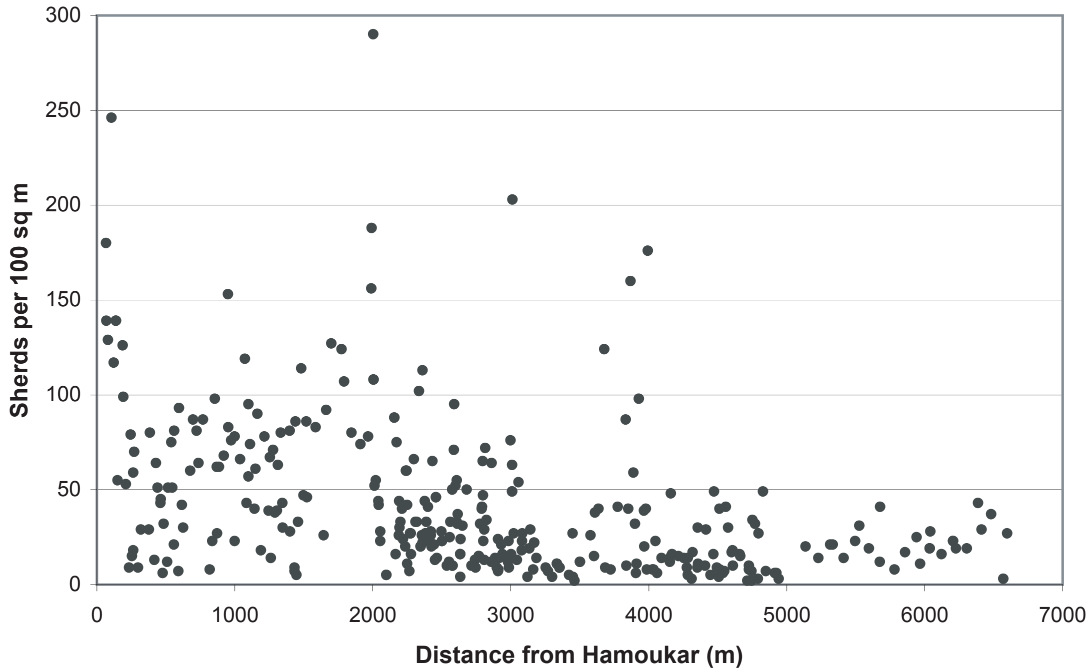


Fig. 5.5. Field Scatter Density and Distance from Hamoukar.

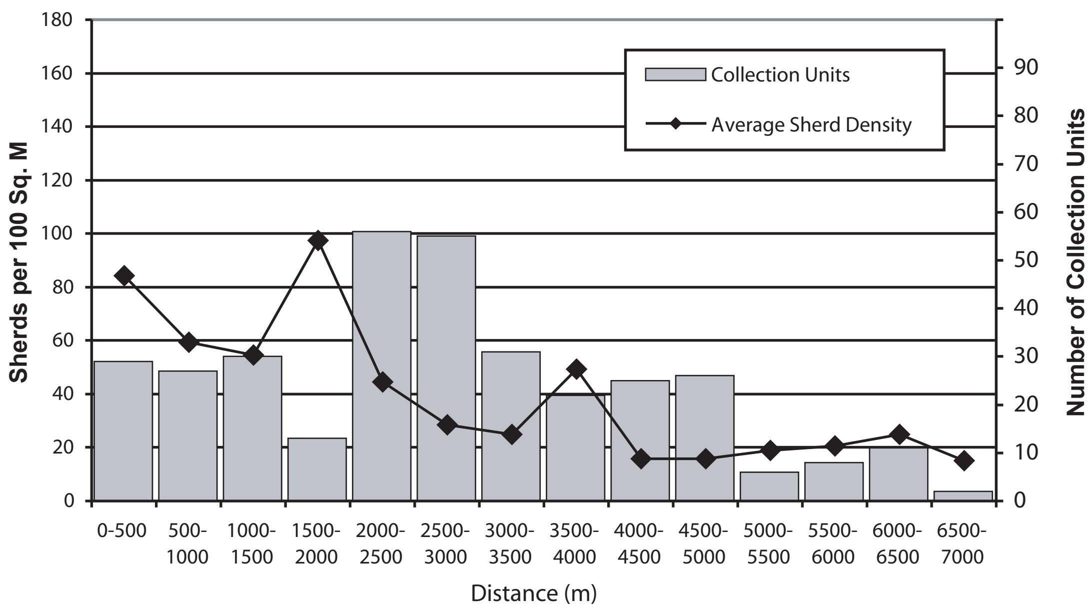


Fig. 5.6. Average sherd density with distance from Hamoukar

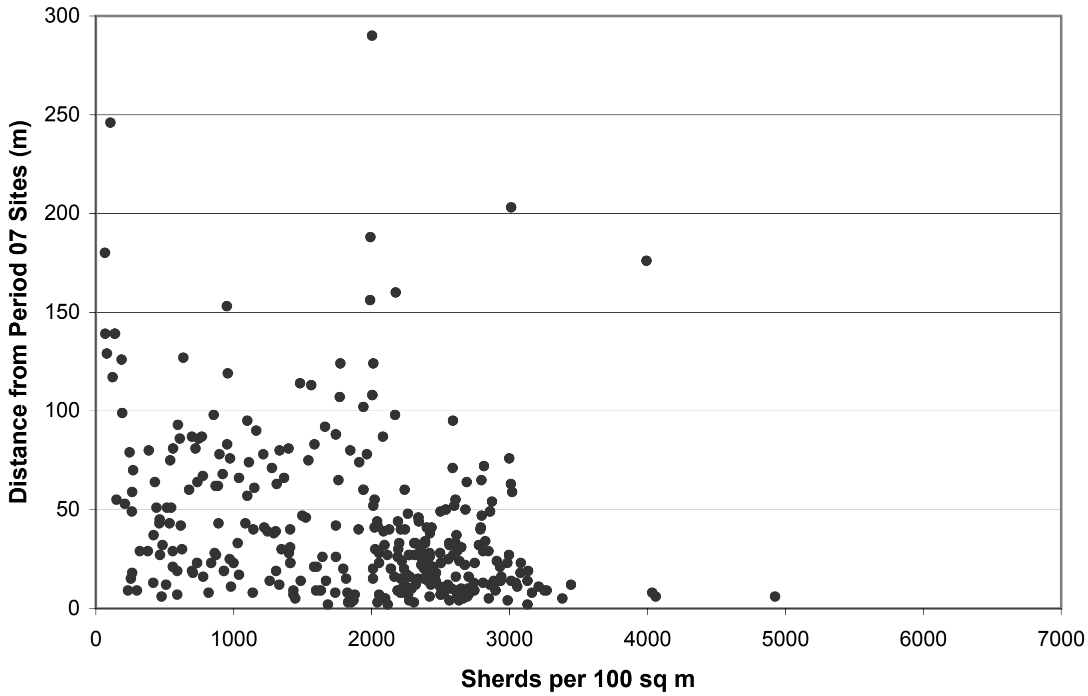


Fig. 5.7. Field Scatter Density and Distance from Period 07 Sites.

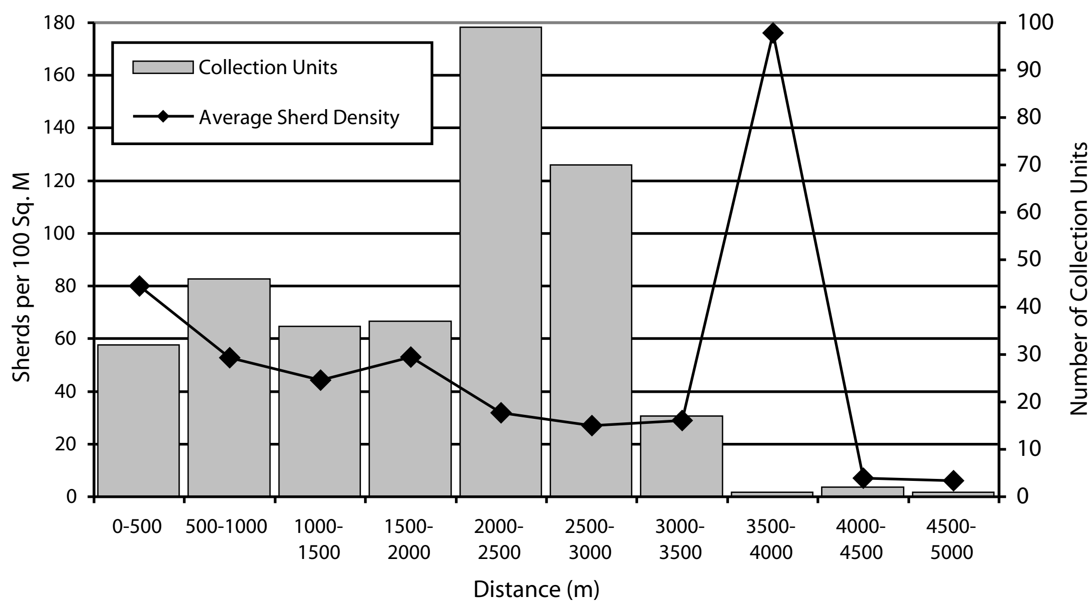


Fig. 5.8. Average sherd density with distance from all major Period 07 sites.

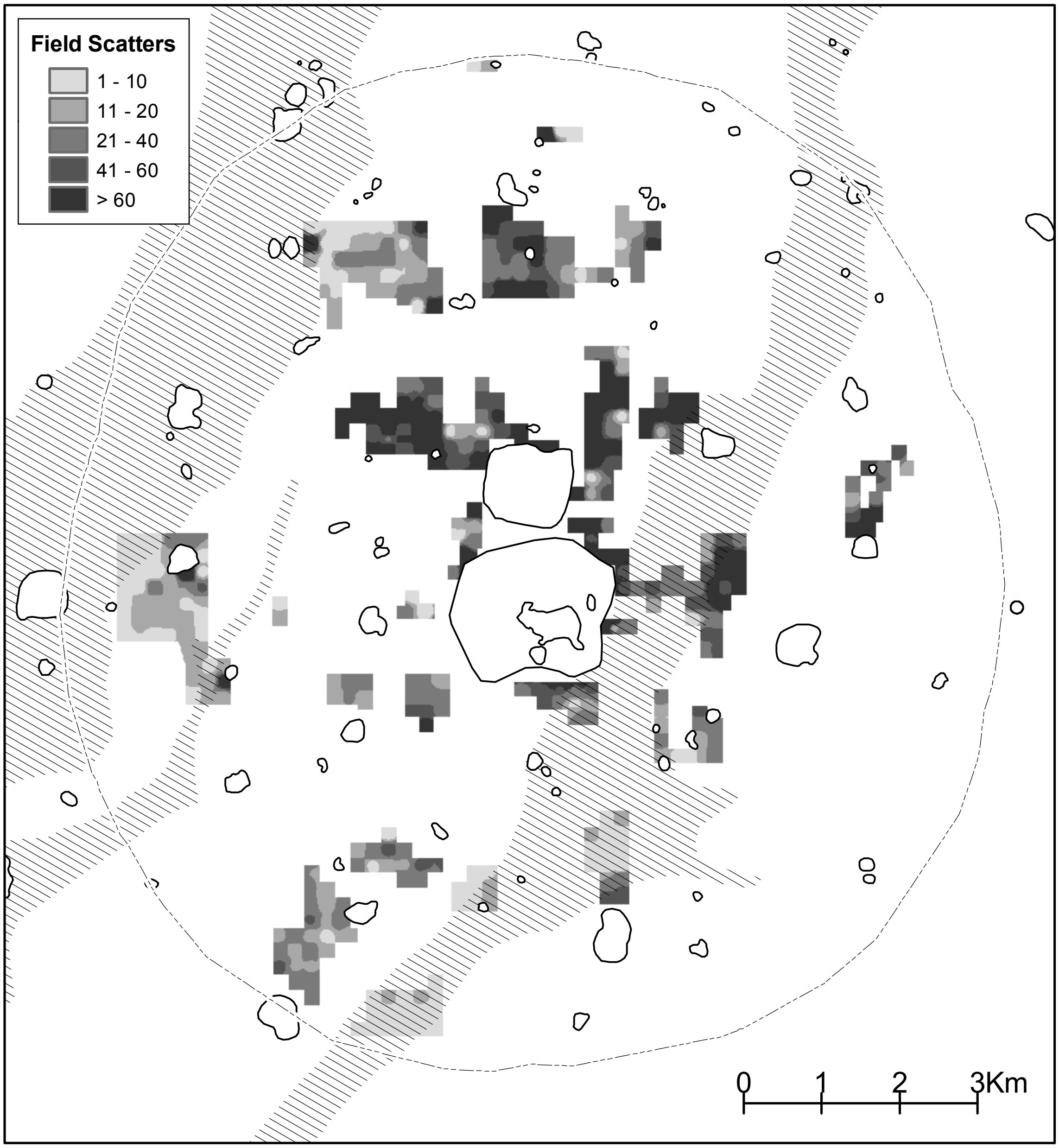


Fig. 5.9. Interpolated sherd density in the THS region. Counts are in sherds per 100 square meters.

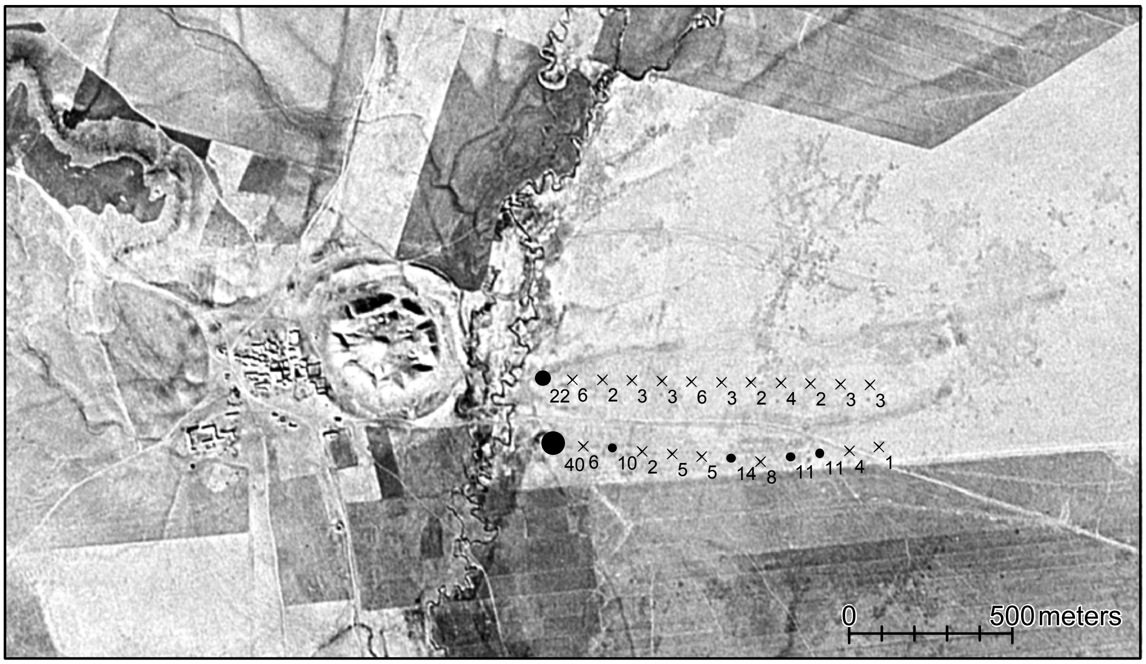


Fig. 5.10. Field scatter collection east of Tell Beydar. Southern transect was conducted on a clean fallow field; northern transect was on a recently plowed field. CORONA 1105-1025DF057 (5 November 1968).

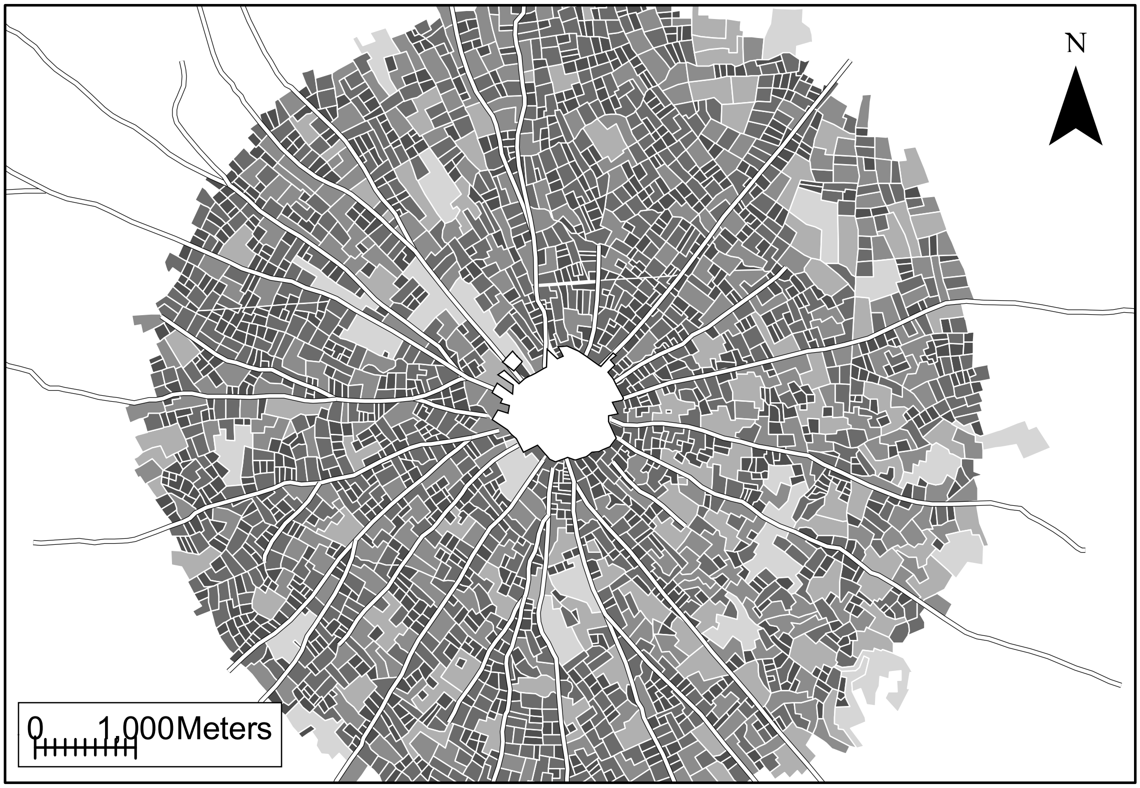


Fig. 5.11a. Radial tracks and field systems at Qaraqosh, Iraq, based on CORONA satellite photographs. See also Wilkinson 2003: Fig. 6.13.

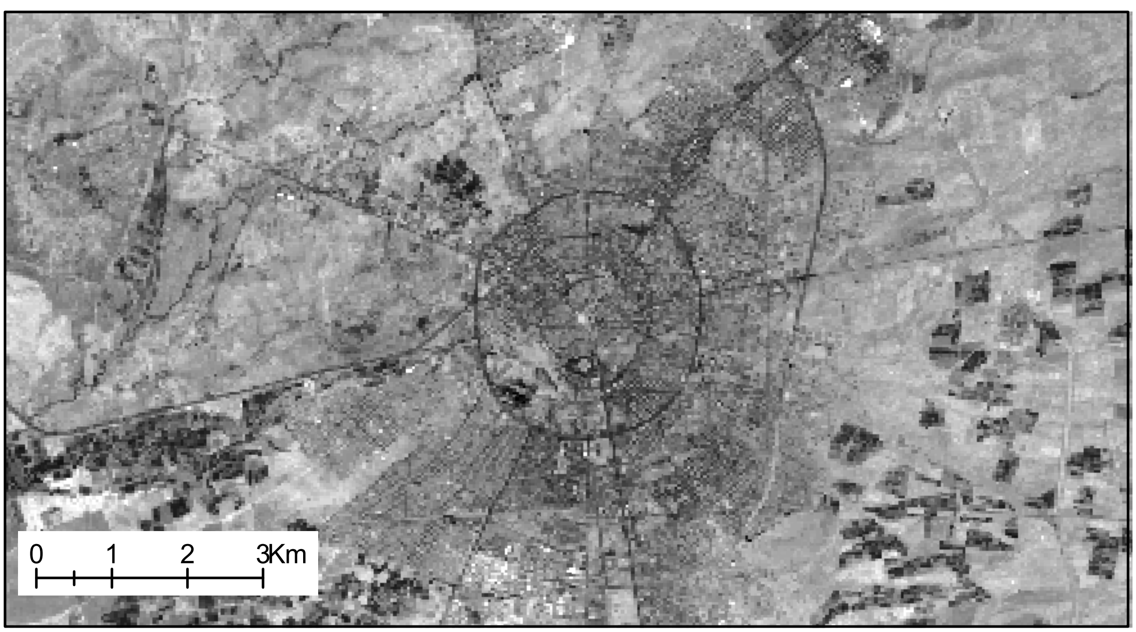


Fig. 5.11b. SPOT image of Erbil, Iraq (22 June 1991).

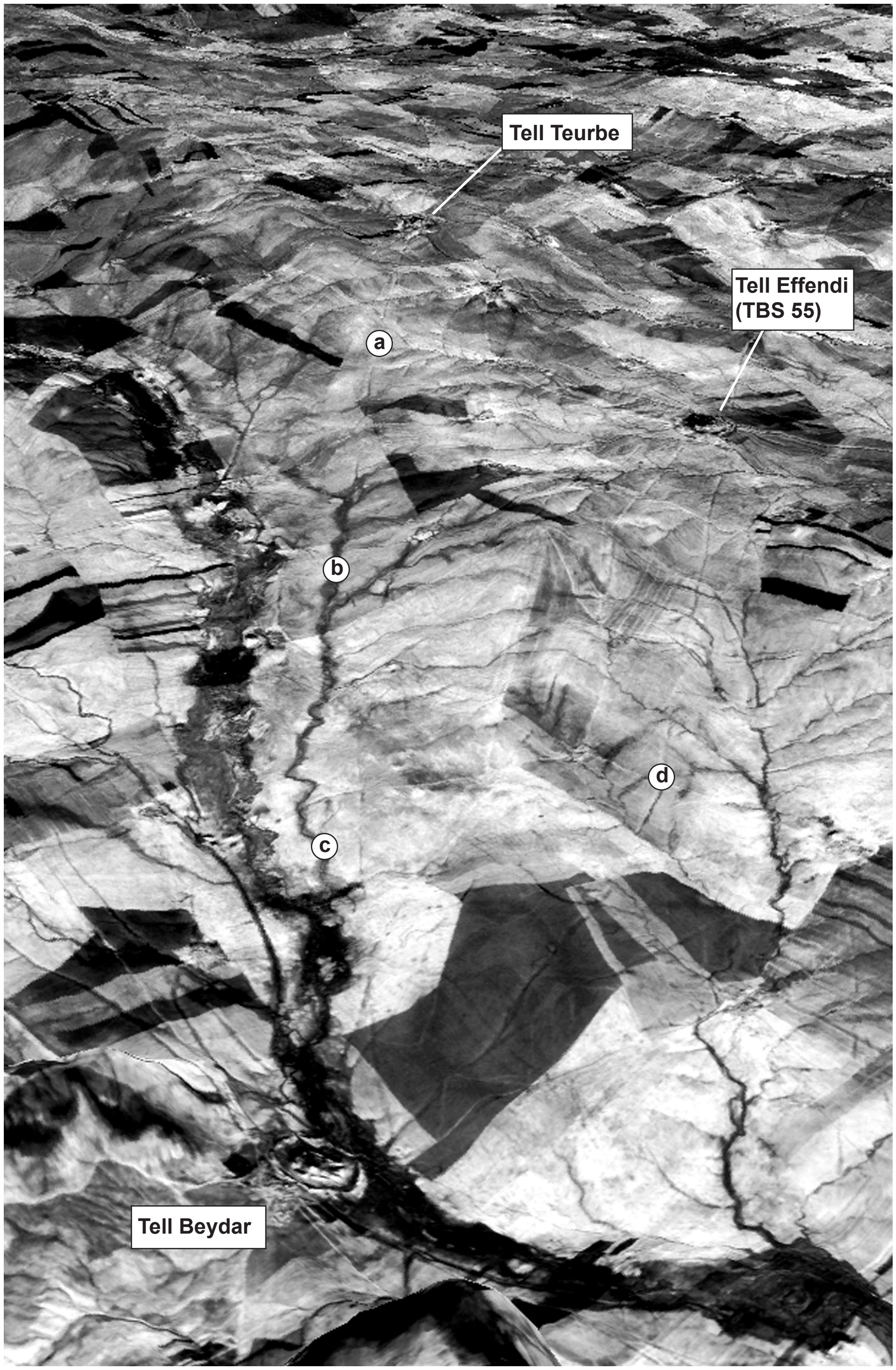


Fig. 5.12. Wadi capture along the hollow way from Tell Teurbe to Tell Beydar.
a. Hollow way leading from Teurbe to Beydar; b. hollow way trough capturing and redirecting surface runoff; c) meanders in hydrologically active hollow way.
CORONA 1102-1025D (11 December 1967).

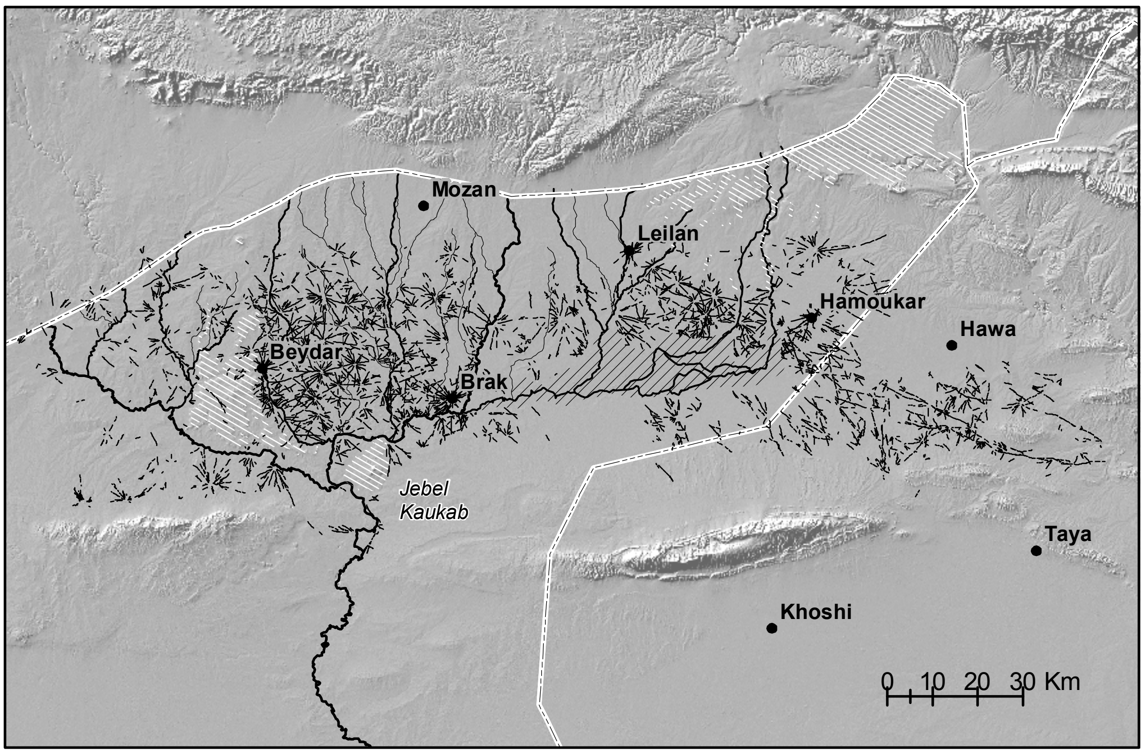


Fig. 5.13. Upper Khabur basin with areas of hollow way mapping indicated. Syrian basalt areas (white hatching) and the Radd marsh (black hatching).

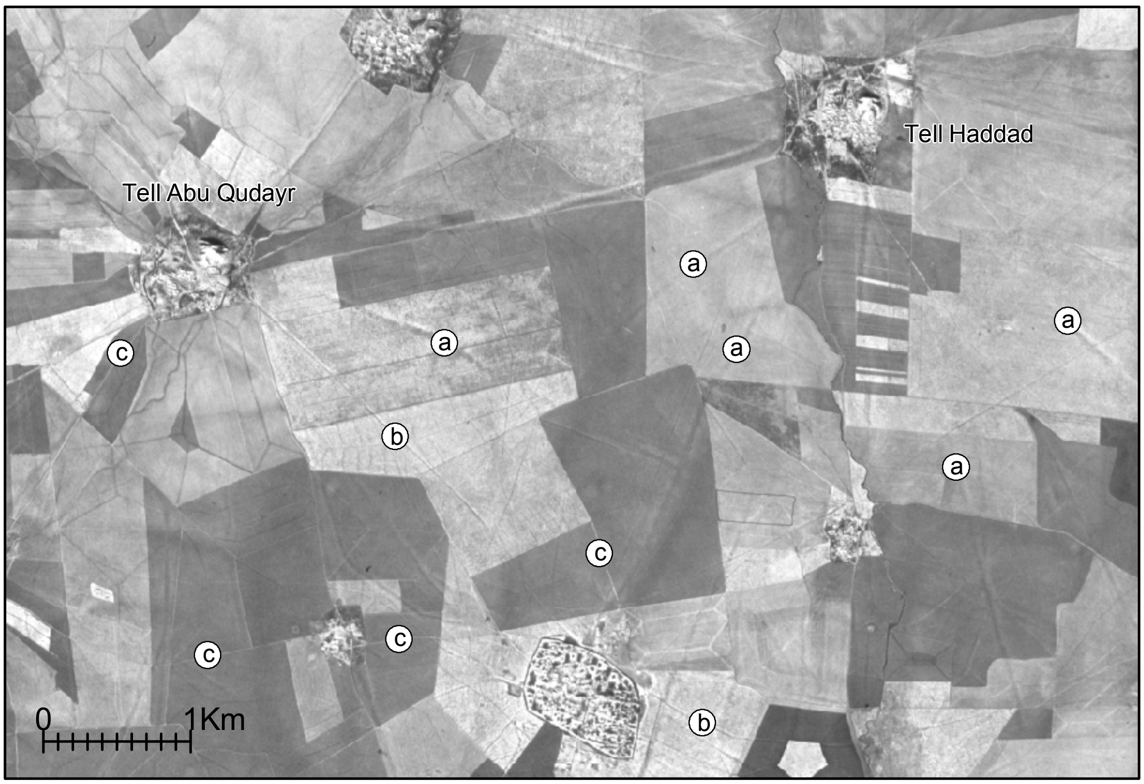


Fig. 5.14. Comparison of the signatures of hollow ways and modern tracks on CORONA photographs. a. Broad hollow ways radiating from tell sites; b. Narrow hollow ways; c. Modern tracks and roads. CORONA 1108-1025DA005 (6 December 1969).

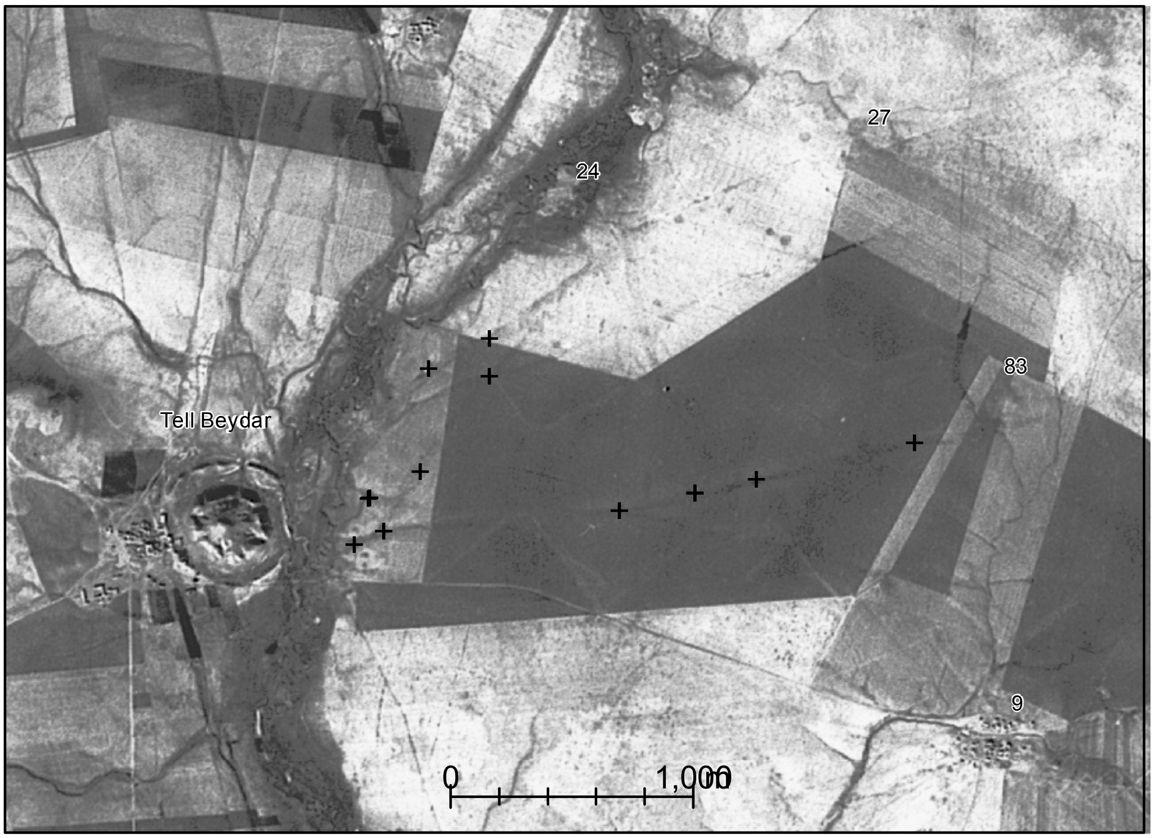


Fig. 5.15. Ground observations of hollow ways east of Tell Beydar in 2000. Crosses indicate points where the hollow way was visible on the ground. CORONA 1102-102DA012 (11 December 1967).

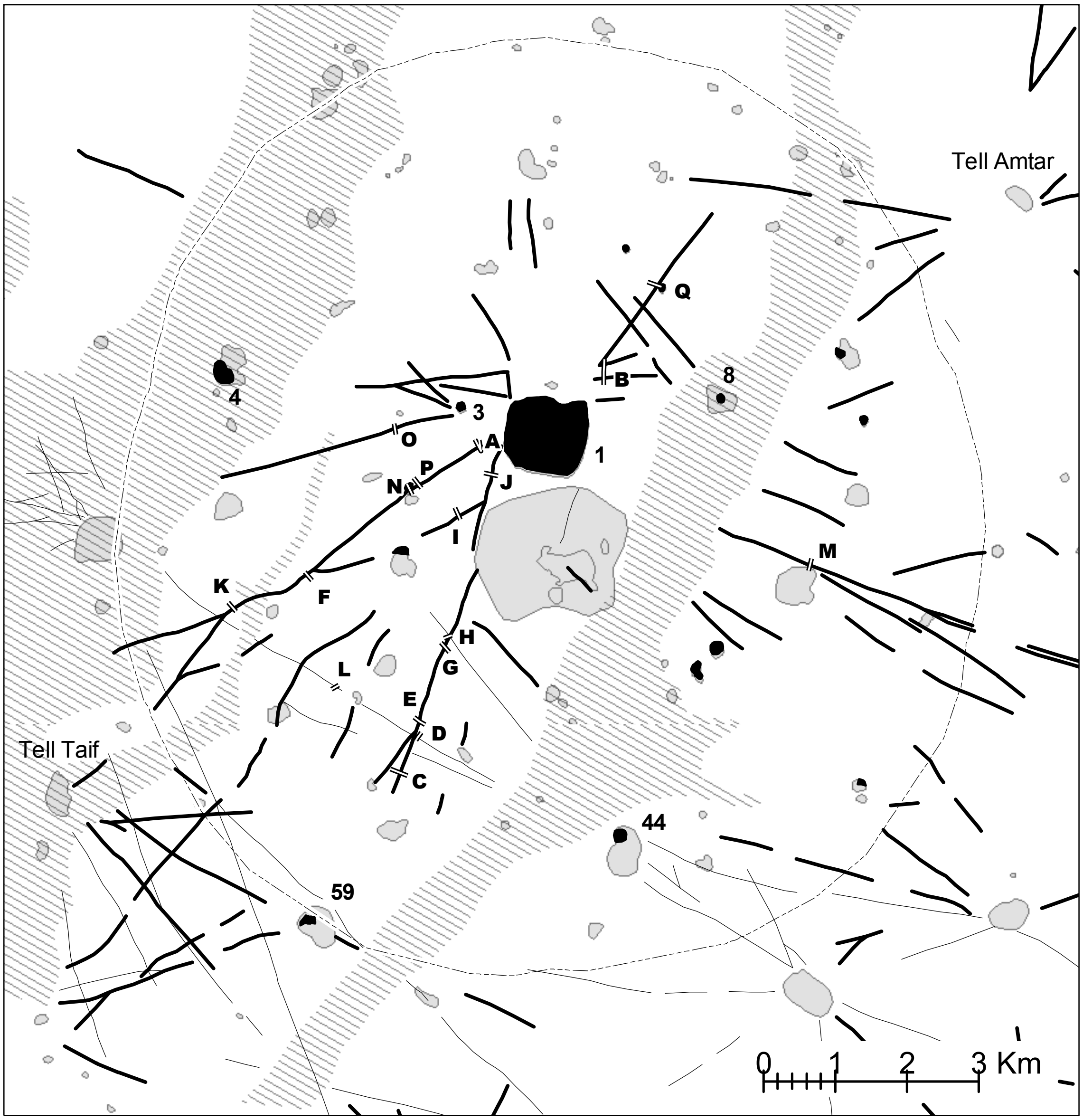


Fig. 5.16. Hollow ways in the THS region. Black sites occupied in Period 07, other sites and unsurveyed sites in gray. Thick lines are broad hollow ways (ca. 100 m wide); thin lines are narrow hollow ways (ca. 50 m wide). Profiles labeled with letters.

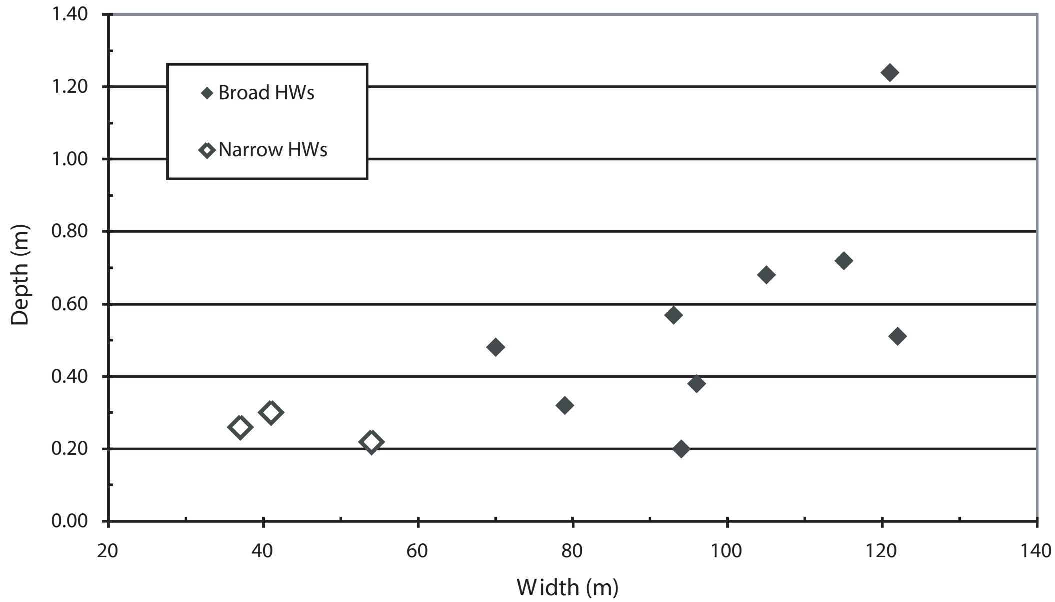


Fig. 5.17. Widths and depths of thirteen hollow way profiles in the THS region.

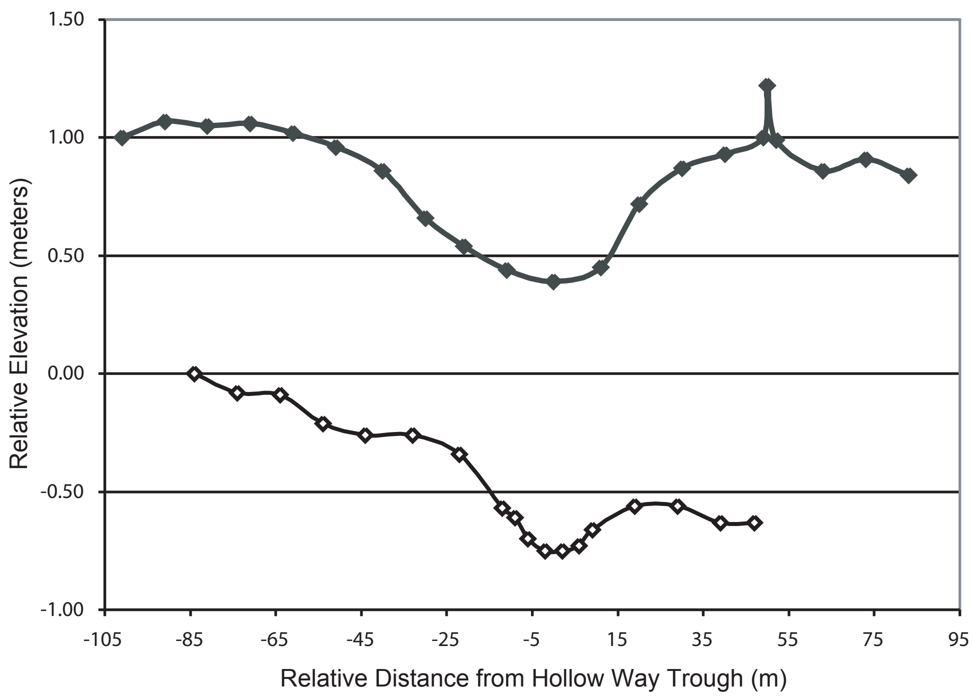


Fig. 5.18. Comparative profiles of broad (Profile E, top) and narrow (Profile H, bottom) hollow ways in the THS region. Note vertical exaggeration. The spike in the top profile is an earthen field boundary.

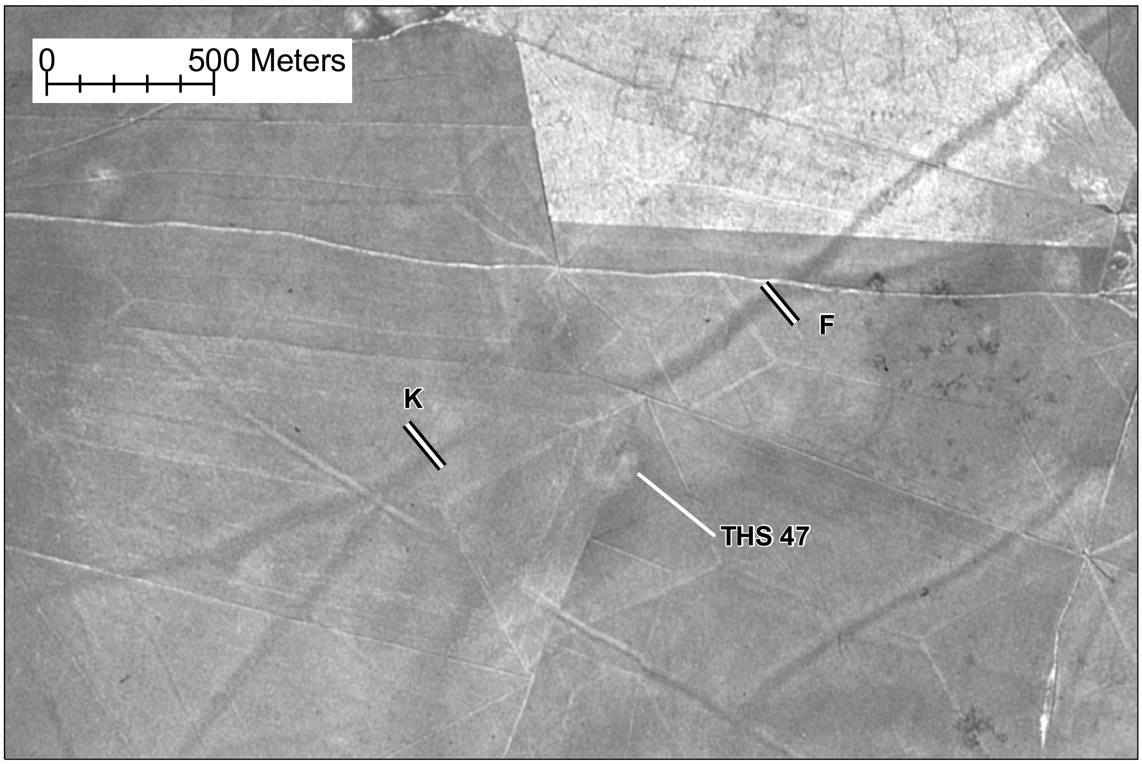


Fig. 5.19. Ancient wadi ford near THS 47. See also Wilkinson 2003: Fig. 3.2. CORONA 1108-1025DA005 (6 December 1969).

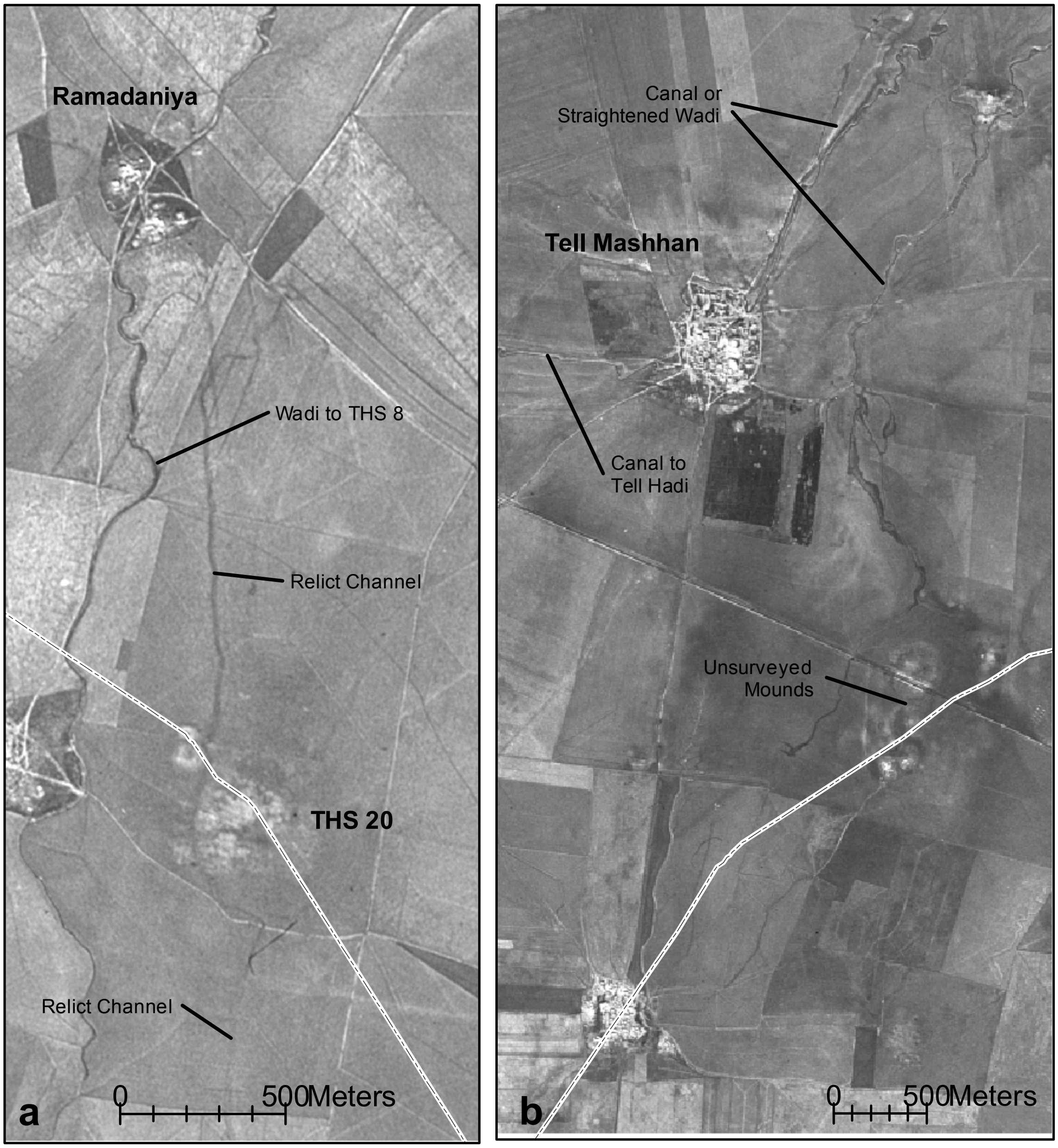


Fig. 5.20. a. Canal traces around Ramadaniya; b. canals near Tell Mashhan. CORONA 1108-1025DA005 (6 December 1969).

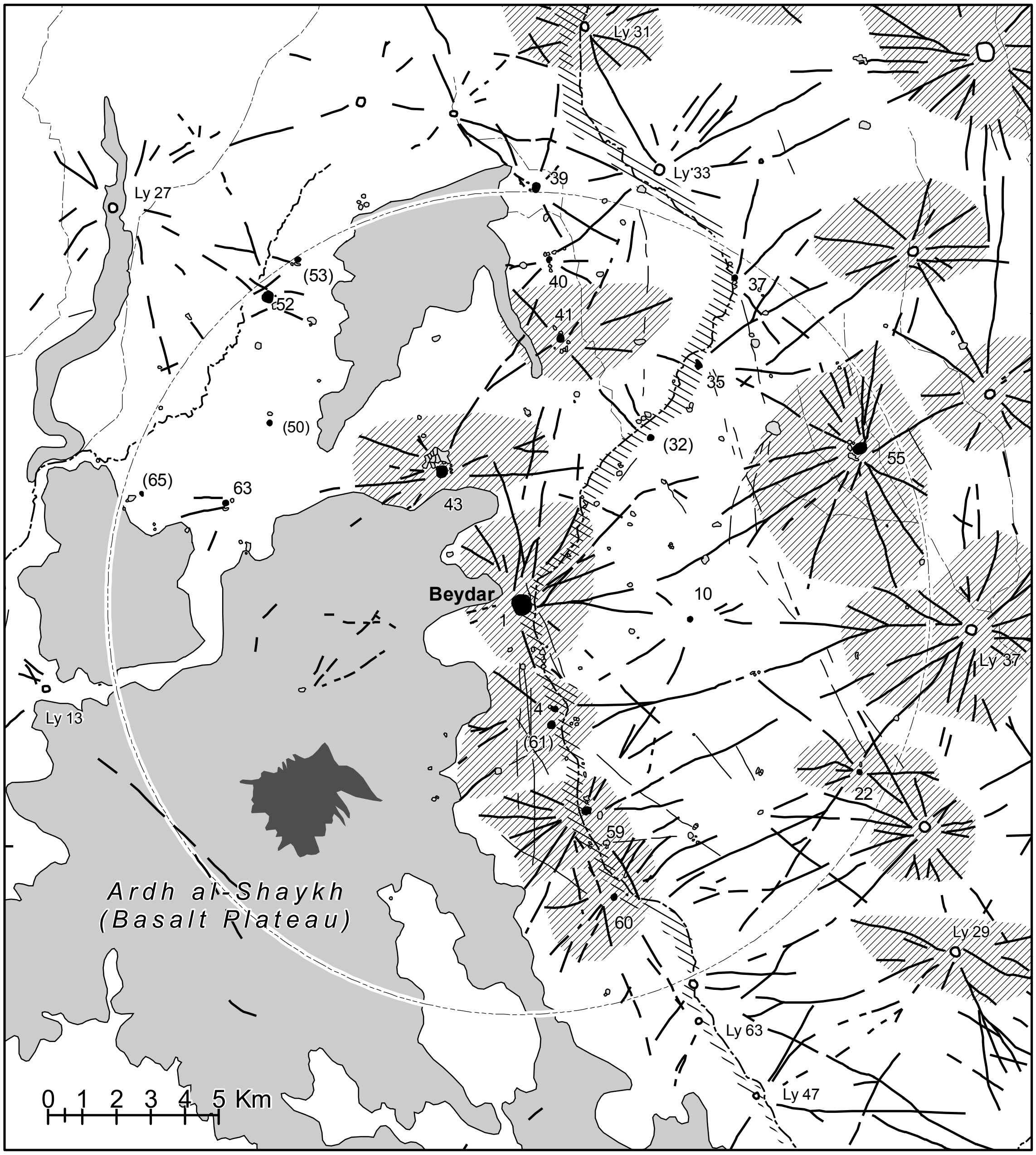


Fig. 5.21. Hollow ways in the TBS Area. Occupied sites (black) and sites of other periods (gray). Sites with minor or non-permanent occupation are labelled in parentheses. Hollow way-defined agricultural territories for Period 07 in tight hatching.

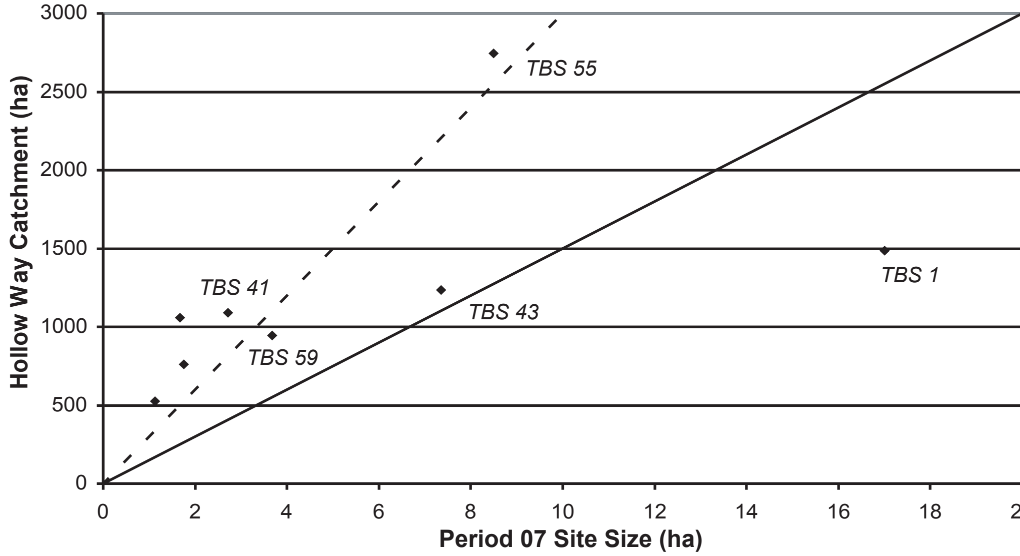


Fig. 5.22. Relationship between site size and hollow way-derived catchment in the TBS area. Lines represents predicted catchments assuming 3 ha harvested per person and 50% agricultural employment. Solid line assumes 100 persons/ha. Dashed line assumes 200 persons/ha.

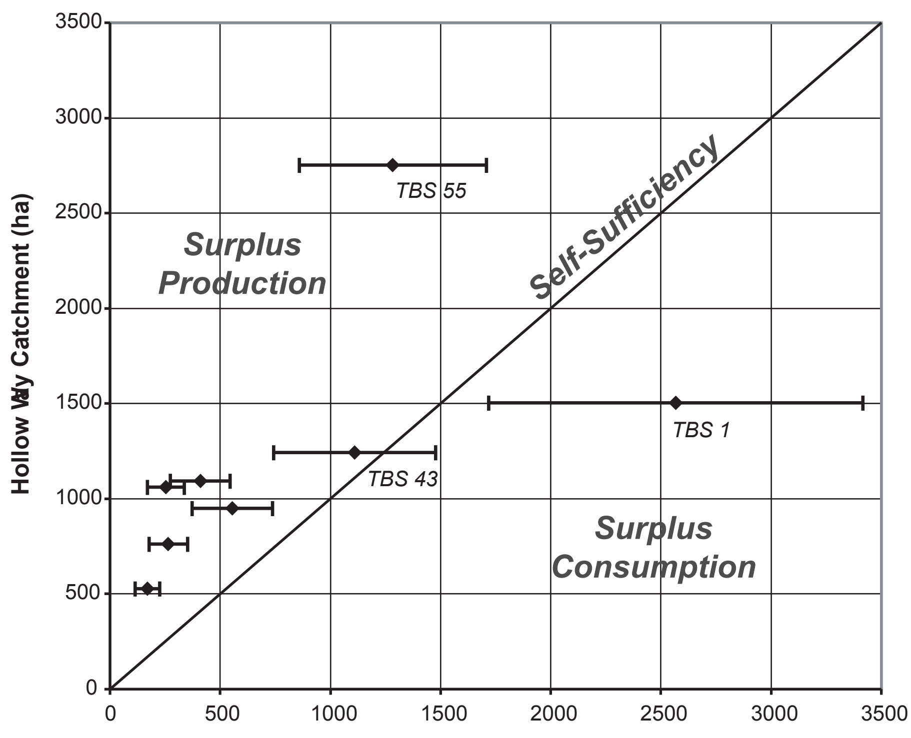


Fig. 5.23. Comparison of population-based required sustaining areas and hollow way-derived catchments. X-axis error bars show sustaining area range assuming 100 to 200 persons/ha settlement density; diamonds mark 150 person/ha sustaining area. Solid 45¼ line represents agricultural self-sufficiency; sites above produced surplus and sites below were net consumers.

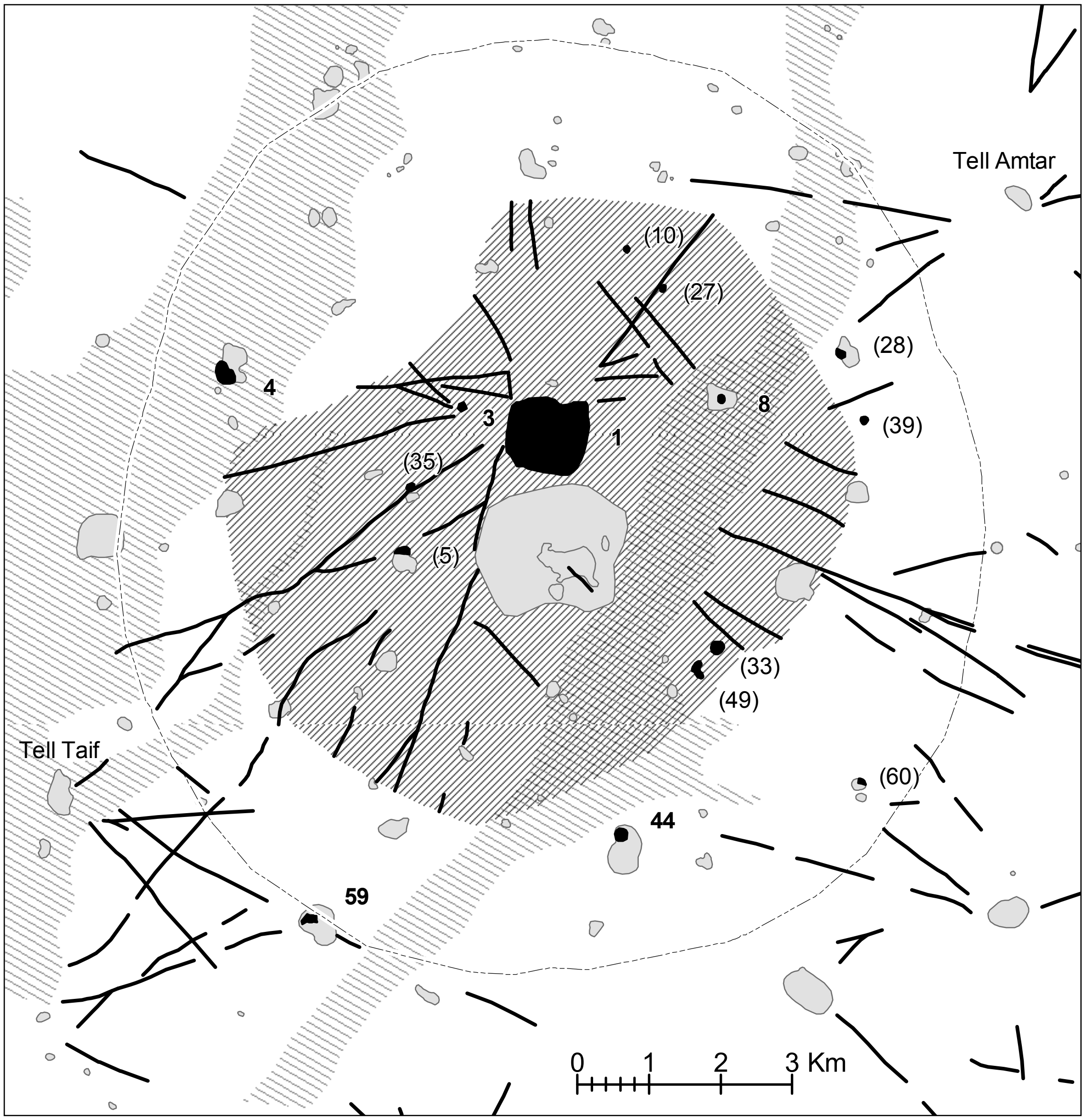


Fig. 5.24. Hollow way-derived catchment around Hamoukar.

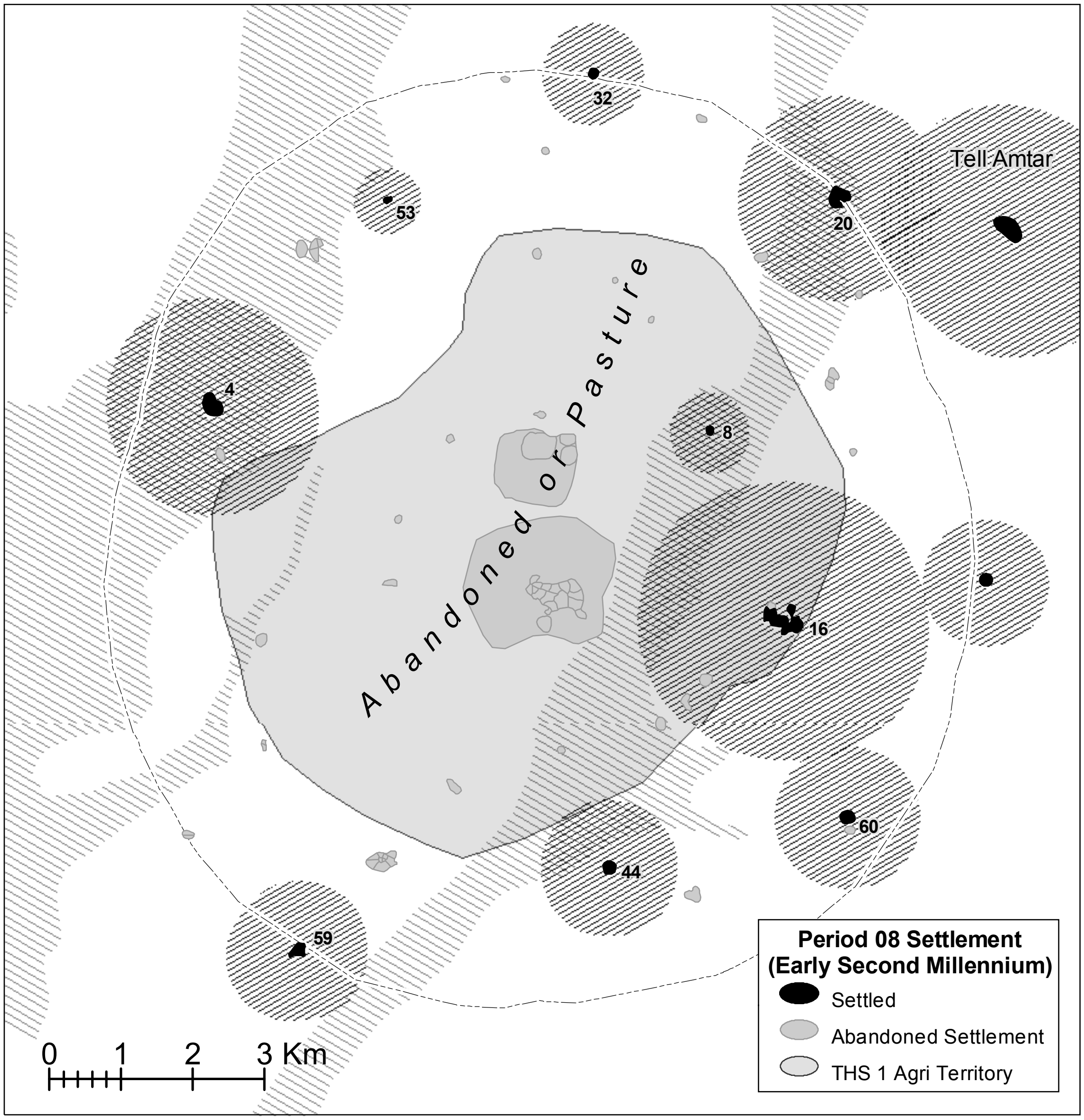


Fig. 5.25. THS Area, Period 08. Period 07 former agricultural terrain (light gray) and Period 08 estimated cultivated areas. Occupied sites (black) and abandoned settlement (dark gray). Period 08 sustaining areas based on 100 persons/ha settlement density, biennial fallow, 500 kg/ha yields.

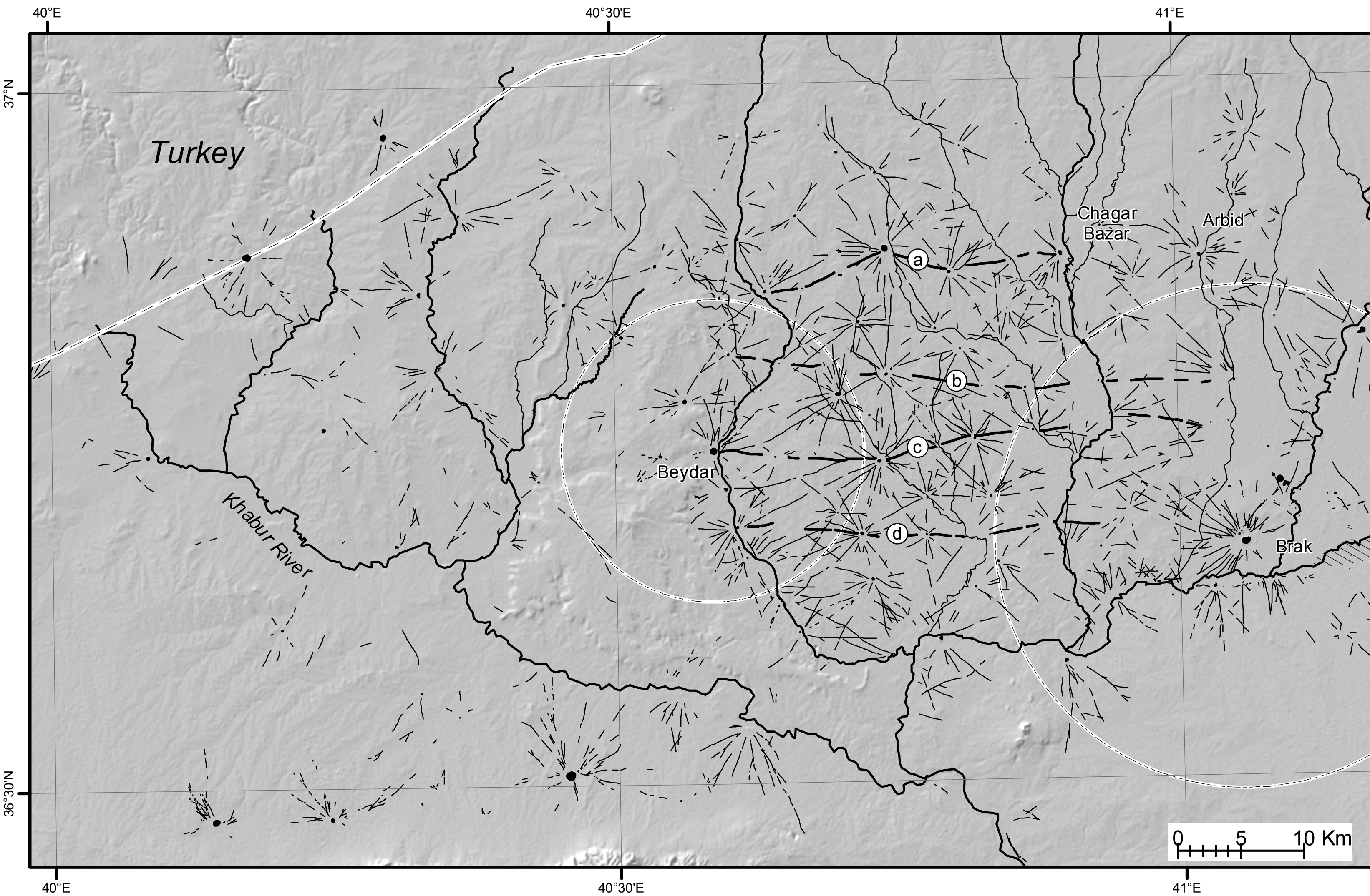


Fig. 5.26. Hollow ways in the central-western Upper Khabur basin. Sample interregional routes in bold. See also Table 5.2.

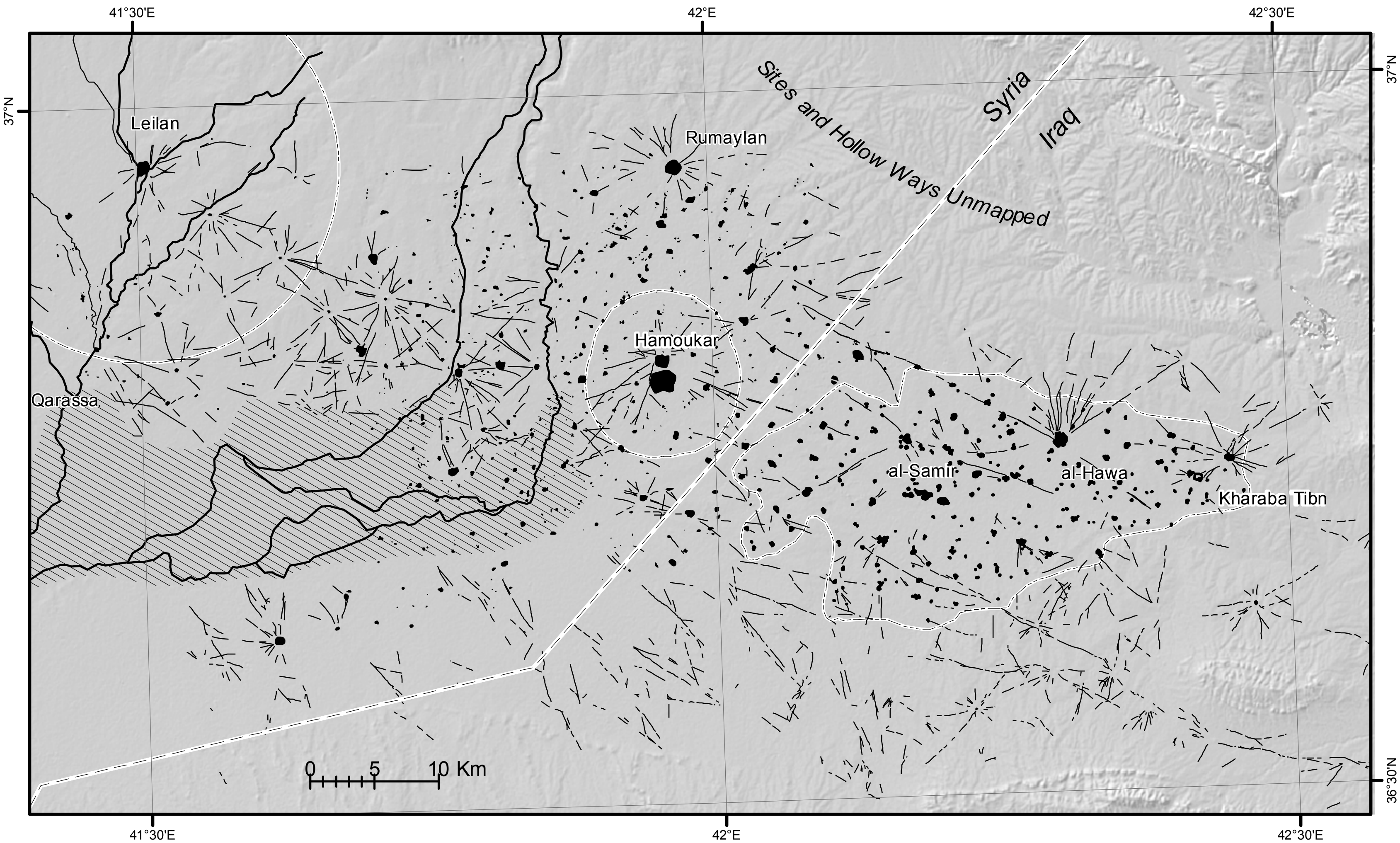


Fig. 5.27. Sites and broad hollow ways in the eastern Upper Khabur basin and Iraqi North Jazira Project area. NJP hollow ways based on Wilkinson and Tucker 1995.

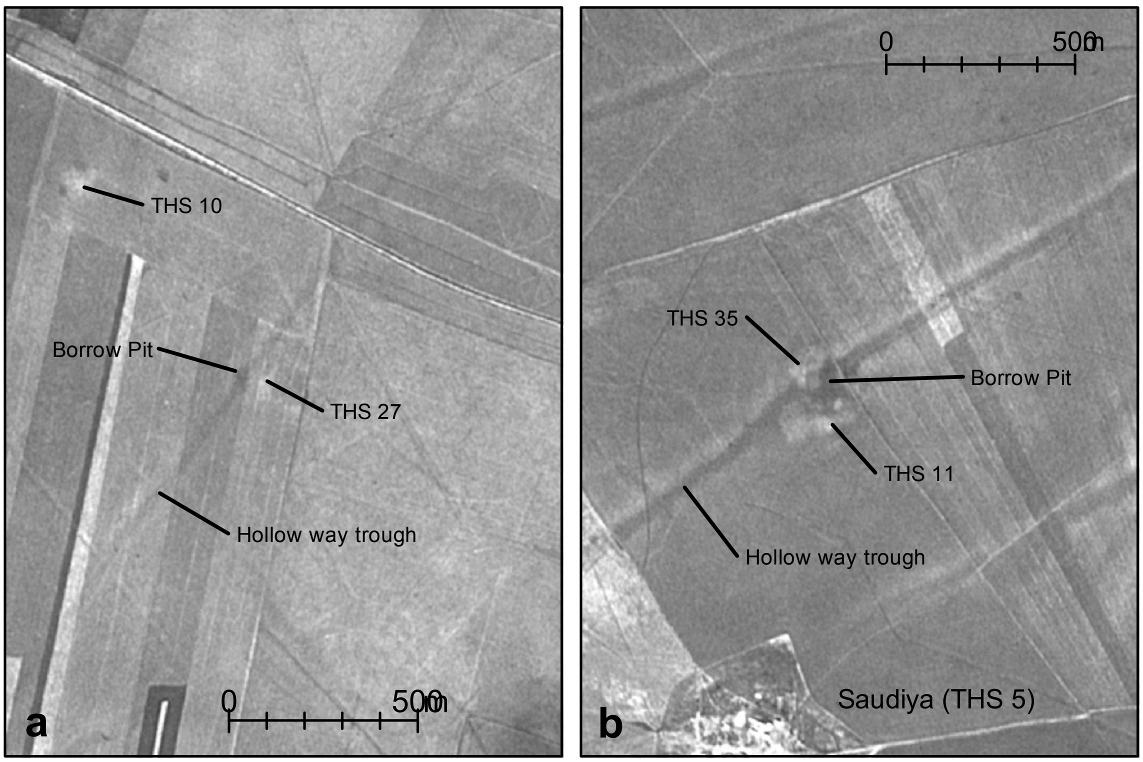


Fig. 5.28. Hollow way reuse for borrow pits during the Late Bronze (THS 11 and 27) and Parthian (THS 35) periods. CORONA 1108-1025DA005 (6 December 1969).

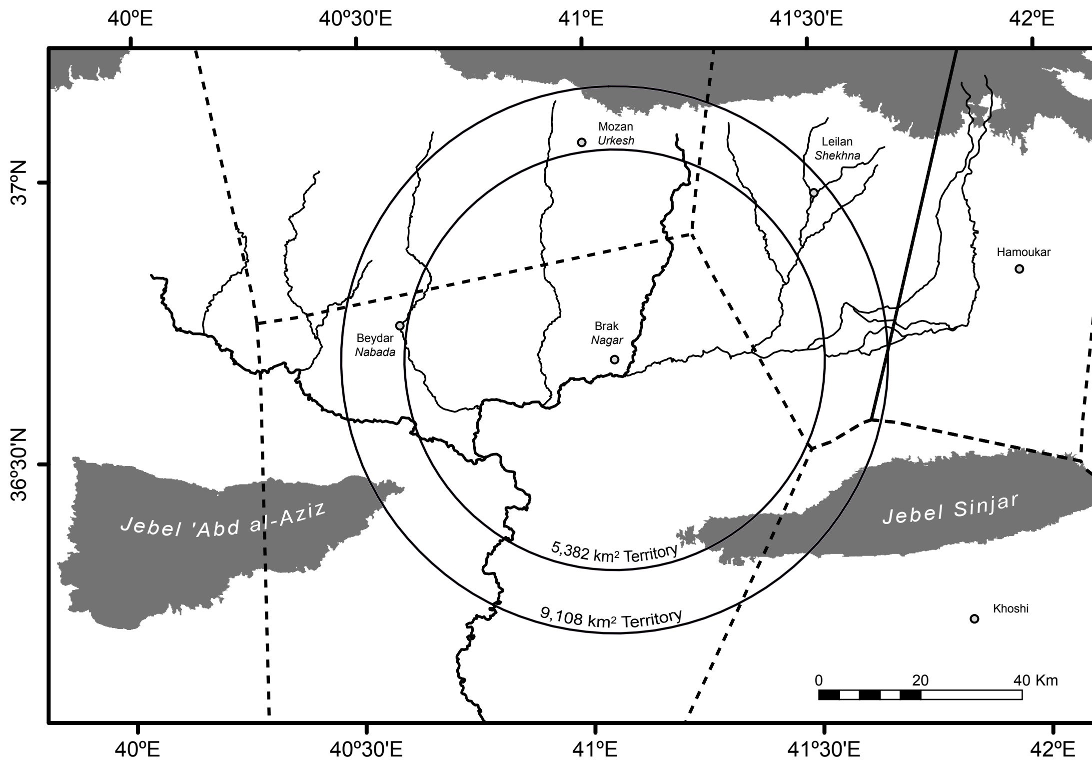


Fig. 6.1. The Upper Khabur Basin with circular territories (solid line) and distance allocation territories (dashed line). Terrain in gray is higher than 500 m above sea level.

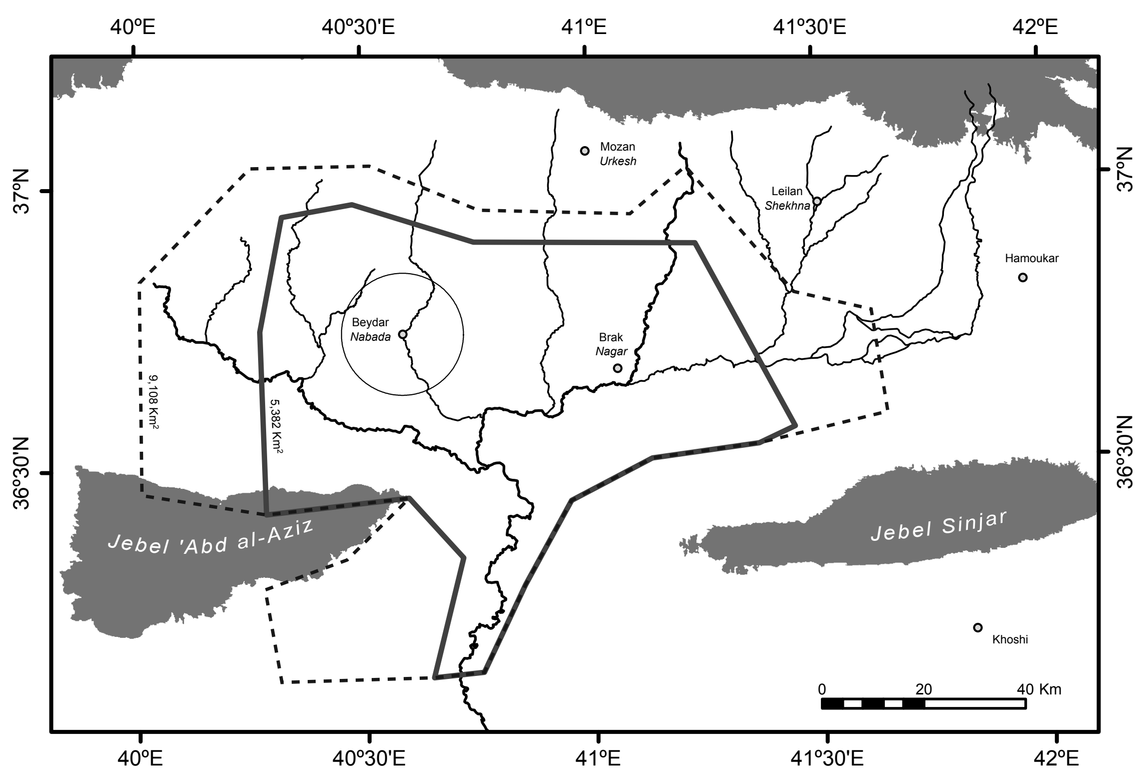


Fig. 6.2. The Upper Khabur Basin with hypothetical Nagar territories.

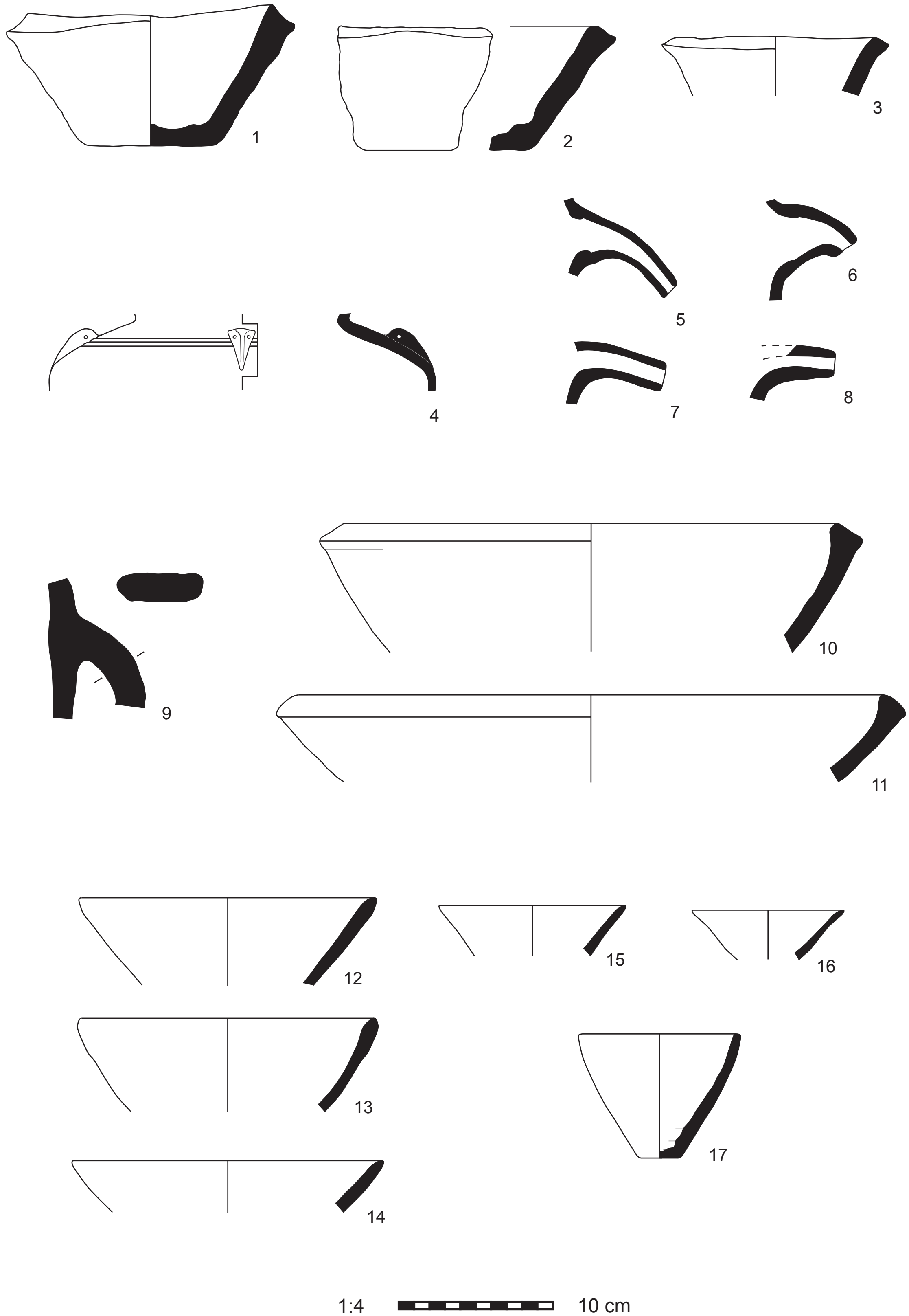
APPENDIX B:

MID-FOURTH TO EARLY SECOND MILLENNIUM SURVEY CERAMIC TYPOLOGY

This appendix contains representative drawings of the most common ceramic types used for dating sites of Period 05 (mid to late fourth millennium) through Period 08 (early second millennium. It is based on the typology used in the publication of the survey of the Iraqi North Jazira (Wilkinson and Tucker 1995) but modified to include information from recent publications of excavations in northern Iraq and northeastern Syria. The illustrated sherds are mostly derived from surface collections in the Tell Beydar and Tell Hamoukar Survey regions but occasionally include large profiles from the excavations at Hamoukar or sherds reproduced from the publication of Wilkinson and Tucker.

Type 6: Bevelled Rim Bowl.		
1.	Orange ext, orange-brown int, brown core; freq. coarse chaff, common fine-med. lime; mold-made. Base dm 8cm.	B.1092.7 THS 57G Kh. Melhem
2.	Orange-red surfs, black core with orange margins; freq. med.-coarse chaff, common sand; mold-made.	B.1092.6 THS 57G Kh. Melhem
3.	Pale orange surfs and core; common fine-med. chaff, freq. fine white grit. rim dm ca. 16cm.	A.385.26 THS 1 Unit 117
Type 18: Nose Lug.		
4.	Yellow slipped ext, orange surfs and core; occ. fine-med. lime.	B.75.7 THS 35
Type 19: Drooping Spout.		
5.	Pale orange surfs, orange core; common sand, occ. med. lime.	B.1095.14 THS 57I Kh. Melhem
6.	Pale orange surfs, orange core; common sand, occ. med. lime.	B.1095.13 THS 57I Kh. Melhem
7.	Yellow-green surfs and core; common sand, occ. med. lime.	B.1094.15 THS 57H Kh. Melhem
8.	Orange-pink surfs, orange-brown core; freq. sand, freq. fine lime.	B.1094.14 THS 57H Kh. Melhem
Type 120: Broad Strap Handle.		
9.	Yellow surfs, buff core; freq. sand, freq. fine-med. lime.	B.1094.13 THS 57H Kh. Melhem
Type 140: Oblique Rimmed Bowl.		
10.	Orange-brown surfs, thin grey core; common sand. Rim dm 36cm.	B.1092.5 THS 57G Kh. Melhem
11.	Yellow surfs, orange core; occ. fine sand, occ. fine lime. Rim dm 38cm.	B.1094.4 THS 57H Kh. Melhem
Type 421: Conical Cup.		
12.	Buff (slipped?) surfs, brown c ore with pink margins; common-freq. sand. Rim dm 19cm.	B.2052.13 THS 57A Kh. Melhem
13.	Orange surfs and core; common sand. Rim dm 19cm.	B.1094.12 THS 57H Kh. Melhem
14.	Buff surfs and core; occ. sand; fine fabric. Rim dm 20cm.	B.2054.6 THS 57C Kh. Melhem
15.	Pale orange surfs and core; freq.-abundant fine lime. Rim dm 12cm.	A.413.2 Area A Loc. 19 Fl. 2
16.	Buff and grey surfs, orange-brown core; common fine sand, common fine lime. Rim dm 13cm.	A.405.4 Area A Loc. 19 Fl. 1
17.	Orange surfs and core; freq. sand, freq. fine lime. Rim dm 10cm, base dm 2.4cm.	B.1095.9 THS 57I Kh. Melhem

Fig. A.1. Diagnostic types for Period 05a (southern Uruk). Scale 1:4.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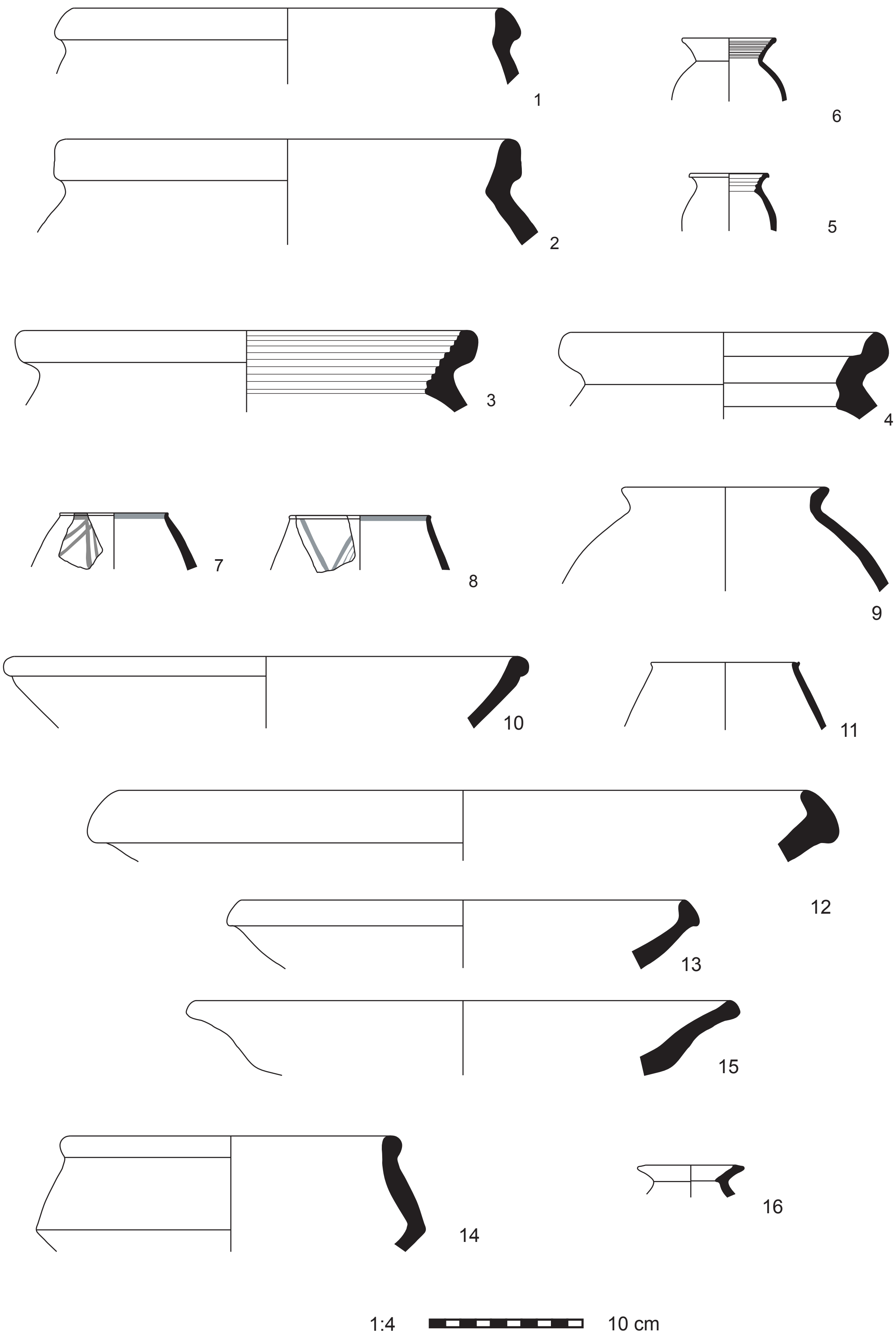
Type 12: Internally Hollowed Rim Jar.		
1.	Orange surfs, brown core with red-orange margins; freq. med. chaff. Rim dm 28cm.	B.2052.2 THS 57A Kh. Melhem
2.	Orange surfs, thick black core; freq. med. chaff. Rim dm 29cm.	B.2052.3 THS 57A Kh. Melhem
Type 14: Internally Grooved Jar		
3.	Buff surfs, black core; freq. med. chaff. Rim dm 29cm.	TBS 32.41 Tell Khatun
4.	Buff surfs, dark grey core; freq. med. chaff. Rim dm 20cm.	B.2065.2 THS 61
5.	[description unavailable]	A.533 Area B Loc. 16 Fl. 1
6.	[description unavailable]	A.463 Area B Loc. 29
Type 20: Small Carinated Bowl		
7.	Pale green smoothed surfaces and core; no visible temper. Rim dm 7 cm.	B.1700.8 Tell Naur
8.	Buff surfaces and core; no visible temper. Reddish brown painted decoration. Rim dm 9 cm.	B.1700.7 Tell Naur
Type 121: Sharply Outturned Rim Jar		
9.	Pale orange surfs, buff core; common sand. Rim dm 13cm.	B.2052.19 THS 57A Kh. Melhem
Type 138: Burnished Greyware		
10.	Grey burnished ext, grey int, black core; common med chaff, common fine lime. Rim dm 33cm.	TBS 32.47 Tell Khatun
Type 150: Grooved Rim Beaker		
11.	Yellow-buff burnished ext, buff int, brown core; no visible temper, fine dense fabric. Rim dm 9cm.	TBS 32.3 Tell Khatun
Type 152: Hammerhead Bowl		
12.	Orange surfs, thick black core; freq.-abundant med. chaff. Rim dm 45cm.	B.1050.2 THS 41
13.	Grey surfs, dark grey core; freq. med. chaff. Rim dm 29cm.	B.1095.6 THS 57I Kh. Melhem
Type 153: Casserole Bowl		
14.	Grey-brown surfs, black core; freq. med. chaff, common med. dark grit. Rim dm 21cm.	B.75.4 THS 35
Type 405: Scraped Exterior Shallow Bowl		
15.	Orange surfs, brown core; freq.-abundant med.-coarse chaff; scraped and scored exterior bottom. Rim dm 35cm.	A.373.2 THS 1 Unit 108
Type 406: Sharp Interior-Carination Fine Ware Jar		
16.	Buff-yellow surfs, orange core; rare fine lime. Rim dm 7cm.	TBS 41/2.2 T. Sekar Tahtani

Fig. A.2. Diagnostic types for Period 05b (LC3-5). Scale 1:4.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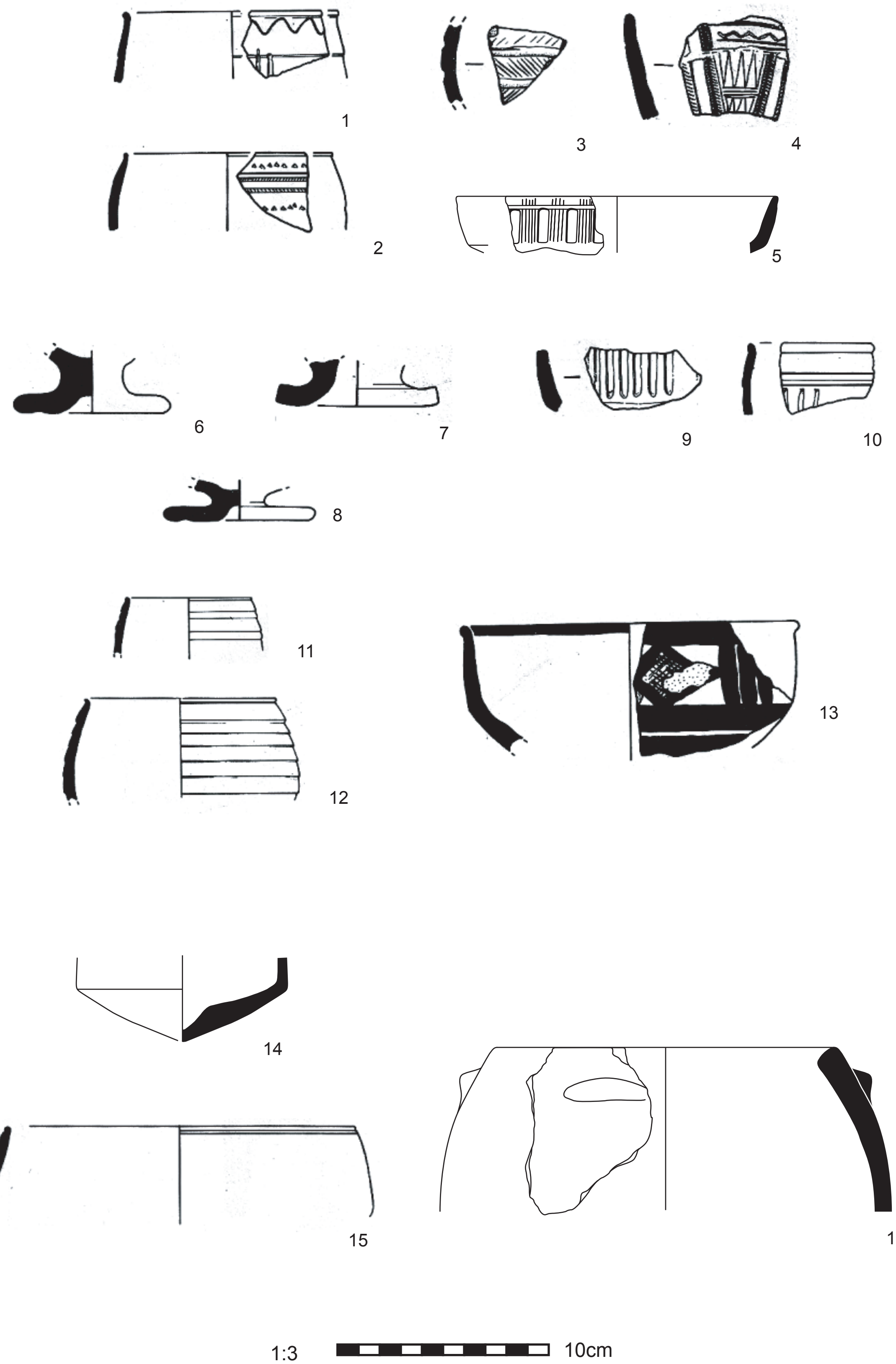
Type 22: Incised Gray Fine Ware.		
1.	Jar rim. Very pale greenish grey throughout; very hard; very fine fabric, some fine voids. Simple incised wavy line and broad vertical gouges.	NJS HW.B.37 no. 632
2.	Jar rim. Smooth fine grey fabric; very rare fine voids. (Note: this example shares some characteristics with excised Nin.5, namely the raised bar with oblique slashes).	NJS 86B no. 86.35
Type 23: Excised Gray Fine Ware.		
3.	Body sherd. Very pale grey-brown surfs., grey core; fine sand, common small voids, occasional chaff impressions on surfs. Broad horiz. gouges with short oblique incisions as infill.	NJS 14A no. 28
4.	Body sherd. Light grey core and int,, light greenish grey ext.; sparse chaff with small calcite grits. Smoothed surfs. Decoration includes: in upper panel, row of incised zigzags; in lower panel, incised zig-zag line, acute apices and oblique incisions on raised bands.	NJS HW.1 no. 206
5.	Buff surfaces and core; no visible temper. Vertical excised panels with vertical incised lines. Rim dm 15 cm.	TBS 60.14 Tell 'Aloni
Type 24: Pedestal Base.		
6.	Type 24A. Dark grey, pale grey surfs.; common fine chaff.	NJS HWA.103 no. 643
7.	Type 24C. Pale brown throughout; rare fine chaff voids.	NJS HW.M.119 no. 644
8.	Type 24A. Hard greenish grey, pale olive surfs.; occasional fine chaff voids, rare medium grits.	NJS HW.B.38 no. 645
Type 25: Vertical Grooved Fine Ware.		
9.	Body sherd. Pale greenish-grey throughout; moderately hard and fine, occasional fine sand. Vert. broad gouges on ext.	NJS HW.L.73 no. 649
10.	Bowl rim. Very pale yellowish-green core and ext.; sparse chaff, sand and calcite. Smoothed surfs., vert., parallel grooved lines below plain cordon; gouged line below ext. rim edge. Dia. 8 cm.	NJS HW.B.11 no. 203
Type 26: Ribbed Fine Ware.		
11.	Bowl rim. Pale grey throughout; very hard.	NJS 12D no. 1
12.	Bowl rim. Very hard greyish-green; very fine slightly granular fabric.	NJS 20A no. 100
Type 27: Painted Ware		
13.	Bowl. Very pale greenish-cream surfs. and body; common fine, occasional medium sand, purplish brown matt paint on ext. and rim int.	NJS 20A no. 61
Type 28: Pointed or Parabolic Base		
14.	Green-buff surfaces, buff core; no visible temper. Dm at carination 10 cm.	A.169.2 THS 1 Unit 66
Type 133: Fine Ware Beaded Rim Bowl		
15.	Bowl rim. Pale grey throughout; occasional small calcite grits. Smoothed surfs., grooved line beneath ext. rim edge.	NJS 43H no. 202
Type 426: Crescent Handle Holemouth Cooking Ware		
16.	Red-brown surfaces with burnished exterior; abundant medium-coarse dark grit. Horizontal lug handle. Rim dm 16 cm.	A.371.2 THS 1 Unit 106

Fig. A.3. Diagnostic types for Period 06 (Ninevite 5). NJS sherds from Wilkinson and Tucker 1995. Scale 1:3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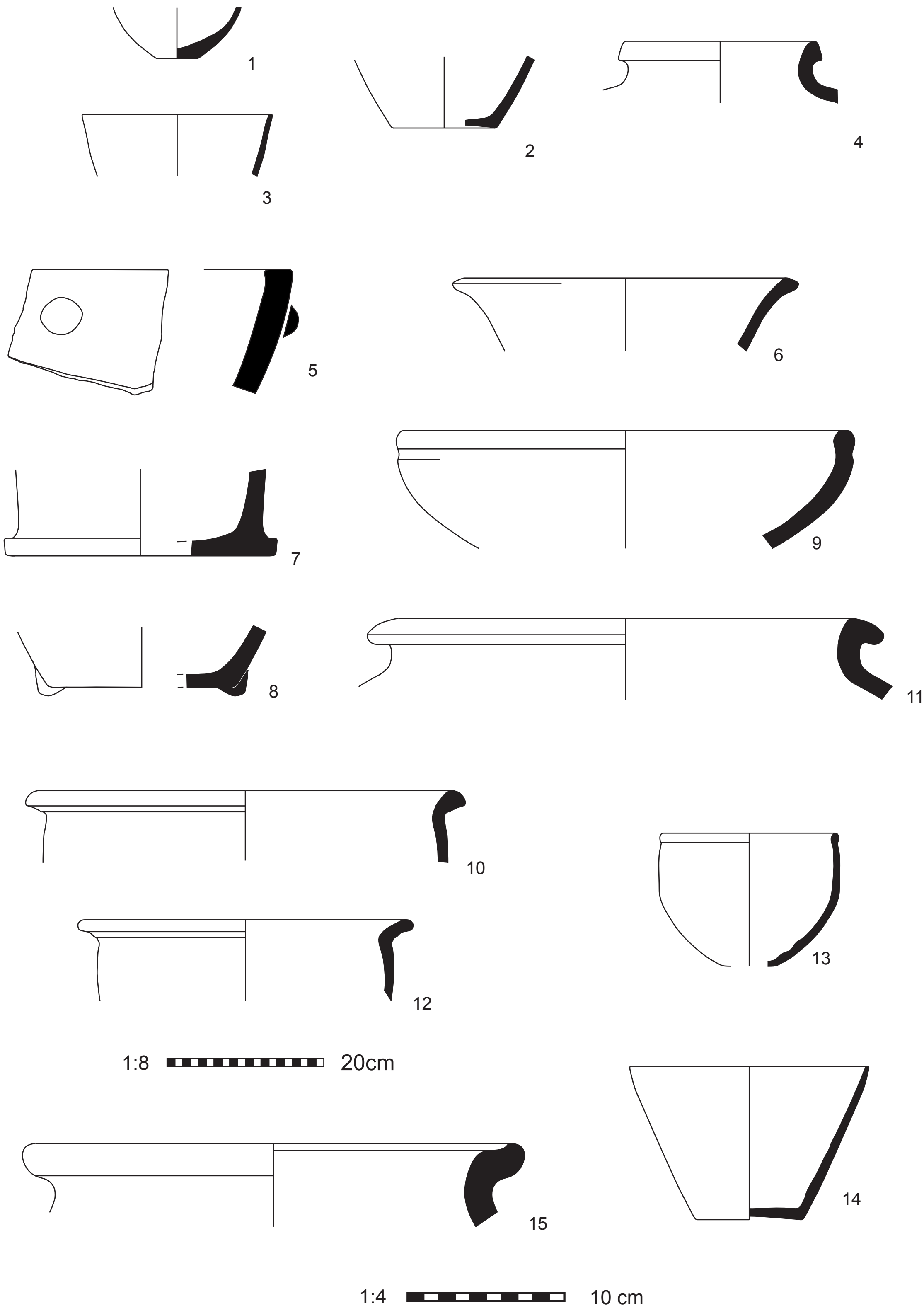
Type 29: Flat-Based Bowl.		
1.	Grey-green surfs, green core; sandy fabric, possibly overfired. Base dm 2.25cm.	A.283.14 Area A Loc. 4 Fl. 3
Type 30: Flat-Based Beaker.		
2.	Pale green surfs and core; no visible temper. Fine fabric. Base dm 6.5cm.	A.377.8 Area D
Type 33: Calcareous Stoneware.		
3.	Yellow and reddish-brown streaked surfs, grey core; no visible temper. Rim dm 12cm.	B.1700.1 THS 59B Tell Naur
Type 103 Band- or Indented-Rim Jar.		
4.	Pale yellow-green surfs, buff core; common fine sand, occ. med. chaff. Rim dm 12cm.	A.283.9 Area A Loc. 4 Fl. 3
Type 154: Lugged Large Bowl.		
5.	Pale yellow surfs, orange-brown core; common fine chaff. Rim dm 46cm.	A.174.1 THS 1 Unit 73
Type 401: Large Flaring-Rim Vat		
6.	Yellow surfs, pink core; common sand, common med. chaff. Rim dm 41cm.	A.353.5 Area D
Type 402: Flat Extended-Foot Base		
7.	Pale yellow surfs, orange-pink core; common fine chaff, common fine-med. lime. Base dm 23cm.	A.366.1 THS 1 Unit 102
Type 403: Lug-Footed Base		
8.	Pale yellow-green ext, buff int, buff-grey core; freq. sand, occ. fine chaff. Base dm at carination 16cm.	A.161.6 THS 1 Unit 60
Type 404: (Grayware) Round Rim Bowl		
9.	Grey lightly burnished ext, grey int and core; occ. fine sand. Rim dm 28cm.	A.354.7 Area D
Type 407: Folded-Rim Straight-Sided Jar		
10.	Pale yellow-green surfs and core; common med. sand, common med. chaff. Rim dm 53cm.	A.151.4 THS 1 Unit 50
Type 408: Triangular Cooking Ware Jar Rim		
11.	Orange-brown burnished surfs, black core; occ. fine chaff, abundant fine-med. dark grit. Rim dm 29cm.	A.189.6 THS 1 Unit 87
Type 412: Folded Ridged Jar Rim		
12.	Yellow-green surfs and core; freq. med. chaff, freq. sand. Rim dm 41cm.	A.353.4 Area D
Type 413: Beaded Rim Cup		
13.	Grey-green surfs and core; no visible temper, fine sandy fabric. Rim dm 11cm.	A.316.2 Area A Loc. 14 Fl. 2
Type 414: Fineware Straight-Sided Cup		
14.	Yellow-green surfaces and core; occasional fine lime, common ware. Wheel striations. Base dm 5.5 cm.	C.277.3 THS 1 Area D Loc. 6
Type 423: Lid-Seated Storage Jar Rim		
15.	Yellow to buff exterior, pink-orange interior and core; common fine-medium lime and fine chaff. Rim dm ca. 38 cm.	TBS 59/2.1 Tell Jamilo

Fig. A.4. Diagnostic types for Period 07 (mid to late third millennium BC). Nos. 6, 10 and 12 scale 1:8; all others scale 1:4.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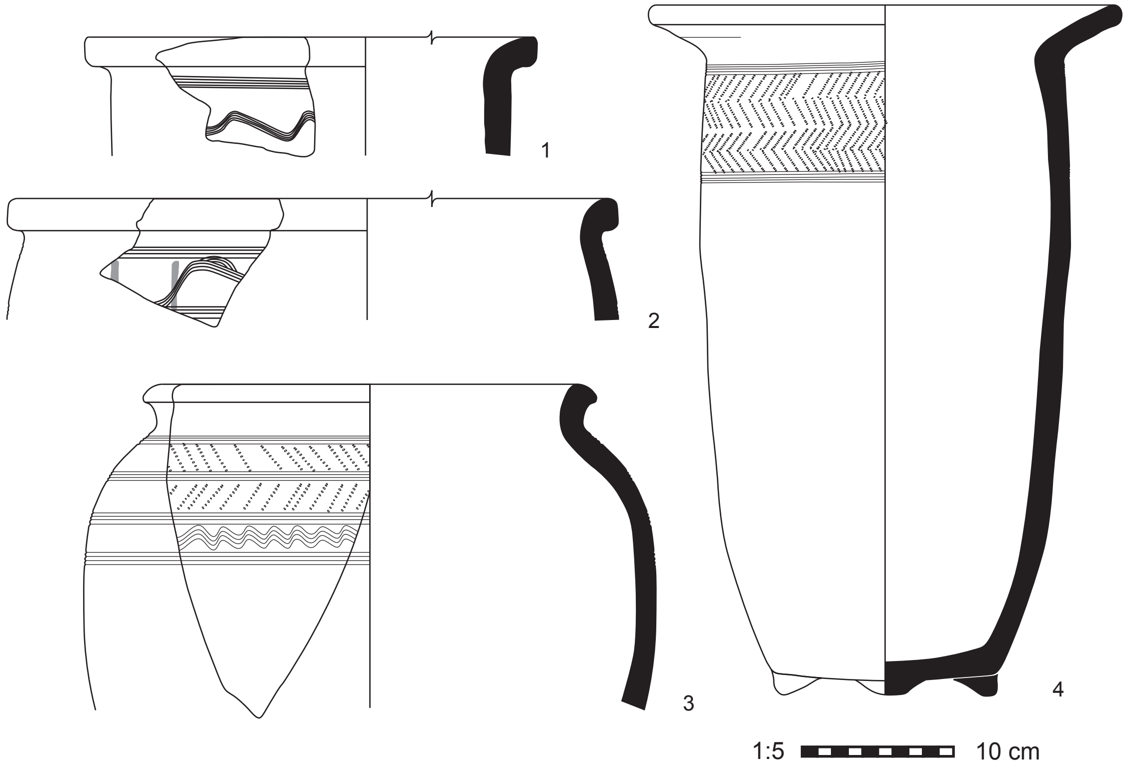
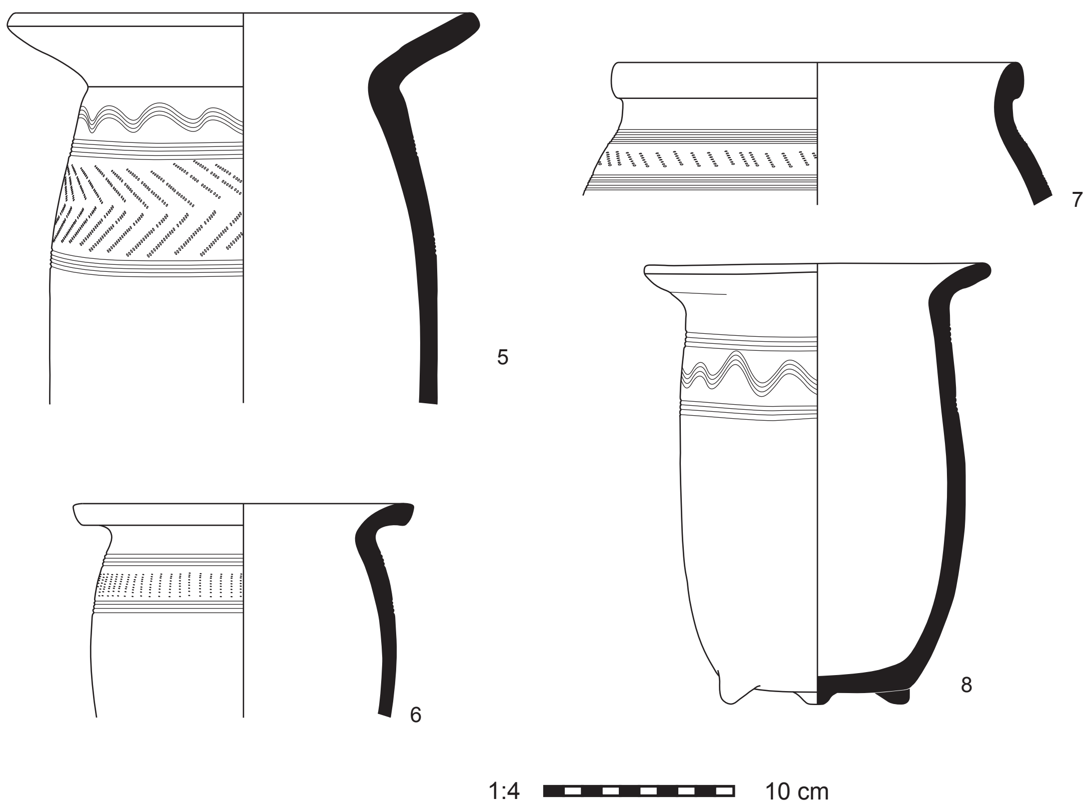
Type 32: Comb-Incised Ware.		
1.	Yellow-green surfaces, pale green core; frequent fine chaff, occasional fine lime. 4pt bands of comb incision. Rim dm 27 cm..	B.526.24 THS 8 Tell al-Sara
2.	Buff surfaces, gray core; frequent fine-medium chaff. 4pt bands of comb incision, with two vertical smears of black paint or bitumen. Rim dm 37 cm.	B.1701.1 THS 59C Tell Naur
3.	Pale yellow surfaces and core; common fine chaff, occasional fine-medium lime. 4pt bands of comb incision with 9pt diagonal punctate. Interior vertically scraped. Rim dm 22 cm.	C.1926.2 THS 1 Area D Loc. 11
4.	Pale yellow surfaces, pink core; common medium-coarse chaff. 4pt bands of comb incision, with 13pt diagonal punctate lines. Interior body vertically scraped. Rim dm 28 cm; base dm 15 cm at carination.	C.1914 THS 1 Area D Loc. 11
5.	[no desc. Available]	C.3195 THS 1 Area C
6.	Pale yellow surfaces, pink-orange core; common fine chaff and occasional fine-medium lime. Exterior surface wet-smoothed. Interior vertically scraped. 4pt bands of comb incision with 9pt vertical punctate lines. Rim dm 17 cm.	C.1712 THS 1 Area D Loc. 17
7.	Green-buff surfaces and core; common medium chaff, fine sand. 7pt bands of comb incision with 7pt diagonal punctate lines. Rim dm ca. 21 cm.	CB 2570 CB Area D Loc. 10
8.	Pale yellow surfaces, pink core; common fine-medium chaff. 4pt bands of comb incision. Rim dm 18 cm.	C.1730 THS 1 Area D Loc. 22

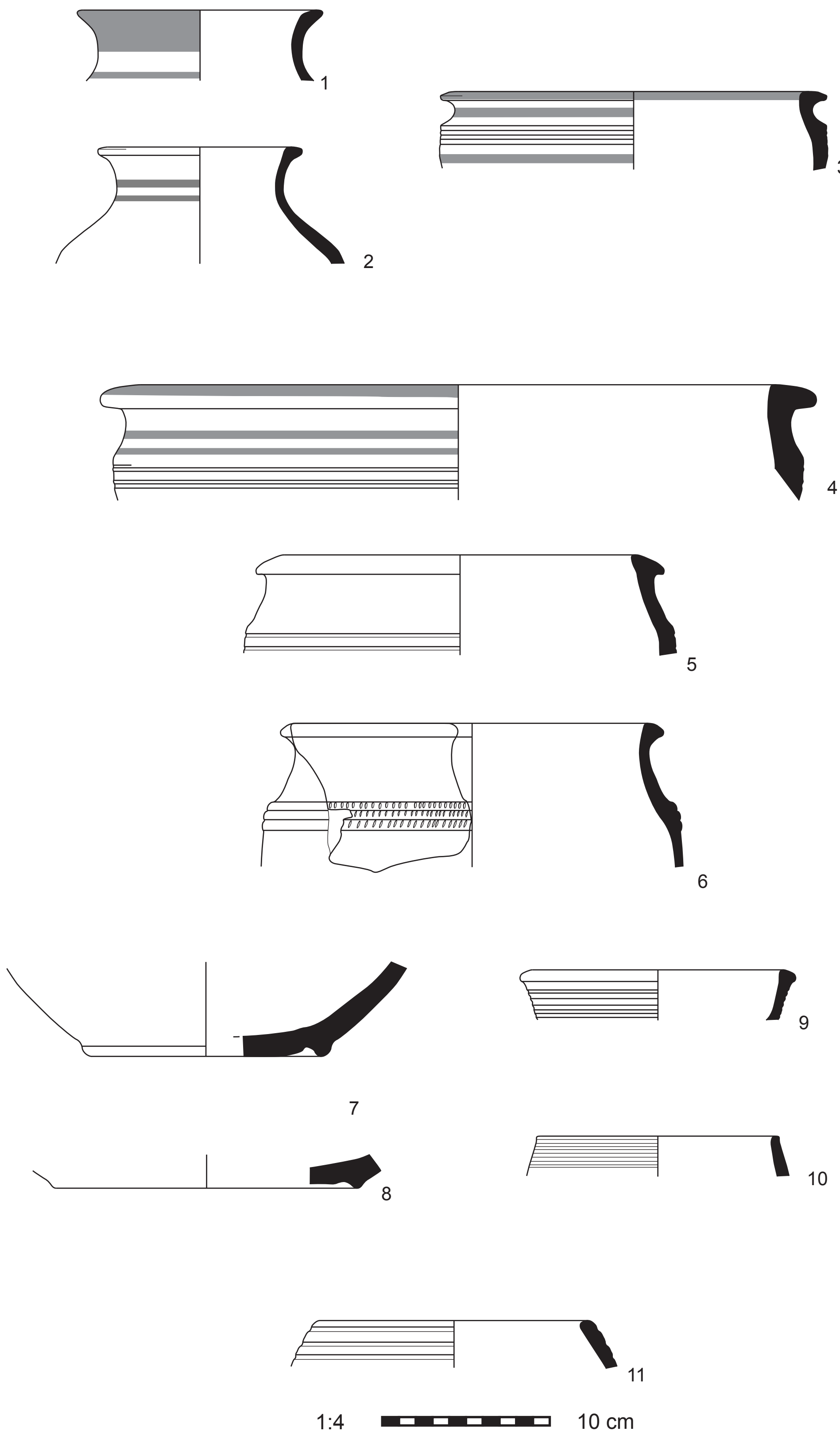
Fig. A.5. Type 32 comb incised sherds (late or post-Akkadian). No. 4 scale 1:5; all others scale 1:4.


1
2
3
4
1:5
10 cm


5
6
7
8
1:4
10 cm

Type 34: Khabur Painted Ware.		
1.	Buff surfs; freq. fine-med. chaff, occ. lime; dark brown painted bands. Rim dm 14cm.	B.1106.18 THS 44A Umm Adham
2.	Pink ext, red int, dark brown core; common very fine lime; red painted bands. Rim dm 11cm.	B.526.1 THS 8A Tell al-Sara
3.	Yellow-buff surfs, buff core; common med. chaff; raised band of grooves and dark red painted bands. Rim dm 20cm.	B.141.5 THS 16J Kh. al-Abd
4.	Buff surfs and core; occ.-common fine chaff; dark red painted bands and grooves. Rim dm 38cm.	B.1080.1 THS 4E Tell Tamr
Type 35: Jar with Horizontally Grooved Shoulder.		
5.	Yellow-green surfs, green core; occ. med. chaff, common sand. Rim dm 21cm.	B.160.10 THS 16G Kh. al-Abd
6.	Light pink surfs, orange-pink core; freq. fine lime; 3 notched ridges. Rim dm 21cm.	B.526.22 THS 8A Tell al-Sara
Type 40: Channel Base.		
7.	Orange surfs, brown core; common med. chaff. Base dm 13cm.	B.160.15 THS 16G Kh. al-Abd
8.	Buff surfs, orange core; common fine-med. chaff, rare fine lime. Base dm 18cm.	B.161.5 THS 16H Kh. al-Abd
Type 41: Burnished Gray Ware Bowl.		
9.	Pale grey surfs, grey core; rare sand, rare fine chaff, fine fabric. Rim dm 15cm.	B.1701.19 THS 59C Tell Naur
10.	Pale grey surfs, grey core; rare sand, rare fine chaff, fine fabric. Rim dm 14cm.	B.1701.20 THS 59C Tell Naur
Type 42: Externally Grooved Bowl.		
11.	Grey burnished surfs; occ. med. chaff, common fine white grit. Rim dm 16cm.	B.1106.25 THS 44A Umm Adham

Fig. A.6. Diagnostic types for Period 08 (Khabur, early second millennium). Scale 1:4.


1
2
3
4
5
6
7
8
9
10
11
1:4
10 cm

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